

Politicians' Luck of the Draw: Evidence from the Spanish Christmas Lottery*

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Abstract

It is well known that incumbent politicians tend to receive more votes when economic conditions are good. In this paper we explore the source of this correlation, exploiting the exceptional evidence provided by the Spanish Christmas Lottery. This is a unique lottery: 75% of Spaniards play, sharing tickets, and every year at Christmas 0.3% of the Spanish GDP is at stake. Because winning tickets are mostly sold by one lottery outlet, winners tend to be geographically clustered. These features allow us to study the impact of exogenous good economic conditions on voting behavior. We find that incumbents receive significantly more votes in winning provinces. Given that individuals are well aware of the random nature of the shock, it is unlikely that this effect is due to voters wrongly attributing economic conditions to the government. Moreover, information from surveys from the same period shows that Christmas Lottery prizes increase the propensity to vote for the incumbent, but they do not affect respondents' assessment of the government. The evidence is consistent with a temporary increase in happiness making voters more lenient toward the incumbent, or with a stronger preference for the status quo.

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1 Introduction

In the 1980 U.S. presidential election campaign, where incumbent President Jimmy Carter was running against Ronald Reagan, in one of the debates Reagan asked American voters the following question:

“Next Tuesday all of you will go to the polls, will stand there in the polling place and make a decision. I think when you make that decision, it might be well if you would ask yourself, are you better off than you were four years ago?”¹

Years later, during his successful 1992 presidential campaign against incumbent George H. W. Bush, Bill Clinton put it more bluntly:

“It’s the economy, stupid!”

These quotes reflect the main idea behind economic voting: when economic conditions are good, voters tend to vote for the incumbent. There is substantial evidence showing a robust correlation between economic outcomes and the re-election of incumbent politicians in elections.² According to Lewis-Beck and Stegmaier (2007), approximately 400 books and articles on economic voting have been published.³

It is unclear what the positive correlation between good economic outcomes and re-election reflects. In a context of asymmetric information, voters may interpret economic conditions as a signal of incumbent’s ability or effort, and thus apply a simple retrospective voting rule (Nordhaus 1989). This correlation may be also partly due to voters’ systematic *attribution errors*. There is experimental evidence in social psychology finding that subjects aiming to assess competence systematically fail to take sufficient account of background or environmental factors (Ross and Nisbett 1991).

It is difficult to disentangle empirically why economic outcomes affect voting behavior. A problem that is common to most empirical studies tackling this issue is how to identify variations in economic conditions that are independent from incumbents’ actions. Even in the case of seemingly exogenous events such as natural disasters, where incumbents may not have direct control over the event itself, the incumbents may be plausibly held responsible by voters for either preparation or response. In this paper, we manage to overcome these problems by exploiting the exceptional evidence provided by a unique randomized natural experiment at the macroeconomic level: the Spanish Christmas Lottery. This lottery, held every Christmas, offers several convenient features. First, the Christmas Lottery is a syndicate lottery: around 75% of Spaniards participate in the lottery, and they typically share tickets with family, friends, and co-workers. In other words, the Spanish Christmas Lottery is more of a social event than a gamblers’ lottery. Second, instead of awarding one big prize to a few individuals, as is the case in most lottery systems, the top prize, known as *the Fatty* (“el Gordo”),

¹As quoted by Lewis-Beck and Stegmaier (2007).

²A well-known example of a current politician who may have benefited from good economic conditions is Hugo Chávez. Chávez’s popularity in Venezuela has likely been helped by the sharp rise in the price of oil, the country’s only significant export: when Chávez took office in 1998, the price of oil was \$11 a barrel—the price peaked in July 2008 at \$147, a time during which Chávez was enjoying high popularity (“Socialism with cheap oil”, *The Economist*, December 30th, 2008; “An axis in need of oiling”, *The Economist*, October 23, 2008).

³See the literature review in the next Section for details.

awards many relatively small prizes to several thousand individuals sharing the same ticket number. Third, its economic impact is very large: Spaniards spend approximately €3 billion on the Christmas Lottery, amounting to about 0.3% of the Spanish GDP (in 2009, the average Spaniard spent €70 on the Christmas Lottery). Because each number is mostly sold by one lottery outlet, winners tend to be geographically clustered. In the period we consider, the main winning province receives a mean income shock equivalent to 3% of its GDP.

Given these features, this paper uses provincial information on Christmas Lottery top prizes and expenditure from 1986 through 2008 to identify random variations in annual provincial income. We find a significantly positive effect on national electoral outcomes. In a province receiving Christmas Lottery awards equivalent to 1% of per capita GDP, the incumbent party enjoys a significant increase in the share of votes of approximately 0.21 percentage points.

Because it is public knowledge that the incumbent cannot affect which province receives *the Fatty*, our results rule out explanations according to which voters may be rewarding the incumbent. The data also seem to reject the possibility that voters are subject to some type of attribution error. Since winners are well aware of the random nature of lottery, it is unlikely that they are wrongly attributing variation in their economic conditions to the government. Moreover, information from surveys from the same period shows that Christmas Lottery prizes increase the propensity to vote for the incumbent, but they do not affect respondents' assessment of the government.

Therefore, the positive correlation that we observe between good economic outcomes and incumbent re-election must be explained by some other factor. There are at least two possible explanations that are consistent with the observed evidence. First, it might be due to psychological factors: perhaps when economic outcomes are good, voters become more lenient toward the incumbent; perhaps because they feel happier. This would be consistent with the evidence in Healy et al. (2010), who, using information from a completely different setting (local college football games), find that the outcome of U.S. local college football games just before an election affects the incumbent's re-election. Based on this, they argue that personal well-being might influence voting decisions on a subconscious level. Second, perhaps when voters become richer they become more conservative and, in turn, their preference for the status quo increases.

The rest of the paper is organized as follows. Section 2 offers a literature review. In Section 3 we describe the background information on Spanish elections and the Spanish Christmas Lottery. Section 4 describes the data, and Section 5 turns to the empirical analysis. Section 6 discusses the results and concludes.

2 Literature review

There is vast empirical evidence going back to at least the 1940s documenting the existence of economic voting: incumbent politicians tend to obtain more votes when the economic situation is relatively better. The earlier studies focused on the relationship between U.S. voting behavior and a number of measures that capture the macroeconomic situation.

Pearson and Myers (1948) found support for the hypothesis that voters tend to vote for the continuation of administrations that have been in power during prosperous times, and to vote against the incumbent administration when times are bad. A number

of studies from the 1940s and 1950s use either price indices or indices of economic activity, in either longitudinal or cross-sectional studies (e.g., Gosnell and Coleman (1940) use data from 65 Pennsylvania counties). In general, those simple early studies tend to find a positive correlation between good outcomes and incumbent re-election, even though the estimated effect is small and the relationship sometimes fails to be systematic (Kramer 1971).

Kramer (1971) used data from U.S. congressional elections over 1896-1964 and found a connection between the re-election of the incumbent party and real personal income. The results are in line with those in Fair (1978), who analyzes data from U.S. presidential elections: he finds a correlation between both the growth rate of real per capita GNP and the change in the unemployment rate and the U.S. president's chances of re-election. Lewis-Beck (1988) provides similar findings using data from national elections in OECD countries. More recently, Brender and Drazen (2008) examine a large panel of countries and find a correlation between economic growth and incumbents' re-election in less developed countries and new democracies, but not in developed countries, with the exception of the U.S.

While the existence of economic voting seems to be a stylized fact, its causes are not yet well understood. One problem is the endogeneity of economic conditions. A number of studies try to disentangle the effect of competence from the effect of luck on re-election using a number of identification strategies. Wolfers (2002) finds that, in the US, voters in oil-producing states tend to re-elect incumbent governors during oil price rises, and attributes it to voters' *attribution errors*. This hypothesis is consistent with Weber et al. (2001), who, in an economics lab experiment, find that subjects attribute differences in outcomes to differences in the effectiveness of leaders.⁴ Leigh (2009) finds that incumbents in national elections benefit from economic growth in the world economy. There is also a body of research that exploits evidence from either natural disasters (Healy and Malhotra 2010) or terrorist attacks (Gardeazabal 2010, Montalvo 2010). A problem common to these papers is that, even in the case of seemingly exogenous events, where incumbents may not have direct control over the event itself, the incumbents may be plausibly held responsible by voters for either preparation or response. Using information from lottery winnings should mitigate this concern.

There is a growing literature that is turning to lottery data in order to examine the importance of exogenous (unearned) income shocks on a number of decisions. For instance, Imbens et al. (2001) study the effects on labor supply, earnings, savings and consumption. Other authors have analyzed the effect of lottery earnings on health and mortality (Lindahl 2005), on physical and mental health (Apouey and Clark 2009), on marriage and divorce (Hankins and Hoekstra 2010), and on individual bankruptcy (Hankins et al. 2010). Kuhn et al. (2010) analyze how lottery prizes affect winners

⁴Subjects played an abstract coordination game similar to many organizational problems. Previous research showed that when larger groups play the game, they rarely coordinate on the Pareto-optimal (efficient) outcome, but small groups almost always coordinate on the efficient outcome. After two or three periods of playing the game, one subject who was randomly selected from among the participants to be the "leader" for the experiment was instructed to make a speech exhorting others to choose the efficient action. Based on previous studies, the authors predicted that small groups would succeed in achieving efficiency but that large groups would fail. Based on social psychological studies of the fundamental attribution error, they also predicted that the subjects would underestimate the strength of group size and attribute cause to personal traits of the leaders instead. Confirming this hypothesis, the authors find that leaders were credited for the success of the small groups, and blamed for the failure of the large groups.

consumption, as well as their neighbors'. They find that effects on winners are largely confined to cars and other durable goods, and that there are relatively substantial effects on the purchases of cars by winners' neighbors.⁵ Our paper shares a caveat with the other lottery studies in that our results may not be typical responses to other forms of unearned income.

Our paper differs from these studies in several respects. We study an unusual lottery system of syndicate play, the Spanish Christmas Lottery. In contrast to most lottery systems, which are gamblers' lotteries, a vast majority of Spaniards participate in the Christmas Lottery, more of a social event: about 75% of the Spanish population aged 18 or more participate.

In general, lottery studies analyze the effect of exogenous increases in individual income. However, our research question looks at how improvements in economic conditions affecting a whole community are connected with the re-election of incumbents. In that sense, the lottery system we analyze here provides a unique setting to study economic voting: we estimate the effect of an unexpected income shock on several thousands of winners residing in the same geographic area. This effect might be very different from that of an unexpected income shock affecting an isolated individual.

3 Background

3.1 Spanish political system

Spain is a relatively young democracy. After Franco's death in 1975, a Constitution was passed establishing Spain as a democratic constitutional monarchy. In what follows, we discuss the system of national elections from the end of Franco's dictatorship onward.

