ARGENTINIAN ELECTIONS: FORECASTING OUTCOMES

Elecciones argentinas: pronóstico de resultados

Eleições argentinas: previsão de resultados

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Keywords:	**Abstract**
Forecasting elections; Argentina; presidential elections; legislative elections	Election forecasts, based on public opinion polls or statistical structural models, regularly appear before national elections in established democracies around the world. However, in less established democratic systems, such as those in Latin America, scientific election forecasting by opinion polls is irregular and by statistical models almost non-existent. Here we attempt to ameliorate this situation by exploring the leading case of Argentina, where democratic elections have prevailed for the last thirty-eight years. We demonstrate the strengths—and the weaknesses—of the two approaches, finally giving the nod to structural models based political and economic fundamentals. Investigating the presidential and legislative elections there, 1983 to 2019, our political economy model performs rather better than the more popular vote intention method from polling.

Palabras clave:
pronósticos electorales; Argentina; elecciones presidenciales; elecciones legislativas

Resumen

Antes de las elecciones nacionales en las democracias establecidas de todo el mundo suelen aparecer regularmente pronósticos electorales basados en encuestas de opinión pública o modelos estadísticos estructurales. Sin embargo, en sistemas democráticos menos establecidos, como los de América Latina, la predicción científica de las elecciones por medio de encuestas de opinión es irregular y por modelos estadísticos es casi inexistente. Aquí intentamos mejorar esta situación explorando el caso principal de Argentina, donde las elecciones democráticas han prevalecido durante los últimos treinta y ocho años. Demostramos las fortalezas —y las debilidades— de los dos enfoques, y remarcando finalmente la utilidad de los modelos estructurales basados en fundamentos políticos y económicos. Al investigar las elecciones presidenciales y legislativas de Argentina, desde 1983 a 2019, nuestro modelo de economía política funciona bastante mejor que el método más popular de intención de voto de las encuestas.

Palavras-chave:
previsões eleitorais; Argentina; eleições presidenciais; eleições legislativas

Resumo

As previsões eleitorais com base em pesquisas de opinião pública ou modelos estatísticos estruturais geralmente aparecem antes das eleições nacionais em democracias estabelecidas em todo o mundo. No entanto, em sistemas democráticos menos estabelecidos, como os da América Latina, a previsão científica de eleições por meio de pesquisas de opinião é irregular e, pelos modelos estatísticos, quase inexistente. Aqui, tentamos melhorar esta situação explorando o caso principal da Argentina, onde as eleições democráticas prevaleceram nos últimos trinta e oito anos. Demonstramos os pontos fortes – e fracos – das duas abordagens e, por fim, destacamos a utilidade dos modelos estruturais baseados em fundamentos políticos e econômicos. Ao pesquisar as eleições legislativas e presidenciais da Argentina de 1983 a 2019, nosso modelo de economia política tem um desempenho muito melhor do que o método de intenção de voto das pesquisas mais populares.

INTRODUCTION

Throughout the democratic world, election forecasting has become catching. Scientific forecasting efforts began in America and Britain, perhaps facilitated by their leading roles as two-party polities, ones monitored heavily by public opinion pollsters (Lewis-Beck and Tien, 2011). Currently, however, almost all established democratic countries have scholars and journalists who aim to foretell elections, usually from poll results or statistical models (Jérôme and Lewis-Beck, 2010; Campbell and Lewis-Beck, 2008; Linzer, 2013; Stegmaier and Lewis-Beck, 2014). In the broad region of Europe, the use of vote intention surveys represents an enduring, not to say leading, approach[1]. For Britain, especially, there exists a bounty

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1. These models are known as Polling Models and use individual variables from public opinion polls. These employ questions that ask individuals about their vote intention for the next elections and use that to estimate the electoral results.

of work, seriously launched in the 1970s. With respect to more recent scholarship there, see the useful example of Whiteley, Sanders, Stewart and Clarke (2011).

Structural models[2], so called because they are based on more fundamental political and economic indicators, represent a rival approach to vote intention polls and are also becoming well-placed. See the following exemplary studies: Whiteley (2005) on Britain; Nadeau and Bélanger (2010) on France; Norpoth and Gschwend (2010) on Germany; Dassonneville and Hooghe (2012) on Belgium; Magalhães, Aguiar-Conraria and Lewis-Beck (2012) on Spain; Larsen (2016) on the Scandinavian countries. These structural models usually derive from political economic theories of voting as reward-punishment or referenda (Key, 1966; Lewis-Beck and Stegmaier, 2000; Tufte, 1978) and focus on single-country, single-equation, time series regression analyses.

In certain democracies, however, election forecasting barely exists; it is, in the title words of a special collection on the subject, "neglected" (Lewis-Beck and Bélanger, 2012). There are different reasons for such neglect. An obvious one bears on the financial and organizational resources available for building a model or executing a survey. The necessary data need to be scientifically gathered and made available to interested researchers, otherwise the election forecasting enterprise will come to a dead stop. Low-income democracies tend to be hard pressed here, and our case of Argentina represents no exception, as we shall see.

