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RESEÑAS

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FORECASTING ELECTIONS IN LATIN AMERICA: AN OVERVIEW

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INTRODUCTION

Before every election, politicians, pundits, political scientists, commentators, and ordinary citizens try to predict who will win. In recent years, the spread of public opinion polls and the rise of data journalists reporting on these polls have gained great attention, although the promised forecasts are not always achieved (Traugott, 2014). Of course, prediction can be improved with the proper application of voting theories accounting for the electorate's behavior. Good data for testing such theories are long time series, which expose the electoral variation under study and allow it to be subject to scientific statistical analysis. Data and theories organized under this mantel form the core of the election forecasting discipline (Leigh and Wolfers, 2006; Lewis-Beck, 2005; Lewis-Beck and Tien, 2011).

The science of electoral forecasting has a relatively long tradition in the United States (Lewis-Beck and Rice, 1992). A quarter of a century ago, scientific models that predicted elections were scarce. But since then, important advances have been made and are currently proliferating (Lewis-Beck and Stegmaier, 2014; Linzer, 2013; Linzer and Lewis-Beck, 2015). This literature has also seriously expanded in other industrial democracies, e.g., the United Kingdom (Whiteley et al., 2011), France (Nadeau et al., 2010), Canada (Bélanger and Godbout, 2010). For virtually every established democracy, some political scientist or economist has proposed at least one such model. Thus, beyond the opinion polls on voter intention, which increasingly appear in the press, scientific models have gained ground and

are often based on political and economic fundamentals heading into the election (Erikson and Wlezien, 2014; Lewis-Beck and Dassonneville, 2015; Bélanger and Trotter, 2017).

Commonly, these models postulate an equation that predicts government support, estimated via regression analysis of a vote function or a popularity function (Stegmaier et al., 2017). Depending on the characteristics of the country under investigation, the variables may differ somewhat, conceptually or empirically. The United States forecasting models tend to focus on the vote function, with the dependent variable expressed as party vote share. The French forecasting models started as popularity functions, but from there moved to vote functions (Dubois and Fauvelle-Aymar, 2004). In the British case, forecasting studies have been almost entirely popularity functions with the dependent variable as percentage of party support registered in a public opinion poll (Lewis-Beck et al., 2004).

The field of election forecasting has been a significant object of study in large Western democracies. More recently, attention has spread to other parts of the democratic world, such as the new democracies of Eastern Europe, and other democracies outside the European sphere, such as Japan (Lewis-Beck and Tien, 2012). But not as much attention has been paid to smaller, or less industrial, democracies (Lewis-Beck and Bélanger, 2012). However, for such democracies, especially those in countries with lower income levels, the election forecasting enterprise is just showing itself. The Latin American region represents an outstanding case of this relative neglect. The papers in our special collection aim to overcome this gap by gathering and systematizing advances in Latin American election forecasting that have been made by researchers there. In this way, we hope to encourage further scientific exploration of election forecasting in this pivotal part of the democratic world.

FORECASTING ELECTIONS IN NEGLECTED DEMOCRACIES: OPPORTUNITIES AND DIFFICULTIES

Different reasons could be put forward for why the science of forecasting elections has not made more progress, overall, in the democracies of Latin America. We suggest a simple reason: the serious limitations that most, although perhaps not all, these countries face in terms of data gathering and access. That problem has at least four main aspects: 1) relative newness, even fragility, of the democratic system; 2) the small-N problem; 3) data availability; 4) contextual variations. We elaborate on these issues below.

The first aspect deals with the shorter, or perhaps more interrupted, democratic experience that prevails across the region. These countries have suffered from long periods of disruption of the democratic order, i.e. dictatorships,

non-competitive regimes, often without guarantees for free, competitive, and fair elections. Only recently integrated into the Third Wave of democracy, the most successful cases commonly have just reached between 30 and 40 years of unbroken democracy. As a consequence, many of these countries still face stages of democratic consolidation that coexist with patterns of instability, often resulting in a fragile state.

This brings us to the second point, the small-N data problem, i.e., too few data points for analysis. Most of these countries have only about 30 years of democracy, meaning about eight general elections and, where non-concurrent elections exist, 16 or so midterm elections. With such a short time period and scarce number of observations, even construction of a statistically secure baseline prediction model becomes problematic.

The third problem concerns data availability. In many countries in the region, access to electoral result records poses grave obstacles, as does access to data about popularity from public opinion polls. This makes cross-national comparisons, for example, very difficult.

The last aspect refers to contextual variations, e.g., contrasting cultures, volatile party systems, large economic swings, etc. This implies that in order to have vote prediction models that conform adequately to the country (or countries) under study, it may be necessary to incorporate these factors. However, completion of this task risks putting the attainment of an operative general model out of reach.

FORECASTING ELECTIONS IN LATIN AMERICA

So far, what does the published literature on election forecasting in the region consist of? We systematically searched for relevant articles in the following journals: *International Journal of Forecasting*; *Electoral Studies*; *Latin American Journal of Public Opinion* (*RLOP*); *Latin American Research Review* (2013-2016); *Latin American Politics and Society* (2013-2016); *Latin American Perspectives*; *Political Science Review* (Chile). Then, we checked the following journal databases: JSTOR, SCIELO, Google Scholar, Science Direct, Elsevier and Springer Links. Finally, we examined the references listed in the articles we found. The results are presented in Table 1.

Table 1 shows the papers published that relate to forecasting elections in Latin American countries. As can be seen, not much exists, except for scattered pieces on campaigns or polling data. In particular, the Latin American forecasting literature has been heavily concerned with understanding campaign poll biases (that lead to prediction errors in voting intentions, sampling error, survey errors) and correcting for these biases.

Table 1. Articles published on forecasting elections in Latin America

Year	Authors	Title/journal	Scope/countries
2020	Bunker, K.	«A two-stage model to forecast elections in new democracies». *International Journal of Forecasting*	Comparative 11 Latin American countries: Argentina; Brazil; Chile; Colombia; Costa Rica; Ecuador; El Salvador; Mexico; Paraguay, Peru; Uruguay
2017	Kennedy, R., Wojcik, S. and Lazer, D.	«Improving election prediction internationally». *Science*	Comparative Worldwide
2016	Bunker, K. and Bauchowitz, S.	«Electoral forecasting and public opinion tracking in Latin America: an application to Chile». *Revista de Ciencia Política*	Single country Chile
2018	Rodríguez S., Allende-Cid, H.; Palma, W., Alfaro, R., Gozález Arias, C. Elortegui, C. and Santander, P.	Forecasting the chilean electoral year: using twitter to predict the presidential elections of 2017. In: Meiselwitz G. (eds) *Social Computing and Social Media. Technologies and Analytics.*	Single country Chile
2017	Santander, P., Elórtegui, C., González, C., Allende-Cid, H., and Palma, W.	«Redes sociales, inteligencia computacional y predicción electoral: el caso de las primarias presidenciales de Chile 2017». *Cuadernos*	Single country Chile
1999	Beltrán, U. and Valdivia, M.	«Accuracy and error in electoral forecasts: the case of Mexico», *International Journal of Public Opinion Research*	Single country Mexico
2016	Mendoza, L. E. and Nieto-Barajas, M.	«Quick counts in the Mexican presidential elections: A Bayesian approach». *Electoral Studies*	Single country Mexico

Year	Authors	Title/journal	Scope/countries
2016	Cantú, F., Hoyo, V. and Morales M. A.	«The utility of unpacking survey bias in multiparty elections: mexican polling firms in the 2006 and 2012 Presidential Elections», *International Journal of Public Opinion Research*	Single country Mexico
2014	Moreno, A., Aguilar, R. and Romero, V.	«Estimaciones de encuestas preelectorales en México: en busca de las principales fuentes de error». *Revista Latinoamericana de Opinion Pública*.	Single country Mexico
2012	Turgeon, M. and Rennó, L.	«Forecasting Brazilian presidential elections: Solving the N problem». *International Journal of Forecasting*,	Single country Brazil
2015	Maldonado, M. and Sierra, V.	«Can social media predict voter intention in elections? The case of the 2012 Dominican Republic Presidential Election.» Paper delivered at *Americas Conference on Information Systems (AMCIS)*	Single country Dominican Republic
2001	Oliva, M.	«Aplicación de las encuestas en la investigación del comportamiento electoral». *Metodología de Encuestas*	Single country Argentina
2017	Castro, R. and Vaca, C.	«National Leaders' Twitter speech to infer political leaning and election results in 2015 Venezuelan Parliamentary Elections,» *2017 IEEE International Conference on Data Mining Workshops (ICDMW)*	Single country Venezuela

Source: own elaboration.

Overall, from these sources, we identified a total of 13 published papers. Almost all were published in the last ten years or so, with only two exceptions: Beltrán and Valdivia (1999), and Oliva (2001). Further, just two papers are comparative. The paper of Bunker (2020) compared 11 Latin American countries and the paper of Kennedy et al. (2017) made a worldwide comparison pooling 85 countries across the world, including some in Latin America. Both these studies rely on poll aggregation and correct for various systematic biases (e.g., sampling, context). Regarding single country studies, Mexico and Chile lead the way, the former with four papers and the latter with three. For the remaining countries, there exists a scatter of single paper exercises for the following: Argentina, Brazil, Dominican Republic, and Venezuela. These papers examine mostly presidential elections; just a few look at legislative elections.

For the most part, these papers rely on one of two very specific methods. The first one is a two-stage model, initially using vote intention polls and then applying to these results an error correction mechanism, i.e., Bayesian. The second method, more recent and gaining popularity, employs social media data to predict electoral results. These studies create a political sentiment measure using social media data (especially Twitter), which they apply in an effort to predict election outcomes in advance. These techniques are innovative and being used more widely, although the supporting literature for them remains quite limited.

Only one paper has a political economy model, that of Turgeon and Rennó (2012). In this paper, the authors addressed the small-N problem and developed a forecasting model to predict Brazilian presidential elections since 1994 using subnational data of 27 states. The authors conclude that forecasting elections in recent democracies is neither futile nor impossible, as some of the models presented produced reasonably accurate forecasts. Their work stands closer to several United States election forecasting efforts, bringing together political and economic variables in a structural model of election forecasting (Erikson and Wlezien, 2014).

CONCLUSIONS

From a look at the literature generated by the Latin American electoral forecasting studies to date, we can affirm that, while there are as yet few studies, a relevant body of work is emerging, representing a brand new way of studying Latin American elections. The main goal of this special issue is to stimulate further research in the field. In this regard, a question arises: Is it possible to move beyond campaign poll models towards political-economy models or other types of models? Accurate forecasting argues for models and theories that allow us to capture Latin American realities. Will it be possible to generate models that allow forecasting in scenarios of democratic fragility and institutional and economic instability? If the

current work on economic voting in Latin America is any guide, it would seem a promising avenue (Lewis-Beck and Ratto, 2013; Nadeau et al., 2017, chapter 5).

Certainly, the sophisticated theoretical and empirical work represented by the scientific election forecasting studies in this collection offers grounds for optimism. We have assembled here a diverse sample of Latin American democracies—Argentina, Brazil, Chile, Jamaica, Peru—varying in terms of language, ethnicity, geography, size, and democratic history. Nevertheless, they share in common their success as pathbreaking forays into the forecasting thicket. Kenneth Bunker tests the accuracy of a Bayesian two-stage model, as applied to forecasting the outcome of the 2020 Chilean national plebiscite. Christopher Charles, Dalkeith Dempster, and Trevaun Welcome develop a statistical model based on the national economy, violent crime, and leader popularity which predicts, with good lead time, the 2020 General Election in Jamaica. Turning to Brazil, Frederico Bertholini, Lucio Rennó, and Mathieu Turgeon effectively build on their analysis of subnational units, adding the elections of 2010, 2014, and the turbulent 2018. With respect to Peru, Moisés Arce and Sofía Vera thoughtfully explore a parsimonious political economy equation to forecast support for the candidate who is «the lesser evil.» Celeste Ratto and Michael Lewis-Beck, tackling the complex case of Argentina, craft a classic political economy model that manages to perform, at least as well, if not better, than the usual vote intention polls. In sum, the body of scholarship at hand demonstrates that Latin American elections, crisis ridden and uncertain as they may sometimes appear, are still amenable to explanation, and even prediction, much as other democratic systems around the world.

Beyond the approaches on display in this collection, which involve structural, statistical models as well as more traditional public opinion polls, will it be possible to explore still newer approaches, such as citizen forecasting, a growing literature in other parts of the democratic world (Murr, 2016; Murr et al., 2021)? The citizen forecast idea appears simple enough: ask a sample of voters who they believe will win. What would Latin American data reveal on such a question? At present, we do not know. Clearly, one of the pending tasks for the future research agenda on election forecasting in Latin America would be overcoming this, and other noted, data limitation problems.

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ARTÍCULOS

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ARGENTINIAN ELECTIONS: FORECASTING OUTCOMES

Elecciones argentinas: pronóstico de resultados

Eleições argentinas: previsão de resultados

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Abstract
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

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.

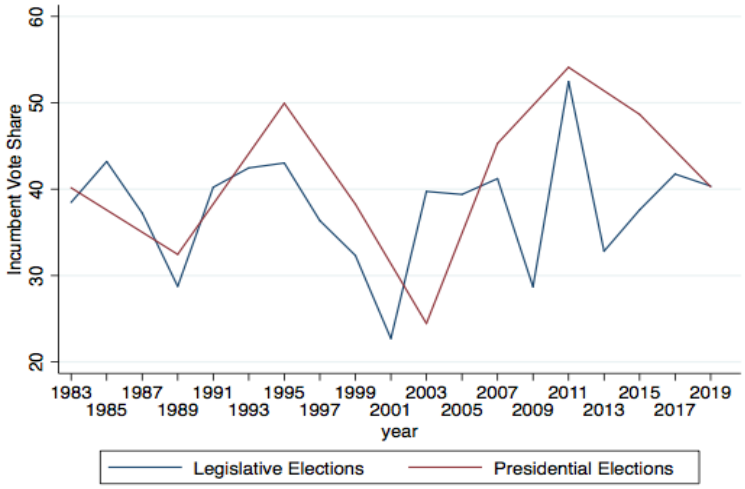
approaches to systematic election forecasting— vote intention polling and political economy modeling (a structural model). The two offer different, not to say conflicting, strategies. After laying out empirically each method, we move on to a comparison of their performance, thus entering an ongoing debate 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).

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 /

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

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-

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,

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

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).

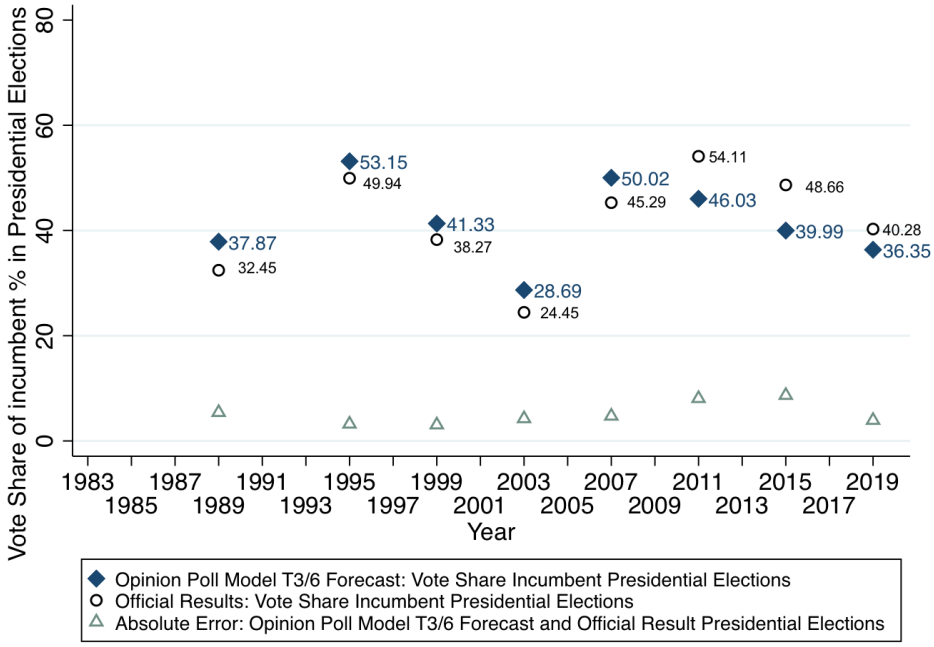
As an evaluation tool, the presidential election model has desirable characteristics (Lewis-Beck, 2005). It has parsimony (with only one independent variable), replicability (the polling data are publicly available), and lead time (at a non-trivial distance from the contest). However, on the criterion of accuracy, the picture appears mixed. Model I for presidential elections yields a moderate model fit (R2 of 0.64). This middling assessment continues upon examination of the actual prediction errors, where the within-sample error (MAE)[16] is 4.73 points. We can observe 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 general (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 R2 falls by more than half, to 0.24. Still, clearly the legislative result adds some relevant information, 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 sample size. We see in Model 3 (Table 1) the results on this presidential-legislative combination. The overall fit, judged by the R2, deteriorates compared to the presidential model (Model 1). However, the Median Absolute Error within sample 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

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 jackknife 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.

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 $_{t\text{-}6\ months}$	0.46*	0.36**	0.40***
	(0.20)	(0.11)	(0.09)
Annual Economic Growth $_{t\text{-}1year}$	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., R2 = .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

	Presidential elections		Legislative elections		Combined elections (presidential + legislative)	
Criterion	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:

$$V = 20.05 + 0.50\ \text{VOTING INTENTIONS}_{T-3/6} + 3.97\ \text{PRESIDENTIAL ELECTIONS} + E$$
$$(4.95)^{***} \qquad (0.14)^{***} \qquad (2.99)$$
$$N = 21\ R^2 = 0.47\ \text{RMSE} = 6.63$$
*** 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:

$$V = 17.99 + 0.58\ \text{ANNUAL EC. GROWTH}_{T-12} + 0.40\ \text{SAT. W GOV.}_{T-6} + 5.89\ \text{PRES ELEC.} + E$$
$$(4.30)^{***} \qquad (0.17)^{***} \qquad (0.09)^{***} \qquad (2.06)^{**}$$
$$N = 28\ (1983\text{-}2019) \quad R^2 = 0.61\ \text{RMSE} = 5.00$$
*** 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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ONLINE APPENDIX

APPENDIX A. SUMMARY STATISTICS, CORRELATIONS, AND PLOTS

Table A1. Summary Statistics for variables included in opinion poll and structural models exploring incumbent vote share in Argentinean general elections 1983-2019

Variable	N	M	S/d	Min	Max
Incumbent Vote Share: Presidential elections	9	41.51	9.23	24.45	54.11
Incumbent Vote Share: Legislative elections	19	37.83	6.62	22.71	52.46
Incumbent Vote Share: Combined elections	28	39.01	7.59	22.71	54.11
Voting intention for Government in Presidential elections: mean polling result T-3-6	8	35.16	11.56	16.1	52
Voting intention for Government in Legislative elections: mean polling result T-3-6	13	33.72	11.01	14.96	52
Voting intention for Government in Combined elections: mean polling result T-3-6	21	34.27	10.95	14.98	52
Satisfaction with Government$_{t-6}$ in Presidential elections	9	42	10.64	26.76	55.49
Satisfaction with Government$_{t-6}$ in Legislative elections	19	46.20	11.10	31.36	67.33
Satisfaction with Government$_{t-6}$ in Combined elections	28	44.85	10.94	26.76	67.33
GDP$_{t-1\ year}$	28	1.71	5.64	-10.9	10.1
Type of election	28	0.32	0.47	0	1

Source: Authors' own elaboration.

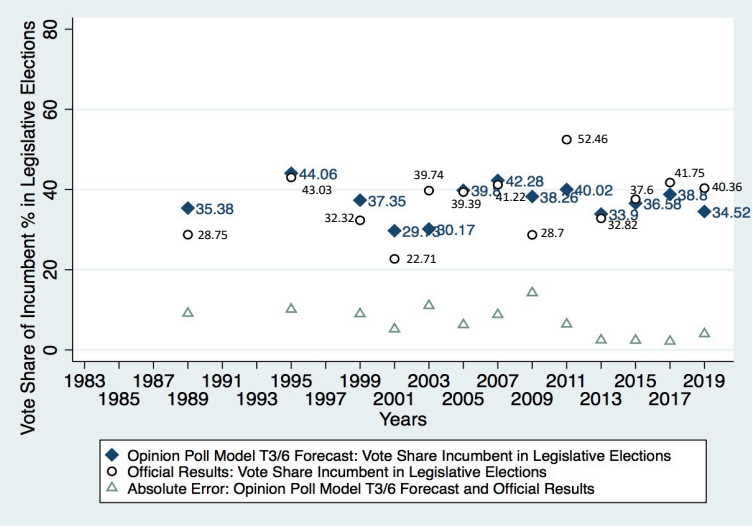
Table A2. Bivarate correlation matrix of independent variables with dependent variables included in opinion poll and structural models exploring incumbent vote share in Argentinean elections 1983-2019

Variable	Incumbent Vote Share: Presidential	Incumbent Vote Share: Legislative	Incumbent Vote Share: Combined
Voting intention for Government: mean polling result T-3-6	0.80	0.55	0.65
Satisfaction with Government$_{t-6}$	0.80	0.54	0.56
GDP$_{t-1\ year}$	0.78	0.28	0.46
Type of election	-	-	0.23

Note: Based on 8/13/21 for Polling model and 9/19/28 for structural mode

Source: Authors' own elaboration.

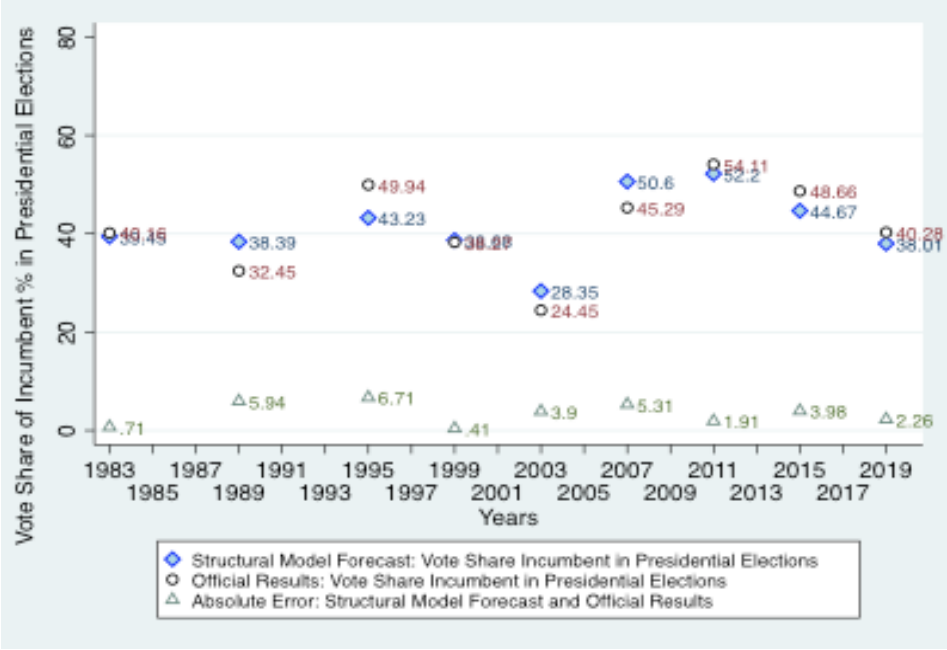
Figure A1. Within-sample forecasts of incumbent vote share in Legislative Electionsat T-3/6 months from election yielded from opinion polls (diamonds) compared with official results for 13 Argentinean general legislative elections 1989-2019 (white circles)



Note: Based on estimates from Table 1 Model II. Triangles are the absolute error between the within-in forecast and the official result.