After the first election in 1977, Spain was ruled until 1982 by the Union of the Democratic Center (*Unión de Centro Democrático*), a centrist party which collapsed in 1982 due to internal conflicts. The 1982 elections gave an absolute majority to the *Partido Socialista Obrero Español* (the main left-wing party, henceforth Socialist Party), which was led by Felipe González. González, leading the Socialist Party, later won the 1986, 1989 and 1993 elections. In March 1996, José María Aznar's *Partido Popular* (the main right-wing party, henceforth People's Party) received more votes than any other party, winning almost half the seats in the Congress. Prime Minister Aznar was re-elected in March 2000, obtaining absolute majorities in both chambers of parliament. For the March 2004 elections, the People's Party nominated Mariano Rajoy to replace Aznar as candidate. However, in the aftermath of the March 11

⁵Kuhn et al. (2010) analyze the effects of prizes in the Dutch Postcode Lottery, probably the closest lottery to the Spanish Christmas Lottery. The Dutch Postcode Lottery (*Nationale Postcode Loterij*) is also a lottery system awarding winners in the same geographical location: the participant's 6-digit postcode. Just as in the case of the Spanish Christmas Lottery, the popularity of the Dutch Postcode Lottery may be due to its potential to induce regret among nonparticipants, as nonparticipants living in a winning code know that, had they purchased a ticket, they would have won (Zeelenberg and Pieters 2004).

There are at least three differences between the Spanish Christmas Lottery and the Dutch Postcode Lottery. First, the participation in the Spanish Christmas Lottery is much higher (approximately 75% vs. 30%, respectively). Second, participants in the Dutch Postcode Lottery win relatively little money: most winners get €12,500 per ticket, compared to €300,000 received by the average Spanish Christmas Lottery winner. Third, Dutch Postcode Lottery winners form a much smaller group: on average, 19 households live in a postcode, while approximately 2,000 winning tickets share in *the Fatty* awards.

terrorist bomb attacks in Madrid, the People’s Party lost the 2004 elections to the Socialist Party and its leader José Luis Rodríguez Zapatero. Rodríguez Zapatero was appointed Prime Minister after having secured the support of a few minor parties. In the 2008 general elections, Prime Minister Zapatero was re-elected by a plurality, short of a majority.

In sum, between 1986 and 2008, the period we consider in this paper, there have been seven elections and Spain has been ruled by the two main parties: the Socialist Party (for 14 years) and the People’s Party (for eight years).

3.2 The Spanish Christmas Lottery

3.2.1 Origin and tickets

The Spanish Christmas Lottery (*Lotería de Navidad de Navidad* or *Lotería del Gordo*) is a national lottery game which is held every year the 22nd of December, and is considered the biggest lottery event worldwide. It has been organized since 1812 by the National Lottery Organization (*Organización Nacional de Loterías y Apuestas del Estado*), a branch of the Spanish Public Administration. The Spanish Christmas Lottery In 2008, the value of all tickets sold was approximately €3 billion, representing roughly 0.3% of Spanish GDP. As shown in Figure 1, this figure has remained stable over the last two decades.

Christmas Lottery tickets have five-digit numbers. Until 2004, there were 66,000 numbers played; since 2005, there are 85,000 numbers played, between 00000 and 84999. For historic reasons, due to the cost and the enormous popularity of the game, each number is split into several smaller units, called “series”. As shown in Table 1, the number of series printed has increased over time, to accommodate growth in sales. Each number is currently divided into 195 series. Each series consists of ten fractions (called *décimos*). In turn, each fraction can be further divided into smaller units, called *participaciones*. People usually buy either a fraction, at a cost of €20 each, or a *participacion*, at a cost of between €2 and €5. Figure 2 shows a sample fraction for the 2010 Christmas Lottery, and Figure 3 shows a sample *participación*.

In his excellent account of syndicate lottery play, Garvía (2007) explains how syndicate play arose in Spain in 1862, when the Spanish lottery system was reformed. Because lotteries at the time were widely blamed for poverty and crime—as “many people, and particularly the uneducated, were unable to control their gambling instincts once they had fallen under their spell”⁶—the government decided to protect society by making lotteries unaffordable to the working poor. The rising cost of tickets did not, however, reduce the lottery’s appeal among the working classes. On the contrary, revenues steadily increased due to the way that players responded to the reform: since many of them could not afford to participate individually, they turned to their social networks and began syndicate playing (Garvía 2007).⁷

Spain’s National Lottery Organization manages the distribution of lottery tickets

⁶Garvía (2007), p. 622.

⁷The winning ticket of the Christmas Lottery of 1862 was shared in the following way: “Five or six fractions were distributed among more than 40 people, who syndicated... Four or five fractions were shared by cousins and uncles of the same working poor family, and the last fraction was purchased by a cooking oil supplier, who shared it with 32 other people, some of whom split their own shares with people who only paid two or three *reales* to participate. As a result, more than 60 people, all of them very poor, have a share in this last fraction” (Garvía 2007, citing the magazine *El Enano*).

throughout lottery outlets across the country. Each number is mostly sold by one lottery outlet.⁸ This is for a number of reasons: first, given syndicate play, people like to share the same number; second, this makes distribution easier; and third, this makes winners more visible. Which particular number is allocated to each outlet is determined randomly using a computer.⁹

Due to the nature of syndicate play, and for convenience, most people buy lottery in their province of residence. An exception is the lottery outlet of Sort, a small village in the province of Lleida, that receives buyers from all over the country for superstitious reasons (“Sort” is the Catalan word for “Luck”). In recent years Sort has sold ticket fractions with a total value over 100 million, about 3% of total sales.¹⁰ Another phenomenon that might have increased over time is the availability of Christmas Lottery tickets for sale on the internet. However, internet sales of Christmas Lottery tickets remain relatively small: only around 2% of all tickets are purchased online.¹¹

3.2.2 Functioning

Next we describe the functioning of the Christmas Lottery. There are many rules regulating the process and these are strictly observed and adhered to. Two drums are used for the draw, the larger is used for the numbers, thus containing 85,000 balls, with each ball corresponding to one number; the smaller drum is used for the prizes. Small balls are introduced for each number and prize in each drum respectively. The day before the draw, the balls with numbers and prizes are publicly examined and counted. Once this procedure is over, the hall where the balls are kept is sealed and locked, with keys held by only three people. The next morning, the hall is opened at 8:00 AM and the committee that will be in charge of the draw is formed. Before the draw is held, the general public is allowed to inspect the balls. Once this is done, the balls are introduced in the respective drums through a mechanical transportation device. Both drums are closed and start turning once the committee’s president provides authorization for it. The draw is held in front of the public and the committee. The balls are extracted by primary schoolers: as one child extracts one of the numbered balls, another child extracts one of the prize balls. This process continues for several hours until the point where no balls are left in the prize drum.¹²

The draw attracts wide TV audiences, and when the top prize, *the Fatty*, is drawn, TV cameras travel to the winning location to show images of some of the happy winners. All in all, the process constitutes a popular Spanish Christmas tradition.

⁸For instance, according to our calculations using data from the last 25 years, on average, 80% of tickets of the winning numbers were sold by one outlet each year.

⁹*Dossier de Prensa, Sorteo de Navidad 2009*, National Lottery Organization.

¹⁰“Hacienda ingresará unos 660 millones de euros con el sorteo de la Lotería de Navidad”, *El Mundo*, December 21, 2006.

¹¹This information comes from a personal conversation with a representative of *Ventura 24*, one of Spain’s top sellers of lottery online.

¹²For two centuries, children from *San Ildefonso Primary School* in Madrid have extracted and *sung* the winning numbers of the National Lottery in December.

3.2.3 Prizes

In 2008, the total payout of prizes was approximately €2 billion.¹³ About half of this was awarded in the top three prizes. For the top prize, *the Fatty*, all holders of fractions of the winning number won €15,000 for every euro played. In practice, this means that a winning player with a fraction was awarded €300,000, and a winning player with a *participación* worth €5 received €75,000. The second and third prizes awarded winners €5,000 and €2,500 per euro played, respectively.¹⁴ In aggregate terms, this meant that the top prize was worth €585 million; the second prize was €195 million; the third prize was awarded €97.5 million. There typically are also 13334 smaller prizes (8499 of them are equivalent to reimbursements).

Due to this lottery design, and given that most fractions in each number are sold by only one lottery outlet, *the Fatty* ends up awarding many relatively small prizes to several thousand individuals living in the same area.

3.2.4 Players' characteristics

Table 2 shows descriptive statistics for survey information on Christmas Lottery expenditure.¹⁵ On average, 75% of the Spanish population aged 18 or more participate in the Christmas Lottery. The amount of lottery bought by each player is fairly similar. As shown in Figure 4, the median lottery player in 2009 was planning to spend between €30 and €60, while relatively few people were planning to spend over €150.¹⁶ This survey information fits the picture that we get from the aggregate data on Christmas Lottery expenditure, according to which in 2009 the average Spaniard spent approximately €70 on the Christmas Lottery. Most Christmas Lottery players (62%) only buy lottery in the particular case of Christmas Lottery; only 10% of Christmas Lottery players are frequent lottery players.

The popularity of the Spanish Christmas Lottery may be due to its potential to induce regret among nonparticipants, as nonparticipants in a winning (personal or professional) network know that, had they purchased a ticket, they would also have won.¹⁷ Furthermore, individuals tend to share tickets. According to the survey data, 87% of the individuals who participate syndicate play. They share their tickets with relatives (64%), friends (33%), or co-workers (28%). 54% of players purchase shares (*participaciones*) at places they frequent.

In Table 3 we explore whether lottery expenditure is connected to political ideology.

¹³70% of revenues are distributed as prizes and the remaining 30% are retained for commissions paid to outlets, revenue for Internal Revenue, and administration costs. Lottery outlets keep 3% of the ticket value as revenue, e.g., 60 cents for every fraction sold. Christmas lottery prizes are tax exempt (*Dossier de Prensa, Sorteo de Navidad 2009*, National Lottery Organization).

¹⁴Between 1986 and 2004, the prizes per euro played were €10,000, €4,800 and €2,400 respectively.

¹⁵The *Centro de Investigaciones Sociológicas* (CIS, Spain's Centre for Sociological Research) has surveyed the Spanish population regarding their Christmas Lottery expenditure on six occasions over the period of study. These surveys were conducted in December 1988, January 1998, January 1999, January 2001, December 2004 and December 2009 (surveys number 1779, 2274, 2316, 2406, 2587 and 2824 respectively.)

¹⁶The distribution of Christmas Lottery expenditure in Spain is consistent with a popular saying, usually attributed to King Charles III, according to which "playing a lot is crazy, but not playing at all is foolish" (*"El que juega mucho es un loco, pero el que no juega nada es un tonto"*).