Another reason for "neglecting" forecasting can be the complexity of the dependent variable itself. Without doubt, the sine qua non remains "lead time," i.e., the forecast must be made before the election takes place, preferably some time before (Lewis-Beck and Rice, 1992). Also critical is the issue of accuracy. The aim is quantitative prediction of an election outcome, such as the percentage vote share of a party. But which party? Does the government consist of one party, or a complex coalition of parties? A frequent remedy in the face of coalitional complexity consists of measuring the total vote share for all parties in the coalition, e.g., a ruling left-wing coalition as in the French case (Nadeau et al., 2012). Another strategy merely measures the vote share of the lead party in the coalition. [A useful reference here comes from the Dutch case, with its many parties (Dassonneville et. al. (2017)].

These foundational questions of data availability and measurement are the first bridges to be traversed and we begin with them below, before turning to methods and their application. We aim to develop for Argentina the two leading

2. Structural models use aggregated variables at the country level to predict the electoral results. Namely, political and economic characteristics of countries, for example the level of economic growth, gross domestic product, the level of unemployment, the satisfaction with the government, the presidential approval, among others. An example would be, using the economic growth registered in the country in the last year, to predict the electoral results that the president's party will have this year.

approaches to systematic election forecasting— vote intention polling and political economy modeling (a structural model). The two offer different, not to say conflicting, strategies. After laying out empirically each method, we move on to a comparison of their performance, thus entering an ongoing debate about "Modelers v. Pollsters" (Lewis-Beck, 2001). As shall be seen, while both approaches have their virtues, in the Argentinian case the modeling effort seems to offer more yield.

THE ARGENTINIAN CASE

As we mentioned in the previous section, Argentina can be defined as a neglected democracy in terms of electoral forecasting. This is a presidential and federal country, with the power divided between the executive, the legislative, and the judicial branches. Since the democratic return of 1983, a total of 28 free, fair and competitive elections have held; 9 presidential and 19 legislative elections. Until the constitutional reform of 1994[3], the term of the presidential administrations was 6 years without reelection, then became 4 years with a permitted reelection. The incumbent parties were the Radical Civic Union (UCR) that governed between 1983 and 1989, and between 1999 and 2001 under an Alliance led by the UCR. The Peronist Party (PJ) ruled between 1989 and 1999, and also between 2001 and 2003. Furthermore between 2003 and 2015 a faction of the PJ, known as "Frente para la Victoria" (FPV), occupied the presidency. Finally, between 2015 and 2019, the country was governed by a center-right alliance – Cambiemos – led by the Republican Proposal Party (PRO).

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3. The election of the president since the 1994 reform is by a special majority, it is an attenuated balloting (the most voted for candidate must obtain 45% or more of the valid votes or obtain a difference of 10 percentage points with respect to the second place winner, otherwise they should go to a second round). Further, in the period between 1983 and 1994, the election of the president was indirect by Electoral College and by simple majority. In fact, there was only one year, in 2015, in which a second round was held. For the rest of the elections the first round was the fundamental one. (In 2003, the most voted for candidate did not achieve the required majority, but since he did not will win in the second round, he withdrew earlier. Likewise, the 2003 election was quite particular, not only because of that but also because they were coming out of the 2001 crisis and the political system was convulsed.). Thus, effectively, there has been only one second round election, until the present.

Figure 1. Vote Share of Incumbent Party in presidential and legislative elections, 1983-2019
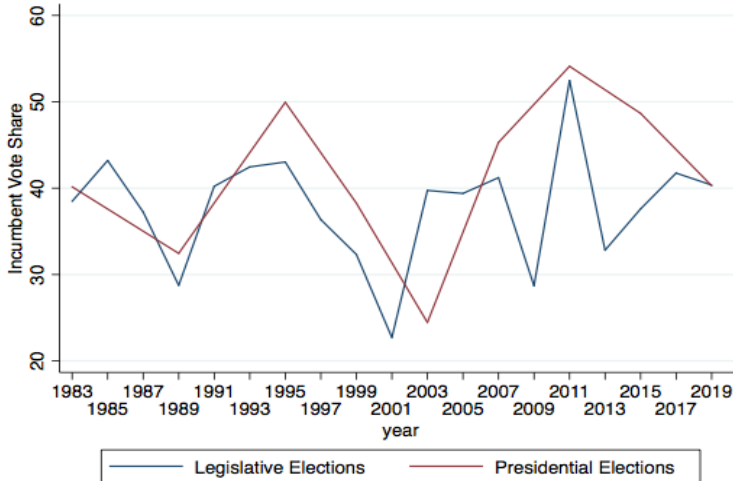
Note: The graph shows the electoral performance of the ruling party, in each of the elections between 1983 and 2019. This does not always coincide with the party that wins the elections. For details on the incumbent parties, refer to table B1 in the appendix.

Source: Author's own elaboration from National Electoral Directorate (DINE) of Argentina data.

In Figure 1, it is possible to see the performance of the incumbent party between 1983 and 2019. The vote share obtained in presidential elections is shown in the red line and in the blue line the percentage obtained in legislative elections. The performance is quite varied, from years in which the governing party had very bad electoral results, such as 2001 and 2003, to other years in which the incumbent party obtained big victories close to 50% of the votes (1995) or even exceeding that amount (2011).