Source: Authors' own elaboration.

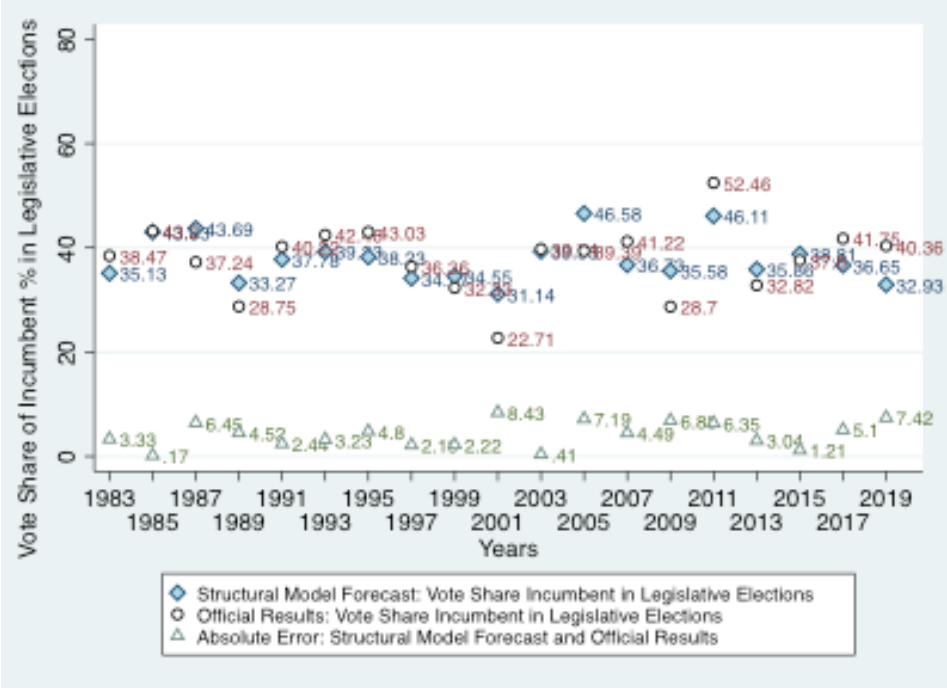
Figure A2. Within-sample forecasts of incumbent vote share in presidencial elections as a function of the at T-6 months from election yielded from Structural Model (diamonds) compared with official results (circles) for 9 Argentine presidential elections 1989-2019



Note: Based on estimates from Table 2 Model I. Green triangles are the absolute error between the within-sample forecasts and the official result.

Source: Authors' own elaboration.

Figure A3. Within-sample forecasts of incumbent vote share in Legislative elections at T-6 months from election yielded from Structural Model (diamonds) compared with official results (circles) for 19 Argentinean legislative elections 1983-2019



Note: Based on estimates from Table 2 Model II. Green triangles are the absolute error between the within-sample forecast and the official result.

Source: Authors' own elaboration.

APPENDIX B. VARIABLE OPERATIONALIZATIONS

Table B1. Incumbent Government in Argentina by elections 1983-2020

Election Year	Incumbent Government Composition by Party
1983	Peronist Party (PJ – Partido Justicialista)
1985	Radical Civic Union (UCR –Unión Cívica Radical)
1987	Radical Civic Union (UCR –Unión Cívica Radical)
1989	Radical Civic Union (UCR –Unión Cívica Radical)
1991	Peronist Party (PJ – Partido Justicialista)
1993	Peronist Party (PJ – Partido Justicialista)
1995	Peronist Party (PJ – Partido Justicialista)
1997	Peronist Party (PJ – Partido Justicialista)
1999	Peronist Party (PJ – Partido Justicialista)
2001	Alliance UCR-FREPASO
2003[1]	Peronist Party (PJ – Partido Justicialista)
2005	Peronist Party (PJ – FPV)
2007	Peronist Party (PJ – FPV)
2009	Peronist Party (PJ – FPV)
2011	Peronist Party (PJ – FPV)
2013	Peronist Party (PJ – FPV)

1. On January 2, 2002 Duhalde was nominated President of Argentina by the Legislative Assembly. That decision was made through a broad consensus in Peronism and the opposition, so allowing Duhalde to lead the country. Duhalde was invested by the deputies and senators with 262 votes in favor, 21 against and 18 abstentions, and with a mandate until December 10, 2003. That is, until the four-year exercise for which De la Rúa had been elected was finished. Therefore, there would be no early elections, being the majority opinion of the legislators that what was urgent was to obtain a stable Executive with the maximum partisan support.

Election Year	Incumbent Government Composition by Party
2015	Peronist Party (PJ – FPV)
2017	PRO (Cambiemos)
2019	PRO (Cambiemos)

Note: In 2001 there was a major institutional crisis, namely the president (UCR / 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 with a mandate until December 10, 2003; therefore we put the votes that PJ obtained (as incumbent party). That is to say, Duhalde was of PJ, the party that was governing despite not having been elected at the polls.

Source: Authors' own elaboration.

Vote Share of the Incumbent Government

This variable measures the share of the total valid vote achieved by the incumbent government. The parties comprising the incumbent government for the said election year are detailed in Table B1. This was measured for presidential, legislative or combined elections.

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/*.

Voting intention for Government: mean polling result $_{t-3/6}$

This variable measures the share of the total number of survey respondents reporting that they intended voting for the governing party in the next general election in surveys conducted between three to six months before the election. When multiple surveys were conducted in the said time period, the result is averaged. The parties comprising the incumbent government for the said election year are detailed in Table B1. This was measured for presidential, legislative or combined elections.

For most years, we collected voting intention polls conducted 6 months prior to the election. In 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.

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).

Satisfaction with Government$_{t-6}$

This variable measures the share of public opinion measures of government approval, between three to six months before Election Day, coming from Executive Approval Database (EAD) 2.0 (Carlin, Hartlyn, Hellwig, Love, Martínez-Gallardo and Singer 2020). We used the median (not mean) approval percentage to the 3 to 6 months prior to the election, for each year it depended on the election date.

GDP$_{t-1\ year}$

This variable measures the annual percentage growth rate of GDP at market prices in local currency, at constant prices. The aggregates are expressed in United States dollars at constant 2010 prices. GDP is the sum of the gross added value of all resident producers in the economy plus all taxes on products, less any subsidy not included in the value of the products. It is calculated without making deductions for depreciation of manufactured goods or for depletion and degradation of natural resources. The variable GDP, is lagged one year with respect to the election. That is, the growth rate of the year before the election.

Type of election

This variable distinguished with value 1 presidential elections and with value 0 legislative elections.

For the incumbent vote share variable (Y) the lags are from 1983 to 1989 every 6 years, and from 1995 to 2019 every 4 years. In 1995 there was a constitutional reform that reduced presidential terms from 6 to 4 years. In the table that follows are the lags and time periods used for each variable:

Table B2. Time reference for GDP and Government approval variables

Y Incumbent vote share	GDP Growth	Government Approval
1983	1982	Median between April, May and June
1989	1988	Median between November, December and January
1995	1994	Median between November, December and January
1999	1998	Median between April, May and June
2003	2002	Median between October November, and December (previous year)
2007	2006	Median between April, May and June
2011	2010	Median between April, May and June
2015	2014	Median between April, May and June
2019	2018	Median between April, May and June

Source: Authors' own elaboration.

APPENDIX C. SUPPLEMENTARY ANALYSIS

Table C1. Within-sample forecasts of incumbent vote share from the Opinion Poll Model. Prediction error is the difference comparing the forecasts with official results incorporating 8/13/21 Argentine elections, 1989-2019 (Presidential, Legislative and combined elections)

Year of Election	Election Type	Prediction Errors Combined Elections	Prediction Errors Presidential Elections	Prediction Errors Legislative Elections
1989	Presidential	6.42		5.42
1995	Presidential	0.20		3.22
1999	Presidential	3.15		3.06
2003	Presidential	7.66		4.24
2007	Presidential	2.54		4.73
2011	Presidential	9.22		8.07

Year of Election	Election Type	Prediction Errors Combined Elections	Prediction Errors Presidential Elections	Prediction Errors Legislative Elections
2015	Presidential	8.22		8.67
2019	Presidential	2.53		3.92
1989	Legislative	6.15	6.63	
1995	Legislative	3.14	1.03	
1999	Legislative	5.12	5.02	
2001	Legislative	4.85	7.02	
2003	Legislative	11.60	9.57	
2005	Legislative	1.25	0.41	
2007	Legislative	2.64	1.06	
2009	Legislative	9.93	9.56	
2011	Legislative	11.54	12.44	
2013	Legislative	0.16	1.08	
2015	Legislative	1.13	1.01	
2017	Legislative	2.41	2.95	
2019	Legislative	6.58	5.84	
Average Absolute Error		5.07	4.89	5.17
Median Absolute Error		4.86	5.02	4.24

Source: Authors' own elaboration.

Table C2. Within-sample forecasts of incumbent vote share from the Structural Model. Prediction error is the difference comparing the forecasts with official results incorporating 9/19/28 Argentine elections, 1989-2019 (Presidential, Legislative and combined elections)

Year of Election	Election Type	Prediction Errors Combined Elections	Prediction Errors Presidential Elections	Prediction Errors Legislative Elections
1983	Presidential	4,40		6.57
1989	Presidential	2,36		5.51
1995	Presidential	10,57		2.05
1999	Presidential	3,01		0.09
2003	Presidential	1,08		0.41
2007	Presidential	0,70		0.99
2011	Presidential	6,62		2.76
2015	Presidential	8,32		
2019	Presidential	5,86		
1983	Legislative	1,71	3.33	
1985	Legislative	1,59	0.17	
1987	Legislative	8,57	6.45	
1989	Legislative	6,12	4.52	
1991	Legislative	0,98	2.44	
1993	Legislative	0,94	3.23	
1995	Legislative	2,67	4.80	
1997	Legislative	0,06	2.19	
1999	Legislative	4,22	2.22	
2001	Legislative	10,07	8.43	
2003	Legislative	0,36	0.41	
2005	Legislative	9,53	7.19	

Year of Election	Election Type	Prediction Errors Combined Elections	Prediction Errors Presidential Elections	Prediction Errors Legislative Elections
2007	Legislative	2,17	4.49	
2009	Legislative	8,89	6.88	
2011	Legislative	3,92	6.35	
2013	Legislative	4,64	3.04	
2015	Legislative	2,67	1.21	
2017	Legislative	3,60	5.10	
2019	Legislative	5,94	7.42	
Average Absolute Error		4,34	4,20	3.63
Median Absolute Error		3,60	4,49	6.42

Source: Authors' own elaboration.

Table C3. Out-of-sample forecasts of incumbent vote share as a function of the Opinion Poll Model using a jackknife approach and comparing the R^2 and the Root MSE of each Argentine presidential and legislative elections 1989-2019

	Combined Elections			Legislative Elections			Presidential Elections		
Jackknife replications	R2	Root MSE	N	R2	Root MSE	N	R2	Root MSE	N
Without 1989	0.49	6.64	20				0.64	6.49	7
Without 1995	0.42	6.85	20				0.62	6.74	7
Without 1999	0.48	6.80	20				0.65	6.85	7
Without 2003	0.45	6.49	20				0.39	6.45	7
Without 2007	0.46	6.82	20				0.68	6.54	7
Without 2011	0.45	6.41	20				0.67	5.77	7
Without 2015	0.49	6.51	20				0.74	5.63	7
Without 2019	0.47	6.82	20				0.67	6.73	7

	Combined Elections			Legislative Elections			Presidential Elections		
Jackknife replications	R2	Root MSE	N	R2	Root MSE	N	R2	Root MSE	N
Without 1989	0.46	6.67	20	0.30	6.75	12			
Without 1995	0.47	6.80	20	0.26	7.08	12			
Without 1999	0.47	6.73	20	0.32	6.90	12			
Without 2001	0.38	6.72	20	0.14	6.57	12			
Without 2003	0.58	6.08	20	0.47	6.12	12			
Without 2005	0.47	6.84	20	0.29	7.09	12			
Without 2007	0.47	6.81	20	0.28	7.09	12			
Without 2009	0.51	6.37	20	0.37	6.35	12			
Without 2011	0.50	6.18	20	0.29	5.72	12			
Without 2013	0.46	6.85	20	0.28	7.09	12			
Without 2015	0.47	6.85	20	0.30	7.09	12			
Without 2017	0.47	6.82	20	0.29	7.03	12			
Without 2019	0.50	6.64	20	0.34	6.82	12			
Median Root MSE		6.73			6.90			6.54	

Source: Authors' own elaboration.

Table C4. Out-of-sample forecasts of incumbent vote share from the Structural Model using a jackknife approach and comparing the R^2 and the Root MSE of each Argentine presidential and legislative elections 1983-2019

		Combined Elections			Legislative Elections			Presidential Elections		
Jackknife replications	Type of Elections	R2	Root MSE	N	R2	Root MSE	N	R2	Root MSE	N
Without 1983	Presidential	0.61	5.11	27				0.79	5.3	8
Without 1989	Presidential	0.63	4.94	27				0.82	4.6	8
Without 1995	Presidential	0.61	4.89	27				0.86	4.1	8
Without 1999	Presidential	0.61	5.11	27				0.79	5.3	8

		Combined Elections			Legislative Elections			Presidential Elections		
Jackknife replications	Type of Elections	R2	Root MSE	N	R2	Root MSE	N	R2	Root MSE	N
Without 2003	Presidential	0.56	5.02	27				0.63	5.1	8
Without 2007	Presidential	0.62	4.96	27				0.88	4.0	8
Without 2011	Presidential	0.55	5.10	27				0.72	5.3	8
Without 2015	Presidential	0.60	5.03	27				0.83	4.6	8
Without 2019	Presidential	0.61	5.09	27				0.81	5.1	8
Without 1983	Legislative	0.62	5.05	27	0.45	5.37	18			
Without 1985	Legislative	0.61	5.11	27	0.41	5.44	18			
Without 1987	Legislative	0.65	4.85	27	0.50	5.14	18			
Without 1989	Legislative	0.59	5.05	27	0.40	5.30	18			
Without 1991	Legislative	0.62	5.08	27	0.44	5.40	18			
Without 1993	Legislative	0.61	5.08	27	0.43	5.37	18			
Without 1995	Legislative	0.62	5.02	27	0.45	5.29	18			
Without 1997	Legislative	0.61	5.09	27	0.44	5.41	18			
Without 1999	Legislative	0.60	5.10	27	0.42	5.41	18			
Without 2001	Legislative	0.58	4.83	27	0.35	4.88	18			
Without 2003	Legislative	0.61	5.11	27	0.43	5.44	18			
Without 2005	Legislative	0.67	4.72	27	0.53	4.98	18			
Without 2007	Legislative	0.62	5.02	27	0.46	5.30	18			
Without 2009	Legislative	0.62	4.90	27	0.44	5.11	18			
Without 2011	Legislative	0.58	4.99	27	0.31	5.09	18			
Without 2013	Legislative	0.61	5.08	27	0.43	5.38	18			
Without 2015	Legislative	0.61	5.11	27	0.44	5.43	18			
Without 2017	Legislative	0.63	4.98	27	0.46	5.27	18			
Without 2019	Legislative	0.66	4.79	27	0.51	5.04	18			
Median Root MSE			5.05			5.30			5.1	

Source: Authors' own elaboration.

Table C5. Step-ahead forecasts of incumbent vote share as a function of the Opinion Poll Model are compared with the official result for Argentine presidential and legislative elections 1999-2019, via the calculation of their Absolute Forecasting Error

Year of Election	Absolute Forecasting Error PRES ELECTIONS	Absolute Forecasting Error LEG ELECTIONS	Absolute Forecasting Error PRES + LEG ELECTIONS
1999			4,57
2001		3,04	4,87
2003	1,29	17,36	3,5
2005		2,75	0,47
2007	1.30	1,56	1,89
2009		7,9	8,33
2011	12,17	15,46	11,96
2013		0,02	1,34
2015	11,08	2,23	0,74
2017		7,98	2,99
2019	6,67	4,99	3,29
Mean Absolute Error	6,50	6,33	3,99
Median Absolute Error	6,67	4,99	3,29

Note: Mean Absolute Error (MAE) of the step ahead forecast for presidential = 6.5, for legislative =6.33, and for combined elections= 3.99. – obtained from averaging the absolute errors between the predicted vote shares' from the step-ahead procedure and the official result. Median Absolute Error (MAE) out-of-sample for presidential = 6.67, for legislative =4.99 and for combined=3,29 – 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. Step-ahead procedure involves estimating the model on the entire time-series up to a particular year and estimating the vote share for the next election. For example, the 2019 vote share estimation is based on data from 1999-2015 only. Each subsequent estimate is based on re-estimating with an even smaller time series.

Source: Authors' own elaboration.

Table C6. Step-ahead forecasts of incumbent vote share from the Structural Model are compared with the official result for Argentine presidential and legislative elections 1991-2019, via the calculation of their Absolute Forecast Error

Year of Election	Absolute Forecasting Error PRES ELECTIONS	Absolute Forecasting Error LEG ELECTIONS	Absolute Forecasting Error PRES + LEG ELECTIONS
1991		2,18	2,28
1993		14,63	14,67
1995		5,13	3,35
1997		0,7	1,36
1999		1,2	3,07
2001		9,7	14,23
2003	17,86	3,48	0,95
2005		8,73	10,92
2007	13,75	5,86	1,53
2009		1,26	6,72
2011	4,3	7,73	1,44
2013		2,09	1,07
2015	11,91	0,42	5,58
2017		5,85	5,91
2019	6,5	8,38	2,53
Mean Absolute Error	10,86	5,16	5,04
Median Absolute Error	11,91	5,13	3,07

Note: Mean Absolute Error (MAE) of the step ahead forecast for presidential = 10.86, for legislative =5.16, and for combined elections= 5.04. – obtained from averaging the absolute errors between the predicted vote shares' from the step-ahead procedure and the official result. Median Absolute Error (MAE) out-of-sample for presidential = 11.91, for legislative =5.13 and for combined=3,07 – 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. Step-ahead procedure involves estimating the model on the entire time-series up to a particular year and estimating the vote share for the next election. For example, the 2019 vote share estimation is based on data from 1999-2015 only. Each subsequent estimate is based on re-estimating with an even smaller time series.

Source: Authors' own elaboration.

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CHOOSING THE LESSER EVIL: FORECASTING PRESIDENTIAL ELECTIONS IN PERU

¿Escogiendo el mal menor? Pronosticando las elecciones presidenciales en Perú

Escolhendo o mal menor: Previsão de eleições presidenciais no Peru

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Abstract
The Peruvian political landscape is dominated by the weakness of party organizations, the continuous rotation of political personalities, and, in turn, high electoral volatility and uncertainty. Nevertheless, we observe patterns of electoral competition that suggest candidates learn to capture the political center and compete over the continuation of an economic model that has sustained growth. We use this information to record the vote intention for the candidate viewed as the lesser evil. Our forecasting results predict a good share of the variation in political support for this candidate. The out-of-sample prediction also comes fairly close to the real electoral results. These findings provide some degree of electoral certainty in an area that, to date, remains understudied.

Palabras clave:
pronosticación; elecciones presidenciales; voto económico; Perú

Resumen
El panorama político peruano está dominado por la debilidad de las organizaciones partidistas, rotación continua de las personalidades políticas y, a su vez, una alta volatilidad e incertidumbre electoral. Sin embargo, observamos patrones de competencia electoral que sugieren que los candidatos aprenden a capturar el centro político y competir por la continuación de un modelo económico que ha tenido un crecimiento sostenido. Usamos esta información para registrar la intención de voto del candidato percibido como el mal menor. Nuestros pronósticos predicen una buena parte de la variación en el apoyo político a dicho candidato. La predicción fuera de la muestra también se acerca bastante a los resultados electorales reales. Estos hallazgos aportan cierto grado de certeza electoral en un área que, hasta la fecha, sigue siendo poco estudiada.

Palavras-chave:
prognóstico; eleições presidenciais; voto econômico; Peru

Resumo
O cenário político peruano é dominado pela fraqueza das organizações partidárias, pela rotação contínua das personalidades políticas e, por sua vez, pela alta volatilidade e incerteza eleitoral. No entanto, observamos padrões de competição eleitoral que sugerem que os candidatos aprendem a conquistar o centro político e competir pela continuidade de um modelo econômico com crescimento sustentado. Usamos essas informações para registrar a intenção de voto para o candidato considerado o mal menor. Nossos prognósticos predizem uma grande parte da variação no apoio político a este candidato. A previsão fora da amostra também se aproxima bastante dos resultados eleitorais reais. Estes resultados fornecem certo grau de certeza eleitoral em uma área que, até o momento, permanece pouco estudada.

INTRODUCTION

When talking about elections, it is a common saying that "anything can happen in Peruvian politics." This statement reflects the poor quality of party representation in the country and the ensuing electoral volatility of the Peruvian electorate. Starting in the late 1980s, in fact, the country's party system became unglued and the political landscape is now occupied by a broad swath of political outsiders with little or no experience in government. These politicians are not supported by stable party organizations or institutions, and party identification is very weak. The uncertain political environment makes it very difficult for the Peruvian voters to evaluate incumbency for one government to the next and voters are typically drawn to making choices based on who is likely do less damage while in office.

Our analysis of presidential elections shows that candidates are keen to move to the political center to win office (what we characterize as centrism), and in a context of an expanding economy, voters have a large preference for the continuity of economic model. This economic model is anchored in market-friendly policies, which can be traced to the government of Alberto Fujimori (1990-2000) (Arce, 2005). In an environment characterized by the fluidity of political organizations

and political personalities, voters weigh centrism and continuity, and support the candidate who is perceived to be the lesser evil.

We use polling data on vote intention from March 2000 to September 2020 to forecast the outcomes of elections in Peru. The dataset includes 181 election surveys and it is most comprehensive source on electoral polls to date. Forecasting models draw on theories of voting behavior and empirical evidence about what matters to voters when they cast their ballots (Lewis-Beck and Tien, 2012; Stegmaier and Norpoth, 2013). Building on these models, and forecasting literature in Latin America (Bunker and Bauchowitz, 2016; Turgeon and Rennó, 2012; Bunker, 2020), we seek to add some degree of certainty in an area of Peruvian politics that has remained largely unexplored.

We begin this paper by highlighting broad patterns that can be observed across the presidential elections since 2000, and the political and economic context faced by Peruvian voters. After situating this paper in the forecasting literature, we describe the data and methods we use to predict the country's presidential elections. We present our results with both monthly aggregated and disaggregated data poll data, longer lead time before elections, and alternative indicators of the national economy. The results predict a good share of the variation in political support for the candidate viewed as the lesser evil. Our out-of-sample prediction also comes fairly close to the real electoral results. We conclude this paper by discussing the implications of these findings for the study of Peruvian elections going forward.