¹⁷Sharing tickets at Christmas has become a way to reinforce social ties. "I don't want to be the only idiot who has to turn up to work if the office number wins." "Gamblers united", *The Economist*, December 17, 2009.

We do not observe lottery expenditure for 266 of 7,660 individuals (3.5% of the sample), therefore we use Tobit regressions. In column (1) we regress the amount spent on Christmas Lottery on political party dummies. Socialist Party voters spend on average €64; on average, People’s Party voters spend slightly more: approximately €70. In column (2) we control for an array of individual characteristics, such as gender, age, education and employment status. Spanish men spend significantly more on Christmas Lottery: the difference amounts to €14. Expenditure increases with age. Looking at educational levels, high school graduates are those with the highest Christmas Lottery expenditure. Finally, the unemployed, the retired, and students all spend significantly less than the employed.

4 Data

In this section we describe the sources of data used in this paper to analyze the relationship between economic conditions and voting. We draw information at the provincial level from four sources. First, we use electoral outcome information. Second, we have collected information on the main macroeconomic variables at the provincial level. Third, we use information on Christmas Lottery top prizes and expenditure. Fourth, we use survey data with information on the intention to vote and the subjective assessments of the surveyed individuals.

4.1 Electoral data

We use electoral outcome information from national elections from 1986 through 2008.¹⁸ Table 4 shows descriptive statistics at the province level for the variables used in the paper. In panel 1 we display electoral figures. In the average province, the electoral roll is composed of around six hundred thousand people, with voter turnout at 74%. Incumbent parties received 41% of votes on average. Slightly more votes went to the Socialist Party (40%) than to the People’s Party (38%); consistent with the Socialist Party winning five out of the seven national elections in our sample.

4.2 Macroeconomic data

In panel 2 in Table 4 we display statistics for the macroeconomic variables we use.¹⁹ The average province has a population of 827,000 and its GDP equals €12,174 million (in what follows, all the macroeconomic variables are measured in year 2000 constant euros). On average, the unemployment rate over the period has been 16%, and the consumer price index has been slightly above 4%. Housing prices are around 1,000 euros per square meter, and approximately 32,000 new automobiles are registered each year. We have also collected information on a measure included in National Accounts

¹⁸The data come from the *Ministerio del Interior*. Available at <http://www.elecciones.mir.es/MIR/jsp/resultados/index.htm> (retrieved December 2009).

¹⁹Data on the GDP of Spanish provinces come from “Contabilidad Regional de España” (*Fundación BBVA* and *Instituto Valenciano de Investigaciones Económicas*). Data on housing prices were provided by a property valuation company (*Sociedad de Tasación, S.A.*, available at <http://www.st-tasacion.com>). Data on automobile registrations was obtained from official sources (*Dirección General de Tráfico*, available at <http://www.dgt.es>). All of the other macroeconomic variables used in the analysis (population, unemployment rate, consumer price index, other transfers) come from the National Bureau of Statistics (*Instituto Nacional de Estadística*, available at <http://www.ine.es>).

called “Other (current) transfers” (*Otras transferencias corrientes*). This item provides information on residents’ income from “scholarships, fines, lottery winnings and games of chance”(note that GDP does not include lottery winnings). This information is available at the provincial level since 1995.

4.3 Christmas Lottery data

We use data on awards and on expenditure on Christmas Lottery by province.²⁰ In particular, we observe the province where tickets receiving the top three prizes were sold, as well as the total number of tickets sold in each province. Descriptive statistics for the lottery data are provided in panel 3 in Table 4.

The average yearly expenditure in Christmas Lottery per province over the period is equal to 0.28% of GDP. Christmas Lottery prizes amount to 70% of sales, approximately 0.19% of GDP. We observe the geographical distribution of the top three prizes. The top three prizes make up around half of the total quantity assigned to prizes, 0.10% of GDP; of this, 0.06% represents the top prize, 0.03% represents the second prize, and 0.02% represents the third prize. Most tickets for the same number are usually sold within a single province. Due to this geographical clustering, provinces where the winning tickets are sold tend to experience relatively large income shocks. Figure 5 shows the awards received by the main winning province each year in the Christmas lotteries held between 1986 and 2008. The province obtaining the largest award receives a mean (median) income shock of about 3.3% (1.5%) of provincial GDP. Note that in two cases the awards were larger than 10% of provincial GDP, corresponding to two small provinces, Segovia (2000) and Soria (2006).

We cannot observe the geographical distribution of the remaining 13,331 small prizes that are awarded in the Christmas Lottery, but given the random nature of the prizes, it can be safely assumed that their distribution is proportional to provincial expenditure in Christmas Lottery.²¹ In what follows, by lottery prizes we mean the top three prizes.

4.4 Survey data

The *Centro de Investigaciones Sociológicas* (CIS, Spain’s Centre for Sociological Research) performs regular surveys with questions relating to current issues and intention to vote. We have gathered information on all surveys including political information conducted over our period of study. These are the surveys held in January, April, July and October between July 1986 and April 2010.²² In total, we have information for 96 surveys covering information on approximately 300,000 individuals.

In the first panel of Table 5 we show descriptive statistics for survey respondents’ individual characteristics. The average age of respondents is 46 years, and about half of them are male. A majority of respondents have primary school as their highest level of education; 24% of them are high school graduates, and around 14% have

²⁰Lottery data were kindly provided by the National Lottery Organization.

²¹For instance, in 2010, in addition to the fourth prize (20,000 per euro played), and the fifth prize (5,000 per euro played), there are 1,774 *pedreas* (100 per euro played), 8,499 refunds as well as several other minor prizes.

²²The January survey is usually conducted in late January or early February, and the April survey is usually conducted in late April or early May. The July survey is almost always carried on in mid July. The October survey is usually conducted in the last two weeks of October.

higher education. Around 45% of respondents are employed, 20% are retired, 19% are homemakers and 10% are unemployed.

In the second panel of Table 5 we show descriptive statistics for our variables of interest. Surveys typically ask respondents about the political party they would vote for were there a national election the following day (first row). Respondents are then asked about the political party which they sympathize with (second row). In most surveys, respondents are also asked to evaluate the incumbent party using a five-point scale (*very good*, *good*, *average*, *poor* or *very poor*; third row). In some surveys, the same five-point scale is used to inquire about respondents' evaluation of the opposition party (fourth row). Finally, in some surveys respondents are asked to provide their own assessment of the country's economic situation (fifth row) and/or the political situation (sixth row).²³ Unfortunately, there is no systematic collection of respondents' subjective well-being.

5 Empirical analysis

In this section, first we analyze the potential existence of economic voting in Spain. Next we exploit the random income shocks generated by the Christmas Lottery in order to deal with the potential endogeneity of variations in economic conditions.

5.1 Economic conditions and electoral outcomes

We investigate the relationship between economic outcomes and voting behavior in national elections across Spanish provinces. Following the standard literature in the topic, in our first specification we regress the change in votes received by the incumbent on a number of measures of economic conditions: the growth rate in income per capita, the change in the unemployment rate, the change in the consumer price index and in housing prices. That is, we run the regression:

$$\Delta Votes_{st} = \alpha_t + \beta \Delta Economic\ variables_{st} + \varepsilon_{st} \quad (1)$$

where $\Delta Votes_{st}$ denotes the variation in the percentage of votes received in province s by the incumbent party in the national elections between the election in year t and the previous election.²⁴ The inclusion of election fixed-effects, α_t , allows to control

²³The questions can be respectively translated into English as follows. 1. *If the national elections were to be held tomorrow, which party would you vote for?* 2. *In any case, which of the following parties do you sympathize with more, or which of the following parties do you consider closer to your own ideas?* 3. *Overall, how would you describe the management task led by the government party: very good, good, average, poor, very poor?* 4. *In general, how would you describe the political action taken by the opposition party: very good, good, average, poor, very poor?* 5. *Regarding Spain's overall economic situation, how would you describe it: very good, good, average, poor, very poor?* 6. *Regarding Spain's overall political situation, how would you describe it: very good, good, average, poor, very poor?*

²⁴In Spain there are no term limits, and for national elections from 1986 through 2008, it is almost always the case that the incumbent party coincides with the incumbent politician. The only national election in which the incumbent party had a candidate that was not the incumbent politician was 2004. That year, Mariano Rajoy was appointed by José María Aznar, then the Prime Minister, to be the candidate running for election for the People's Party.

The national election candidates and outcomes in Spain in our period of study are as follows (Socialist Party and People's Party candidates, respectively): in the 1982 and 1986 elections, Felipe González vs. Manuel Fraga (the former won both elections); in the 1989, 1993 and 1996 elections,

for the effect of factors that may have affected simultaneously voting behavior in all provinces. The economic changes that we are thus identifying are variations relative to other provinces in the same term. It is not possible to use these estimates to answer questions such as how would voting change if the whole country experienced good economic conditions or, as it is currently the case, an economic recession. In all of our regressions, we cluster standard errors at the province level to account for the fact that events at the provincial level might be affecting individuals in the same province.

In Table 6 we report the OLS results from estimating regression (1). We find a positive relationship between the growth rate of income per capita during the election cycle and the percentage of votes received by the incumbent. According to the estimates in column (1), an increase in one percent in the growth rate of per capita GDP of a province relative to the national average is associated with a significant increase in the incumbent's votes of 0.33 percentage points. The positive association we estimate for Spain, a relatively young democracy, is consistent with the results of Brender and Drazen (2008) for new democracies. We do not find a significant relationship between the incumbent's votes and other economic variables.

5.2 Christmas Lottery

In the previous subsection we have found a positive relationship between economic conditions and the percentage of votes received by the incumbent. Nevertheless, it is not clear what this correlation reflects: it could be that good politicians both create policy conducive to economic growth and attract votes, but it could also be that, for some reason, economic growth leads voters to favor the incumbent.

In order to deal with the endogeneity of economic conditions we exploit the evidence provided by the Spanish Christmas Lottery. First, we analyze whether the Christmas Lottery is really random, and whether it is safe to assume that individuals buy Christmas Lottery in the province where they vote. Then we explore how the income shocks generated by the Spanish Christmas Lottery affect macroeconomic variables and, finally, voting behavior. For this we use information on electoral results at the provincial level and survey data. The latter may allow us to investigate the mechanism behind the Christmas Lottery effect on the votes received by the incumbent.

5.2.1 Identification strategy

Our analysis relies on the assumption that the Spanish Christmas Lottery is random. In other words, our identification strategy exploits the fact that, because of the random assignment of prizes, $E[Prizes_{st}|Expenditure_{st}] = E[Prizes_{st}|Expenditure_{st}, \cdot]$, where $Prizes_{st}$ and $Expenditure_{st}$ denote the Christmas Lottery income awarded and the Christmas Lottery expenditure in province s in year t as percentage of GDP respectively.