Many of these fluctuations are associated with the occurrence of economic and political crises. Thus, in economic matters we can mention the hyperinflationary crisis of 1989 that raised prices by almost 5000 percent during that year; the devaluation crisis of 2001 and a slightly milder one, but still acute, in 2018. These crises had political consequences. For instance, they involved the change, in advance, of the presidency between Raúl Alfonsín and Carlos Menem[4], or the succession of 5 presidents in a week at the end of 2001. In that year the president (UCR /

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4. Carlos Menem took office on June 30, 1989, 5 months before the constitutionally scheduled date.

Alianza) resigned and was succeeded by 3 more presidents, who also resigned after a few days. Then, the Legislative Assembly nominated Eduardo Duhalde, senator of PJ party, as President, until the 2003 elections.

As a consequence of this strong economic instability, there is also a strong exercise of accountability, and the management of the economy is often reflected in political terms. In Argentina, the President is the Chief Executive and thus holds primary responsibility for the economy. The deputies and senators, in contrast, are formally disconnected from the attribution of responsibilities for the management of the economy. Even so, the midterm elections are usually taken as a test of presidential management. In other words, the mid-term legislative elections are also read as a result of the evaluation of the president's performance up to that point.

The limited length of the democratic experience in Argentina, coupled with strong economic and political instability make electoral forecasts here a great challenge. Furthermore, the field of electoral polls is young, having been launched more widely during the mid-eighties and nineties. If we refer to scholarly works on forecasting elections in Argentina that rely on polling data, we can only name two articles. The paper by Cabrera et al. (2016), who analyze the accuracy of a total of 369 pre-election polls carried out between 1985 and 2015. The authors conclude that between 7 and 8 out of 10 electoral forecasts, based on data from public opinion polls, have been reasonably correct; they go on to emphasize, that despite the difficult circumstances, surveys can be suitable instruments for prospective analysis (Cabrera et al., 2016: 22-23). In another paper, Oliva (2001) reflects on different strategies for investigating electoral behavior through surveys to predict electoral results in Argentina, via regression or projection of undecided by previous vote, or different weighting schemes. The author demonstrates that the precision of electoral polls varies from election to election as well as with the research strategies employed.

Another work that constitutes a relevant background for this paper is that of Bunker (2020). He proposes a two-stage model (TSM) for forecasting elections – a TSM and computed estimates with Bayesian algorithms and Markov chains – with the aim of minimizing the difference between electoral predictions and electoral results. He has tested the model using data stemming from 11 countries and 26 elections in Latin America, including Argentina. The results show that the TSM is effective in reducing the difference between poll predictions and results, and its forecasts have been more accurate than the average poll[5]. "This is especially relevant in the context of new democracies, and especially of Latin America, where

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5. This approach was also applied for the Chilean elections. For more details see Bunker and Bauchowitz (2016).

accuracy levels of polls have been harshly scrutinized in recent years" (Bunker 2020: 10).

To date, we do not know of papers that make electoral forecasts of the Argentine elections based on structural models. At this point, then, it represents an open field of inquiry and one we pursue here.

DATA, VARIABLES, AND METHODS

We have compiled data for a total of twenty-eight general elections, nine presidential elections and 19 legislative elections, stretching from 1983 to 2019. We start with 1983 when the first elections, after the last dictatorial period, were held. Since then, Argentina has enjoyed almost 38 years of uninterrupted democracy, the longest period of institutional stability (i.e., no constitutional breakdowns) in Argentine history. The election data come from the National Electoral Department (DINE for its acronym in Spanish, Dirección Nacional Electoral) and the web site of Andy Tow, *https://www.andytow.com/blog/*.

Our dependent variable, which we wish to forecast, consists of the incumbent administration's electoral performance, namely its vote share in presidential and legislative elections. The presidential elections of 2003 were particular. Not only because they were the first to be held after the great political crisis of 2003, but also because the National Congress of the Justicialist Party annulled the within-party primaries and approved the system of "neolemas", which authorized Carlos Menem, Adolfo Rodríguez Saá and Néstor Kirchner to participate directly in the general election called for April 27. This decision of the political party was confirmed by a court order from Federal Judge Cervini de Cubría. In this way, 3 of the 5 most voted for candidates belonged to the PJ[6]. To report the percentage of votes for the 2003 incumbent, we used the percentage obtained by one of these formulas, corresponding to the "Alianza Frente por la Lealtad – UceDe" since they were the candidates of the majority faction within the PJ.

The primary independent variable, in our polling model, is the average vote intention estimates for the incumbent government three to six months before the contest[7]. When multiple estimates are available for the month in question, we av-

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6. They were the candidates of "Alianza Frente por la Lealtad – UceDe" (Menem-Romero); "Alianza Frente para la Victoria" (Kirchner-Scioli); "Frente Movimiento Popular – Unión y Libertad (Rodriguez Saá-Posse).