CENTRISM AND CONTINUITY

As is commonly acknowledged, the quality of representative institutions in Peru is very low. Soon after the country's return to democracy in the 1980s, two sweeping crises – hyperinflation and political violence – took a toll on the party system, and since 1990 political outsiders and independent politicians have dominated the political scene. New parties or political movements are created in almost every electoral cycle, but these organizations do not have national reach and are disconnected from social bases. They also typically win office with fragile pluralities. Scholars view the country as a democracy without parties (Levitsky and Cameron, 2003), and further characterize the existing party system as personalistic vehicles for private, individual gains (Levitsky, 2013), not a mechanism for the implementation of broad public policies or the distribution of public goods. Hereafter, we talk about candidates or politicians, not parties.

Presidential campaigns kick off in early January and elections are scheduled in early April. A runoff follows in early June (see Table 1). The high level of electoral volatility and uncertainty places the Peruvian electorate in a very tight corner.

However, some broad patterns can be discerned across the presidential elections since 2000, when data on vote intention are readily available. These patterns include: (a) the emergence of front runners, (b) candidate learning and moderation to capture the political center (or centrism), as well as (c) a broad electorate preference for the continuity of the economic model. The latter two developments – centrism and continuity – are the byproducts of an extended period of economic growth following a commodity boom (Arce, 2014) and the weakness of the Peruvian political class (Vergara and Encinas, 2016).[1]

First, there was a clear frontrunner in some of these electoral contests. For instance, Alejandro Toledo had previously run for office in the highly controversial presidential elections in 2000, which followed the abrupt fall from power of Alberto Fujimori. Toledo occupied the political center and become the clear frontrunner in the 2001 presidential contest. The 2001 contest was thus a race for the second place (or runoff). Polls showed a three-way tie for the second spot among Fernando Olivera (13 %), Lourdes Flores Nano (12 %) and former President Alan García (12 %) (Schmidt, 2003). Similarly, in the presidential elections of 2016, Keiko Fujimori—the daughter of Alberto Fujimori—enjoyed consistent support from approximately a third of the electorate, and these elections also become contest for the second place. The Jurado Nacional de Elecciones (JNE) disqualified two candidates in early March of that year – well after the campaign had already started – and by early April, Pedro Pablo Kuczynski and Verónica Mendoza were on a statistical tie for the second spot (Schmidt, 2016).

However, the presidential elections of 2006 and 2011 were more uncertain, but consistent with the electoral volatility of the Peruvian electorate. For instance, in October 2005, six months before the presidential election of 2006, polls showed Flores Nano as the clear frontrunner (Schmidt, 2007). But support for Ollanta Humala began to rise in January 2006 and García's support peaked at the very end of the campaign. Both Humala and García went on to meet in the June runoff. The early rise of Flores Nano was attributed to polling error as most public opinion polls are drawn from Lima, where her support was the strongest (Schmidt, 2007). In the same way, in 2010 several polls predicted a tight race between Luis Castañeda and Keiko Fujimori, and showed little support for Humala. However, Humala had a very late surge and became a clear frontrunner by early April, just days before the election (Schmidt, 2012). He emerged first in the first round (31.7 % of valid votes) and won the presidency during the runoff (51.4 %).

Second, there is ample evidence of what may be characterized as candidate learning and moderation to occupy the political center of the ideological spectrum.

1. The authors understand a political class to be weak when political parties do not receive a significant percentage of the vote; elected authorities have short tenures; and political vehicles and their leaders are disconnected from social bases (Vergara and Encinas 2016, 163).

As shown in Table 1, and based on the electoral results of the first-round elections, several of the top presidential contenders reappear in subsequent elections. But candidate García of 2001 is different from then President García of 2006, and candidate Humala of 2006 is also different from then President Humala of 2011, just to name a few examples.

Table 1. Top Presidential Contenders and Dates of the Elections, 2001-21

Elections 2001	Elections 2006	Elections 2011	Election 2016	Elections 2021[a]
Toledo	*Humala*	***Humala***	*Fujimori*	Forsyth
García	***García***	*Fujimori*	***Kuczynski***	Mendoza
Flores Nano	Flores Nano	Kuczynski	Mendoza	Lescano
Olivera	Chávez	Toledo	Barnechea	Fujimori
Boloña	Paniagua	Castañeda	García	de Soto
April 8, 2001[b]	April 9, 2009	April 10, 2011	April 10, 2016	April 11, 2021
June 3, 2001[c]	June 4, 2006	June 5, 2011	June 5, 2016	June 6, 2021

Notes: Candidates are listed based on their share of valid votes from the first round of the electoral contest. Names in italics faced each other in the runoff. Names in bold won the runoff.

([a]) Top presidential contenders based on vote intention (La República, 2021)

([b]) Dates in this row are the dates of the first-round elections.

([c]) Dates in this row are the dates of the runoffs.

Source: Authors' own elaboration based on data from ONPE (2021).

In 2001, for instance, García returned to Peru after a nine-year exile abroad, and only after the Supreme Court lifted his arrest warrant. He arrived in the country in late January 2001, just a few months before the April 8 contest. García emerged as a staunch critic of Fujimori's neoliberal policies and his authoritarian style (Schmidt, 2003). During the electoral campaign, the Peruvian electorate were frequently reminded of the many social and economic hardships suffered during his first presidency in 1985. Annual inflation, for example, reached a historical record of 7,649 percent in 1990, and political violence from guerrilla groups, such as Sendero Luminoso (SL) and the Movimiento Revolucionario Tupac Amaru (MRTA), rose considerably. The 1980s in Peru were aptly described as "a national trauma" (Leiteritz, 2010). In 2006, however, García was a different candidate. He "stressed that he had learned the value of responsible economic policies from past

mistakes" (Schmidt, 2007, p. 816). He also "offered qualified support for the free trade agreement [with the United States], highlighted a scheme to stimulate agricultural exports from the Andes, and promised to defend the weak from vagaries of the market" (Schmidt, 2007, p. 816).

A more pronounced change came from Humala, a former military officer who staged an armed uprising in southern Peru against the government of Alberto Fujimori. In 2006, Humala, a political outsider, toed closely the *Chavista* line (after Venezuela's Hugo Chávez). In the campaign trail, for instance, he "praised the nationalist, left-leaning dictatorship of Juan Velasco (1968-1975), called for a stronger state role in the economy, vowed to halt the eradication of coca, and opposed ratification of the recently negotiated free trade agreement with the United States" (Schmidt, 2007, pp. 815-816). In early January 2006, he visited Venezuela and meet with Hugo Chávez. Like Chávez, Humala "promised to convoke elections for a constitutional convention, oversee the drafting of a new charter, and then hold elections for a new Congress" (Schmidt, 2007, p. 816). But in 2011, Humala dropped his views favoring economic nationalism entirely and sought to reassure voters his commitment to democratic norms and practices. As Schmidt (2012, p. 627) writes, Humala "went to extraordinary lengths to moderate his image still further, promising consensus building, economic stability, and gradualism." He also "took a public oath not to seek re-election and to respect the constitution, the division of powers, the legal order, civil liberties, and human rights" (Schmidt, 2012, p. 627). In brief, whereas the Humala of 2006 aligned himself with Venezuela's Hugo Chávez, the Humala of 2011 was different and now sided with Brazil's moderate Luiz Inácio Lula da Silva (Schmidt, 2012). In the words of Lupu (2012, p. 622), Humala "even replaced the red shirts he had worn in the earlier campaign with a suit and tie." The red shirts were a nod to *Chavismo*. After winning the runoff, Humala "went on a foreign tour that pointedly omitted Venezuela" (Lupu, 2012, p. 623).

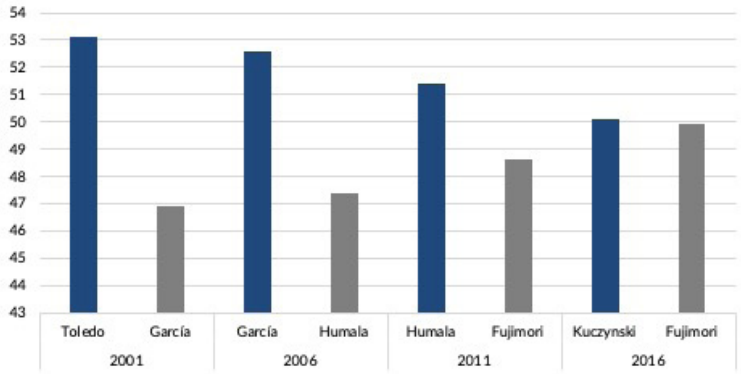
Keiko Fujimori also took some steps toward moderation, but the legacy of her father, Alberto Fujimori, remains a large shadow. During the 2011 electoral contest, she initially considered pardoning her father's conviction for corruption and human-rights abuses, but later backed away from this idea (Schmidt, 2012). She admitted that her father had made some mistakes, but at the same time referred to him as "Peru's best president" (Lupu, 2012, p. 623). She argued that she would be more effective than Humala in combating crime, but late in the runoff, Jorge Trelles, a spokesperson for her campaign, defended her father's record by stating: "We killed fewer people than other governments" ("Nosotros matamos menos que otros gobiernos") (Schmidt, 2012, p. 627).[2] In the 2016 presidential election,

2. Fujimori recruited former New York City Mayor Rudy Giuliani as an advisor on public safety.

she made a bold move and "vetoed over half of her party's incumbent members of Congress from seeking re-election, including several who were strongly associated with her father" (Schmidt, 2016, p. 451). She criticized her father's decision to run for reelection in 2000. She also promised, once again, not to pardon him and embraced the findings of the Truth and Reconciliation Commission that were critical of his government (Schmidt, 2016).

Third, and finally, candidate learning and moderation reflects a broad preference for continuity by the Peruvian electorate. Voters weigh which candidate most aptly captured the political center (centrism) and who was perceived to do the less damage while in office by embracing continuity.[3] Centrism and continuity work well across the presidential elections, save for 2011. In virtually all of the runoffs, Peruvians faced a stark choice (and reality), and the runoffs have become increasingly tighter over time (see Figure 1). In 2001 runoff, for example, many Peruvians disliked Toledo and García, and some journalists went even further and asked Peruvians to cast spoiled or blank ballots in the runoff (Schmidt, 2003, p. 349). Heeding this call, polls showed an increase for the abstention option between late March and early April. Polls also showed a tight race, and near the end of the campaign, it appeared that García was in front of Toledo. As Schmidt (2003, p. 350) writes, the "prospect of another García presidency triggered a major shift from the abstention option to Toledo in the final week, which may well have been decisive." In the end, Peruvians "resigned themselves to voting for the one deemed to be the lesser of the two evils" (Schmidt, 2003, p. 350).

Figure 1. Share of Valid Votes in the Runoffs, 2001-2016



Source: Authors' own elaboration based on data from ONPE (2021).

3. To clarify, we don't see centrism and continuity as two separate, unrelated conditions. See also Tanaka (2011), and Dargent and Muñoz (2016).

The 2006 runoff between García and Humala was also seen "as a choice between two very flawed candidates" (Schmidt, 2007, p. 818). With the benefit of candidate learning and moderation, García now advocated for "responsible change," and aptly moved to the center of the political spectrum (Schmidt, 2007, p. 817). Humala, in contrast, was widely perceived as the anti-establishment candidate, following *Chavismo* and even running a campaign with covert financing by Hugo Chávez (Schmidt, 2007, p. 816).

Turning to the 2011 electoral contest, three candidates competed for the "mantle of continuity" of the economic model (Kuczynski, Toledo and Castañeda), but none of them made it to the runoff (Lupu, 2012, p. 621). Had it been for stronger parties, these three candidates could have produced a single ticket with better odds to win the election (Bril-Mascarenhas, 2012). Instead, their lack of coordination led to a runoff between Humala on the left of the political spectrum and Fujimori on the right. Mario Vargas Llosa, Peru's Nobel Prize winning novelist, depicted the runoff as a choice "between Aids and cancer."

In the runoff, both candidates moved quickly to court moderate votes (Lupu, 2012, p. 623). Humala softened his rhetoric. He also "took on some of Toledo's economic advisors and courted the former president's tacit endorsement" (Schmidt, 2012, p. 623). Fujimori admitted "mistakes" made by his father (Lupu, 2012, p. 623) and picked up the endorsements of Kuczynski, Castañeda, and even García (Schmidt, 2012, p. 623). Keiko represented greater continuity to the economic model and was expected to follow the pro-business policies of her father (Lupu, 2012, p. 622). Humala, in contrast, "made promises to redistribute the fruits of Peru's economic growth and resource wealth" (Lupu, 2012, p. 624). Humberto Speziani, the president of CONFIEP, Peru's largest business group, described Humala as an individual who "has a lot of social sentiment" ("*tiene bastante sentimiento social*") (Ponce Acuña, 2011). Humala wanted to reduce extreme poverty, but business leaders were concerned about the impact of these policies on economic growth.

When the votes were counted, Humala won the election. Levitsky notes that "Humala was more successful than Fujimori in moderating his discourse to reach the center of the political spectrum" (quoted in Bril-Mascarenhas, 2012, p. 13). Levitsky adds, notwithstanding "the steady economic growth that marked Peru's neoliberal years, its citizens chose to turn to the candidate that was furthest away from economic orthodoxy" (quoted in Bril-Mascarenhas, 2012, p. 13).[4] Lima's stock exchange plunged 12.51 % after Humala's second-round victory (RPP, 2011).

4. Schmidt (2012, p. 628) also writes: "Humala skillfully calibrated a reformist message that mobilised his base while allowing him to broaden his appeal in the runoff."

The emergence of front runners, the supply of centrism by candidates and the demand for continuity by Peruvian voters are three broad patterns that can be observed across the presidential elections since 2000. A runoff with centrism and continuity is a delicate balance and these conditions operated well across the presidential elections, save for 2011. In that election, Humala offered centrism, but failed on continuity. Keiko Fujimori, in contrast, was a sure bet on the continuity of the economic model, but came short on centrism.

ECONOMIC EXPANSION AND WEAK PARTIES

An extended period of economic expansion driven largely by a commodity boom (Arce, 2014) as well as the weakness of political personalities and parties (Vergara and Encinas, 2016) can help to explain centrism and continuity. First, the economic expansion generated an improved standard of living for all segments of the population. Peru's GDP per capita more than doubled between 1990 (the start of the government of Alberto Fujimori) and 2019 from $2,650 to $6,480 (constant 2010 US$) (World Bank, 2021). The percentage of the population living in poverty declined from 48.5 % in 2004 to 27.7 % in 2017. Those living in extreme poverty dropped from 17.4 % in 2004 to 3.8 % in 2017 (Arce and Incio, 2018). The unprecedented economic expansion influenced a consumer-oriented mindset among the country's growing middle class. To be clear, the "Peruvian miracle" (Mendoza, 2013) was a stark departure from the economic populism and disaster of the 1980s. If there was something Peruvian voters feared the most, it was a redo of that "national trauma" (Leiteritz, 2010).

Second, the weakness of the Peruvian political class is another factor behind centrism and continuity. Even though Humala in 2011 aptly moved to occupy the political center through candidate learning and moderation, he represented the greatest threat to the continuity of the economic model. Vergara and Encinas (2016, p. 160) described him as a "fierce antiestablishment radical." But Humala won the election without a party, having no previous experience in government, as well no strong business support. This vacuum made him vulnerable to empowered technocrats and bureaucrats within the state, particularly the Ministerio de Economía y Finanzas (MEF) and the Banco Central de Reserva del Perú (BCRP) (Dangert, 2012). Vergara and Encinas (2016, p. 160) argue that Humala did not embrace neoliberalism ideologically, but yet embraced it in practice. In the wake of his second-run victory, and to appease markets, Humala recruited former officials from both Toledo and García to key economic positions (Schmidt, 2012; Lupu, 2012). It also took him more than twenty days to find a suitable Minister of Economy. He appointed Luis Miguel Castilla, who was García's vice-minister

of economy. In this way, Humala ensured the continuity to the economic model, albeit after the election (Vergara and Encinas, 2016).

Overall, and compared to neighboring countries like Bolivia and Ecuador that sought to advance "postliberal" economic regimes, the market economic model left by Alberto Fujimori remains largely intact. Cotler (2011, p. 546) criticized Toledo for setting the economy on "cruise control" as his government kept the same economic policies as Fujimori's. García arguably sought to push neoliberalism even further by opening the Amazon rainforest for development (Arce, 2014). Kuczynski was the quintessential insider or establishment candidate. He was a manager from the Central Bank during the first Belaúnde government (1963-68) and then served as Minister of Energy and Mines during his second government (1980-85). He was also a former official of the International Monetary Fund and World Bank, and later served as Toledo's Minister of Economy and Finance and then Prime Minister. He defeated Keiko Fujimori in the runoff of 2016—the difference in votes was 41,057.

The weakness of the party representation, in particular, and political class, in general, makes election forecasting in Peru a toll order. All of the former Presidents since 1990 (Fujimori, Toledo, García, Humala, Kuczynski and Vizcarra) were ousted from office or imprisoned on allegations of corruption over the past three decades.[5] In the 2016 elections, Gregorio Santos, the former governor of Cajamarca, run his campaign from prison and was granted a special furlough to participate in the presidential debate (Schmidt, 2016, p. 452). Keiko Fujimori, who ran for president in 2011 and 2016, also served time in prison for money laundering and obstructing justice. In the presidential contest of 2021, both Keiko Fujimori and former President Humala ran for office again. In this election, and up until February 2021, George Forsyth was the top presidential contender (see Table 1) (O'Boyle, 2020). He is a former goalkeeper and mayor of the populous district of La Victoria in Lima. Then polls on or around March 2021 revealed Yonhy Lescano as the frontrunner. On election night, however, neither Forsyth nor Lescano emerged victorious.[6]

By now, we have established that candidates often move to the political center to win office (centrism) and voters' preference for the continuity of the economic model is related to the economic expansion the country enjoyed during most of the 2000s and 2010s. The weakness of the political class also moves politicians without parties like Humala to embrace this continuity. This does not suggest that other voter concerns don't matter. In the 1980s and early 1990s, in

5. Martín Vizcarra took over after Kuczynski was ousted from office, but in late 2020, Vizcarra was also removed from office over allegations of corruption.
6. As of this writing, the 2021 presidential election was also described as a vote for the lesser evil. See Freeman and McClintock (2021).

fact, security concerns as a consequence of rising political violence in Peru were paramount, and voters rated presidents differently based on who they perceived to be more effective in containing violence (Arce, 2003). But in this period of study – the 2000s and 2010s – and in a context of overall pacification, these security concerns faded considerably. While electoral volatility and uncertainty remain a salient feature in Peruvian politics, we can draw on existing models of voting behavior to forecast the outcomes of elections. We turn to this literature next.

FORECASTING ELECTIONS IN LATIN AMERICA AND PERU

Bunker and Bauchowitz (2016, p. 209) describe the state of electoral forecasting in Latin America as "incipient" because of the relatively young age of Latin American democracies as well as the quality of available data. As the authors (2016, p. 213) write: "Electoral forecasting cannot take place in systems without elections or in environments with incomplete information." To address these limitations and make valid election forecasts, some authors have embraced betting markets (Bunker and Bauchowitz, 2016), while others have recommended the use of subnational data, particularly when the number of elections under study is very small (Turgeon and Rennó, 2012). Betting markets provide forecasts of electoral results based on the buying and selling of candidate futures with real money (Stegmaier and Norpoth, 2013) and provide continuous data points to forecast elections, as in Chile's Bolsa Electoral (Bunker and Bauchowitz, 2016). Turgeon and Rennó (2012, p. 807) produced a forecast model for Brazil using four presidential elections (1994, 1998, 2002 and 2006) for the 27 states that comprise the Union (generating a sample of 108 observations – 27 states x four years). In addition, Cantú, Hoyo and Morales (2015) combined poll aggregation methods with dynamic linear models to forecast presidential elections in Mexico. To our knowledge, studies on electoral forecasting in Peru are rare, but Bunker (2020) proposed a two-stage model to combine polls that produced relatively accurate predictions for Latin American elections and correctly forecasted the placement of candidates in the Peruvian 2016 election. While making important contributions, the volatile nature of the Peruvian electoral scene requires greater attention.

To forecast when the lesser evil will win in a country like Peru, where "incumbent party" is a meaningless concept for forecasting, we build on dominant scientific approaches in the field (see the reviews in Lewis-Beck and Tien, 2012; and Stegmaier and Norpoth, 2013). As Lewis-Beck (2005) presented it, the standard political economy model of voting takes the generic form: election result = f (government support, economic growth). The vote is therefore a function of two core components: a political factor capturing the general mood of the population regarding the outgoing administration's performance and an economic factor

measuring the overall strength of the national economy. This basic model is derived from robust theories explaining vote choice (Fiorina, 1981; Lewis-Beck and Stegmaier, 2007).

While forecasting models with this basic structure generally predict presidential outcomes fairly well, they have not been widely applied to Latin American democracies. As a result, we do not know if support for the lesser evil in Peru will follow the standard political economy model. Since this model is essentially a referendum on how well the current government is handling economic and non-economic issues, we argue that the lesser evil will benefit from the incumbent government's good performance. Other things being equal, therefore, the better the performance of the economy and the better the popularity of the incumbent president, the better the lesser evil candidate will do. Given the large number of unknowns in forecasting Peruvian elections, we have chosen to use the most theoretically-grounded predictors and the most parsimonious model.

DATA AND METHODS

To estimate the vote for the lesser evil, we use polling data from March 2000 to September 2020. We collected 181 election surveys in which a vote intention question was asked and constructed a continuous series with consistent question wording. These polls usually adopt the standard question wording: "If the general elections were held tomorrow, which candidate would you vote for."[7] To our knowledge, this is the first time that a dataset of pre-electoral polls spanning twenty years has ever been compiled for Peruvian elections.[8] We provide descriptive statistics of our variables, including the number of months and polls per election cycle, in the Appendix.

We decided to base our predictive models on vote intention because young democracies like Peru's have a very short history of democratic elections. While forecasting models in advanced democracies – such as the US – generally examine aggregate time series from WWII to the present, Peru has a very small sample size of national elections. Thus, forecasting models cannot be estimated using past election results (Stegmaier and Williams, 2016). To overcome the problem of too few data points, popularity functions with monthly time series data of party

7. In Spanish, the wording is: "Si mañana fueran las elecciones presidenciales, ¿por quién votaría usted?"

8. Our data cover five elections: 2000, 2001, 2006, 2011, 2016, and 2021 (up to September 2020). While the vote intention time series could potentially span 246 months, we only have information for 84 months, given that polling houses typically publish vote intention data only in the months leading up to the election day. See table A2 in the Appendix.

support are an available option that has been used previously to forecast elections in Hungary and the UK (Sanders, 2005; Stegmaier and Lewis-Beck, 2009; Stegmaier and Williams, 2016). In this paper, we adopt this approach.