As explained in the Background Section, the functioning of the Lottery aims to ensure randomness; here we test formally the hypothesis of randomness. For this we regress the Christmas Lottery top prizes received on Christmas Lottery expenditure

Felipe González vs. José María Aznar (the former won the first two elections, while the latter won the 1996 election); in the 2000 election, Joaquín Almunia vs. José María Aznar (the latter won); in the 2004 and 2008 elections, José Luis Rodríguez Zapatero vs. Mariano Rajoy (the former won both elections).

and a number of predetermined macroeconomic and political variables:

$$Prizes_{st} = \alpha + \beta Expenditure_{st} + \gamma \Delta Economic\ variables_{st-1} + \lambda Political\ variables_{st-1} + \varepsilon_{st} \quad (2)$$

where $\Delta Economic\ variables_{st-1}$ includes the variation between year $t-2$ and year $t-1$ in the following variables: per capita GDP, unemployment rate, the consumer price index, and housing prices; and $Political\ variables_{st-1}$ include the percentage of votes received in province s by the incumbent party in the previous national election, and the level of electoral participation.

OLS results from running regression (2) are in Table 7. We observe that provinces where residents spend more on Christmas Lottery tend to receive more money in prizes (column (1)). This is not surprising, as buying more tickets increases the chances of success. However, if the lottery is truly random, we would not expect the prizes to be determined by other variables. As expected, conditional on lottery expenditure, economic conditions do not affect lottery prizes (column (2)). Moreover, provinces in which incumbents obtained more votes do not receive more lottery prizes (column (3)). This evidence is consistent with the randomness of the Christmas Lottery.

5.2.2 Do people purchase lottery tickets in their province of residence?

In this paper, in order to identify the province where awards were received we use information on the province where the tickets were sold. Some players, however, may exchange tickets with people in their networks who live in other areas, or they may purchase tickets while on vacation outside their area of residence. Here we use data from the National Accounts to verify that this assumption is correct and run the following regression:

$$\Delta y_{stk} = \alpha + \beta Prizes_{st+1} + \gamma Expenditure_{st+1} + \varepsilon_{stk} \quad (3)$$

where Δy_{stk} denotes the variation in the amount of “Other (current) transfers” (*Otras transferencias corrientes*), a measure that provides information on residents’ income from “scholarships, fines, lottery winnings and games of chance”, received by province s between year t and year $t+k$, for $k = \{1, 2, 3, 4\}$, and $Prizes_{st+1}$ and $Expenditure_{st+1}$ are defined as before.

OLS results from running regression (3) are in the first column of Table 8. The Christmas Lottery prizes show up in the National Accounts the very same year the Christmas Lottery was held, as well as on the National Accounts for the following year. For a prize equivalent to 1% of the province’s GDP, there is an increase in *Other transfers* the same year equivalent to 0.67% of the GDP (first row), and an increase of 0.28% of the GDP the following year (second row). The latter might reflect that individuals have up to three months to cash in their winning tickets. The effect does not persist in later years (rows three to four), as would be expected. In sum, the evidence suggests that approximately 95% of prizes are collected in the province where the tickets were sold.²⁵

²⁵Unfortunately, this information is only available since 1995. Otherwise, we would have analyzed voting behavior using an instrumental variable strategy; specifically, instrumenting the income data with the Christmas Lottery prizes.

5.2.3 The macroeconomic effects of the Christmas Lottery

Before turning to voting data, we examine how the Christmas Lottery prizes relate to a number of macroeconomic variables. For this we run a regression of the same form as specification (1) to study whether the increase in individuals' disposable income due to the Christmas Lottery winnings has an effect on the economy (columns (2)-(7) in Table 8).

In our context it is not possible to disentangle how an unexpected income shock might affect winners and how it might affect individuals who did not win, but live in the same community as winners. That is, the results in this paper reflect the sum of the effect from lottery prizes on winners, and the effect on the rest of the community.²⁶

We do not see any significant change in GDP, population, or in the consumer price index in years following a lottery shock. We also explore the effect of lottery prizes on unemployment. There are two theoretical effects. On the one hand, individuals holding winning tickets may decide to reduce their labor supply. According to the evidence in Imbens et al. (2001), lottery prizes equivalent in size to *the Fatty* do not substantially affect labor supply. On the other hand, individuals living in a winning province who did not win, may benefit from increases in consumption in the province, which would possibly affect their labor supply. We observe a temporary reduction in unemployment of about 0.14 percentage points one year after a prize equivalent to 1% of the GDP has been awarded, suggesting that, of the two effects mentioned above, the latter dominates.²⁷

Kuhn et al. (2010) find that lottery winners use durable spending to smooth consumption. We examine whether Christmas Lottery awards affect housing prices and automobile sales. We observe an increase of about 0.8 percentage points in housing prizes a few years after the prize has been awarded, but this is not statistically significant.²⁸ Automobile sales increase by 1.5% during the two years following a lottery prize equivalent to 1% of the provincial GDP; this effect fades out afterward.

5.2.4 Christmas Lottery and electoral outcomes

We first examine the descriptive evidence. We classify observations in two groups. In the first group, we have the 17 observations corresponding to every province that was awarded most of the top prize in any of the Christmas Lotteries held during the term.²⁹ The second group includes every other observation. Panel 1 in Table 9 provides descriptive information about these two groups. As expected, the group of *winners* receives much larger prizes, both in relative terms (3.39% vs. 0.19% of the GDP), and in absolute terms (€317.06 vs. €18.15 million). As shown in rows three and four, this partly reflects differences in lottery expenditure: while winning provinces had spent on average 1.36% of their GDP in Christmas Lottery during the term, losing provinces had spent only 1.00%. The difference is larger in absolute terms (€311.81 vs. €109.24 million), reflecting the fact that larger provinces have better (unconditional) chances of winning. In the second panel, we explore the potential existence of differences

²⁶In contrast, Kuhn et al. (2010) study the social effects of an unexpected income shocks.

²⁷The unemployment rate is typically measured on January 1st every year.

²⁸The lack of significance and the lag in the effect may be related to the fact that the price measure we use is an estimation performed by a property valuation company.

²⁹During the 21 years in our sample, in two occasions, no province had sold a majority of the tickets, and in two other occasions the same province obtained twice in the same term the top prize.

in electoral behavior between winning and losing provinces. While in the latter the incumbent tends to lose votes (around 0.91 percentage points), in winning provinces the incumbent tends to gain 2.33 percentage points. This difference is significantly different from zero. Participation rates seem to decrease in winning provinces, but the difference is not statistically significant. We do not observe significant differences in the share of votes received by the Socialist Party, the share of votes received by the People’s Party.

Based on this descriptive information only, it is not possible to tell whether the increase in support for the incumbent is due to lottery prizes, or whether it reflects some other underlying cause that affected lottery sales. In order to isolate the effect of prizes, we now regress the incumbent’s votes on the prizes awarded to residents in a given province, controlling for the Christmas Lottery expenditure in the province:

$$\Delta Votes_{st} = \alpha_t + \beta Prizes_{st} + \gamma Expenditure_{st} + \varepsilon_{st} \quad (4)$$

where $Prizes_{st}$ denotes the total income in Spanish Christmas Lottery prizes as percentage of GDP received by province s in the years prior to the election in year t , and $Expenditure_{st}$ is the per capita expenditure on the Christmas Lottery during the same period.

We present OLS results from running regression (4) in column (2) of Table 6. Incumbents receive relatively more votes in provinces awarded with Christmas Lottery prizes. Receiving 1% of GDP in the form of lottery winnings increases the votes received by the incumbent in approximately 0.21 percentage points, relative to the votes obtained by the incumbent in losing provinces. This might reflect either an increase of votes for the incumbent in winning provinces, or a reduction in votes for the incumbent in losing provinces. In winning provinces, the variation in votes could be due to either changes in the votes of winners, or to spillovers to voters who did not win. Interestingly, both GDP increases and Christmas Lottery winnings seem to have an effect of similar magnitude on the votes received by the incumbent.

As shown above, lottery prizes may affect some macroeconomic variables slightly. In order to isolate the direct effect of lottery prizes on voting in column (3) we include economic variables together with lottery information. As robustness check, in column (4) we run the same regression, now including as controls province fixed-effects. In both cases, results remain unchanged. Thus far we have weighted equally the information provided by provinces that, in some cases, differ greatly in their size. In column (5), we re-estimate the specification in column (3), now weighting each observation by the potential number of voters in the province. The impact of lottery prizes in the weighted regression is three times larger (0.66 percentage points), but it is not statistically significant from our previous estimates. In column (6) we exclude the province of Lleida from the sample. As explained before, this province includes the town of *Sort* (which means “Luck” in Catalan), a town that attracts buyers from all around the country. Excluding this province improves the accuracy of the estimation, but the point estimate is basically unchanged.

Next we would like to explore whether the effect is different according on the ideology of the incumbent. In particular, incumbent parties favoring less redistributive policies might benefit more from increases in income (Brunner et al. 2010, Doherty et al. 2006). In columns (7) and (8) we split the sample in two: elections in which the left-wing was the incumbent, and elections in which the right-wing was the incumbent. Right-wing governments seem to benefit electorally more from economic growth. An

increase in 1% of the GDP is associated with an increase of votes for the incumbent of 0.51 percentage points when the People’s Party is in power; the figure is 0.26 percentage points when the incumbent is the Socialist Party. Similarly, the estimated effect of lottery prizes is slightly larger for elections in which the right-wing was the incumbent, but the difference between the coefficients for the two parties is not statistically significant.

We have documented the existence of a positive (causal) relationship between lottery prizes and the share of votes received by the incumbent. As shown above, lottery awards do not affect population size, thus we can discard the presence of a composition effect. However, lottery prizes may have an effect in the number of people that turn out to vote. For instance, Brunner et al. (2010) find that positive economic shocks decrease voter turnout. There is also some additional evidence that subjective well-being might affect turnout (Dolan et al. 2008).³⁰ In Table 10 we investigate this possibility by regressing participation on elections on Christmas Lottery prizes and controls. The main determinant of participation is unemployment rate. An increase in the unemployment rate of one point is associated with an increase in participation of 0.20 percentage points. The estimated coefficient of lottery prizes is negative, but it is not statistically significant at standard levels, and the magnitude is small compared to the effect of lottery awards on the votes received by the incumbent. This suggests that the greater chances of incumbents cannot be explained by variations in voter turnout; therefore, it must be that some voters who would otherwise not have voted for the incumbent are doing so once the province gets *the Fatty*.