7. For most years, we collected voting intention polls conducted 6 months prior to the election. In a few cases, we collected surveys that were conducted 3 or 4 months prior to the election. For the cases of the 1995 and 1989 presidential elections we collected surveys conducted one month before the election considered, since they were the only ones available. See the appendix for more details.

erage the ratings. The data are sourced from several online sources. Lack of data availability is a frequent issue in Latin America. Access to public opinion survey data, although it has improved, remains difficult. Even during the first years after the 1983 re-democratization, polls were scarce. Therefore, we have searched in various available data sources on the internet in order to build our variable of incumbent voting intention in the months prior to the elections. We supplemented these data with a search of 3 national newspapers archives: *Página12*, *La Nación* and *Clarín*. (However, their digital files only go back to 1997 and 1998. For this reason, it was not possible to have a full set of pre-election polling data for legislative elections prior to that time)[8].

The primary independent variables, for the structural model, are based on the so-called "fundamentals" of electoral choice, namely economic and political indicators. [This is sometimes called a Political Economy model; see Lewis-Beck and Tien (2016). For economic voting work on Latin America, see also Lewis-Beck and Ratto, 2013; Ratto, Bélanger, Nadeau, Lewis-Beck, Gélineau, Turgeon, 2015).] Concerning the economic issue, the leading measure is annual economic growth. We measure this using the standard GDP growth the year before Election Day, sourced from the World Bank. Concerning the measurement of political issues, we rely on public opinion measures of "Satisfaction with Government", six months before election day, coming from the Executive Approval Database (EAD) 2.0 (Carlin, Hartlyn, Hellwig, Love, Martínez-Gallardo and Singer 2020).

For both the polling and structural models, we begin by estimating them separately, for presidential and legislative elections, given there may be differences in the way that citizens choose in both types of elections. For the presidential elections, the results reported are those obtained for the category of President; for the legislative elections, the results reported are those obtained for the category of national deputies. Then, we go on to examine combined models[9] (presidential and legislative elections), by including a dummy variable[10] named "Presidential Elections" (scored 1 if the election is presidential and 0 otherwise). These combined models have the added benefit of noticeably increasing the sample size,

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The voting intentions reported in these surveys were averaged and this average percentage is used as the independent variable.

8. Due to the difficulty of obtaining data from the technical notes of each survey collected, we have not been able to report them.

9. The combined models include the electoral results of the presidential elections (1983; 1989; 1995; 1999; 2003; 2007, 2011; 2015; 2019) plus the electoral results of the legislative elections (1983; 1985; 1987; 1989; 1991; 1993; 1995; 1997; 1999; 2001; 2003; 2005; 2007; 2009; 2011; 2013; 2015; 2017; 2019).

10. A dummy variable is a variable that only has two values. In our case, the presidential elections receive the value of 1, and the legislative elections the value of 0. This allows us to identify the effect that the presidential elections have apart from the legislative elections in our model.

so yielding more reliable estimates. The sample size issue often comes up when aggregate level, national election forecasting models are developed for a country. The combination of presidential and legislative elections here considerably increases the sample size. Furthermore, to take into account the relative scarcity of degrees of freedom, we always report the adjusted R-squared, which corrects for this condition[11] (Lewis-Beck and Lewis-Beck) 2015, p. 63.

In this way, our database records the observations of each electoral year by row[12]. The analyses are based on a series of ordinary least squares (OLS)[13] regressions, in three parts. The first two serve to test the election forecasting accuracy of the vote intention model and the structural political economy model. Our third objective contrasts the performance of these two approaches.

THE POLLING MODEL: EMPIRICAL ANALYSIS

We begin with the polling model, which forecasts incumbent vote share (V) as a function of average vote intention (I), measured before the election, i.e., V = f (I t-x). To test the predictive capacity of this model, we estimate three OLS regression equations. In Table 1, Model 1, we regress the average opinion poll estimates of vote intention on the official vote share of the incumbent presidential administration [14], three-six months before the election. Model II adopts a similar strategy, but our dependent variable is the vote share for the incumbent government for legislative elections[15]. Model III combines data for presidential and legislative elections. (It should be noted that sometimes a presidential election and a legislative election may not achieve complete statistical independence because, say, they occur in the same year. Further, presidential and

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11.   The adjusted R-squared, while lowering the reported fit, can still under correct for small samples because of the relative ease of running the line through several points. In that situation, strong theory, e.g., the political economy specification, becomes especially important in avoiding noise.

12.   For the Polling model, we use the Vote share for the incumbent government, the averaged voting intentions from polls and, for the combined models, the dummy variable that distinguishes the presidential elections from the legislative ones. The Structural Model, in addition to the Vote share for the incumbent government, includes the Satisfaction with Government and Annual Economic Growth in the prior year and also for the combined models the dummy variable that distinguishes the presidential elections from the legislative ones.

13.   A linear regression model, is a linear approach to modelling the relationship between a scalar dependent variable and one or more explanatory variables. OLS chooses the parameters of a linear function of a set of explanatory variables by minimizing the sum of the squares of the differences between the observed dependent variable in the given dataset and those predicted by the linear function of the independent variable (see Lewis-Beck and Lewis-Beck, 2015).

14.   The information per row are the results obtained for President category.

15.   The information per row are the results obtained for National Deputies category.

Table 1. Government Vote Share as a Function of Lagged Vote Intention (28 Argentinian general elections 1983-2019).