We aggregate raw poll numbers to create monthly summary measures of vote intention. By doing so we hope to overcome some of the limitations of relying on an individual single poll.[9] Among the numerous challenges of working for polling data, the poor quality of data is one of the most serious concerns.[10] Some polling houses, for instance, are known or suspected of favoring one political party over another (Williams and Reade, 2016). Other polling houses are not transparent about their sampling methodology. Moreover, given that polling data are not always nationally representative, urban and affluent individuals might be overrepresented in poll samples. We assume, therefore, that each poll is a slightly flawed measure of the real support for a party at a given point in time. To address these limitations and biases, we thus run our models with the average percentage of voters intending to vote for a candidate. Then, we compare these results to models using disaggregated data and a subset of data from the most reliable polling sources.[11]

Dependent variable

In attempting to forecast the electoral results in multiparty elections with high levels of volatility, one of the greatest challenges is the difficulty in dealing with the large number of active players and the frequent emergence of new actors (Walther, 2015). We cannot simply use incumbent party vote share as our dependent variable, like forecasting models in advanced democracies do. We can, however, identify the candidates who moved to occupy the political center and embraced the continuity of the economic model. In the case of Peru, candidate learning and moderation shifts political personalities to the center, and some are more successful than others. Some of these candidates also share a similar ideological preference for the prevailing economic model, but not others. In our analysis, therefore, our dependent variable is vote intention for the lesser evil. This is calculated as the average percent of respondents supporting centrist candidates

9. As Bunker (2020, 1409) put it "it is likely that the average of the two polls will be a better estimator of the parameter of interest than any poll chosen at random."
10. See Serrano and Navarro (2017) for an account of the scrutiny that polls in Latin America have faced in recent years.
11. While monthly aggregated poll data might represent an improvement over raw poll numbers, these estimates might still succumb to the well-kwon urban bias in Peruvian polls, so we should use caution when interpreting the estimates in forecasting models of this nature.

who embraced the continuity of the economy model. These candidates are: Toledo in 2001, García in 2006, Fujimori in 2011, and Kuczynski in 2016.[12] These certainly are candidates with vastly different political outlooks but we contend that they share a similar distaste for radical changes to the economic model.

Independent variables

Following standard political economy models of voting (Lewis-Beck, 2005), we selected two predictors or independent variables: government popularity and economic performance. To measure government popularity, we use monthly data on presidential approval. The data was gathered from Ipsos-Peru monthly reports on presidential approval, which regularly ask respondents the following question "In general, would you say that you approve or disapprove of the president [name]'s administration?"[13] To measure the strength of the national economy, we use an indicator of GPD growth collected from the *Instituto National de Estadística e Información*—INEI (2021). There is no agreement on what is the best indicator of the state of the economy. Some scholars rely on objective measures (Stokes et al., 1997), and others on subjective perceptions (Kelly, 2003). While subjective economic evaluations tend to be the most popular economic indicator (Stegmaier and Lewis-Back, 2013; Anderson, 2000; Bartels and Zaller, 2001), a consistent monthly time series of retrospective national evaluation is not available in Peru. We thus complement these monthly data with two alternative measures: mining GPD growth and inflation. Both monthly figures come from the *Banco Central de Reserva del Peru*—BCRP (2021).

Estimation method

To estimate our lesser evil support models, we use simple linear regression models with lagged predictors. Given that forecasting models with longer lead time are more interesting and meaningful (Lewis-Beck, 2005), we estimate models with 1-, 2- and 3-month lags. We decided to limit our lags to 3 months only because of the short length of presidential campaigns in the country. This lag

12. We have shown that candidate moderation and learning is pivotal to capture the political center, and even though these four candidates have vastly different political backgrounds, they all moved toward centrism. What's more, Toledo (2001), García (2006), Fujimori (2011), and Kuczynski (2016) all embraced the continuity of the economic model at the time of the election, but Humala (2011) did not.
13. *In Spanish, the wording is:* "En general, ¿diría que aprueba o desaprueba la gestión del president [nombre del presidente]?"

structure means that, for example, we use data from up to 3 months prior to the pre-election survey to predict the average lesser evil support in a given month. Notice that our models are dynamic and can theoretically go as far back in time as data is available. Nevertheless, few polling houses in Peru release vote intention data prior than six months before the election day, as the pool of candidates is still uncertain early in the campaign. Taking all these factors into account, we expect that models with data from one or two months prior to the pre-electoral survey will provide the best predictions.[14]

An important step in forecasting is evaluating the performance of the forecasting models. To compare the accuracy of the models, we use a resampling technique called cross-validation. The idea of cross-validation is to use a subset of observations to fit a model (called "training set"), and use the held-out observations to estimate the accuracy of the model (called "testing set"). The process is repeated multiple times and the results are aggregated and summarized. Given the small size of our sample, we prefer to use leave-one-out cross-validation (LOOCV) over 5 or 10-fold cross-validation, because with LOOCV the training set would contain n-1 observations, almost as many as in the entire dataset (James et al., 2013; Kuhn and Johnson, 2013). This technique will therefore allow us to assess the relative predictive power of our models.

Finally, we replicate the analysis with disaggregated poll data to check if predictions using monthly aggregated summaries of the lesser evil support represent an improvement over raw poll data. The disaggregated dataset consists of the vote intention for the lesser evil candidate as reported per each individual poll. Another approach could have been increasing the number of observations subnationally, as in Turgeon and Rennó (2016). However, we faced serious data limitations with producing such estimation. Furthermore, to account for different pollster quality, we compare these results to models using a subset of data from the most reliable polling firm.

RESULTS

Table 2 presents the models for the lesser evil support. In each model, the support for the lesser evil was regressed on political and economic predictors measured one, two, and three months before the pre-election survey month. We observe that, consistently across the three models, presidential approval is significantly associated with support for the lesser evil, whereas economic performance is not. The positive sign of the presidential approval coefficient indicates that the

14. For a discussion about the trade-off between accuracy and lead time, read Jennings et al. (2020).

better the presidential approval is doing, the higher the vote intention for the lesser evil. Interestingly, the effect of GDP growth on lesser evil support appears to be positive too, but the relationship is not statistically significant.

Next, we report the fit statistics, which are important for forecasters. Using cross-validation to compute out-of-sample prediction errors helps us gauge how the models perform in a held-out sample. Notice that these fit statistics are more conservative than the in-sample errors (also reported in Table 2). As expected, the model with one-month lag predictors is the strongest. Using only two indicators, the model manages to predict 42 percent of the variation in lesser evil support, which is a fair level of accuracy given the data limitations. Yet, the predicting error of 7.9 indicates that the predictive capacity of the model is somewhat weak.

Table 2. Lesser evil support models

	1 month lag	2 months lag	3 months lag
Presidential approval	0.457***	0.406***	0.383**
	(-0.08)	(-0.1)	(-0.11)
GDP growth	0.351	0.298	0.033
	(-0.32)	(-0.36)	(-0.43)
Constant	7.26	9.958*	12.584**
	(-3.69)	(-4.01)	(-4.5)
N	38	38	38
R-Square	0.552	0.349	0.266
RMSE	7.066	8.512	9.04
CV R-Square	0.423	0. 247	0.068
CV RMSE	7.950	9.489	11.138

Significance levels: *p<0.05, **p<0.01, ***p<0.001 (two-tailed). Standard errors in parentheses.

Observations correspond to poll data for the 2001, 2006, 2011, and 2016 elections.

Source: Authors' own elaboration

To check if monthly aggregated poll data represents an improvement over raw poll numbers, we run the same models with disaggregated data. The results are presented in Table 3. Models 1-3 correspond to results using all available polling data, and models 4-6 present the result using only a subset of the most reliable

polling data. These models yield very similar results and slightly more accurate predictions. We observe again that presidential approval is the best predictor of support for the lesser evil, and the model with the shortest time lead (one month) is the strongest. In these shortsighted models, the r-squared values range from 61.1 percent when using all available polls to 49.6 percent when using the most reliable polls only. In addition, while the economic indicator does not reach statistical significance, the relationship appears to be positive in the models with one-month lagged predictors. That is, the higher GDP growth, the higher the vote intention for the lesser evil.

Table 3. Lesser evil support models with disaggregated data

	All polls			Only Ipsos polls		
	1 month lag	2 months lag	3 months lag	1 month lag	2 months lag	3 months lag
Presidential approval	0.419***	0.327***	0.259***	0.457***	0.381***	0.231*
	(-0.04)	(-0.05)	(-0.06)	(-0.07)	(-0.08)	(-0.1)
GDP growth	0.283	-0.049	-0.327	0.182	-0.087	-0.436
	(-0.19)	(-0.2)	(-0.22)	(-0.3)	(-0.32)	(-0.36)
Constant	8.887***	14.325***	18.209***	8.265*	13.398***	20.556***
	(-2.13)	(-2.2)	(-2.43)	(-3.64)	(-3.73)	(-4.23)
N	113	113	113	59	59	59
R-Square	0.632	0.427	0.337	0.541	0.356	0.169
RMSE	5.735	7.156	7.697	7.275	8.619	9.79
CV R-Square	0.611	0.394	0.309	0.496	0.299	0.106
CV RMSE	5.820	7.266	7.759	7.438	8.781	9.934

Significance levels: *p<0.05, **p<0.01, ***p<0.001 (two-tailed). Standard errors in parentheses.

Observations correspond to poll data for the 2001, 2006, 2011, and 2016 elections.

Source: Authors' own elaboration

To further explore the effect of economic performance on lesser evil support, we re-run our models with alternative national economy indicators: mining GPD

growth and inflation. Table 4 presents the results. Again, presidential approval is the strongest and most consistent predictor of support for the lesser evil. In contrast, the effect of the strength of the national economy proxied by mining production and inflation is not consistently related to support for the lesser evil. While this finding is unexpected, there are two possible explanations for the inconsistent effect of the economy. First, it is possible that subjective measures of the state of the economy could have performed better than the objective measures that we employ here; but unfortunately, a consistent monthly series of subjective economic evaluations is not available in Peru.

Table 4. Lesser evil support models with alternative economic indicator

	Mining GPD Growth			Inflation		
	1 month lag	2 months lag	3 months lag	1 month lag	2 months lag	3 months lag
Presidential approval	0.373***	0.357***	0.339***	0.373***	0.333***	0.312***
	(-0.03)	(-0.04)	(-0.05)	(-0.03)	(-0.04)	(-0.04)
Mining GDP Growth	0.028	0.126	0.108			
	(-0.06)	(-0.10)	(-0.12)			
Inflation				4.276	3.338	8.403*
				(-2.59)	(-3.27)	(-4.00)
Constant	11.452***	12.423***	13.632***	10.281***	13.017***	13.522***
	(-1.21)	(-1.72)	(-2.20)	(-1.33)	(-1.49)	(-1.52)
N	113	113	113	113	113	113
R-Square	0.625	0.434	0.329	0.634	0.432	0.350
RMSE	5.79	7.111	7.746	5.724	7.125	7.622
CV R-Square	0.598	0.394	0.283	0.608	0.400	0.321
CV RMSE	5.912	7.269	7.911	5.842	7.229	7.692

Significance levels: *p<0.05, **p<0.01, ***p<0.001 (two-tailed). Standard errors in parentheses.

Source: Authors' own elaboration

Second, it is possible that the lesser evil candidate is not assigned responsibility for the state of the economy, even if their candidacy represents continuity with the incumbent's economic policies. Stegmaier and Lewis-Beck (2009), for example, argue that economic voters in Hungary were more policy-oriented than incumbency-oriented in the early elections of the post-communist era. Therefore, socialist parties were favored for its economic policies during bad economic times, even if they were in office. A similar policy-oriented economic vote could be present in Peru, where a substantive part of the electorate is consistently supporting the market friendly candidates who, in their eyes, represent the lesser evil that would contain the potential risks of abandoning the economic model.[15]

Finally, since our main forecasting target are the actual election results, we now compare our out-of-sample prediction of the lesser evil support to the real vote share the lesser evil took in the 2011 and 2016 elections. Did the model forecast the outcome? Table 5 presents the results. Since our vote intention data come from surveys mostly conducted in Lima, we compare our forecast to the lesser evil's actual vote shares in Lima. We observe that our out-of-sample point prediction comes fairly close to the real electoral results, suggesting our model performs well in Lima. In 2011, the model is off by 0.83 percent only, because Fujimori obtained 22.75 percent points in Lima and our model predicted 21.92 points. Similarly, in the 2016 election, we are off by 4.12 percent points because PPK garnered 29.63 percent of Lima's votes and our forecast indicated he would obtain 33.75 percent. Even though we do not expect our forecast to perform well nationally given the urban bias of our polling data, we also compare our forecast to the national election outcomes. Not surprisingly, our model under-predicts the vote share of Fujimori by 1.63 points, and over-predicts the vote share of PPK by 12.84 points. The direction and magnitude of the errors are to be expected given that PPK did poorly among non-urban voters, while Fujimori had a more balanced support outside and inside the capital city.

15. It is also possible that the effect of the economy is captured by the presidential approval variable, which could explain why the economic indicator does not reach statistical significance in our model. As Arce and Carrión (2010) have shown, presidential approval in Peru responds to economic performance, in line with standard economic voting models.

Table 5. Predictions

	Vote share forecast	Actual vote share (Lima)	Actual vote share (Nation)	Diff to Lima	Diff to Nation
Fujimori 2011 first round	21.92	22.75	23.55	-0.83	-1.63
PPK 2016 first round	33.75	29.63	20.91	4.12	12.84

Source: Authors' own elaboration

CONCLUSION

Peruvian elections are characterized by a high level of volatility and electoral uncertainty. Anything can (and has) happened in recent elections. Despite the fluidity of political personalities without stable party organizations, however, we observe candidate learning and moderation to capture the political center and also a preference for the continuity of the economic model in the context of an unprecedented economic expansion. The weakness of the Peruvian political class also moves potential antiestablishment candidates like Humala to embrace this continuity. This information allows us to identify the candidate who is perceived to do less damage to the status quo while in office, and in turn, apply standard forecasting models to predict the outcome of the elections. Our results show that the popularity of the incumbent president works as a proxy for continuity and support for the lesser evil candidate. Our results on the importance of the economy remain inconclusive.

In every election, Peruvian voters ponder which candidate most aptly moves to the political center (centrism) and who is perceived to be the lesser evil by embracing continuity. There is no doubt this is a delicate balance. In 2011, the three candidates who represented continuity—Kuczynski, Toledo and Castañeda—collectively captured 43.9 % of the vote, but they competed with each other and split the centrist vote. This failure of coordination due to the poor quality of party representation paved the way for a different contest between Humala and Fujimori, candidates who "clearly represented more dramatic deviations from existing policies" (Lupu, 2012, p. 622). In the end, Humala embraced continuity, but only after the election.

With the spread of democracy in Peru, the polling industry has grown considerably, but there is still room for improvement. In our review of the vote intention series for the 2021 presidential election, for instance, we noticed that some polling firms like Datum International and Ipsos Peru logged the name of

potential presidential contenders almost three years out before the election, but other polling firms like IEP did so much closer to the election date. Moreover, during the election cycle of 2021 it looks like all of these polling firms may have overestimated the likely vote intention of establishment candidates, while underestimating the vote intention of other candidates like Pedro Castillo. "Son of the soil" Castillo faced Keiko Fujimori in the runoff election of June 2021 (Collyns, 2021). Yet vote intention for Castillo was only logged in late 2020 and it stayed within single digits up until March 2021, about a week or so before the election. More consistent reporting and coverage of other candidates across these polling firms would likely improve election forecasting in Peru.

We invite future generations of researchers to revise and refine this basic forecasting model. Future studies could consider ways to identify the lesser evil far enough in advance of elections. While we provided a definition of the lesser evil – the centrist candidate who will maintain the current economic model – to overcome the challenge of dealing with a large number of parties and the frequent emergence of new actors, the difficulty in categorizing the lesser evil candidates sufficiently early remains a limitation of the present work. Nevertheless, this shortcoming is inevitably driven by the volatile nature of the Peruvian electoral scene, where political parties are weak and non-programmatic. Given this reality, forecasters might be forced to wait for the electoral campaign opening to observe candidate proposals and assign the "lesser evil" label. Still, we believe that constructing the dependent variable in this way is a productive exercise because it allows us to test forecasting models in a least-likely setting for predicting elections, which to our knowledge, has not been done before in Peru.

To move beyond our parsimonious model, future research on forecasting elections in Peru should consider subjective evaluations of the economy, which may be better predictors of the health of the economy than the indicators we use. Future work should also consider the policy preferences of voters as well as the salience of other non-economic issues. To be clear, our study primes the continuation of the economic model because of this extraordinary period of economic expansion characterized as the "Peruvian miracle" (Mendoza, 2013). Other voter concerns are likely to be important in other contexts, especially in the post-pandemic era.[16] On this subject, the COVID-19 pandemic dealt a huge blow to the Peruvian economy and has wiped out the social and economic gains attributed to the commodity boom. Periods of economic crisis have always been a harbinger

16. In a context of economic crisis, identifying the lesser evil candidate could also be more difficult. The time scope of our work is circumscribed to a context of economic expansion when the candidates had strong incentive to moderate and seek to represent the continuity of an economic model that appeared to be working for many. Nevertheless, in the months leading up to the 2021 election a clear frontrunner did not appear and the pandemic revealed unresolved economic and social inequalities.

for change in the Latin American region, and the Peruvian presidential election of 2021 will not be an exception. If our arguments favoring a political cleavage around the candidates representing centrism and continuity hold, Peruvians will again decide their vote on for or against the candidate who is likely to do the less damage to the status quo while in office. If they do not, Peruvian voters may face an electoral cycle with a wide range of possible outcomes.

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APPENDIX

Appendix A. Descriptive statistics

Table A1. Summary statistics

Variable	Mean	St. Dev.	Min	Max	N
Lesser evil	22.06	10.15	4.00	50.10	113
GPD growth	4.28	5.35	-39.93	14.02	345
Inflation	0.24	0.29	-0.53	1.30	348
Mining GDP growth	4.39	8.60	-45.61	33.02	347
Presidential approval	35.96	19.01	6.00	87.00	341

Source: Authors' own elaboration

Appendix B. Vote intention data coverage

Table A2 shows the time coverage of vote intention data by election. We collected data leading up to 5 first round elections (2000, 2001, 2006, 2011, 2016, 2021) and 3 runoff elections (2006, 2011, and 2016).

Table A2. Vote intention observations by election

Election	Dates	Number of months	Number of polls
2000 (first round)	March 2000 – April 2000	2	2
2001 (first round)	January 2001 – April 2001	4	22
2006 (first round & runoff)	September 2002 – June 2006	19	55
2011 (first round & runoff)	August 2008 – May 2011	12	24
2016 (first round & runoff)	July 2014 – June 2016	16	28
2021 (first round)	December 2017 – September 2020	33	50
Total		86	181

Source: Authors' own elaboration

Appendix C. Data sources

Table A3. Data sources

Variable	Frequency	Sources	Measurement
Lesser evil	Bi-monthly or irregular	Ipsos-Peru, IEP, Datum, Universidad de Lima, CPI, Imasen	Monthly average of raw polls. "If the general elections were held tomorrow, which candidate would you vote for."
GPD growth	Monthly	Instituto Nacional de Estadística e Información—INEI	
Inflation	Monthly	Banco Central de Reserva del Peru—BCRP	
Mining GDP growth	Monthly	Banco Central de Reserva del Peru—BCRP	
Presidential approval	Monthly	Ipsos-Peru	"In general, would you say that you approve or disapprove of the president [name]'s administration?"

Source: Authors' own elaboration

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FORECASTING TWO-HORSE RACES IN NEW DEMOCRACIES: ACCURACY, PRECISION AND ERROR

Pronosticando carreras de dos caballos en nuevas democracias: exactitud, precisión y error

Prevendo corridas de dois cavalos em novas democracias: exatidão, precisão e erro

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Abstract
The purpose of this article is to explore electoral forecasting in two-horse races in new democracies. Specifically, it applies a Bayesian dynamic linear model (coined the Two-Stage Model, TSM) to look at the 2020 Chilean two-question national plebiscite. The ultimate objective is to test the TSM in terms of accuracy (how close the forecast is to the election results), precision (how close the forecast is to other methods of prediction) and error (how the forecast deviates from perfect accuracy/precision). The article finds that while the TSM does appear to be a stable estimator, its accuracy and precision is affected under certain conditions. Using the difference in the results for each of the two questions, the article discusses how sharp and unexpected shifts in electoral preferences can affect forecasts.

Palabras clave:
Inferencia bayesiana; Campañas electorales; Nuevas democracias; Opinión pública; Plebiscitos

Resumen
El propósito de este artículo es explorar la predicción electoral en carreras de dos caballos en nuevas democracias. Específicamente, aplica un modelo lineal dinámico bayesiano (acuñado el modelo de dos etapas, TSM) para observar el plebiscito nacional de dos preguntas de Chile el 2020. El objetivo final es probar el TSM en términos de exactitud (qué tan cerca está de los resultados de las elecciones), precisión (qué tan cerca está de otros métodos de predicción) y error (qué tanto se desvía de exactitud/precisión perfecta). El artículo encuentra que, si bien el TSM es un estimador estable, su exactitud y precisión se ven afectadas bajo ciertas condiciones. Usando la diferencia en los resultados de las dos preguntas del plebiscito, el artículo discute cómo cambios bruscos e inesperados en las preferencias electorales pueden incidir en los pronósticos.

Palavras-chave:
Inferência Bayesiana; Campanhas eleitorais; Novas democracias; Opinião pública; Plebiscitos

Resumo
O objetivo deste artigo é explorar a previsão eleitoral em corridas de dois cavalos em novas democracias. Especificamente, ele aplica um modelo linear dinâmico Bayesiano (nomeado de modelo de dois estágios, TSM) para observar o plebiscito nacional de duas perguntas do Chile em 2020. O objetivo final é testar o TSM em termos de precisão (quão próximo está dos resultados?), exatidão (quão próximo está de outros métodos de previsão?) e erro (quanto se desvia da precisão / exatidão perfeita?). O artigo conclui que, embora o TSM seja um estimador estável, sua exatidão e precisão são afetadas sob certas condições. Usando a diferença nos resultados das duas questões do plebiscito, o artigo discute como mudanças repentinas e inesperadas nas preferências eleitorais podem influenciar as previsões.

INTRODUCTION

When it comes to electoral forecasting there is a remarkable lack of research stemming from new democracies in general (Lewis-Beck & Bélanger, 2012; Lewis-Beck & Stegmaier, 2008) and from Latin America in particular (Bunker, 2021; Cantú et al., 2016; Turgeon & Rennó, 2012). While some research has been conducted in the region, it has all focused on presidential elections, leaving both more frequent elections (such as those held at the legislative and municipal levels) and less frequent ones (such as regional referendums and national plebiscites) significantly understudied. However, new advances in forecasting methods (mainly associated to statistical techniques), as well as recent events in countries across the region (more direct, more diverse and more democratic elections), provide the perfect opportunity to advance the understanding of electoral forecasting in new democracies at greater levels of depth.