We also examine whether the effect of lottery prizes on the number of votes received by the incumbent varies depending on the characteristics of provinces. First, in the left panel in Table 11 we split the sample into two subsamples, poor and rich provinces respectively, using the median province as threshold. The estimated effect of lottery prizes is larger for richer provinces, but the difference is not statistically significant. Second, we investigate whether the effect is larger for provinces where people spend more on Christmas Lottery. In the central panel of Table 11 we show results of running regression (4) by level of Christmas Lottery expenditure. The effect does not seem to be statistically different for low or high spenders. Finally, in the right panel of Table 11 we split the sample into small and big provinces. The effect is much larger in big provinces but, again, the accuracy of the estimation is relatively low, and we cannot reject the possibility that the effect is similar for both groups.

5.2.5 Timing of the Christmas Lottery effect

Thus far we have considered all the top prizes received by a province over the term prior to the election. Next we would like to examine the timing of the effect. We distinguish between awards obtained the Christmas right before the election (on average, four months before the election is held), and awards obtained two and three Christmas before the election. In Table 12 we run regression (4) using the lottery prizes as percentage of GDP with lags. The coefficients of the lagged variables are not statistically different, but the evidence is consistent with the effect of Christmas Lottery winnings fading out over time.

³⁰Unfortunately, the authors do not examine whether subjective well-being could change voting preferences altogether.

5.2.6 The impact of *the Fatty*

Now we would like to see whether the effect depends on the size of the income shock. Winners of the the top prize (*the Fatty*), by far the most generous and the most visible of all Christmas Lottery prizes, receive €15,000 per euro played. Winners of the second and third prizes, also relatively large, receive only €5,000 and €2,500 respectively per euro played. We run regression (4) distinguishing between the top, second and third Christmas Lottery prizes, controlling for expenditure on the Christmas Lottery. As can be seen in Table 13, only *the Fatty* leads to a significant increase in the share of votes received by the incumbent. This may reflect the larger visibility of top prize, or perhaps the existence of nonlinearities in the effect of lottery prizes. However, the estimation is inaccurate, and it is not possible to reject the hypothesis that the effect of the different top prizes is the same.

5.2.7 Placebo

Finally, in Table 14 we check for the robustness of our results using *placebo* Christmas Lottery prizes. We regress the votes received by the incumbent on the Christmas Lottery prizes *after* an election. If the results in this paper are due to lottery winnings affecting voting behavior, there should be no relationship between the two. Results in Table 14 confirm that the Christmas Lottery awards received after the election are not correlated with the votes received by the incumbent.

5.3 Christmas Lottery and voting: evidence from survey information

In the previous subsection we have found that the incumbent tends to receive more votes in provinces awarded with *the Fatty*, particularly in elections held shortly after the prize is received. However, we do not know which individuals are affected, or why this happens. Now we would like to examine an independent data base in order to investigate these issues. Specifically, we want to investigate if voters in awarded provinces tend to re-elect the incumbent because (in what would be an example of attribution error) they believe, somehow, that the quality of the incumbent has improved. The information on individuals characteristics contained in the surveys will also allow us to investigate the heterogeneity of the effect.

5.3.1 Christmas Lottery and voters' assessments

In order to find out more about the mechanism underlying our results, now we exploit survey information to study how the Christmas Lottery prizes affect individuals' perceptions on a number of issues.

The general specification that we use is as follows:

$$z_{istm} = \alpha_{st} + \beta Prizes_{stm}^j + \gamma Expenditure_{stm}^j + \lambda Individual\ Characteristics_{itm} + \varepsilon_{istm} \quad (5)$$

where z_{istm} denotes a dependent variable related to the survey responses of individual i in province s in fiscal year t and survey month m . $Prizes_{stm}^j$ denotes the Christmas Lottery income awarded in the j months prior to the survey as percentage of GDP, and $Expenditure_{it}^j$ is the corresponding expenditure on the Christmas Lottery as percentage

of GDP. Finally, α_{st} denotes the fiscal year times province fixed-effects. This implies the comparison of survey responses before and after the Christmas Lottery prizes were awarded.

Table 15 provides results from running regression (5) when we consider lottery winnings in the previous month ($j=1$).³¹ Considering the impact of lottery prizes in a short period of time (within one month of the award) minimizes the probability that the effect is due to spillovers, that is, to individuals who do not receive lottery prizes. In column (1), we run a probit regression to look at whether the respondent is willing to vote for the incumbent. As can be seen from the table, in provinces awarded with more Christmas Lottery prizes, individuals are more likely to state that they intend to vote for the incumbent. This effect is significant at the 5% level. The sign of this coefficient is consistent with the results obtained with the aggregate electoral data (Table 6), but the magnitude of the effect is larger (1.2 vs. 0.66, if we consider the effect estimated in the weighted regression in column (5)). This difference may reflect the fact that here we are capturing the effect of lottery prizes shortly after Christmas and, as suggested by Table 12, the effect of lottery prizes on voting tends to fade away over time. In column (2), we use information from a question where respondents are asked whether they sympathize with the incumbent as dependent variable. The magnitude of the effect is similar but in this case it is not statistically significant.

In column (3), we run an ordered probit regression using the respondents' assessment of the incumbent as dependent variable. Similarly, in column (4) we look at the respondents' assessment of the opposition party. In neither of these cases do we observe any significant association with the Christmas Lottery prizes. In other words, we fail to find that respondents in provinces awarded with more Christmas Lottery prizes tend to perceive the incumbent as of better quality. In column (5) we show results from using the respondents' assessment of the economic situation at the national level as dependent variable. There is no relationship between either of these and the Christmas Lottery prizes. That is, voters in awarded provinces do not seem to overestimate the economic situation at the national level: it does not seem that the greater propensity to re-elect the incumbent is due to voters' wrongly thinking that the national economic situation has improved. The evidence is thus overall at odds with the existence of an attribution error. In column (6) we use instead the respondents' assessment of the political situation at the national level as dependent variable. We do not find any significant relationship between this variable and the Christmas Lottery prizes either.

Now we explore the relationship between whether the respondent reported having voted for the incumbent in the previous election and Christmas Lottery prizes. In the presence of cognitive dissonance, there may exist a relationship between living in a winning province and the reported past vote. However, we do not find any relationship between the lottery prizes received by the province and whether the respondent reports to have voted for the incumbent in the previous election (column (7)).

Other interesting results are as follows. From the results in columns (1)-(3) we can see that voters in larger towns tend to favor the incumbent less. The same is true for younger voters, women, and the unemployed. In contrast, the retired and homemakers tend to favor the incumbent more. As for the results from columns (5)-(6), voters in larger towns tend to be more pessimistic about the country's economic and political situation. The same is true for women and the unemployed. Older voters, and more educated voters, students and homemakers tend to be more optimistic.

³¹Considering slightly longer periods ($j=4$ or $j=7$) yields qualitatively similar results.

5.3.2 Who is affected by lottery prizes?

We exploit survey information on the characteristics of respondents to disentangle which individuals are driving our results. We run regression (5), now interacting Christmas Lottery awards and expenditure with individual characteristics. Results are provided in Table 16. In column (1) we show the determinants of the vote for the incumbent. The estimated effect seems to increase with education, even though this is not significant. Our results seem to be mainly driven by the retired and homemakers. This cannot be due to higher lottery expenditure by these two groups, because if anything, they tend to spend less on Christmas Lottery (Table 3). Moreover, in the case of homemakers, we observe some evidence consistent with attribution errors: Christmas Lottery prizes lead to increases in their sympathy for the incumbent and in their assessment of the incumbent. Finally, perhaps because of cognitive dissonance, Christmas Lottery prizes also increase the share of homemakers reporting having voted for the incumbent in the past.

6 Conclusions

There is a large body of evidence suggesting that good economic outcomes are associated with the re-election of incumbent politicians. Due to the endogeneity of good economic outcomes, the nature of this relationship is not clear.

In order to deal with this problem we exploit the exceptional evidence provided by the Spanish Christmas Lottery. This lottery, held every year around Christmas, offers several convenient features. First, its economic impact is very large. Spaniards spend about 0.3% of the Spanish GDP on the Christmas Lottery. Second, the Christmas Lottery is a syndicate lottery: over 75% of Spaniards participate, and they typically share tickets with family, friends and co-workers. Third, there are many shares for the same number, meaning that *the Fatty* awards many relatively small prizes to several thousand individuals. Because each number is mostly sold by one lottery outlet, winners tend to be geographically clustered.

Given these features, we are able to use annual provincial information on the Christmas Lottery prizes and expenditure to identify random increases in annual provincial income. The main winning province experiences a median income shock equivalent to 1.5% of provincial GDP. We find that, despite the fact that it is understood that the lottery outcome is completely random, the incumbent party tends to obtain relatively more votes in winning provinces. In a province receiving Christmas Lottery awards equivalent to 1% of its GDP capita, the incumbent party enjoys a significant increase in the share of votes, approximately 0.21 percentage points (Table 6, column (2)).

This effect is robust to a number of robustness checks, including the use of provincial population weights, provincial fixed-effects, placebo lottery prizes, as well as the exclusion of outliers. The effect seems to be due to the top prize, *the Fatty*, and it seems to disappear after two or three years. Right-wing incumbents seem to benefit more from lottery prizes, but the difference is not statistically significant. Additionally, the differences in voting behavior that we find cannot be explained by variations in voter turnout.

What is the magnitude of the effect? Consider the case of the average province in 2008, with an approximate electoral roll of 675,000, receiving Christmas Lottery prizes equivalent to 1% of provincial GDP, that is, €218 million. Taking the estimated

effect on the incumbent's votes of 0.21 percentage point of votes, this means that the incumbent has obtained approximately 1,400 more votes than expected. Considering the prizes awarded, this makes a "total cost" of €150,000 per vote.

Because we do not have individual information on the recipients of the Christmas Lottery prizes, we cannot separate to what extent, within neighborhoods, individuals are voting based on personal economic circumstances, or based on what they observe about their neighbors' economic circumstances. Nevertheless, if we want to know if there is a social effect from voting, we can compare the number of people receiving lottery prizes in a given province with the number of additional votes that the incumbent obtained. A province that has been awarded with €218 million (1% of the GDP of the average province), may have received this money through 730 fractions awarded with the first prize. Each fraction is usually shared by several individuals, and is often divided in *participaciones*. If we compare these figures with the estimated 1,400 additional votes received by the incumbent, our results are consistent with two possibilities, lottery prizes strongly affect the voting behavior of winners, or lottery prizes also affect the voting behavior of individuals who were not awarded with Christmas Lottery prizes.