Dependent variable: Vote share for the incumbent government			
	I	II	III
Variable	Presidential	Legislative	Combined Pres + Leg elections
Mean polling estimate for Government$_{t3-6}$	0.68***	0.39*	0.50***
	(0.21)	(0.177)	(0.14)
Presidential Elections	-	-	3.97
			(2.99)
Constant	17.72*	23.95***	20.05***
	(7.69)	(6.27)	(4.95)
N elections	8	13	21
R^2	0.64	0.30	0.47
Adjusted R^2	0.58	0.24	0.41
Root Mean Squared Error (RMSE)	6.39	6.76	6.67
Median Absolute Error (MAE) Within-sample	4.73	5.02	4.86
Median Absolute Error (MAE) Out-of-sample Jackknife	6.54	6.90	6.73
Median Absolute Error (MAE) Out-of-sample One-Step-Ahead	6.67	4.99	3.29

Note: Entries are unstandardized coefficients of regression with standard errors in parentheses; * = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$ in one tail test. Root Mean Squared Error (RMSE) also referred to as Standard Error of Estimate (SEE).

Source: Vote share for the incumbent government: Author's own elaboration from National Electoral Directorate (DINE) of Argentina data. Voting intention for Government: mean polling result t-3/6: Author's own elaboration. We have searched in various available data sources on the internet in order to build our variable of voting intention for the incumbent in the months prior to the elections. We supplemented these data with a search of 3 national newspapers archives: *Página12*, *La Nación* and *Clarín*. (However, their digital files only go back to 1997 and 1998. For this reason, it was not possible to have a full set of pre-election polling data for legislative elections prior to that time).

legislative election results are, virtually of necessity, correlated to some extent; to take into account this dependency, we enter into the combined equation a dummy variable, labeled Presidential Elections, to indicate the type of election being estimated).

As an evaluation tool, the presidential election model has desirable character-istics (Lewis-Beck, 2005). It has parsimony (with only one independent variable), replicability (the polling data are publicly available), and lead time (at a non-trivial distance from the contest). However, on the criterion of accuracy, the picture appears mixed. Model I for presidential elections yields a moderate model fit (R^2 of 0.64). This middling assessment continues upon examination of the actual pre-diction errors, where the within-sample error (MAE)[16] is 4.73 points. We can ob-serve the pattern of errors in Figure 2, which offers a scatterplot of presidential vote share on the Y axis, and vote intention of the X axis. For three elections, we can see the error exceeds five points (1989, 2011, 2015). However, the RMSE, seen as an approximate estimate of the model's average forecasting error in gen-eral (Lewis-Beck & Lewis-Beck, 2015, p. 38), climbs to 6.39 points. Turning to legislative elections (Model II, Table 1), the picture worsens, e.g., the R^2 falls by more than half, to 0.24. Still, clearly the legislative result adds some relevant in-formation, indicating that legislative balloting, as well, responds significantly to heightened vote intentions.

Given the small N for presidential elections, it certainly seems worthwhile to pool the data-sets, yielding an N = 21, almost tripling the presidential sam-ple size. We see in Model 3 (Table 1) the results on this presidential-legislative combination. The overall fit, judged by the R^2, deteriorates compared to the presidential model (Model 1). However, the Median Absolute Error within sam-ple stays comparable to the presidential result, i.e., 6.67 and 6.39, respectively. Moreover, the out-of-sample comparisons hold up fairly well, in particular the one-step-ahead error, i.e., 6.67 and 3.29, respectively. (More on these out-of-sample results below).

While Figure 2 depicts the within-sample estimates, giving us a visual sense of how well our linear model fits the data, the forecasting endeavor is principally concerned with making out-of-sample election forecasts in real-time. We take a two-pronged approach in estimating out-of-sample predictions: jackknife and one-step-ahead diagnostics. The jackknife test involves omitting one election at a time from the analysis and re-estimating the vote and seat share models based on the remaining 7 (for presidential elections), 12 (for legislative elections), and 20 (for combined elections) contests. Thus, we devise 8/13/21 models (dropping one

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16.   MAE, is the Median Error of the Estimate. It is calculated from the absolute error, which is the difference comparing the forecasts with official results in absolute terms. Then the MAE is the median of these errors.