Gaining greater insight into forecasting is relevant considering the sharp rise of fake news and post-truths surrounding electoral processes (see Allcott & Gentzkow, 2017) in election campaigns across the world (Cassino, 2016). Because

new democracies have less safeguards than established ones, and as such are at higher risks of disinformation related vulnerabilities (McKay & Tenove, 2020), it is particularly important to study public opinion trends in their electoral cycles. And because of the rise of direct democracy mechanisms (Altman, 2018), and their implications for governance, it is especially important to study the matter at deeper tiers of citizen electoral engagement beyond its representative scope. This article particularly proposes to look at electoral forecasting in new democracies at the level of national plebiscites—which particularly falls within the two-horse race category (in contrast to multi-candidate or multi-party elections).

In addition to the theoretical warrant, new methodological and computational developments offer a perfect opportunity to apply large-N methods to case studies more efficiently than previously possible. Thus, instead of adopting a traditional custom-fit method purposely tailored to study country-specific dynamics, this article instead applies a previously developed method tested, and to a relevant degree proven to produce accurate and precise forecasts, to a very particular electoral scenario. Specifically, it uses a Bayesian Dynamic Linear Model (DLM) coined the Two-Stage Model (TSM), and applies it to the 2020 Chilean national plebiscite. In this way, this article seeks to contribute not only to the electoral forecasting literature in general, but also the burgeoning body of Chilean electoral studies and public opinion research.

Chile is a particularly suitable case to study electoral forecasting at a more granular level for two major reasons. First, because it is one of the few countries in Latin America that has already accumulated some research on electoral forecasting. As such, this study cannot only contribute to develop a more robust understanding of both election dynamics and public opinion trends in the country, but can also use previous evidence as a point of comparison. The second reason is because the 2020 Chilean national plebiscite was not only a rare event in the institutional history of the country, but was also an election with great political significance (since major constitutional overhaul was on the ballot). In this way, gaining a deeper insight into public opinion trends during a particularly rare and relevant electoral cycle can further contribute to identify the boundaries of accurate and precise electoral forecasting.

The remainder of this article is structured as follows. The following section briefly summarizes some of the main problems related to modern democratic processes and describes how electoral forecasting can contribute to solve some of them. It particularly proposes DLMs in general and the TSM in particular as resolution mechanisms, and pushes the case for the need to advance lines of electoral forecasting research that look at elections other than presidential ones. The third section justifies the case selection (Chile), and describes the electoral process surrounding the 2020 national plebiscite. The fourth section presents the specific

research questions and the data, the fifth section shows the main findings, and the final section puts forward a discussion on the greater implications of the results.

FORECASTING ELECTIONS[1]

There is a growing trend of citizens receiving inaccurate information during electoral cycles (Cassino, 2016). This is a problem because voters use their knowledge to inform their decisions (Markus & Converse, 1979). Those with more information are not only more likely to vote (Bartels, 1996; Feddersen & Pesendorfer, 1996; Lassen, 2005; Palfrey & Poole, 1987), but are also more likely to vote for the candidate that yields them with the highest total utility (Ghirardato & Katz, 2006; Matsusaka, 1995). Thus, voters with little or inaccurate information do not only vote less but are also less likely to report having voted for the "right candidate" (Matsusaka, 1995). This can ultimately contribute to the production of artificial, and potentially harmful outcomes for democracy (Fowler & Margolis, 2014; Winters & Weitz-Shapiro, 2013). Because uniformed voters make inefficient assumptions on the distribution of preferences, including their own, they echo preexisting information biases (Nadeau et al., 1993), and ultimately misinform the electoral process (Blais et al., 2009; Larcinese, 2007).

In contrast, democracies that institutionally account for misinformation, and aim at curbing asymmetries, do not only tend to produce elections with higher rates of citizen participation but also tend to produce higher levels of post-election satisfaction (Carpini & Keeter, 1997; Milner, 2002). Thus, curbing information asymmetries is important not only to gap the space between the electoral process and the voter but for the process of democracy itself. Graefe et al. (2014) describe how methods to estimate and relay the "true state" of electoral races date back to at least the early twentieth century. They show how methods have evolved from experts, to polls, to quantitative models, to electronic betting markets. But in the light of some recent and surprising electoral results (such as the UK in 2015 and Australia in 2019), research has moved to attempt to further reduce noise and increase signal.

Data aggregation

Recent research stemming from political and computational science suggests that the solution may lie in poll aggregation (Armstrong et al., 2015; Lewis-Beck &

1. The discussion in this section draws heavily from Bunker (2021).

Dassonneville, 2015; Pasek, 2015; Wang, 2015). Technically, aggregation is simply the combination of data stemming from pre-election information and is grounded in likelihood theories and bracketing principles (see Mannes et al., 2014). Take an election in which two polls are fielded with the intention of predicting the vote difference between the top two candidates as an example. It is likely that the average of the two polls will be a better estimator of the result than any poll chosen at random. Studies have shown that, as a general rule, as more data is considered, accuracy levels improve (Jackson, 2018). And, while experiments and research are still burgeoning, they have already shown that accuracy levels can at least matched those of traditional ones (Graefe et al., 2014).

While aggregation models do not go without limitations, they do provide solutions to many of the pitfalls that traditional methods have not been able to yet solve (Graefe et al., 2015). In contrast to polls and betting markets, they are less vulnerable to late swings and outliers, as they do not generally take potentially biased information at face value. In comparison to quantitative models, they are more versatile, since they can be easily designed to incorporate data from alternative sources. In comparison to experts, they are more likely to tend toward the average preference, because they are naturally more effective in detecting latent trends. And because of their parsimony, they have been on the rise. While their use in media can be traced back to the website FiveThirtyEight, initiatives have since burgeoned (Jackson, 2018). The most basic model is known as the Poll of Polls model.

The Two-Stage Model

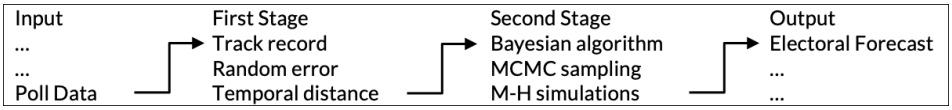
It is in this context that the TSM was developed. The TSM (see Bunker, 2021) essentially uses a poll aggregation method but adds the complexity of space state DLMs (West & Harrison, 1997). Its main objective is to estimate latent trends of support for parties (or candidates) and extrapolate them into the future (Bodell, 2016). Its contribution is its effectivity to combine data over time within the restrictions of probability theory, and to perform real-time tracking of electoral support with minimal and continuous information (Walther, 2015). It is built in the tradition of Jackman, who was among the first to use Bayesian methods to simulate the "true" state of an election using just polls (Jackman, 2005). But it also takes into account the body of literature that has since been developed in North America (Linzer, 2013; Lock & Gelman, 2010; Pickup & Johnston, 2007; Rigdon et al., 2009), the United Kingdom (Fisher & Lewis-Beck, 2015; Hanretty et al., 2016; Whiteley et al., 2016), and continental Europe (Bodell, 2016; Montalvo et al., 2019; Stoetzer et al., 2019; Stoltenberg, 2013; Walther, 2015).

As an extension of these models, the TSM does not intend to be a replacement, yet to propose a simpler set-up, that can be employed in more irregular settings with less specific regulations. For example, in comparison to the Jackman (2005) model, it puts less emphasis on house effects, considering that in developing democracies pollsters tend to be more irregular over time. In comparison to the Linzer (2013) model, the TSM can be easily adapted to any country in which votes are tallied at the national level. All in all, the intention of the TSM is to provide a method of forecasting that bypasses irregularities in the polling industry and electoral system restrictions. It can be applied across a wider number of democracies.

Figure 1 shows a graphical summary of how the TSM works. In the first stage polls are weighed according to three criteria: their accuracy track record, their estimated random error, and their distance from the election. The logic is that polls that are relatively more accurate in one election will be relatively more accurate in the next, polls that structurally anticipate lower levels of random error will be more accurate in comparison to polls that anticipate higher levels of random error, and polls that are fielded closer to the election will be more accurate in comparison to those that are fielded further away from the election. Once these quantities are individually computed, data is normalized to account for different measurements, and each is assigned a specific weight related to their overall corrected expected average error.

In the second stage the weighted polls are used to produce the electoral forecast. Essentially, a Bayesian approach is adopted, in which the parameters are treated as random, but are described by probability distributions. The process begins with the specification of a posterior model, conditional on observed data and prior knowledge (Berger et al., 1988; Bernardo & Smith, 2009). First, it combines the likelihood and prior using the Bayes algorithm (Posterior ∝ Likelihood × Prior) to generate an estimate. Then, it uses a Markov chain Monte Carlo (MCMC) to simulate the election thousands of times. Finally, it simulates the probability of that estimate by means of a Metropolis-Hastings (MH) iterative process.

Figure 1. Summary of the TSM

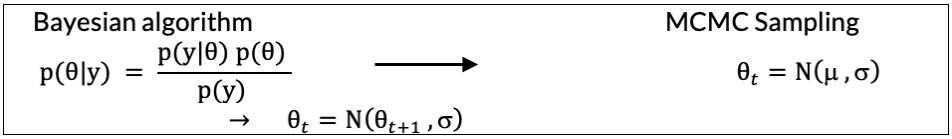


Source: Author

Consider a vector of polling data y, which is assumed to be a sample from a probability model with an unknown parameter vector θ. The objective is to infer its properties. Thus, the model is first represented by a likelihood function where $\int(y_i|\theta)$ represents the probability density function. It is then represented by a prior

distribution in which θ has a probability distribution p(θ). And because both *y* and θ are random, Bayes theorem can be applied to derive the posterior distribution of θ given data *y*. However, because posteriors often involve multidimensional integrals, they have to be estimated via simulation; normally through MCMC sampling (Gamerman & Lopes, 2006; Tanner & Wong, 1987). Thus, θ at time *t* (with a normal distribution of mean μ and variance σ) is updated until it converges in a posterior (Petris et al., 2009).

Figure 2. Bayesian and MCMC set-up



Source: Author

To update θ, and move through the chain, this study follows a four-step adaptive Metropolis-Hastings (MH) algorithm (see Metropolis & Ulam, 1949). Ultimately, the objective is to decide if the production of new values of θ are accepted or rejected (Haario et al., 2001; Roberts & Rosenthal, 2009). To explain how this is done, let q(×) be a probability distribution and θ_z the starting state. Then, at each step *t* a proposal state θ_z is generated conditional on the current state. After drawing uniform random numbers, θ_z is accepted or rejected, and updated, according to the previously defined acceptance probability. Figure 3 shows this reiterative process, for *t* = 1,...,T-1.

Figure 3. Metropolis-Hastings set-up

	Step		Specification	
⌐	1.	A proposal state is defined	←	$\theta_z \sim q(\cdot \mid \theta_{t-1})$
|	2.	An acceptance probability is set	|	$\alpha(\theta_z, \theta_{t-1}) = \min[r(\theta_z \mid \theta_{t-1}), 1]$ where $(\theta_z \mid \theta_{t-1}) = \frac{p(\theta_z \mid y)\, q(\theta_{t-1} \mid \theta_z)}{p(\theta_{t-1} \mid y)\, q(\theta_z \mid \theta_{t-1})}$
|	3.	A random number is generated	|	$\mu \sim \text{Uniform}(0, 1)$
↳	4.	An update is conducted	⌙	$\theta_t = \theta_z$ if: $\mu < \alpha(\theta_z \mid \theta_{t-1})$, otherwise: $\theta_t = \theta_{t-1}$

Source: Author

The TSM was tested using data from eleven democracies of the Americas (Bunker, 2021). In that study, the objective in that study was to assess its accuracy in an institutionally unstable setting with relatively low quality of data. The results were remarkable. The TSM produced a more accurate election forecast (in comparison

to polls) for 100 percent of the elections (26), and 95 percent of the candidates (126), in the sample. Now, like most models of its nature, the TSM (in its current form) has been only applied at the cross-national level and uniquely for presidential elections. Thus, a contribution to the literature would be to apply the TSM in a different setting. But, not only in a case study where the TSM can be properly tested and compared to itself, but also one in which the context can help provide information on how the preset weights of sample size, method, and distance from the election (described above) can be recalibrated to increase the predictive power of the model. Indeed, it is not only relevant to understand if the TSM is accurate, but also how the TSM can become even more accurate. The next section describes why the 2020 Chilean national plebiscite provides the perfect institutional framework and political context to do just this.

CASE STUDY: CHILE

The selection of Chile as the case study makes sense for a lot of reasons. First, because the TSM was first developed there. Indeed, its origin can be traced back to a study that looked at public opinion trends during the 2013 Chilean presidential election (see Bunker & Bauchowitz, 2016), in which the algorithm worked remarkably well, producing a significantly accurate and precise forecast for all nine candidates that competed in that year's first round of voting. But the selection also makes a lot of sense because the TSM has more recently been tested in three additional presidential elections (2005, 2009, 2017), providing further evidence for a baseline. Together, these studies can help understand if the results of the application of the TSM to the 2020 national plebiscite are in-line with the historical trend or are instead outliers.

In sum, with evidence from Chile, this article proposes to look at a new type of election, which has hitherto been neglected by the literature. It proposes to look at a national plebiscite, that has not only been generally understudied as a generic type of election, but that is also specifically rare and relevant event in the historical context of the Chilean political timeline. Ultimately, this study seeks to not only provide further insight into electoral forecasting at the level of national plebiscites, and two-horse races in general (e.g., run-off elections), using evidence from Chile, but also into electoral forecasting in the context of major elections which are naturally uncertain. This study also seeks to provide a deeper understanding of the particular election at hand, the 2020 Chilean national plebiscite, insofar as it can help identify key moments that took place during the one-year electoral cycle.

The 2020 Chilean national plebiscite

The origin of the 2020 Chilean national plebiscite can be traced back to at least the 2019 social and political crisis, when masses unexpectedly took to the streets to protest against a hike in metropolitan public train (Metro) fares (Sehnbruch & Donoso, 2020). Backed into a corner, the government called for a surprise snap referendum, which at the moment seemed like the only possible solution to diffuse a situation that had suddenly turned critically violent. The objective of the plebiscite was for Chileans to answer two questions: (Q1) "Do you want a New Constitution?", and (Q2) "What type of body should draft the new Constitution?". Each question had two possible answers, or options.[2] While the former simply proposed "Approve" and "Reject" as options, the latter offered "Fully Elected Constitutional Convention" and "Half Elected Constitutional Convention" as options.

The plebiscite was originally planned to take place on the 25 of April of 2020 but was ultimately postponed six months (due to Coronavirus related concerns) and held on the 25 of October of 2020. It was the first major national plebiscite to take place since the 1988 and 1989 referendums, which together marked the transition to democracy in 1990 after nearly seventeen years of dictatorship. Like its predecessors, the 2020 plebiscite was expected to have a long-lasting effect on the party landscape if the results were as bi-modally distributed as those of the 1988 referendum, which asked Chileans if they would like to prolong the dictatorship of Augusto Pinochet or would instead like to transition to democracy (it resulted in 55 percent in favor of the latter). Indeed, if the distribution would have been the case once again in 2020, roughly splitting the country in two, it would have been interpretable as a forecast for a strongly divided country, much like the one in 1990-2020.

The results, however, showed a substantially different picture. Chileans strongly supported change, with 78 percent in favor of drawing a new Constitution and 80 percent in favor of a Fully Elected Constitutional Convention. In other words, in comparison to the 1988 referendum, the 2020 showed a largely unified electorate. But how stable were preferences leading up to the historical event? Did voters make up their mind at the last minute, after being influenced by campaigns or did they decide their votes as soon as the government announced the plebiscite in November of 2019? Furthermore, and more directly related to the matter of this study, were public opinion instruments able to anticipate the results of the election? Did pre-election polls correctly predict that roughly 80 percent of Chileans would vote in one direction? Or did they fail to capture voting intentions in an unexpected, and as such unpredictable, election? Furthermore, was there any way of anticipating the results of the election to a certain degree of accuracy and precision?

2. On the ballot (in Spanish): Q1 was "¿Quiere usted una Nueva Constitución?" and Q2 was "¿Qué tipo de órgano debiera redactar la Nueva Constitución?".

RESEARCH QUESTIONS AND DATA

Linked to electoral forecasting research, presented in Section 2, and Chilean electoral studies and public opinion research, presented in Section 3, this section puts forward three research questions. The first research question is if the TSM can accurately forecast the 2020 Chilean national plebiscite. The answer to this question is relevant because, as mentioned above, it would be some of the first evidence related to forecasting two-horse referendums in new democracies. Also, it would be a test of the stability of the TSM, which has been proved to produce accurate results in multicandidate first round presidential elections but has hitherto been tested in different contexts. To answer this question, the TSM will be applied using the formulae described in Section 2. In terms of data, following the same criteria as in previous studies, all public opinion polls fielded in the election cycle will be included in the dataset.

The second question is if the TSM can produce a more precise forecast than its alternatives. The answer to this question is relevant because within the electoral forecasting body of research there are competing methods, including everything from expert opinions to betting markets to econometric models. And perhaps more importantly, different methods within polls-only models. Hence, to answer this question, the TSM point estimate output will be compared to a series of other methods that can be derived from public opinion polls to produce an election prediction to find out if the TSM output could have provided voters with more precise information than they would have obtained otherwise. Using the same dataset of polls, the TSM point estimate will be compared to each individual pollster's last poll, the average of polls during the campaign, and other methods, such as Lowess and Polynomial specifications.

The third and final question is related to the source of the errors produced by the TSM model. The answer to this question is functional to the specific characteristics of the model and can indicate its stability. Some of the independent variables that will be placed to understand their effect on accuracy will be the time each poll was conducted, the number of people interviewed by each poll, and if the poll was fielded online, face-to-face, via telephone or a mix of any of these methods. To answer this question, this study will simply look at the predictive capacity of each poll, as part of the full set of polls, and in relation to the final result of each of the two questions of the plebiscite. Naturally, the expectation is that polls fielded closer to the plebiscite will produce less error (will be more accurate) and polls that interview more people will produce more error (will be less accurate). Naturally, it will also look at the effect of the campaign and if its interaction with other variables to understand if they had any additional impact on their error.

Table 1 contains a summary of the polls that were used as input for the TSM in order to forecast the 2020 Chilean national plebiscite. All of the polls were

published in national mainstream media and collected by the author of this article at the time of their publication. All of the polls met the minimum standards in order to be included into the full sample. This included information regarding fieldwork dates, the number of individuals interviewed, and if they had polled in Chile at any previous point in time. In terms of the latter, and in accordance with the methods of the TSM, all of the polls were assigned a rating bounded between one and zero based on their accuracy in previous elections. In turn, companies that fielded polls for the first time (and as such were unpredictable in terms of their previous record), were assigned a rating equivalent to that of the worst ranked pollster.

Table 1. Summary of the input data

	Full Sample (One year)		Subsample (Three months)	
Pollster	**Q1**	**Q2**	**Q1**	**Q2**
Activa	22	22	6	5
Cadem	14	14	0	0
CEP	1	1	0	0
CIIR	1	1	1	1
Coes	1	1	0	0
Criteria	8	5	3	2
Data Influye	5	5	2	2
Mori	2	2	1	1
Numen	2	1	2	1
StatKnows	2	2	1	1
TOTAL	58	54	16	13

Source: Author with data from each individual pollster.

In summary, Table 1 distinguishes between a full sample (polls fielded between the 16 of November of 2019 and election night) and a subsample (polls fielded between the 25 of July of 2020 and election night). It is important to note that public opinion polls that contain information on voter preferences (that can be interpreted as voting intentions) can legally only be published until fifteen days before the election. As such, the latest poll registered in the full sample was fielded before the 11 of October of 2020 (to be precise on the 9 of October of 2020). The data presented in the Table suggests at least three things. First, that

there were more polls fielded for the first of the two questions. Second, that one company (Activa) polled significantly more than all other companies. And third, that only around one fourth of all polls were fielded during the three-month election campaign cycle.

Table 2 shows a summary of poll predictions. Here it is important to note that the percentages reflect the average prediction made by each pollster. If a pollster only fielded one poll, the percentage is equal to that poll's prediction. It is also important to note that within each poll, the estimations do not necessarily add up to one hundred, since the sample does not consider likely voter models, and most polls also include estimates relative to interviewees that answered "don't know" or had "no opinion" to the questions.[3] Finally, it is important to note that not all posters fielded polls during the campaign cycle, as visible in Table 1, but among those who did, the trend does not show any major deviations. In other words, and considering that most polls were fielded in the nine months previous to the

Table 2. Summary of public opinion results

	Full Sample (One year)		Subsample (Three months)	
	Q1	Q2	Q1	Q2
Activa	71.8	12.5	70.6	12.4
Cadem	70.0	22.4	--	--
CEP	77.0	13.0	--	--
CIIR	75.0	12.0	75.0	12.0
Coes	85.5	8.1	--	--
Criteria	72.4	18.1	73.0	18.0
Data Influye	72.8	17.2	71.0	15.5
Mori	67.0	16.0	66.0	15.0
Numen	40.2	34.1	40.2	34.1
StatKnows	55.5	38.9	55.4	43.1

Source: Author with data from each individual pollster.

3. The method does not consider likely voter polls too produce a wider range of results and, as such, increase the emphasis of the "let the data speak for itself" approach. Also, including likely voter models which are essentially different across pollsters, could risk introducing unexpected bias. At any rate, very few polls actually conduct likely voter polls, as Table 3 shows.

election, the Table suggests that electoral preferences generally tended to be stable during the year leading up to the plebiscite.