What is the source of the observed effect? The literature has mainly relied on two potential explanations for the positive correlation between economic conditions and incumbents' electoral performance: asymmetric information (voters learn about politician quality and effort through economic conditions) or attribution errors (voters are mistaken regarding the cause of good economic outcomes). Our results are not consistent with either of these hypotheses; if anything, they seem to be at odds with both, given that voters are well aware of the randomness of the Christmas Lottery winnings. Information from surveys spanning our period of study allows us to further investigate the mechanism underlying this effect. The evidence from survey data confirms that respondents in winning provinces are more likely to vote for the incumbent, but they do not think that the incumbent is more competent, or that the national economic or political situation has improved.

The results in this paper suggest that the positive correlation between good economic outcomes and incumbent re-election may reflect something other than voters being uninformed. Given that the effect of lottery prizes on votes seems to vanish after two or three years, our results are suggestive of a temporary happiness effect. This is consistent with the evidence in previous literature finding that, after a period of peak experience following a lottery award, winners return back to their prior level of happiness (Eckblad and van der Lippe 1994, Falk and Mañpää 1999, Kaplan 1987). In the same vein, perhaps when voters are happier, they become more lenient with the incumbent. Alternatively, increases in wealth may reinforce voters' preference for the status quo.

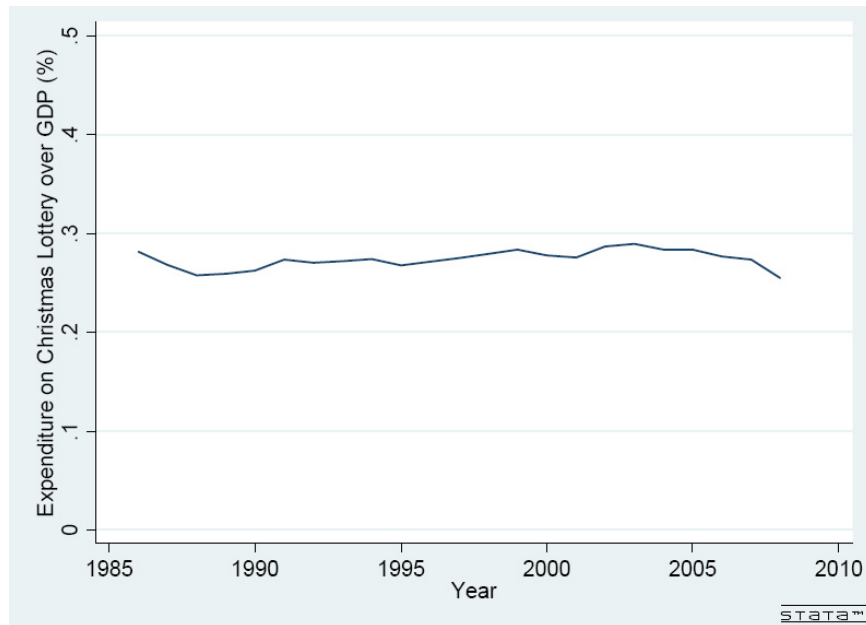
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Figure 1: Total value of Christmas Lottery sales (% of GDP)



Source - Authors' calculations using data from the National Lottery Organization

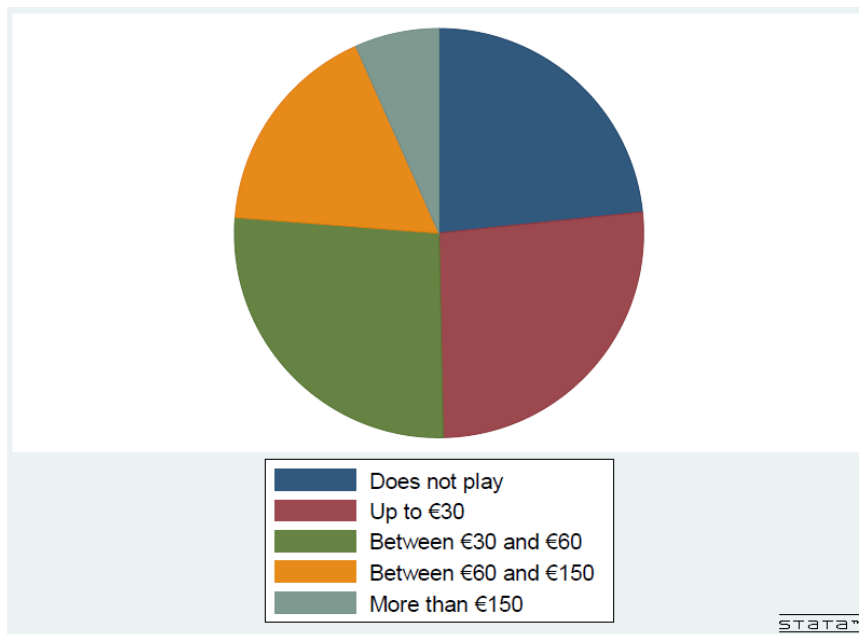
Figure 2: Sample ticket or fraction, 2010 Spanish Christmas Lottery



Figure 3: Sample *participación*, 2010 Spanish Christmas Lottery

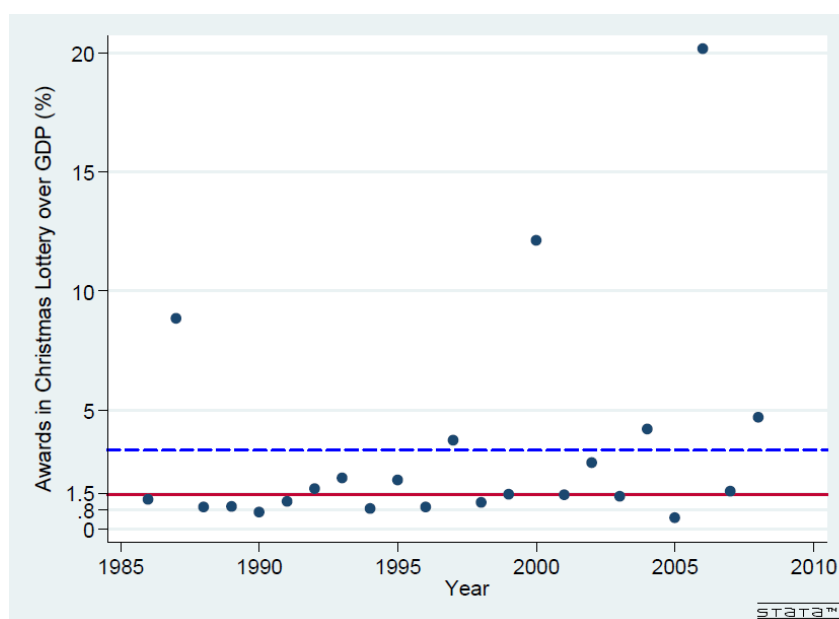


Figure 4: Expenditure in Christmas lottery, 2009



Source - Authors' calculations based on data from CIS survey number 2824, December 2009. The corresponding question was: "Overall, how much are you planning to spend on Christmas Lottery?"

Figure 5: Christmas Lottery prizes at the provincial level (% of GDP)



Note: The figure provides information about the top three Christmas Lottery prizes received each year by the main winning province, as percentage of their GDP. For instance, in 2007 the main winning province was Asturias, receiving prizes equivalent to 1.6% of GDP. The blue dashed horizontal line indicates the mean prize received the main winning province (approximately 3.3% of GDP). The red solid horizontal line indicates the median prize received by the main winning province (approximately 1.5% of GDP). Source - Authors' calculations using data from the National Lottery Organization

Table 1: Descriptive Information on Christmas Lottery

Year	Numbers	Tickets per number	Price per ticket (€)	Total value (million €)	Total sales (million €)
	(1)	(2)	(3)	(4)	(5)
1986	66000	650	15	645	577
1987	66000	710	15	704	615
1988	66000	720	15	714	657
1989	66000	800	15	793	740
1990	66000	900	15	892	837
1991	66000	950	18	1130	955
1992	66000	1050	18	1249	1017
1993	66000	1080	18	1285	1059
1994	66000	1120	18	1333	1135
1995	66000	1170	18	1392	1194
1996	66000	1200	18	1428	1283
1997	66000	1300	18	1547	1382
1998	66000	1400	18	1666	1505
1999	66000	1450	18	1725	1640
2000	66000	1550	18	1844	1748
2001	66000	1700	18	2023	1871
2002	66000	1800	20	2376	2087
2003	66000	1900	20	2508	2261
2004	66000	1950	20	2574	2378
2005	85000	1700	20	2890	2571
2006	85000	1800	20	3060	2713
2007	85000	1850	20	3145	2867
2008	85000	1950	20	3315	2787
2009	85000	1950	20	3315	2702

Notes: Information from the Yearbook of the National Lottery Organization, different years. Price per ticket, total value and total sales are in nominal terms.

Table 2: Descriptive Statistics - Information on Christmas Lottery Buyers

	Mean	Min	Max
	(1)	(2)	(3)
Buys Christmas lottery	.75	0	1
Among Christmas lottery buyers:			
Buys lottery only in Christmas	.61	0	1
Buys lottery sometimes	.30	0	1
Buys lottery almost every week	.09	0	1
Syndicate player	.87	0	1
Shares tickets with relatives	.64	0	1
Shares tickets with friends	.33	0	1
Shares tickets with co-workers	.28	0	1
Buys ticket shares	.54	0	1

Notes: The table reports information from 13,422 individuals surveyed by the Centre for Sociological Research (CIS) in December 1988, January 1998, January 1999, January 2001, December 2004 and December 2009 (surveys number 1779, 2274, 2316, 2406, 2587 and 2824 respectively). Information on the frequency of lottery purchases and lottery sharing is available only in four of these surveys (N=9,903 and N=8,479 respectively). *Syndicate player* refers to players who share tickets with relatives, friends or co-workers.