Figure 2. Within-sample forecasts of incumbent government vote share in Presidential Elections at T3-6 months from election yielded from opinion polls (diamonds) compared with official results for 8 Argentinian general presidential elections 1989-2019.
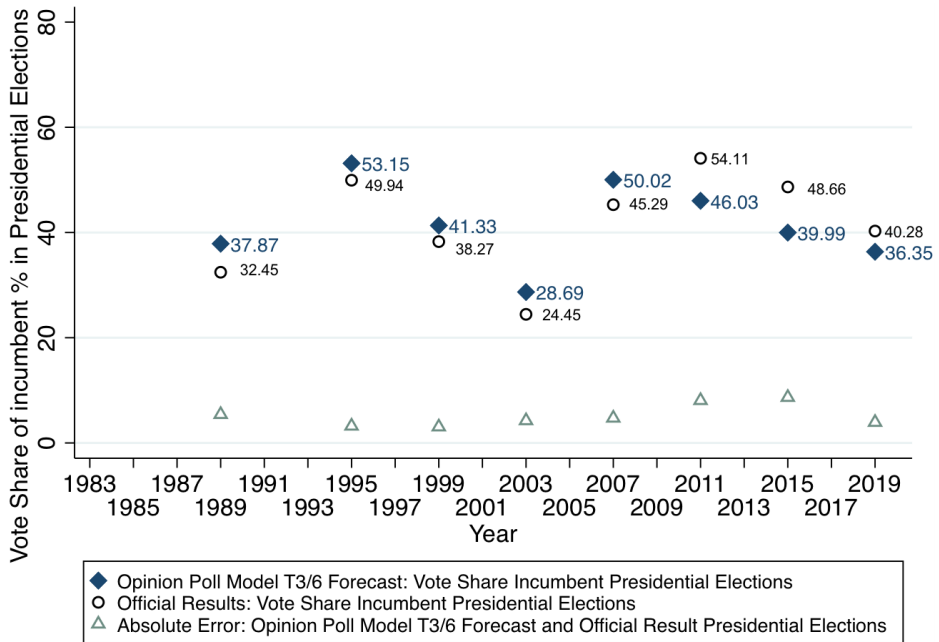
Note: Based on estimates from Table 1 Model I. Triangles are the absolute error between the within sample forecast and the official result.

Source: Vote share for the incumbent government: Author's own elaboration from National Electoral Directorate (DINE) of Argentina data. Voting intention for Government: mean polling result t-3/6: Author's own elaboration. We have searched in various available data sources on the internet in order to build our variable of voting intention for the incumbent in the months prior to the elections. We supplemented these data with a search of 3 national newspapers archives: *Página12, La Nación* and *Clarín*. (However, their digital files only go back to 1997 and 1998. For this reason, it was not possible to have a full set of pre-election polling data for legislative elections prior to that time).

election at a time) and estimate the predicted vote for presidential, legislative or both elections omitted from the analysis and compare it with the official result in that year's election. From this, we deduce an out-of-sample median absolute error

(MAE), enabling us to assess the model's projection potential[17]. We detail the jack-knife diagnostics for the opinion poll model in Table C3 in Appendix C.

Our second out-of-sample diagnostic is the one-step-ahead procedure (Lewis-Beck, 2005, pp. 153-154), involving estimating the model on the entire time-series up to a particular year and then forecasting the share for the next election. For example, the 2019 presidential elections estimation is based on data from 1983-2015. Each subsequent forecast is based on re-estimating with an ever-smaller time series. Given the small sample size (n=8/13/21) at our disposal, we restrict our computations to one-step-ahead estimates from 1999 onwards, which we detail in Table C5 of appendix C. The median absolute error[18] for these step-ahead forecasts is 3.29 for the combined model, 4.99 for the legislative elections model and 6.67 for the presidential elections model. This provides evidence that the combined estimates from opinion polls yield more accuracy than the separated presidential and legislative elections prognosis.

The analysis also reveals the 2011 elections are especially problematic for the three opinion poll models, with the error between step-ahead prediction and the official result exceptionally high (12.17 for presidential elections, 15.46 for legislative elections and 11.96 for the combined elections model, respectively). On the contrary, for some elections the prognosis is close to the official result. For example for legislative elections in 2013 the MAE one-step-ahead is 0.02 and for combined elections in 2005 the MAE one-step-ahead is 0.47.

In sum, taking the customary forecasting lead time of three to six months, Argentinian opinion poll ability to accurately predict the performance of the incumbent government with an appropriate lead time appears mixed and perhaps more varied than conventional wisdom has assumed. Can structural models do better?

THE STRUCTURAL MODEL: EMPIRICAL ANALYSIS

The structural model, to which we now turn, posits a political economy equation for incumbent vote share (V), with elections serving as a referendum on the government's handling of economic and political issues before the contest. Thus, $V = f(E_{t-x}, P_{t-x})$, where E measures annual economic growth and P measures satisfaction with the government.

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17. The Out-of-sample forecasts of incumbent vote share using a jackknife approach, takes the median Root MSE of each Argentine presidential and legislative elections as reference.
18. Median Absolute Error (MAE) of the step ahead forecast it is obtained from absolute errors between the predicted vote shares' from the step-ahead procedure and the official result, ordering them from lowest to highest and establishing the number that divides the absolute errors sample in two.

Table 2. Incumbent Vote Share as a Function of Government Satisfaction (t – 6 months), Economic Growth (t – 1 year), in 28 Argentinian general elections 1983-2019

Dependent variable: Vote share for the incumbent government			
	IV	VI	VII
Variable	Presidential	Legislative	Combined Pres + Leg elections
Satisfaction with Government $_{t-6\ months}$	0.46*	0.36**	0.40***
	(0.20)	(0.11)	(0.09)
Annual Economic Growth $_{t-1year}$	0.67*	0.48*	0.58***
	(0.33)	(0.23)	(0.17)
Presidential Elections	-	-	5.89**
			(2.06)
Constant	21.60*	20.18***	17.99***
	(8.35)	(5.48)	(4.30)
N	9	19	28
R^2	0.79	0.44	0.61
Adjusted R^2	0.72	0.36	0.56
Root Mean Squared Error (RMSE)	4.85	5.27	5.00
Median Absolute Error (MAE) Within-Sample	2.76	4.49	3.82
Median Absolute Error (MAE) Out-of-sample Jackknife	5.1	5.30	5.05
Median Absolute Error (MAE) Out-of-sample One-Step-Ahead	11.91	5.13	3.07

Note: Entries are unstandardized coefficients of regression with standard errors in parentheses; += p<0.1; * = p<0.05; ** = p<0.01; *** = p<0.001 in one tailed test. Root Mean Squared Error (RMSE) also referred to as Standard Error of Estimate (SEE).