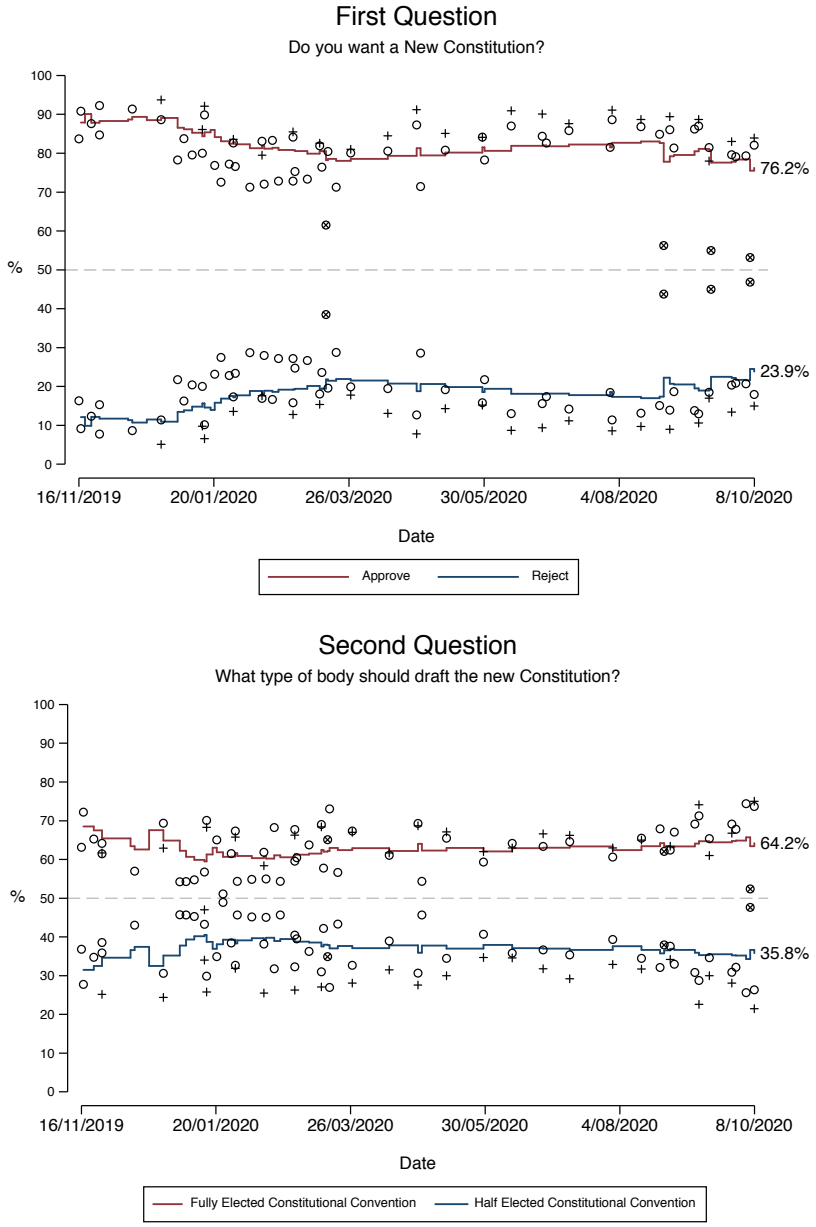
Now, before moving on to the findings, it is relevant to double-check the overall distribution of the polls to avoid including biased data into the sample. A simple inspection immediately suggests that two of the pollsters in the full sample stand out because of their odd deviations: Numen and StatKnows. Both of these companies, which incidentally are the only two non-Chilean firms, produced significantly lower differentials than all other pollsters; they were strongly biased in favor of the "Reject" and "Half Elected Constitutional Convention" options. For example, in the first question, as most polls showed an average advantage of 60 percent in favor of the first option, both Numen and StatKnows showed an average advantage of less than 15 percent. Because both of these companies were new to the Chilean polling industry, they were structurally assigned the lowest rating in the sample yet included all the same. However, because of their remarkably odd deviations, and strong outlier behavior, their influence on the final forecast will be studied with greater detail in the following section.

FINDINGS

The first research question is if the TSM can produce equally accurate results for the 2020 national plebiscite as it has for first round multiparty presidential elections. As the question suggests, there are two parts to it. First, if the TSM can produce an accurate result for the plebiscite, and second, if those results are more accurate than what the TSM has previously produced. Beginning with the former, Figure 4 shows the TSM forecast (line) superimposed over the polls (circles). Note that the polls have been re-scaled to sum 100 percent, as this is part of the essential transformations proposed by the TSM in the first stage of computations. Likely voter polls (crosses) are shown but not used to produce the forecast. The plot on the left shows the trend for the first question and the plot on the right shows the trend for the second question.

In terms of the first of the two questions, the TSM was remarkably accurate. While the actual result for the "Approve" option was 78.3 percent, the TSM forecast was 76.2 percent. In other words, the TSM forecast produced an absolute error of 2.1 percent. In terms of the second of the two questions, the TSM was significantly off its mark. In this case, while the actual result for the "Fully Elected Constitutional Convention" option was 79 percent, the TSM forecast was 64.2 percent. Ergo, the TSM forecast produced an absolute error of 14.8 percent. These mixed results are indeed alarming and worth inspecting at greater depth.

Figure 4. TSM Forecast and Rescaled Polls



Source: Author. *Note*: Circles fit with crosses are Numen and StatKnows polls.

Is it that the TSM is structurally accurate (as evidenced by the first question) and the error of the second question can be explained contextually, or is it that the TSM is imprecise (as evidenced by the second question) and the accuracy of the first question is an exception to the norm? Naturally, the former would be in line with the expectations. But to prove that this is the case there should be clear evidence that the errors are neither election-specific (i.e., the TSM cannot produce an accurate forecast for plebiscites), nor country-specific (i.e., the TSM cannot produce an accurate forecast for Chile). The question, then, is a matter of consistency. Which of the forecasts for the plebiscite is consistent with the baseline? If the TSM forecast for the first question is in line with the TSM forecast for other types of elections, and for previous elections in Chile, then the outlier is clearly the forecast for the second question.

So, let us begin with the former: is the forecast of the TSM for the first question of the plebiscite in line with the TSM forecast for other types of elections? In its application to twenty six first round presidential elections in eleven countries, Bunker (2021) shows that the mean absolute error of the TSM is significantly lower than the mean absolute error of the polls. More specifically, it shows that while the model erred by an average of 4.1 percent, the polls erred by an average of 5.2 percent. Which of the observations in this study are in line with that pattern? The answer is that the error associated to the first question is more consistent with the average error produced by the TSM elsewhere (in other types of elections) than the error associated to the second question. While the absolute mean difference between the TSM error elsewhere and the TSM error for the first question is 2 percent, the absolute difference between the TSM error elsewhere and the TSM error for the second question is 10.7 percent. In this way, there is no evidence that the second question fits the pattern. Instead, there seems to be evidence that the error is instead correlated to the specific question.

Now, we turn to the latter: is the forecast of the TSM for the first question of the plebiscite in line with the TSM forecast for previous forecasts of elections in Chile? In its application to four presidential elections in Chile (2005, 2009, 2013 and 2017), the mean absolute error of the TSM is significantly lower than three percent (see Bunker & Bauchowitz, 2016). Which of the observations in this study are in line with that pattern? The answer, again, is that the average error associated to the first question is more consistent with the average error produced by the TSM in Chile (in previous elections) than the error associated to the second question. While the absolute difference between the TSM error in previous elections and the TSM error for the first question is 1.6 percent, the absolute difference between the TSM error in previous elections and the TSM error for the second question is 11.8 percent. Once again, there is no evidence that the forecast for the second question fits the pattern; it seems that the error is instead correlated to the specific question.

In sum, there is no evidence that the error is related to the model (TSM), the type of election (plebiscite) or the country (Chile). Instead, it seems to be associated to the second question itself, which seems to have been particular in more than one way. In retrospect, there are several observations that buttress that idea. Indeed, few election observers would dispute the fact that the first question ("Do you want a New Constitution?") was significantly more popular than the latter ("What type of body should draft the new Constitution?"). There is some evidence that supports this claim. For example, the proportion of people who did not answer voting intention questions was significantly higher in the latter question. In the first question, the average "does not know/no opinion" response was 8.1 percent for the full sample and 10.1 percent for the subsample. In the second question, the average "does not know/no opinion" response was 11.3 percent for the full sample and 12.9 percent for the subsample. This suggests that voters were more decided and likely informed for the first question than for the second. Also consistent with the claim that the attention surrounding the first of the two questions was more prevalent, is the fact that campaign contributions were significantly lopsided in its favor. Indeed, of the total 520 million Chilean pesos donated to the campaigns, 484 million (93 percent) went to the first question as just thirty six million (7 percent) went to the second question (Servel, 2020).

All in all, it seems that the second question was very particular in its nature. First, because it was the less defining question of the two questions asked. Indeed, if people would have rejected the first question, then the second question would not have mattered. Second, as polls show, less people were actually aware of what the second question was before the election. This was confirmed by election voting patterns: while the total turnout was equal for both questions (around 7.5 million votes), Q1 totaled less than 40 thousand invalid votes (blank and null votes), Q2 totaled over 400 thousand of the same. Of course, the lopsided campaign financing in favor of the first question did not help the second question. Indeed, anecdotal evidence suggests that TV campaign spots (broadcasted twice a day for the final 30 days of the campaign) significantly favored the first question over the second one.

The second research question is if the TSM adds any value to the information we could have obtained otherwise to anticipate the results of the election. The traditional manner to answer this question is to compare the results with its alternatives. In the case of the TSM, or DLMs that use poll-only data in general, the standard comparison is to both other methods of the like as well as to the polls themselves. While the comparison of poll-only DLMs to the same polls they use as input is not necessarily a fair comparison, since models are structurally built to bracket results and produce averages, it is still a relevant comparison if the objective is to know if the voters could have had access to better information during electoral cycles. In this way, it is important to show the comparison of the TSM to other methods, as well as the polls, in different combinations and configurations.

Table 3 shows the final poll of each pollster that fielded a poll during the three-month campaign cycle and its error in comparison to the result of the election. The parameter of interest is the result for the "Approve" and the "Fully Elected Constitutional Convention" options. The data suggests that the last polls fielded in the cycle overestimated the outcome of the first question and underestimated the outcome of the second question. Two observations are worth noting. First, that the two polls mentioned above as possible outliers (Numen and StatKnows) were indeed off by more than twenty percent on average, preliminarily suggesting that the model does better without them. The other observation is on the uncertainty surrounding the second question. Indeed, as two polls fell within the traditional three percent margin of error for the first question, just one did the same for the second question. Errors for the second question were also consistently and significantly high.

Table 3. Poll Predictions and TSM Forecast

	First Question, Winning Option (78.3%)		Second Question, Winning Option (79%)	
Polls	**Prediction**	**Error**	**Prediction**	**Error**
Activa*	83.9	5.6	75.0	4.0
CIIR	75.0	-3.3	65.0	14.0
Criteria*	72.0	-6.3	59.0	20.0
Data Influye	69.0	-9.3	61.0	18.0
Mori	78.0	-0.3	61.0	18.0
Numen	38.5	-39.8	38.5	40.5
StatKnows	55.4	-22.9	54.0	25.0
Methods	**Forecast**	**Error**	**Forecast**	**Error**
TSM	76.2	2.1	64.2	14.8
TSM 2.0.	81.6	3.3	66.4	12.6
30-day average	69.4	8.9	59.3	19.7
Lowess	73.7	4.6	67.9	12.1
Lpoly	72.1	6.2	67.0	13.0

Source: Author. *Likely voter models

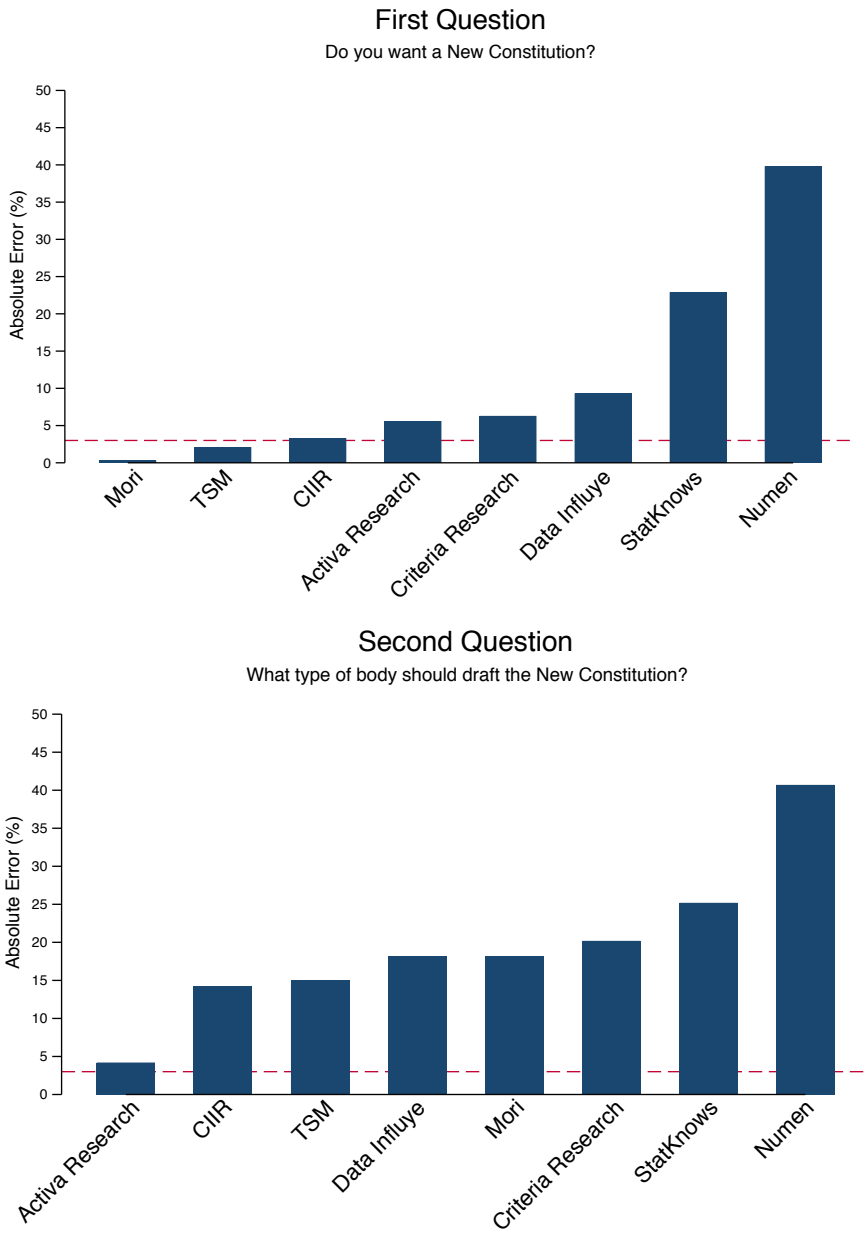
Table 3 also shows the results of the TSM and some other methods used to forecast election results from polls. It considers the full sample of polls. As anticipated above, it shows that the TSM forecast was 76.2 percent, and its associated error was 2.1 percent. This is simply the point estimate for the trend shown in Figure 4. It shows that in comparison to polls, the TSM was more precise. In both questions, the TSM forecast would have given more information than any poll chosen at random—notwithstanding its significant error for the second question. TSM 2.0. shows the same process, but excludes Numen and StatKnows from the sample, because of their outlier behavior. It suggests that while the forecast would have been worst in case of the first question, it would have been better in case of the second. At any rate, it does not generate major differences in the overall order of precision considering both the TSM and the polls.

In addition to the TSM, the Table 3 shows that other common methods used to aggregate polls, such as Lowess and Polynomial specifications, would not have been more precise than the TSM in the first question, yet would have been marginally more accurate for the second question. Because both methods are more sensitive to outliers, placing less weight on historical trends, they are structurally able to shift their forecast at the last minute. In a way, this can be interpreted as evidence that a shift in preferences took place at the end of the campaign for the latter of the two questions.[4] This idea will be further explored in the following subsection, as it may be able to explain the error. At any rate, it is worth noting that a simple average of the last 30 days (a common benchmark) would have been significantly off the mark.

Figure 5 shows the errors of all pollsters for the first and second questions. The superimposed red line shows the three percent reference marker, which is what polls normally use as their standard margins of error. The plot on the right shows that the TSM placed second, only after Mori, with an error of 2.1 percent. The plot on the left shows that the TSM placed third, only after Activa and CIIR, with an error of 14.8 percent. As can be inferred from the data above, the error related to the second question was significantly higher, and likely related to the specific context of that particular question (and not to the model, the election, or the country). Indeed, with the exception of Activa (which fielded more polls than any other pollster, and also fielded the last poll in the cycle) that produced an error of only

4. The Lowess specification was run considering Cleveland's tricube weighting function with a bandwidth of 0.8. The Lpoly kernel was run considering the default Kernel Epanechnikov using a rule-of-thumb estimator. Both are based on the specified literature and are the default and standard measures for the statistical package Stata v. 15. These two measures are thus able to capture more natural variations in the data than the TSM, which is set to look for more structural variations. Methodologically, the Lowess and Lpoly are found to be useful estimators, but if used with default settings, will produce inconsistent results.

Figure 5. TSM Forecast and Poll Prediction Errors



Source: Author.

one percent, all pollsters were significantly off the mark, most notably Numen and Statknows. Even if these polls were rescaled to 100 percent, to represent the proportions of the valid options, they still would have been off by around 20 percent. In sum, the TSM produced the most accurate average forecast for the election.

The third and final research question is related to the errors produced by the polls fielded to predict the results of the 2020 Chilean national plebiscite. Here the objective is to understand which variables were more relevant in determining accuracy levels. Previous studies that have looked at large-N cross-national data have found the number of pollsters included in the dataset have the strongest effect on error; they have also found that elections that are contested under more restrictive rules (when the president is elected by simple majority) produce lower errors than elections contested under more permissive ones (when the president is elected by absolute majority) (see Bunker, 2021). However, because of the nature of this particular article (a case study), it is difficult to understand if those variables hold significant beyond what could be expected theoretically for an election with few pollsters and only two answers to each question. However, they do serve as theoretical vectors, and open up avenues to further explore sources of accuracy within single system elections.

Thus, to explore the nature of the difference between predictions and results, the remainder of this section looks at the specific characteristics of the data. For this, the outcome variable is the absolute difference between the prediction for the winning option ("Approve" in the case of the first question, and "Fully Elected Constitutional Convention" in the case of the second question) and their respective results (78.3 percent for the former, and 79 percent for the latter). The independent variables are the number of interviewees in each poll (N), a dummy indicating if the polls prediction was the result of a likely voter model (LVM), the percentage of interviewees that answered "don't know" or had "no opinion" (DK/NO), a dummy indicating if the poll was conducted online or via any other method (Online), and a log transformation of Delta, to capture the effect of the interaction between the three month campaign and the number of days between the poll and election night.

The following table shows several models referring to the sources of error in the first and second questions of the 2020 Chilean national plebiscite. The first and third models are simply baselines, containing a linear regression with robust standard errors. The second and fourth models are the same as the baselines, but cluster the data by pollster to control for house effects. While the pair-wise difference in the beta coefficients does not vary, the standard errors do, revealing significance patterns. Several other specifications were explored, such as one that included an interaction term between LVM polls and the campaign period, and one that included an interaction term between Delta and the campaign period. The models below were chosen do to their methodological simplicity and consistency.

In terms of the first question, Table 4 shows that while sample size appears to be significant, the beta coefficient is too low to have any meaningful effect on the results. At any rate, there is evidence to infer that as the proportion of DK/NO respondents increases, the error also increases. Now, what is even more interesting, is that likely voter models were less accurate than regular polls. In other words, LVM polls produced larger errors than non-LVM polls. This is already some evidence of the stability of electoral preferences in the first question. But it is not the only evidence. Indeed, the same can be deduced from the idea that there was no significant difference between online, face-to-face, phone, or mixed methods polls. They were all equally accurate. But most importantly, there is no evidence to suggest that time had a significant impact on accuracy. Because the logged Delta is not significant, there is no indication that time influenced accuracy. These findings are

Table 4. Sources of Error

	First Question				Second Question			
	M1 (Baseline)		M2 (House effect)		M3 (Baseline)		M4 (House effect)	
	beta	rse	beta	rse	beta	rse	beta	rse
Interviews (N)	0.002***	0.00	0.002***	0.00	0.000***	0.00	0.000**	0.00
Likely Voter (LVM)	3.037*	1.54	3.037***	1.17	-5.470***	1.63	-5.470***	1.49
DK/NO	0.203	0.13	0.203***	0.08	0.658***	0.16	0.658**	0.22
Online	-0.345	1.19	-0.345	1.34	1.848	1.96	1.848	3.01
Log(Delta)	0.992	0.61	0.992	0.76	2.461***	0.70	2.461***	0.53
constant	-1.516	3.50	-1.516	3.21	5.431	4.54	5.431	3.74
N	80		80		76		76	
Clusters			10				10	
F	47.22		259.57		67.63		490.26	
R-squared	0.636		0.636		0.709		0.709	
Root MSE	4.072		4.072		4.447		4.447	

Dependent variable: Absolute difference between winning option final result and poll prediction. Note: ***: p > 0.1; **: p ≤ 0.05; *: p ≤ 0.1.

Source: Author.

consistent with the literature, particularly the work of Jennings et al. (2020), which shows that polls are generally accurate and informative early in campaign cycles.

In terms of the second question, there is some evidence that echoes the preliminary findings above; for example, that sample size was largely irrelevant to determine accuracy and that polls with higher levels of DK/NO respondents showed higher levels of error. And, as above, the method was irrelevant—all polls were equally inaccurate.

Remarkably, however, there is evidence that in the second question accuracy levels increased over time, even in the context of its higher baseline error (as interpretable by the constant). This is similar to the above, and consistent with the idea that as polls are fielded closer to the election, their accuracy tends to increase (Jennings & Wlezien, 2016); even though the accuracy sweet spot generally tends to fall weeks out from election night (Jennings et al., 2020). At any rate, it is relevant to note that, in contrast to the first question, time did play a role in the accuracy of the second question, suggesting that the political context did have an effect that was invisible, or absent, surrounding the first question. Yet, that is not all. There is also other evidence that seems to indicate that preferences in the second question were more volatile than preferences in the first question, as hypothesized above. For example, while regular polls produced lower errors than LVM polls in the first question, LVM polls produced lower errors than regular polls in the second question. The relationship is inverse, strong, and significant. In essence, the evidence shows that more sophisticated methods were necessary to grasp the state of the race in the second question—preferences were more disperse, and as such less predictable.

DISCUSSION

The purpose of this article has been to test a Bayesian Dynamic Linear Model (DLM) developed to forecast multiparty elections in a new, rare and understudied context. It specifically applied the Two-Stage Model (TSM) to the 2020 Chilean two-question national plebiscite. In doing so it has provided some of the first evidence of electoral forecasting for plebiscites in new democracies. It has also contributed by providing a plausible account of public opinion trends that will be useful for Chilean electoral studies and public opinion research. In sum, this study has shown that the TSM can produce an accurate (an absolute measure) and precise (a relative measure) forecast for two-horse races, and that the sources of error related to the model are correlated to structural features of polls, such as the number of interviews conducted, the proportion of valid responses and the method through which polls are conducted.

Interestingly, as the forecast for one of the two questions was remarkably accurate (Q1), the forecast for the other was significantly off its mark (Q2). In comparison to evidence at the regional- (eleven countries in Latin America) and country- (four presidential elections in Chile) levels, it showed that the outlier was clearly the second question. In other words, that the error was neither model-specific, election-specific, or country-specific, but question-specific. This idea was reinforced after looking at a battery of determinants of error in both questions. Because the evidence pointed to the fact that there were irregular shifts in preferences for the second question, and there is a particular law which does not allow for polls to take place the final fifteen days before election night, the TSM could not capture late shifts. The lesson here is that the weight of polls fielded late in the campaign should be increased when there are irregular patterns in the electoral cycle, as evidence from the application of the Lowess method shows. Recalibration to consider LVM polls at a higher weight in these irregular, unstable scenarios should also be considered.

At the theoretical level this study is a contribution to the literature since it advances the understanding of forecasting two-horse races in Latin America. Because many of the countries in the region use two-round elections to choose their leaders, the methods applied here can be easily fit to forecast presidential runoffs. And because the error related to the second question can be, at least partially explained because of the volatility related to the second question and the ban on polls, the results should be more accurate in more stable elections. At the national level, this article has contributed to Chilean electoral studies and public opinion research by providing evidence of trends during the 2020 Chilean national plebiscite, an election that will go down in the books as a crucial moment in the country's political and constitutional history. At the same time, it has contributed to identify some crucial questions that will also help further explain the critical juncture. Most importantly, why was there a surge in electoral preferences in favor of the winning option of the second question at the last moment of the campaign cycle?