Table 3: Characteristics of lottery players

Dependent variable:	Christmas Lottery expenditure	
	(1)	(2)
People's Party voter	6.40** (2.81)	6.06** (2.80)
United Left party voter	2.20 (5.86)	0.13 (5.80)
Other	-13.32*** (2.37)	-11.61*** (2.35)
Age		0.14 (0.09)
Male		14.94*** (2.22)
Secondary education		15.20*** (2.53)
Higher Education		6.31** (3.02)
Unemployed		-25.84*** (3.42)
Retired		-15.41*** (3.68)
Student		-48.61*** (4.84)
Homemaker		-5.29 (3.39)
Constant	63.95*** (1.85)	52.55*** (4.76)
Number of observations	7660	7595
Right-censored obs.	266	264

Notes: The sample includes 7,660 individuals surveyed in December 1988, January 2001, December 2004 and December 2009 (surveys number 1779, 2406, 2587 and 2824 respectively). The table reports results from a tobit regression, where the information on lottery expenditure was right-censored for 22 individuals who spent over €150 in 1988, 81 individuals who spent over €180 in 2004 and 163 individuals who spent over €150 in 2008. *Other* includes individuals who voted for other parties, as well as individuals who abstained. Standard errors in parentheses. The omitted categories are Socialist Party voter, female, primary education or less, and employed. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 4: Descriptive Statistics - Information at the Provincial Level

	Mean	Standard deviation	Minimum	Maximum
1. Electoral data (N=350)	(1)	(2)	(3)	(4)
Electoral roll (1,000s)	639	755	74	4459
Voter turnout (%)	73.50	6.02	49.97	84.15
Incumbent votes (%)	41.44	9.60	11.45	65.31
Socialist Party votes (%)	39.69	8.36	18.40	62.22
People's Party votes (%)	38.10	12.81	7.00	65.31
2. Macroeconomic variables (N=1150)				
Population (in thousands)	818	975	91	6272
GDP (in million €)	12174	18633	1178	152296
Unemployment rate	15.36	7.49	2.96	43.57
Consumer price index (CPI)	4.23	1.76	0.58	10.95
Housing price/m ²	1143	460	432	3591
Automobile registrations	32825	55445	1968	499798
Other transfers (% GDP)	5.57	1.36	2.81	23.77
3. Christmas lottery (N=1150)				
Expenditure (% GDP)	0.28	0.10	0.08	0.95
Top prizes (% GDP)	0.10	0.81	0	20.18
Top prize (% GDP)	0.06	0.78	0	21.44
Second prize (% GDP)	0.03	0.31	0	9.39
Third prize (% GDP)	0.02	0.18	0	4.67
Winning province dummy	0.02	0.13	0	1

Notes: Electoral information at the provincial level for the national elections held in 1986, 1989, 1993, 1996, 2000, 2004 and 2008. The table includes information on macroeconomic variables and lottery for the period 1986-2008 for the fifty Spanish provinces. *GDP* refers to the Gross Domestic Product and *CPI* refers to the Consumer Price Index. *Other transfers* refers to the homonym chapter in the Income accounts and includes residents' income from "scholarships, fines, lottery winnings and games of chance". This variable is only available since 1995. *GDP* and *Housing price/m²* are in constant year 2000 euros.

Table 5: Descriptive Statistics - Survey Information

	N	Mean	Min.	Max.
1. Individual Characteristics				
Age	306407	46	18	98
Female	306835	0.52	0	1
Educational Level				
Primary education or less	305473	0.61	0	1
Secondary education	305473	0.24	0	1
Higher education	305473	0.14	0	1
Occupational Status				
Employed	303572	0.45	0	1
Unemployed	303572	0.10	0	1
Retired	303572	0.20	0	1
Student	303572	0.06	0	1
Homemaker	303572	0.19	0	1
Voted for incumbent in previous election	303572	.32	0	1
2. Dependent Variables				
Would vote for the incumbent	299238	0.28	0	1
Sympathizes with the incumbent	280448	0.34	0	1
Assessment of the incumbent	242995	3.0	1	5
Assessment of the opposition	187903	2.7	1	5
Economic situation	231509	2.8	1	5
Political situation	215780	2.8	1	5

Notes: The table reports information from 96 surveys conducted between October 1986 and April 2010, covering around 300,000 individuals. Variables “Assessment of the incumbent”, “Assessment of the opposition”, “Economic situation”, “Political situation” are codified in the following way: *5=Very good, 4=Good, 3=Average, 2=Poor and 1=Very poor*. *Secondary education* includes High School graduates and graduates from Occupational Training Schools. *Higher education* includes individuals with at least three years of higher education.

Table 6: The Effect of Christmas Lottery Prizes on Electoral Outcomes

Dependent variable:	Δ Votes for Incumbent (%)							
	All incumbents				Ex. Sort	Left-wing	Right-wing	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ GDP per capita	0.33** (0.13)		0.33** (0.12)	0.27* (0.13)	0.28 (0.17)	0.36*** (0.12)	0.26* (0.15)	0.51** (0.21)
Δ Unemployment	-0.03 (0.05)		-0.03 (0.05)	-0.09 (0.05)	-0.08 (0.07)	-0.03 (0.05)	0.01 (0.07)	-0.06 (0.08)
Δ CPI	0.01 (0.77)		0.02 (0.76)	-0.20 (0.85)	-1.40 (1.07)	0.05 (0.78)	0.34 (0.79)	-1.54 (1.88)
Δ Housing prices	-0.02 (0.03)		-0.02 (0.03)	-0.03 (0.04)	-0.10*** (0.03)	-0.03 (0.03)	-0.00 (0.04)	-0.09 (0.16)
Lottery prizes		0.21** (0.09)	0.22** (0.09)	0.25** (0.12)	0.66** (0.29)	0.21*** (0.07)	0.19** (0.09)	0.31* (0.18)
Lottery expenditure		-0.73 (0.67)	-0.70 (0.70)	-1.67 (1.50)	-1.23 (0.82)	-1.13 (0.68)	-0.92 (1.14)	-0.44 (0.68)
Province fixed-effects	No	No	No	Yes	No	No	No	No
Population weights	No	No	No	No	Yes	No	No	No
Adjusted R-sq	0.60	0.59	0.60	0.61	0.64	0.61	0.21	0.84
N	300	300	300	300	300	294	200	100

Notes: Robust standard errors clustered by province in parentheses. All regressions include year fixed-effects. *Lottery prizes* and *Lottery expenditure* measure respectively the total amount of Christmas Lottery prizes and expenditure during the term as percentage of provincial GDP. *Lottery prizes* only includes information corresponding to the top three prizes. Regression in column (5) is weighted by the number of potential voters. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 7: The Determinants of Lottery Prizes

Dependent variable:	Lottery Prizes per capita		
	(1)	(2)	(3)
Lottery expenditure	1.20* (0.66)	1.25* (0.70)	1.33* (0.72)
Δ GDP per capita, t-1		-0.00 (0.01)	-0.00 (0.01)
Δ Unemployment, t-1		-0.01 (0.01)	-0.01 (0.01)
Δ CPI, t-1		0.01 (0.01)	0.01 (0.01)
Δ Housing prices, t-1		-0.00 (0.00)	-0.00 (0.00)
Votes obtained by the incumbent, t-1			-0.00 (0.00)
Participation rate, t-1			-0.00 (0.00)
Constant	-0.24 (0.16)	-0.30 (0.22)	0.07 (0.17)
Adjusted R-sq	0.02	0.02	0.02
N	1100	1100	1100

Notes: *Lottery prizes* includes information corresponding to the top three prizes in the Christmas Lottery. *Votes obtained by the incumbent* and *Participation rate* provide information from the previous election. Standard errors clustered by province. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 8: The Effect of Christmas Lottery Prizes on Economic Conditions

Independent variable: Prizes year t+1, as share of GDP							
Dep. var.:	Other transfers (Income)	GDP	Unemployment	Population	CPI	Housing prices	Automobile registrations
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\Delta_{t,t+1}$	0.67** (0.29)	-0.03 (0.03)	-0.05 (0.04)	0.00 (0.03)	0.01 (0.01)	0.06 (0.06)	0.26 (0.33)
$\Delta_{t,t+2}$	0.28 (0.27)	-0.03 (0.11)	-0.13** (0.06)	0.06 (0.06)	-0.00 (0.03)	0.17 (0.21)	1.53** (0.65)
$\Delta_{t,t+3}$	-0.02 (0.06)	-0.00 (0.09)	-0.00 (0.07)	0.12 (0.18)	-0.02 (0.02)	0.57 (0.67)	1.48** (0.60)
$\Delta_{t,t+4}$	-0.02 (0.06)	-0.04 (0.21)	-0.02 (0.04)	0.24 (0.24)	-0.04 (0.03)	0.80 (0.76)	1.10 (1.79)
N	600	950	950	950	900	950	850

Notes: Each column reports information from four regressions using as independent variable the prizes awarded in a province in year t+1 as a share of provincial GDP, and as dependent variable the growth rate between year t and year t+s in the corresponding variable, for s={1,2,3,4}. For instance, the first cell in the first column indicates that a province receiving Christmas Lottery prizes equivalent to 1% of GDP in year t+1 experiences an increase in year t+1 in "Other transfers" (Income accounts) equivalent to 0.67% of GDP. All regressions also include as control (not reported) the expenditure in Christmas Lottery as share of GDP. Robust standard errors clustered by province in parentheses. The sample for column (1) includes only data from 1995, when information on *Other transfers* at the province level became available, to 2007. The samples for columns (2),(3),(4) and (6) includes data for every province from 1986 onward. The sample in column (5) includes only information until 2007. The sample in column (7) includes only information from 1988 onward. *significant at 10%; **significant at 5%;***significant at 1%.

Table 9: Descriptive Statistics - Christmas Lottery Prizes and Electoral Outcomes

	Mean values				
	All (N=300)	Winners (N=17)	Other (N=283)	Difference [=(2)-(3)]	P-Value diff = 0
	(1)	(2)	(3)	(4)	(5)
1. Christmas lottery					
Lottery prizes (%GDP)	0.37	3.39	0.19	3.20***	0.00
Lottery prizes (million €)	35.08	317.06	18.15	298.91***	0.00
Lottery expenditure (%GDP)	1.02	1.36	1.00	0.36***	0.00
Lottery expenditure (million €)	120.72	311.81	109.24	202.58***	0.00
2. Post-lottery outcomes					
Δ Votes Incumbent	-0.73	2.33	-0.91	3.25**	0.02
Δ Votes Socialist Party	0.12	0.91	0.07	0.83	0.46
Δ Votes People's Party	2.13	2.96	2.08	0.88	0.51
Δ Participation rate	1.13	-1.28	1.28	-2.56	0.11

Notes: The table includes information at the provincial level for general elections held between 1986 and 2008. The group of winning provinces corresponds to provinces awarded most of the top prize in any of the Christmas lotteries held during the term. *Lottery prizes* and *Lottery expenditure* provide information for Christmas lotteries held during the term previous to the election. *Lottery prizes* only includes information corresponding to the top three Christmas Lottery prizes. Electoral data is measured in percentage terms. Column (5) provides the p-value for a (two-sided) t-test where the null hypothesis is that the variables reported in columns (2) and (3) have equal mean, allowing for unequal variance. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 10: The Effect of Christmas Lottery Prizes on Electoral Participation