Source: Vote share for the incumbent government: Author's own elaboration from National Electoral Directorate (DINE) of Argentina data. Satisfaction with Government t-6: Executive Approval Database (EAD) 2.0 (Carlin, Hartlyn, Hellwig, Love, Martínez-Gallardo and Singer 2020). GDPt-1 year: World Bank Open Data: https://datos.bancomundial.org/

In Table 2, we detail the OLS estimates of this equation for presidential elections (model IV), legislative elections (model V) and combined elections (Model VI), based on elections between 1983 and 2019. Observe that the models fulfill the first three evaluation criteria, i.e., it is parsimonious, replicable, and has good lead-time, at six months.

The slope estimates for the three models favor the theory underlying this political economy model, namely incumbent support appears to respond in the expected ways to changes in satisfaction with government, annual economic growth, and election type (presidential or legislative), reaching statistical significance (at 0.05 or more) for all the independent variables. On explanatory value, we see the presidential elections model offers better goodness-of-fit than the legislative model (i.e., R^2 = .79 versus .44, respectively). Further, the presidential model delivers a superior within-sample error measure (MAE = 2.76 versus 4.49, respectively.) Nevertheless, the presidential model stumbles with regard to out-of-sample error measures, in particular the one-step-ahead measure, which registers a whopping 11.91. Such gross error underlines the value of combining the two election streams into one pool, in the combined model (Model VI, Table 2). Focus on the crucial out-of-sample measures which, after all, offer the toughest tests, as they are *ex ante* in form. With respect to the jackknife test, we observe it has the lowest value of the three models, if only by a hair (at 5.05). But the combined model shines with the one-step-ahead test, yielding a much lower value than the other two models (i.e., 3.07 compared to 5.12 and 11.91, respectively), in Table C4 of appendix C we detail the jackknife test. Looking at its pattern of point forecasts, we tend to see little error across the time span. That is, the one-step-ahead forecasts for 1997, 2003, 2011, and 2013 are within 1.5-points of the official result (we detail the one-step-ahead test in Table C6 of appendix C). This lays the groundwork for guarded optimism with regard to the model.

In summary, the political economy models, especially in combined form, may have potency in forecasting government vote share in Argentina. Below we go on to a fuller, face-to-face performance comparison of the polling approach versus the structural approach.

THE POLL MODEL VERSUS THE POLITICAL ECONOMY MODEL: A PERFORMANCE COMPARISON

There exist several ways of teasing out how structural models, such as the political economy equation, compare to polling models, such as the vote intention equation. In Table 3 we compare the approaches, as applied to Argentinian elections, on several metrics.

Table 3. Comparison of Predictive Properties of Polling Models and Structural Models, As Applied to Forecasting Incumbent Vote Share in 28 Argentinian general elections, 1983-2019

Criterion	Presidential elections		Legislative elections		Combined elections (presidential + legislative)	
	Opinion Polls Model	Structural Model	Opinion Polls Model	Structural Model	Opinion Polls Model	Structural Model
Adjusted R^2	0.58	0.72	0.24	0.36	0.41	0.56
Root Mean Squared Error (RMSE)	6.39	4.85	6.76	5.27	6.67	5.00
Within-sample						
Median Absolute Error (MAE)	4.73	2.76	5.02	4.49	4.86	3.82
Out-of-sample: Jackknife						
Median Absolute Error (MAE)	6.54	5.1	6.90	5.30	6.73	5.05
Out-of-sample: One-Step-Ahead						
Mean Absolute Error (MAE)	6.67	11.91	4.99	5.13	3,29	3.07

Note: The statistics reported come from the Tables 1 and 2. For the Out-of-sample case: Jackknife, it was taken into account the Root Mean Squared Error (RMSE) of each election.

Source: Author's own elaboration

We begin with a traditional comparison of the predictive power of an OLS regression equation, contrasting the R2 (or, more properly the Adjusted R2) and the RMSE (i.e., the SEE). Regardless of the equation choice – presidential, legislative, or combined – the Structural Model offers a slightly better fit, in terms of the Adjusted R2. However, as is known, the R2 do not necessary give the same

potency ranking as the RMSE (Lewis-Beck and Skalaban, 1990). Such is the case here, where the political economy model consistently outperforms the vote intention model, always yielding a lower value. For example, for the combined model, the values, respectively, are 6.67 v 5.00, indicating a clear forecasting advantage, overall, when the analyst seeks to predict outside the sample. This advantage is demonstrable across the equations, when the jackknife test results are considered; the median absolute error (MAE) falls to its lowest value (at 5.05) in the combined political economy model.