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THE ROLE OF THE ECONOMY, SECURITY AND PARTY LEADER ACCEPTANCE IN FORECASTING THE 2020 GENERAL ELECTION IN JAMAICA

El papel de la economía, la seguridad y la aceptación de los líderes de partido en la previsión de los resultados de las elecciones generales del 2020 en Jamaica

O Papel da Economia, da Segurança e da Aceitação do Líder do Partido na Previsão das Eleições Gerais de 2020 na Jamaica

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Abstract
Three econometric models were built between January and March 2020 to predict the September 3, 2020 General Election in Jamaica. These are the economics and security model (model1), the economics and security model with JLP leader acceptance (model 2), and the economics and security model with PNP leader acceptance (model 3). All three models accurately predicted a win for the Jamaica Labour Party. A Jack-knife resampling was performed for cross validation. These models show how the macro-economy, security concerns and party leader popularity influence election outcomes, with similar findings in the literature. However, there are peculiarities in the Anglophone Caribbean because the

Jamaican voters respond to economic and security concerns in different ways than the voters in the global north. For example, increases in the debt to GDP ratio and the homicide rate predicted a JLP win. This work should be replicated in the Caribbean and Latin America using panel data.

Palabras clave: macroeconomía; seguridad; aceptación del líder del partido; resultados electorales; Caribe

Resumen

Entre los meses de enero y marzo del 2020 se construyeron tres modelos econométricos para predecir los resultados de las elecciones generales del 3 de septiembre de 2020 en Jamaica. El Modelo 1 era un modelo de economía y seguridad; el Modelo 2 un modelo de economía y seguridad con los niveles de aceptación del líder del Partido Laborista de Jamaica (JLP, por sus siglas en inglés), y el Modelo 3 un modelo de economía y seguridad con los niveles de aceptación del líder del Partido Nacional del Pueblo (PNP). Los tres modelos acertaron al proyectar una victoria electoral para el JLP. Como validación cruzada de los datos, se utilizó el método "Jack-knife" para realizar un remuestreo. Estos modelos demuestran que, como ya venían señalando otros estudios, los resultados electorales se ven influidos tanto por la macroeconomía, como por los problemas de seguridad y la popularidad del líder del partido. Sin embargo, se debe tener en cuenta la idiosincrasia del Caribe anglófono, ya que los votantes jamaicanos no responden a los problemas económicos y de seguridad de la misma manera que los votantes del Norte global. Por ejemplo, el aumento tanto del coeficiente deuda/PIB como de la tasa de homicidios llevaron a la proyección de una victoria electoral del JLP. Se necesitaría replicar el presente estudio en el Caribe y Latinoamérica utilizando datos de panel.

Palavras-chave: macroeconomia; seguridade; aceitação do líder do partido; Resultados eleitorais; Caribe

Resumo

Para prever as eleições gerais do 3 de setembro de 2020 na Jamaica, três modelos econométricos foram elaborarados. Estes são: o modelo econômico e securitário (o modelo nr. 1), o modelo econômico e securitário com a aceitação do líder do JLP (o modelo nr. 2), e o modelo econômico e securitário com a aceitação do líder do PNP (o modelo nr. 3). Os três modelos previram corretamente a vitória do Partido Trabalhista da Jamaica (JLP). Para a validação cruzada, o método "Jack-knife" foi executado. Estes modelos, apoiados pelos achados semelhantes nos dados, indicam a medida em que a macroeconomia, as preocupações com segurança e a popularidade do líder do partido podem influenciar os resultados das eleições. Sem embargo, existem particularidades no Caribe anglófono devido ao fato do que os eleitores jamaicanos reagem às preocupações econômicas e securitárias de maneiras diferentes dos eleitores do hemisfério norte. Por exemplo, os aumentos da relação dívida/PIB e a taxa de homicídios previram uma vitória para o JLP. Este estudo deve ser reproduzido no Caribe e na América Latina com a aplicação de painel de dados.

INTRODUCTION

This study, describes and explains the indigenous forecasting models used to predict the 2020 General Election in Jamaica. There are few studies dealing with model-based election forecasting in developing states like Jamaica, so this study is a modest start to understanding the possible peculiarities of election outcomes in the global south. The models in this study should be somewhat helpful for election forecasting throughout the Caribbean and Latin America. The study starts with a discussion of election forecasting. Next, is a discussion of the macroeconomy and elections, crime and elections, followed by a discussion of party leadership. The method is outlined next, the election forecasting models are specified and their output interpreted and explicated.

ELECTION FORECASTING

Election forecasting is predicting which leader, candidates and/or political party will win an upcoming election. So, in essence, predicting the winner is seeing into the electoral future (Charles & Reid, 2016; Charles, et al., 2019; Jennings, et al., 2020). Forecast models are well established in the global north. There are several well-known models some of which are mentioned here. There is the vote function model which has revealed a strong association between macroeconomic variables and election outcomes in Canada (Bélanger & Godbout, 2010). The seat and vote models have incorporated the dynamic perspective and forecasted swings between the major political parties in Britain (Lebo & Northpoth, 2006). The election market model uses data on market participants who buy and sell the shares of candidates to predict several US presidential elections (Kou & Sobel, 2004). The political economy model uses political and economic variables to predict presidential elections in the United States and France (Jérôme, et al., 2020; Lewis-Beck, et al., 2008; Lewis-Beck & Tien, 2012).

These election-forecast models tend to be multifaceted and incorporate a range of economic and political variables with many data points over time. So, these models should be able to capture the imperceptible and subtle shifts in voter preference compared to polls that sometimes generate statistical dead heats (Kou & Sobel, 2004; Lewis-Beck, 2005). Despite their strengths, election forecast models are not prediction panaceas and caution is advised when uncertainty is being forecasted in turbulent election environments. Good models are parsimonious, have good lead time, and are transparent and accurate. Election forecasters should strive to achieve these benchmarks with their political economy models (Holbrook, 2001; Jennings, et al., 2020; Jerôme & Jerome-Speziari, 2012; Lewis-Beck & Tien, 2012; Royes & Cid Bastos, 2006).

THE ECONOMY AND VOTING BEHAVIOUR

One school of thought is that voters' perception of national economic performance, rather than their personal economic condition (their pocketbooks) significantly influences election outcomes, while another argues that pocketbook matters (Whiteley, 1984; Guseh, 1996). The context voters experience at the national level matters in economic voting because it affects the very nature and degree of this type of voting behaviour (Singer & Carlin, 2013). Voters attribute the state of the economy to political executives who strategically and frequently engage in economic rhetoric (Wood, 2004). Unemployment, inflation and growth in income are crucial predictors of election outcomes (Guseh, 1996). Dassonneville and Lewis-Beck (2014) reveal that a good economy rewards incumbents and a bad one punishes them. Positive economic growth has significantly less electoral effects than negative growth. Therefore, governments are more accountable to the electorate during hard times and Jamaica is no exception.

Jamaica is a middle-income developing country that has experienced marginal economic growth, high debt and high rates of poverty and inequality since political independence in 1962. Therefore, general elections are largely determined by "bread and butter" issues based on voters' economic perceptions. The incumbents engage in a lot of public spending in the election year (the political business cycle) to attract voters which contradicts the agreements with the International Monetary Fund (IMF) (Stiglitz, 2012; Stone, 1980, 1989; World Bank, 2020). The JLP government through the 2016-2020 electoral cycle engaged the people about the economic targets it wanted to achieve and what it had "achieved" (Charles, 2020).

Crime and Elections

Vote share in the Unites States tends to be influenced by the crime rate which confirms the responsibility hypothesis, but less so compared to economic indicators, because citizens weight crime and economic domains differently (Hagerty, 2006). Crime and violence are also major societal issues in Latin America. However, candidates who have campaigned with plans to address these issues, have had varying electoral success for several reasons. These are the extent of the security services organization, and the extent to which repression recently occurred in the country; there are also candidates with civilian backgrounds who balance security with other important campaign issues and so tend to have greater success (Uang, 2013). The organized crime syndicates that perpetrate high profile violence in certain regions of Mexico make voters living in these regions cautious about voting. The impact of criminal contexts on voter turnout goes beyond people's victimisation experiences (Ley, 2018).

Crime and violence are also serious problems in Jamaica. Escalating gun-related homicides in Jamaica led to the passing of the Gun Court Act in 1974 which provides for most firearm offences (except where murder is committed) to be tried by only a judge. The act had the support of 80 per cent of Jamaicans. The Suppression of Crime Act, also passed in 1974, suspended the use of warrants and other constitutional protections that secured the rights of citizens and was also very popular, as well as the 1976 Period of Emergency (POE) to deal with escalating political violence. The popularity of this POE helped the government to win the 1976 General Election (Ellis, 1991; Gendreau & Surridge, 1978; Stone, 1980).

Jamaica has a homicide rate of 40.1 per 100,000 of the population, the fourth highest in the world. A 2019 *Jamaica Gleaner* Don Anderson Poll found that 90 percent of the persons polled supported the POEs and 73 percent supported the zones of special operations (ZOSO) and POEs established across the country since 2017 in response to the high homicide rate. Some 67 percent disagreed with the PNP Opposition which did not support the government's extension of the POE (Virtue, 2019). These measures remained popular with the electorate and helped the government to win the 3 September 2020 General Election (Charles, 2020; Charles & Dempster, 2020).

Party Leaders and the Party

The dominance of Westminster party leaders extend beyond the party and the government to the society because party supporters generally vote for the party leader more so than for the party in national elections. The colossal influence these leaders possess have led to an increasing number of political parties moving the leader selection process from the control of a small party elite to election by rank and file party members (Denham, 2017). Some political leaders in parliamentary democracies who are dubbed prime minister heir apparent, tend to underperform when they become maximum leaders despite the many years they spent in office with diverse ministerial responsibilities so they become unpopular (Helms, 2020). Some party leaders are populist making it difficult to employ forced exits. Populist leaders tend to be political entrepreneurs with favourable political appeals who makes use of the existing opportunity structures (González & Young, 2017). Populist leaders pose a threat to liberal democracies when institutional weaknesses exist that create vulnerabilities that these leaders can exploit, and when societal crises give them a large support base that they use to override institutional constraints on power (Weyland, 2020). These leaders usually have charisma driven connections with subordinates and followers. This relationship should be understood in relation to parties that have constitutional roles, because democracies cannot exist without them. The weakness of parties can lead to the

rise of populist leaders. These leaders' influence can be curbed by citizens with the support of the state backing and facilitating parties (Barber, 2019).

High party leader acceptance in Jamaica backed by the party-political culture of the People's National Party (PNP) and the Jamaica Labour Party (JLP) made internal party electoral challenges to the leader taboo between 1962 and 1990. Populist leaders tend to have a higher level of party acceptance than non-populist leaders, and, more often than not, they do not face leadership challenges. Jamaica has had two populist party leaders among its nine prime ministers since independence in 1962. These are the JLP's Alexander Bustamante (on the right) from 1962 to 1967 and the PNP's Michael Manley (on the left 1974-1980) between 1972 and 1992. These leaders were charismatic, identified with the poor and engaged in more redistributive policies compared to other leaders (Charles, 2009, 2020).

Both the JLP and PNP have experienced several leadership challenges since 1990. Challengers find it very difficult to defeat party leaders in internal party elections because the majority of the rank and file party delegates tend to converge around the leader in the Westminster system (Charles, 2009; Stone, 1977, 1981, 1987, 1989). However, leadership challenges generally divide the major political parties and lead to chronic disunity if the loser refuses to embrace and support the winner (Charles, 2009, 2020; Edie, 2011).

Purpose of the Present Study

The objective of this study is to build indigenous election forecasting models to accurately predict the 2020 General Election in Jamaica. Several macroeconomic indicators, migration rate, the annual homicide rate and party leader acceptance from 1962 to 2020 were used to see how these predictors influence election outcomes. How voters feel about the state of the economy, how they feel about the level of security in the country, and the extent to which the party leaders are accepted are important in general election outcomes. The research question states: which of the two major political parties, JLP or the PNP were likely to win the general election held in 2020?

METHOD

Data

Data on inflation rate, employment rate, interest rate, the exchange rate, and debt to gross domestic product (GDP), the number of persons emigrating from

Jamaica, and the annual homicide rate were collected from 1962 to 2019. Data on general election results were also collected from annually from 1962 and 2020.

The online archives of the *Jamaica Gleaner* and the *Jamaica Observer* were searched for news stories on party leadership challenges between 1962 and 2020. The stories found were read repeatedly and used to help identity the number of leadership challenges in the JLP and PNP, when the challenges occurred, and who were the party leaders and challengers. The news story data were triangulated with pertinent scientific publications on party leadership challenges.

Procedure

This study uses integrated method because the quantitative economic, demographic and homicide variables (the economic and security model) were combined with the qualitative JLP leader acceptance (LA) and PNP leader acceptance (LA) variables. The annualised average was calculated for inflation, employment, interest rate, and the exchange rate and external debt to GDP, as well the annual homicide rate for each electoral cycle between 1962 and 2019. Exponential smoothing was used to project the 2020 data from the economic, demographic and homicide variables because data for 2020 were not available when the models were built. The homicide data is used as a proxy for the level of security in the country.

Leadership conceptualised as party leader acceptance was added to the model. Party leader acceptance is the extent to which the party members and party supporters embrace the party leader. The level of party leader acceptance might be undermined by electoral leadership challenges and/or party factions undermining the leader. A leadership challenge is defined as a party member running against the party leader (who was elected or selected) in an internal party leadership election to take over leadership of the party. How and when a leadership challenge occurs and the repercussion it has in the party largely determines party leader acceptance. The acceptance the leader has in the party ranges from low to moderate, to high.

Low leader acceptance in the party means that the party leader (1) was selected by the MPs (not the rank and file party delegates) and went into a general election without majority support of rank and file party delegates; (2) has won at least one internal party electoral leadership challenge and the loser and his or her supporters refuses to embrace and support the leader; (3) has not been challenged by members of the senior party leadership electorally because they fear for their safety but clandestinely undermine the leader; (4) has been challenged within two years of a general election. A leader who experiences one or more of the scenarios above has low acceptance in the party and receives a score of 1.

Moderate leader acceptance in the party means that the party leader was elected by the majority of the rank-and-file party delegates in a leadership contest and has prevailed in at least one leadership challenge. However, there is some disquiet in the party made public by one or more party factions supported by some senior party leaders. Therefore, the party remains somewhat divided because the leadership issue remains unsettled. A leader with moderate party acceptance receives a score of 2.

High leader acceptance means that the party leader has not been challenged or has won at least one leadership challenge. Despite this challenge, there is no disquiet in the party made public about the leader because the large majority of party members and supporters including all the senior leaders have converged around the leader so the party is united because the leadership issue is settled. A leader with high party acceptance receives a score of 3.

Each PNP and JLP party leader between 1962 and 2020 was given a leader acceptance score between 1 and 3. Two party LA variables were created, a PNPLA variable, and a JLPLA variable. The PNPLA variable and the JLPLA variable were added separately to the economic and security model as predictors of party in power (PNP/JLP) in two logistic regression models.

The economic and security model was built and ran in January 2019 eight months before the 3 September 2020 General Election. The PNPLA and the JLPLA were added to the economic and security model and ran in March 2019, five months before the general election.

The output of the economic and security model forecasting a JLP win was reported at the writers' retreat hosted by the Faculty of Social Sciences, University of the West Indies, Mona from 10-12 January 2020. Abstracts for the forecasting models were submitted on 10 January 2020 in two abstracts to the World Association for Public Opinion Research (WAPOR) for paper presentations at the 2020 conference. The abstracts were accepted. The outputs for models 1, 2 and 3 were also reported to senior officials of the JLP and the PNP in April 2020. Negotiations for public release of the forecasts via major media outlets in Jamaica hit a snag because of a preference for, and hence bias towards pre-election polls. Therefore, we were only able to nationally release the forecasts publicly in the last two weeks before the general election on *Beyond the Headline* on Radio Jamaica, and in the Jamaica Gleaner newspaper (Charles, 2020).

RESULTS

Table 1 shows the definitions of the independent and dependent variables used in models 1-3. Table 2 shows the variables used in Model 1, the economics and security model. A logistic regression was performed to forecast the effects of migration, inflation, interest rate fluctuation, exchange rate, debt to GDP ratio, and homicide rate on the likelihood of determining party in power. The logistic regression model was statistically significant, $\chi 2(7) = 58.139$, $p < .0005$. The model explained 83.6 % (Nagelkerke R2) of the variance determining party in power and correctly classified 89.8 % of cases. In respect of interest rates, every unit increase is associated with an 84.1% decrease in the odds of the JLP being in power and for exchange rates, every unit increase is associated with a 20 % decrease in the odds of the JLP being in power.

Both increasing debt to GDP ratio and homicide rate were associated with an increased likelihood of the JLP being in power.

Table 1. Definition of Variables

Variable Name	Definition
Dependent Variables	
Party in Power	Dichotomous Variable 0= Peoples National Party (PNP) 1= Jamaica Labour Party (JLP)
Independent Variables	
Unemployment Rate	Continuous Variable A continuous measure ranging from 9 - 31
Migration (000)	Continuous Variable A continuous measure ranging from negative -1 - 38
Inflation (Avg)	Continuous Variable A continuous measure ranging from 0 - 80
Interest Rate (Avg.)	Continuous Variable A continuous measure ranging from 3 - 42
Currency Exchange Rate per USD	Continuous Variable A continuous measure ranging from 0 - 130
Debt to GDP Ratio (%)	Continuous Variable A continuous measure ranging from 7 - 159

Variable Name	Definition
Homicide Rate per 100,000	Continuous Variable A continuous measure ranging from 4 - 63
JLP/PNP Leadership Attributes	Categorical Variable 1 – Low party acceptance 2 – Moderate party acceptance 3 – High party acceptance

Source: Authors' own elaboration

Table 2. Variables in Model 1

	B	S.E.	Wald	Exp(B)	95 % C.I. for EXP(B)	
					Lower	Upper
Step 1[a] Unemployment Rate	-.477	.327	2.128	.621	.327	1.178
Migration ('000)	-.144	.109	1.735	.866	.699	1.073
Inflation (Avg)	-.097	.115	.720	.907	.724	1.136
Interest Rate	-1.871*	.788	5.632	.154	.033	.722
Exchange Rate	-.223**	.083	7.173	.800	.680	.942
Debt to GDP %	.234*	.097	5.883	1.264	1.046	1.527
Homicide Rate	.318*	.154	4.271	1.374	1.017	1.857
Constant	15.826	8.887	3.171	7467032.657		

Note. N= 59. The test of hypotheses of B=0 are based on Wald's χ 2, df=1. Hosmer and Lemeshow Goodness-of-Fit= 1.494, -2 Log L= 23.500 [a]Low. *p< 0.05, **p< 0.01.

Source: Authors' own elaboration

Table 3 shows the variables used in the JLPLA model (model 2). A logistic regression was performed to forecast the effects of migration, inflation, interest rate fluctuation, exchange rate, debt to GDP ratio, homicide rate and JLP leadership acceptance on the likelihood of determining party in power. The logistic regression model was statistically significant, $\chi 2(9) = 65.337$, $p < .0005$. The model explained 89.4 % (Nagelkerke R2) of the variance determining party in power and correctly classified 91.5 % of cases.

Table 3. Variables in Model 2 JLPLA

	B	S.E.	Wald	Exp(B)	95 % C.I. for EXP(B)	
					Lower	Upper
Step 1[a] Unemployment Rate	-.896	.573	2.441	.408	.133	1.256
Migration ('000)	-.206	.142	2.117	.814	.616	1.074
Inflation (Avg)	-.130	.088	2.178	.878	.738	1.044
Interest Rate	-2.517*	1.121	5.044	.081	.009	.726
Exchange Rate	-.381*	.186	4.220	.683	.475	.983
Debt to GDP %	.308*	.129	5.690	1.361	1.057	1.753
Homicide Rate	.442	.233	3.607	1.555	.986	2.453
JLP_LA[a]			3.425			828229.832
JLP_LA(1)	6.618**	3.576	3.425	748.650	.677	
JLP_LA(2)	-7.402	11442.526	.000	.001	.000	
Constant	26.499	15.451	2.941	3.224E+11		

Note. N= 59. The test of hypotheses of B=0 are based on Wald's χ 2 , df=1. Hosmer and Lemeshow Goodness-of-Fit= 4.255, -2 Log L= 16.302 [a]Low leadership acceptance is the reference category. *p< 0.05, **p< 0.10.

Source: Authors' own elaboration

Increasing interest rate and exchange rate were associated with a reduction in the likelihood of the JLP being in power, while increasing debt to GDP ratio and homicide rate were associated with an increased likelihood of the JLP being in power. Moderate JLPLA was statistically significant at the 10 percent level with a p-value 0.64. Moderate JLPLA increased the odds of the JLP winning the general election as opposed to low JLPLA.

Table 4 shows the variables in Model 3, PNPLA. A logistic regression was performed to forecast the effects of migration, inflation, interest rate fluctuation, exchange rate, debt to GDP ratio, homicide rate and PNP leadership acceptance on the likelihood of determining party in power. The logistic regression model was statistically significant, $\chi 2(9) = 61.257$, $p < .0005$. The model explained 86.0% (Nagelkerke R2) of the variance determining party in power and correctly classified 91.5% of cases. Increasing interest rate and exchange rate were associated

with a reduction in the likelihood of the JLP being in power, while increasing debt to GDP ratio and homicide rate were associated with an increased likelihood of the JLP being in power.

Table 4. Variables in Model 3 PNPLA

		B	S.E.	Wald	Exp(B)	95 % C.I. for EXP(B)	
						Lower	Upper
Step 1[a]	Unemployment Rate	-.951***	.524	3.298	.386	.138	1.078
	Migration ('000)	-.173	.121	2.052	.841	.664	1.066
	Inflation (Avg)	-.124	.138	.805	.884	.674	1.158
	Interest Rate	-2.541**	.977	6.764	.079	.012	.535
	Exchange Rate	-.206**	.075	7.617	.814	.703	.942
	Debt to GDP %	.291**	.106	7.586	1.338	1.088	1.646
	Homicide Rate	.559*	.246	5.171	1.749	1.080	2.832
	PNP_LA[a]			2.823			
	PNP_LA(1)	-9.881	17050.623	.000	.000	.000	
	PNP_LA(2)	-15.471***	9.208	2.823	.000	.000	13.156
	Constant	27.344*	13.721	3.972	7.505E+11		

Note. N= 59. The test of hypotheses of B=0 are based on Wald's χ 2 , df=1. Hosmer and Lemeshow Goodness-of-Fit= 1.643, -2 Log L= 20.382 [a] Low leadership acceptance is the reference category. *p< 0.05, **p< 0.01, ***p< 0.10

Source: Authors' own elaboration

Both unemployment and high PNPLA were statistically significant at the 10 percent level with a p-value 0.69 and of 0.093 respectively. Increasing unemployment reduces the odds of the JLP being in power, as well as high PNPLA reduced the odds of the JLP winning the general election as opposed to low PNPLA. However, the magnitude of the effect is small.

Since the economic and security model predicted which party will win the 2020 General Election and not the share of the vote, it is very important to show how well the model does for previous general elections. Therefore, a Jack-Knife

resampling was done where the year being forecasted (2020) was left out of the data for estimation and forecasting (cross validation).

How close do these results of the leave out one cross validation (LOOCV) models compare to the full model, where all 59 observations were included? Assuming there are no major outliers, the coefficients in the full model should be similar to the mean/median columns in the table below.