Dependent variable:	Δ Electoral Participation (%)							
	All incumbents				Ex. Sort	Left-wing	Right-wing	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ GDP per capita	0.15 (0.09)		0.15 (0.09)	0.08 (0.09)	0.09 (0.10)	0.13 (0.09)	0.21** (0.10)	-0.01 (0.17)
Δ Unemployment	0.20*** (0.05)		0.20*** (0.05)	0.17*** (0.05)	0.25*** (0.08)	0.20*** (0.05)	0.17*** (0.05)	0.23*** (0.07)
Δ CPI	0.08 (0.42)		0.08 (0.42)	-0.12 (0.45)	0.78* (0.44)	0.12 (0.41)	0.06 (0.45)	-0.83 (1.61)
Δ Housing prices	-0.00 (0.03)		-0.00 (0.03)	0.01 (0.03)	-0.01 (0.03)	-0.00 (0.03)	-0.02 (0.03)	0.13 (0.13)
Lottery prizes		-0.07 (0.07)	-0.09 (0.08)	-0.04 (0.09)	-0.38* (0.22)	-0.09 (0.07)	-0.09 (0.08)	-0.17* (0.09)
Lottery expenditure		0.53 (0.37)	0.47 (0.38)	-0.14 (0.79)	0.86** (0.39)	0.76** (0.32)	0.98 (0.81)	-0.08 (0.39)
Province fixed-effects	No	No	No	Yes	No	No	No	No
Population weights	No	No	No	No	Yes	No	No	No
Adjusted R-sq	0.82	0.81	0.82	0.80	0.82	0.82	0.67	0.89
N	300	300	300	300	294	294	200	100

Notes: Robust standard errors clustered by province in parentheses. All regressions include year fixed-effects. *Lottery prizes* and *Lottery expenditure* measure the total amount of Christmas Lottery prizes and expenditure during the term as percentage of provincial GDP respectively. The regression in column (5) is weighted by the number of potential voters in the province. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 11: The Effect of Lottery Prizes on Incumbents' Votes, by type of Province

Dependent variable:	Δ Votes for incumbent (%)					
	Level of GDP		Lottery expenditure		Population	
	Poor	Rich	Low	High	Small	Large
	(1)	(2)	(3)	(4)	(5)	(6)
Lottery prizes	0.10 (0.32)	0.27* (0.14)	0.47 (0.47)	0.20*** (0.06)	0.11* (0.06)	0.83* (0.48)
N	150	150	150	150	150	150

Notes: All regressions include year fixed-effects and control for Christmas Lottery expenditure during the term. Robust standard errors clustered by province in parentheses. Poor (rich) provinces are those with a GDP smaller than (larger than) the median province. Low (high) spending provinces are provinces where inhabitants spend less (more) on Christmas Lottery than inhabitants in the median province. Small (large) provinces are provinces whose population is smaller than (larger than) the median province. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 12: The Effect of Lottery Prizes on Incumbents' Votes, by Year

Dependent variable:	Δ Votes for incumbent (%)	
	(1)	(2)
Lottery prizes, t-1	0.55 (0.57)	0.50 (0.62)
Lottery prizes, t-2	0.22*** (0.07)	0.26*** (0.07)
Lottery prizes, t-3	0.13 (0.55)	0.14 (0.55)
Economic controls	No	Yes
Adjusted R-sq	0.59	0.60
N	300	300

Notes: All regressions include year fixed-effects and controls for Christmas Lottery expenditure one, two and three years before the election. Robust standard errors clustered by province in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 13: The Effect of Lottery Prizes on Incumbents' Votes, by Prize

Dependent variable:	Δ Votes for incumbent (%)	
	(1)	(2)
Top prize (<i>the Fatty</i>)	0.24*** (0.09)	0.27*** (0.10)
Second prize	-0.01 (0.12)	-0.09 (0.12)
Third prize	0.55 (0.72)	0.45 (0.63)
Economic controls	No	Yes
Adjusted R-sq	0.59	0.60
N	300	300

Notes: Both regressions include year fixed-effects and control for Christmas Lottery expenditure during the term. Economic controls include growth in GDP per capita, unemployment, the consumer price index and housing prices. Robust standard errors clustered by province in parentheses. All regressions include year fixed-effects. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 14: Placebo

Dependent variable:	Δ Votes for incumbent (%)
Lottery prizes after the election	-0.07 (0.08)
N	300

Notes: The regression includes year fixed-effects and controls for Christmas Lottery expenditure during the term. Robust standard errors clustered by province in parentheses.

Table 15: Survey Evidence

	Vote for incumbent	Sympathy incumbent	Assessment incumbent	Assessment opposition	Economic situation	Political situation	Voted for incumbent
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lottery prizes	.012** (.006)	.011 (.007)	.006 (.019)	-.019 (.034)	.003 (.021)	0.012 (0.021)	.010 (.008)
Lottery expenditure	.015 (.026)	.009 (.033)	.190* (.097)	.001 (.118)	.116 (.099)	0.086 (0.067)	.0106 (.039)
Population 2,001-10,000	-.004 (.006)	-.004 (.007)	-.010 (.014)	.016 (.016)	-.029** (.014)	-0.018 (0.012)	-.009 (.006)
Population 10,001-50,000	-.006 (.008)	-.008 (.008)	-.052*** (.016)	-.002 (.019)	-.086*** (.014)	-0.057*** (0.012)	-.008 (.008)
Population 50,001-100,000	-.01 (.009)	-.015 (.010)	-.103*** (.024)	-.001 (.026)	-.125*** (.022)	-0.101*** (0.015)	-.015 (.009)
Population 100,001-400,000	.002 (.009)	-.005 (.010)	-.082 (.020)	-.036 (.027)	-.139*** (.015)	-0.087*** (0.015)	-.005 (.012)
Population 400,001-1,000,000	-.023* (.013)	-.024* (.014)	-.147*** (.023)	-.103*** (.032)	-.149*** (.020)	-0.164*** (0.020)	-.030** (.013)
Population over 1,000,001	-.012* (.007)	-.020** (.008)	-.088*** (.019)	-.069*** (.023)	-.108*** (.016)	-0.078*** (0.017)	-.022*** (.009)
Age	.001*** (.000)	.001*** (.000)	.004*** (.000)	.000 (.000)	.004*** (.000)	0.004*** (0.000)	.002*** (.000)
Female	-.018*** (.002)	-.013*** (.003)	-.009 (.007)	.099*** (.007)	-.180*** (.008)	-0.031*** (0.005)	-.010*** (.002)
Secondary education	-.021*** (.006)	-.021*** (.007)	.019** (.009)	-.113*** (.010)	.194*** (.010)	0.052*** (0.008)	-.018** (.007)
Higher education	-.027** (.010)	-.027** (.012)	.035** (.014)	-.192*** (.023)	.383*** (.017)	0.105*** (0.016)	-.006 (.013)
Unemployed	-.009* (.005)	-0.01** (.004)	-.072*** (.009)	.014* (.010)	-.167*** (.012)	-0.055*** (0.007)	-.019*** (.004)
Retired	.028*** (.004)	.026*** (.004)	.068*** (.008)	.104*** (.011)	.023** (.011)	0.006 (0.009)	-.009*** (.003)
Student	-.031*** (.005)	-.031*** (.006)	.055*** (.012)	.117*** (.014)	.142*** (.012)	0.038*** (0.010)	-.131*** (.006)
Homemaker	.015*** (.003)	.014*** (.003)	.049*** (.008)	.056*** (.011)	.019** (.009)	0.027*** (0.006)	.010*** (.003)
Pseudo R-sq	0.0473	0.0660	0.0504	0.0496	0.0986	0.157	0.0564
N	287163	269926	235789	182337	219147	206709	289726

Notes: Columns (1), (2) and (7) provide the marginal effects of a probit regression. Columns (3)-(6) provide results from an ordered probit. Robust standard errors clustered by province in parentheses. The sample includes information from 98 political surveys conducted by the Spanish Center for Sociological Research (CIS) between 1986 and 2010. Lottery prizes measure Christmas Lottery prizes awarded within the previous nine months. All regressions include controls for individual characteristics, the interaction between *Lottery expenditure* and individual characteristics, time dummies and fixed-effects for province times academic year (not reported). *significant at 10%; **significant at 5%; ***significant at 1%.

Table 16: Survey Evidence - Interaction with Individual Characteristics

	Vote for incumbent	Sympathy incumbent	Assessment incumbent	Assessment opposition	Economic situation	Political situation	Voted for incumbent
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lottery prizes	-0.004	-0.014	-0.021	-0.010	-0.018	-0.066	-0.014
Interacted with:	(0.012)	(0.015)	(0.036)	(0.022)	(0.031)	(0.040)	(0.016)
Between 30 and 45 years old	0.010	0.011	0.037	0.024	-0.014	0.060	0.011
	(0.014)	(0.013)	(0.047)	(0.019)	(0.022)	(0.041)	(0.009)
Between 45 and 60 years old	0.008	0.008	0.012	0.019	-0.028	0.025	0.006
	(0.017)	(0.018)	(0.038)	(0.021)	(0.020)	(0.038)	(0.015)
More than 60 years old	-0.001	-0.003	0.018	0.022	-0.041	0.076**	-0.008
	(0.016)	(0.021)	(0.047)	(0.016)	(0.041)	(0.037)	(0.021)
Female	0.011	0.003	0.012	-0.013	0.019	0.001	0.009
	(0.009)	(0.009)	(0.016)	(0.025)	(0.029)	(0.021)	(0.006)
Secondary education	0.017	0.019	0.018	0.008	0.041	0.036	0.016
	(0.016)	(0.017)	(0.029)	(0.025)	(0.025)	(0.033)	(0.012)
Higher education	0.027	0.030	-0.014	-0.016	0.031	0.045	0.009
	(0.022)	(0.020)	(0.049)	(0.026)	(0.028)	(0.033)	(0.026)
Unemployed	-0.013	-0.009	0.024	-0.044*	-0.027	0.019	-0.035***
	(0.023)	(0.023)	(0.032)	(0.023)	(0.045)	(0.041)	(0.011)
Retired	0.032**	0.033*	0.004	-0.056***	0.027	-0.024	0.033*
	(0.015)	(0.018)	(0.026)	(0.018)	(0.036)	(0.032)	(0.018)
Student	0.002	0.008	0.026	0.068*	-0.086	0.060	0.003
	(0.026)	(0.024)	(0.068)	(0.036)	(0.070)	(0.074)	(0.015)
Homemaker	0.026***	0.041***	0.047**	-0.042**	0.014	0.038	0.036**
	(0.008)	(0.010)	(0.018)	(0.019)	(0.030)	(0.027)	(0.014)
R-sq	0.056	0.077	0.123	0.125	0.228	0.158	0.078
N	175587	167630	152120	182461	131776	124784	180581

Notes: Robust standard errors clustered by province in parentheses. The sample includes all political surveys conducted by the Spanish Center for Sociological Research (CIS) between 1986 and 2010 in October and January. All regressions include controls for individual characteristics, the interaction between *Lottery expenditure* and individual characteristics, time dummies and fixed-effects for province times academic year (not reported). *significant at 10%; **significant at 5%; ***significant at 1%.