The advantage of the combined political economy model appears still more clearly in the one-step-ahead results, when the MAE exceeds that of the vote intention model. Indeed, among all the out-of-sample MAE values, it is the smallest, at 3.07. What does that number tell us? It suggests that the forecast of an election not in the sample, such as an upcoming election, can expect to be off about three percentage points when predicting the incumbent vote share. Of course, that indicates the forecast would not likely be dead on.

But it does imply that the forecast should be reasonably accurate, even though made several months before the contest itself. Furthermore, it should be at least as good, perhaps better, than a forecast that from the popular vote intention polls. To take a current example, compare the out-of-sample forecasts (step-ahead) for the 2019 presidential election. For the combined polling model that out-of-sample error registers 3.29. However, for the combined political economy model that out-of-sample error registers only 2.53, thus offering a more accurate forecast. This point precision of the political economy model in forecasting the 2019 contest underlines its potential.

To complete the analysis, taking into account that this year (2021) the legislative elections will be held in Argentina, we offer a forecast of results for the incumbent party, on the basis of the parameters obtained in Tables 1 and 2. We must note that this forecasting has limitations for several reasons. First, we know little for sure about how the pandemic context might affect the electoral outcome. Second, the precise date of the fall elections remains unknown, since the congress is discussing a postponement of the elections to the month of November. Third, the potential candidates to lead the lists are not yet known, which generates greater volatility in public opinion and a greater number of "no" answers to questions on voting intention.

Having said this, we will start with the forecast based on public opinion data and the model presented in table 1. Estimating the equation (OLS) for Argentine elections from 1983 to 2019 yields the following:

$$V = 20.05 + 0.50 \text{ VOTING INTENTIONS }_{T-3/6} + 3.97 \text{ PRESIDENTIAL ELECTIONS} + E$$

(4.95)***   (0.14)***   (2.99)

N= 21 R^2=0.47 RMSE= 6.63

*** significant at 0.001.

To make an out-of-sample forecast for the next Argentine legislative election, we simply plug into the prediction equation the appropriate values for voting intention, at a six month lag, as follows: V2021 = 20.05 + 0.50*29.26 + 3.97*0 = 34.68 %.

Let's see what happens to the structural model. Estimating the equation (OLS) for Argentine elections from 1983 to 2019 yields the following:

$$V = 17.99 + 0.58 \text{ ANNUAL EC. GROWTH }_{T-12} + 0.40 \text{ SAT. W GOV}_{T-6} + 5.89 \text{ PRES ELEC.} + E$$

(4.30)***   (0.17)***   (0.09)***   (2.06)**

N = 28 (1983-2019) R^2=0.61 RMSE= 5.00

*** significant at 0.001; ** significant at 0.01.

Here again, in order to make an out-of-sample forecast for the next Argentine legislative election, we simply plug into the prediction equation the appropriate values for Annual Economic Growth one year before (2020), Satisfaction with Government, and Presidential Elections as follows: V2021 = 17.99 + 0.58*(-9.9) + 0.40*43.48 + 5.89*0 = 29.64 %.

For the above forecast, Satisfaction with Government is measured from the latest record available in the Executive Approval Database (EAD) 2.0 (Carlin et al., 2020). This record is from December 2020. In one way, this appears to be a favored measure, since it comes from the same data-bank (EAD) used to calculate our model estimates. But, in another way, its December date risks being too far away from the fall contest. Hence, we will also make the forecast using, as a measure of Satisfaction with Government, an average of its "positive image" registered in the surveys carried out in March 2021. If we take that value, the forecast is the following: V2019 = 17.99 + 0.58*(-9.9) + 0.40*38.42 + 5.89*0 = 27.62 %

In brief, we see a range of forecasts to be obtained by the incumbent party in the next legislative elections in Argentina as follows: from 28 % to 35 %. If it approaches 35 %, it could be considered a good, not to say surprising, result given the context of the pandemic and the economic recession that this brings to the country. However, that forecast rests on the polling model, whereas and our general analysis gives the nod to the structural model; in that light, the structural model forecast of 28 percent, based on the March surveys, would seem preferred, since its lag structure seems more in keeping with the model design.

CONCLUSION

In Argentina, the field of scientific election forecasting has been little plowed. Vote intention models, the most popular method in democracies worldwide, has just begun to grow. The other leading approach, that of structural models, has not been employed at all, to our knowledge. Herein we develop these two leading approaches, arriving at a polling model and a political economy model that are both tested against data from 28 recent national Argentinian elections (1983 to 2019). After applying varying metrics, it is clear that election forecasting is a viable enterprise in Argentina, despite the relative newness of current democratic institutions, which have faced several political and economic crises.

When comparing the different estimates, we can affirm that the structural model has a better performance regarding polling model, taking into account the goodness of fit of the models (R2 and RMSE) and most of the estimated errors (MAE within-sample and out-sample Jackknife). The Polling model only gets better estimates for the MAE out-sample for presidential and legislative elections, but not for the combined model. While the polling model yields good results, the political economy model yields very good (if not excellent) results. Clearly, much work remains to be done. However, we believe we have provided journalists and researchers a scientific guide map that points the way to future improvements, and to new theory and new data.

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