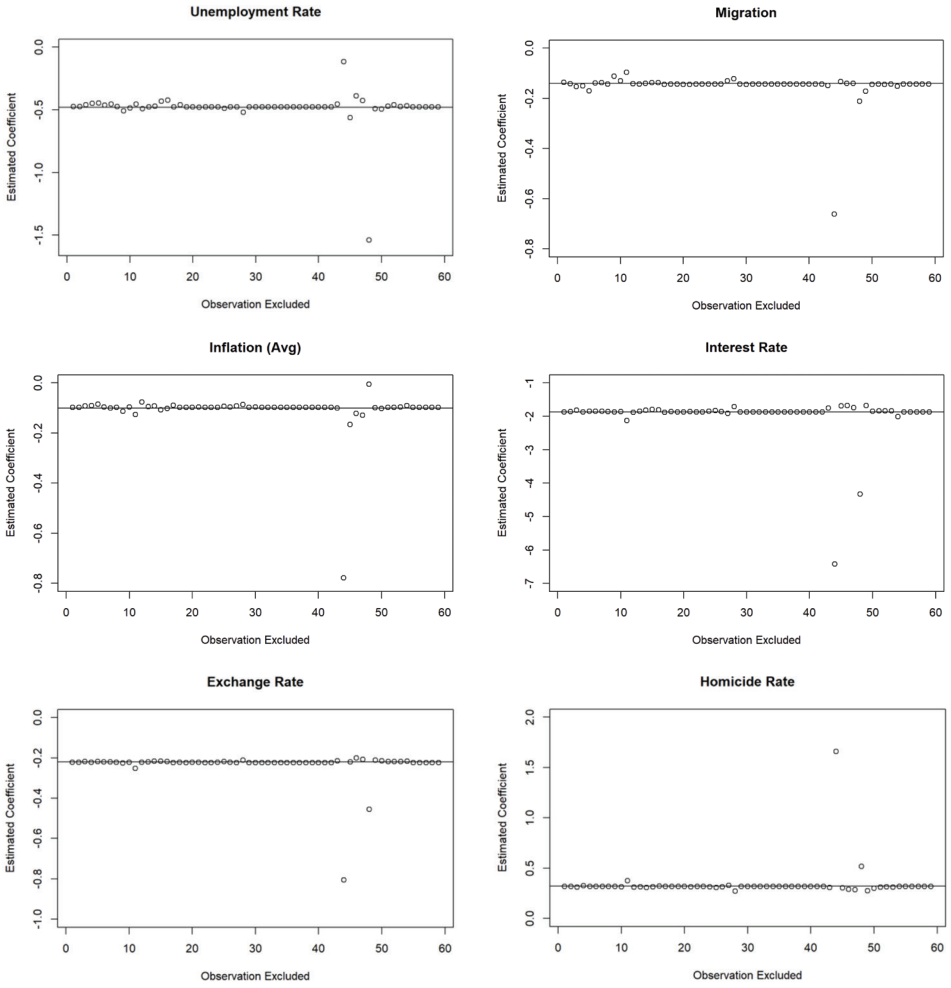
Table 5. Summary Statistics

Variable	N	Mean	SD	Min	Pctl. 25	Pctl. 50	Pctl. 75	Max
Unemployment rate	59	-0.485	0.149	-1.54	-0.477	-0.477	-0.469	-0.115
Migration rate	59	-0.152	0.069	-0.662	-0.144	-0.144	-0.142	-0.097
Inflation rate	59	-0.109	0.09	-0.779	-0.098	-0.097	-0.096	-0.005
Interest rate	59	-1.972	0.675	-6.425	-1.871	-1.869	-1.847	-1.682
Exchange rate	59	-0.235	0.082	-0.806	-0.223	-0.222	-0.219	-0.20
Debt to GDP	59	0.246	0.081	0.212	0.232	0.234	0.234	0.783
Homicide rate	59	0.341	0.177	0.272	0.313	0.318	0.318	1.659
Prob Party in power	59	0.48	0.434	0	0.01	0.497	0.979	1

Source: Authors' own elaboration

Below are the plots (Figure 1) of the estimated coefficients for each variable across all 59 models. The horizontal line indicates the estimated coefficient for that variable in the full model; deviations away from this horizontal line indicate the presence of likely outlying observations. For instance, excluding observation 48 (i.e., year = 2009) has a dramatic impact on the estimate for the impact of unemployment rate on the probability of the JLP being the party in power.

Figure 1. Estimated coefficients



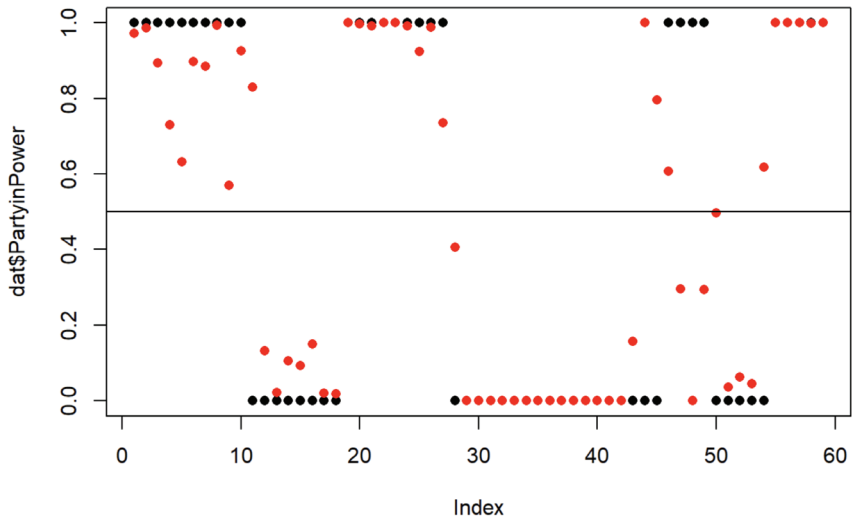
Source: Authors' own elaboration

If we exclude one observation (and use it as the test set), how well would the model predict the Y variable?

Of 59 total observations, we misclassified 7. In 4 observations, the PNP was the party in power; yet, the model(s) predicted JLP. In 3 observations, the JLP was in power; yet the model(s) predicted PNP instead.

To see how the true values compared to the predicted probabilities, Figure 2 above presents the true values of the Party in Power variable (shown in black) vs. the predicted probability of Party in Power variable that the JLP was in power (shown in red). The horizontal line is at 0.5.

Figure 2. True values of the Party in Power variable (black) vs. the predicted probability of Party in Power variable that the JLP was in power (red)



Source: Authors' own elaboration

DISCUSSION

This study built three election forecast models using macroeconomic, demographic, security and party leader acceptance indicators to predict the 2020 General Election in Jamaica and performed a Jack knife resampling (cross validation) test. The significant predictors in Model 1 (the economic and security model) which accurately predicted a JLP victory, were interest rate, exchange rate and debt to GDP ratio and the homicide rate. Decrease in the interest rate and the exchange rate increased the odds of the JLP winning the election and an increase in the debt to GDP ratio also increased the odds of a JLP victory. The model explained 83.6 percent of the variance in party in power. The Jamaican voters' economic perceptions, it seems, are driven by their pocketbooks, as noted by Whitely (1984) and Guseh (1996), because voters get better prices for goods and services with a decrease in the exchange rate and more access to loans with a decrease in the interest rate.

Whitely (1984), Guseh (1996), Singer and Carlin (2013), and Dassonneville and Lewis-Beck (2014) all show that the economy matters to voters. The findings by Wood (2004) that voters' perception of the state of the economy is partly influenced by the frequent economic rhetoric of the government, appears to be the case in Jamaica, because the Andrew Holness-led JLP Government engaged the public in frequent positive rhetoric about the economy (Charles, 2020).

Despite the IMF push for macroeconomic stability and a reduction in public spending (Edie, 2011; Stone, 1989; World Bank, 2020), governments tend to engage in the massive public spending during the political business cycle in the election year to woo voters. This massive public spending with a refusal to raise taxes, which is at variance with IMF stipulations, partly explains why an increase in the debt to GDP ratio increased the likelihood of a JLP victory. Another plausible explanation of this economic anomaly is that the voters chose short-term gains (state patronage) of the political business cycle over the long-term gain of significantly reducing the debt to GDP ratio, where everyone would have been better off economically with lower debt. Also, voters in Jamaica have less income compared to voters in developed countries and so are more likely to accept handouts from politicians. The government also benefits from borrowing more, because it provides the opportunity to renegotiate a new IMF deal, and restructure and reschedule the debt which voters view as good economic management, but this makes the country economically worse off in the long run.

The rise in homicides influencing the likelihood of a JLP win was another anomaly because voters tend to punish governments when they do not feel safe, because of rising homicides, by voting them out of office. However, the works of Ellis (1991) and Gendreau and Surridge (1978) show that tough policing measures like the Suppression of Crimes Act and the Gun Court Act in 1974, and the POE in 1976 in response to the spiking homicide rate were very popular. Recall that, more recently, a Don Anderson Poll capturing the views of Jamaicans about the ZOSOs and POEs since 2017, revealed that these tough policing measures were also very popular although the homicide rate remained high. There was homicide suppression in the targeted hotspots but the overall homicide rate remained high. Also, the majority of people wanted the crime suppression measures implemented throughout the country despite their failure (Virtue, 2019). Voters like the tough security measures that governments implement following spikes in homicides so the government becomes popular. The findings of model 1 also corroborates the findings of Ley (2018) that the influence of criminal context on voters is more than their victimization experiences. Model 1 also supports the findings of Hagerty (2006) that voters tend to weight economic and crime factors differently in relation to their preference for one political party over another. Model 1 shows that the Jamaican voters do not act "rationally" when it comes to the increasing debt to GDP ratio and the increasing homicide rate.

Models 2 and 3, respectively, added JLPLA, and PNPLA to the economic and security model to understand how the acceptance of the party leader influences party in power. The significant predictors in Model 2 are exchange rate, interest rate, debt to GDP ratio, homicide rate as well as moderate JLPLA. Moderate JLPLA, relative to low LA, strongly increased the chances of the JLP winning. Model 2 explained 89.4% of the variance in election outcome. In model 3, the significant predictors are unemployment, interest rate, exchange rate, debt to GDP ratio, homicide rate and high PNPLA. High PNPLA, relative to low LA, would reduce the odds of the JLP winning but the effect size is small. Model 3 explained 86.0% of the variance in party in power. Models 2 and 3 also predicted a JLP general election win in 2020. These two models reveal that the extent to which the leader is accepted in the party is very important for electoral victories. The acceptance of the leader is influenced by whether there is a leadership challenge. If there is a challenge, how early in the election cycle the party leader is challenged for leadership, and the extent of the loser's acceptance of and support for the winner are crucial to future electoral success. Even without an electoral challenge to the party leader, party unity and cohesion are very important because party leaders with low to moderate acceptance in the party are more likely to lose a general election.

None of the party leaders that experienced a leadership challenge since 1990, such as Edward Seaga, Andrew Holness, Portia Simpson-Miller and Peter Phillips, fall into González and Young's (2017) definition of populist leaders, denoted as charismatic political entrepreneurs, with widespread political appeals that made use of the opportunity structures that were available. One possible reason why Jamaica has had only two populist leaders to date (Alexander Bustamante and Michael Manley) is that the JLP and PNP were established political parties with strong institutional structures before Jamaica became independent. Therefore, these large, entrenched, dominant and popular political parties, make the rise of populist leaders in these institutions difficult (Barber, 2019). It should also be noted that all of the party leaders in Jamaica, including the two populist ones now deceased, have shown commitment to the principles of liberal democracy, and have never tried to remove the institutional constraints on their power, unlike what occurred with the populist leaders discussed by Weyland (2020).

The models presented in this study have all met the evaluation criteria of parsimony, transparency, lead time and accuracy, the gold standard for election forecast models (Jennings et al., 2020). These models replicated the work of some election forecast scholars in the global north which showed that politics and economics matter. See, for example, Bélanger and Godbout (2010) vote function model which shows that in Canada there is a strong relationship between macroeconomic variables and election outcomes, and the political economy model (Jérôme et al., 2020; Lewis-Beck et al., 2008; Lewis-Beck & Tien, 2012) which used political and economic indicators to forecast presidential elections in France and the United States.

Two major limitations of Models 1-3 are that they deal with a single country with only 59 data points. These limitations will be addressed in the future by collecting panel data on macroeconomic, leadership and homicide variables in the Caribbean and Latin America to predict election outcomes in these regions. Models 1-3 have contributed to our understanding of the influence of the macroeconomy, security and leadership in election outcomes in Jamaica. One of the most poignant contribution of this study is the use of homicides as a predictor of election outcomes showing that when homicides increase, governments tend to implement tough policing measures that increases the popularity of the government.

CONCLUSION

Studying the influence of voter motivations, voter preferences and voting behaviour on election outcomes are important for understanding voting as nuanced collective behaviour in modern democracies. The majority of the election forecast models created for this purpose have been applied to the developed societies of the global north. The use of election forecast models in the global south, especially in the small states of the Caribbean, is relatively new. It is important to understand voting behaviour and elections in these developing countries compared to developed countries because voters should respond to economic and security concerns in rich and poor countries in different ways. These developing countries have their own histories and political cultures that may yield new insights on the influence of institutions, personalised populist leadership, authoritarianism, public opinion, corruption, crime, violence, voter preferences, campaigning, and voter turnout on election outcomes. We therefore need to understand how voter microlevel characteristics, meso-level patterns of relationships and macro-level institutions influence election outcomes within and across the Caribbean and Latin America.

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AGAINST ALL ODDS: FORECASTING BRAZILIAN PRESIDENTIAL ELECTIONS IN TIMES OF POLITICAL DISRUPTION

Contra todas as probabilidades: Previsão das eleições presidenciais brasileiras em tempos de ruptura política

Contra todo pronóstico: Pronosticando elecciones presidenciales brasileñas en tiempos de disrupción política

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Election Forecasting; Forecasting error; Presidential ections; Methodology; Brazil

Abstract
When the number of observed elections is low, subnational data can be used to perform electoral forecasts. Turgeon and Rennó (2012) applied this solution and proposed three forecasting models to analyze Brazilian presidential elections (1994-2006). The models, adapted from forecasting models of American and French presidential elections, considers economic and political factors. We extend their analysis to the recent presidential elections in Brazil (2010, 2014 and 2018) and find that the addition of the three recent elections does not improve the accuracy of our forecast models although it strengthens the relationship between the explanatory variables and vote for the incumbent. We also find that models based on the popularity of the incumbent outperform those based on trial-heat polls and that electoral forecast models can survive earthquake elections like the 2018 election that led to the unexpected rise of "outsider" and extremist candidate Jair Bolsonaro.

Palavras-chave:
Previsão eleitoral; Erro de previsão; Eleições presidenciais; Metodologia; Brasil

Resumo
Quando o número de eleições observadas é baixo, pode-se usar dados subnacionais para realizar previsões eleitorais. Turgeon e Rennó (2012) aplicaram essa solução e propuseram três modelos de previsão para analisar eleições presidenciais brasileiras ocorridas entre 1994 e 2006. Os modelos, adaptados de modelos de previsão de eleições presidenciais americanas e francesas, consideram fatores econômicos e políticos. Estendemos esta análise para as recentes eleições presidenciais no Brasil (2010, 2014 e 2018) e demonstramos que a adição das três eleições mais recentes não melhora a precisão dos modelos preditivos, embora fortaleça a relação entre as variáveis explicativas e o voto no incumbente. Também concluímos que os modelos baseados na popularidade do incumbente superam aqueles baseados em pesquisas eleitorais e que os modelos de previsão eleitoral podem sobreviver a eleições com muito ruído, como a de 2018, que levou à ascensão inesperada de um candidato de extrema-direita, Jair Bolsonaro.

Palabras clave:
Pronóstico electoral; Error de pronóstico; Elecciones presidenciales; Metodología; Brasil

Resumen
Cuando el número de elecciones observadas es bajo, se puede usar datos subnacionales para hacer predicciones electorales. Turgeon y Rennó (2012) aplicaron esta solución y propusieron tres modelos de predicción para analizar las elecciones presidenciales brasileñas entre 1994 y 2006. Los modelos, adaptados de los modelos de predicción de elecciones presidenciales de Estados Unidos y Francia, consideran factores económicos y políticos. Extendemos este análisis a las recientes elecciones presidenciales en Brasil (2010, 2014 y 2018) y demostramos que la adicción de las tres elecciones más recientes no mejora la precisión de los modelos predictivos, aunque fortalece la relación entre las variables explicativas y el voto por el titular. También concluimos que los modelos basados en la popularidad del titular superan a los basados en encuestas electorales y que los modelos de predicción electoral pueden sobrevivir a elecciones ruidosas como la de 2018, que condujo al ascenso inesperado de un candidato de la extrema derecha, Jair Bolsonaro.

INTRODUCTION

Election forecasting in recently democratized countries is difficult —given the scarcity of elections and more unstable political environments— but not impossible (Bunker and Bauchowitz 2016; Cantu et al. 2016; Jastramskis 2012; Turgeon and Rennó, 2012; Toros 2012). To circumvent the low-N problem, Turgeon and Rennó (2012) moved to a lower level of analysis. By examining presidential Brazilian elections, the authors incorporated information from Brazil's 27 states. The authors relied on election forecast models that have been commonly used in settings of political stability because presidential elections in Brazil since 1994 have been dominated exclusively by two large parties—the *Partido dos Trabalhadores* (PT) and the Partido da Social Democracia Brasileira (PSDB).

How do models fare when more elections are analyzed, including elections followed by disruptive political events and deep institutional changes? This paper expands on Turgeon and Rennó's (2012) original study by including the Brazilian presidential elections of 2010, 2014 and 2018. Do prior results remain stable with more datapoints, showing that models designed for stable two-party systems hold elsewhere? Furthermore, the equilibrium that marked Brazilian elections between 1994 and 2014 ended abruptly in 2018 when an outsider from a marginal party won the presidency—after severe economic and political crises and deep institutional transformations. Do results that focus on stable party systems hold after an earthquake election, like the Brazilian presidential 2018?

The 2018 elections also pose an additional challenge for election forecasting models because the sitting president —Dilma Rousseff— was impeached mid-mandate in 2016, producing an electoral contest with potentially more than one party claiming responsibility for policies while in government and without a clear incumbent, given the disruption of prior governing and opposition coalitions. There were no individual candidate competing for reelection, although many candidates from the previous governments (Dilma's Worker Party and Temer's MDB) were seeking the presidency. Moreover, Brazil, like other parts of the world, has seen the rise of a populist and polarizing figure, Jair Bolsonaro. This change in the political environment might affect the ability of forecasting models, depending on whether they place more emphasis on the fundamentals of the economy and satisfaction with the incumbent or on trial-heat polls, as we have seen in the 2016 American presidential election (Campbell, 2017).

The inclusion of more elections may improve the precision of earlier forecasts by increasing sample size. The electoral earthquake of 2018, however, may hinder predictability, posing the question about how forecasting models fare in less stable environments. We can verify if forecasting models based on the fundamentals of the economy and popularity of the incumbent performed better than those reliant on trial-heat polls. Our findings show that the addition of recent elections does not contribute to improve our models' forecasts, confirming the strength of prior analysis based on fewer cases and showing that the subnational strategy of increasing sample size is a practical and valid solution for forecasting elections in young democracies. What it does, however, is to strengthen the theoretical arguments around our explanatory variables. Finally, our findings also show that the 2018 earthquake election is surprisingly better predicted by a model based on the fundamentals of the economy and popularity of the incumbent than those based on trial-heat polls.

FORECASTING ELECTIONS IN YOUNG DEMOCRACIES

As the literature on electoral forecasting increased exponentially in the established democracies (e.g., US and Great Britain), it has also gradually expanded to Second and Third Wave democracies like France and Germany in Europe and more recently Brazil, Turkey, and Lithuania[1]. The expansion of electoral forecasting models to more recently democratized countries poses new challenges. Two factors deserve particular attention. The new, younger democracies raise a methodological issue because they have held few elections to estimate electoral forecasting models. The question is one of degrees of freedom, reducing the precision of analysis and restricting model specification. A second significant problem concerns adapting forecast models that were initially designed for stable, two-party systems, to unstable, multiparty systems, especially those from the Third Wave democracies. In addition, electoral environments in younger democracies are usually more convoluted (more parties, more candidates, more volatility), rendering election results potentially less predictable. The transposition of electoral forecasting models to new democracies, therefore, provides for a rigorous test of their generalizability.

These challenges have been faced by the extant literature. For instance, a solution for the small-N problem is dealt with by using subnational measures of election outcomes and predictors. The study of the French case, for instance, has relied on local-level data to increase sample size (Jérôme and Jerome-Speziari, 2004; Auberger 2010; Foucault and Nadeau 2012). An identical approach has been adopted for Brazil (Turgeon and Rennó, 2012). These strategies model election outcomes for national level elections using information from subnational units. In a way, this strategy is like the one adopted in the United States to forecast Electoral College results, by modeling voting results at the state-level to anticipate the outcome of the Electoral College (Campbell, 1992; Berry and Bickers 2012; Jérôme and Jerome-Speziari, 2012, 2016; Jérôme et al., 2021). Other studies have attempted to deal with the small-N problem in a similar fashion but by examining other election outcomes. For instance, Jastramskis (2012) forecasts vote for a major national party in Lithuania, instead of focusing on the incumbent. Toros (2012), on the other hand, proposes to forecast mayoral elections in Turkey.

The second challenge concerns the expansion of the electoral forecasting models initially developed to understand older democracies to more recent democracies where elections are few, far in-between and frequently characterized by more complex institutional arrangements. Multiple parties, ballotage systems, party system instability all create specific problems that may limit the applicability

1. See the special issue of the *International Journal of Forecasting* 28:12, Election Forecasting in Neglected Democracies.

of established electoral forecasting models whose main premise is that of reward and punishment for good or bad times. Specifically, the more complex and less consolidated institutional traits of younger democracies may render accountability opaquer (Powell, 2004). Furthermore, young democracies are frequently characterized by weak parties with shallow social roots, increasing electoral volatility and thus rendering elections more unpredictable (Baker et al., 2020).

Finally, specific electoral episodes may be harder to predict given the unfolding of campaigns and the emergence of unexpected, outsider candidates. In this sense, even in strongly consolidated democracies, elections can be hard to forecast (e.g., the 2016 and 2020 US presidential elections)[2]. The literature on electoral forecasting, however, has generally found strong support for the main tenets of retrospective voting that underly most forecasting models. From Brazil to Norway, passing by France, Germany, Spain, and Turkey, forecasting models developed for the US and Great Britain tend to perform well in other contexts. Hence, even earthquake elections, in complex institutional environments, can be explained and modeled with the theoretical assumptions that the state of the economy and government evaluation are central to predicting vote for the incumbent party. The case of Brazil that we discuss hereafter exemplifies the virtues of forecasting models.

FORECASTING ELECTIONS IN TIMES OF POLITICAL DISRUPTION

Brazil has held eight presidential contests (1989, 1994, 1998, 2002, 2006, 2010, 2014 and 2018) since (re)democratization. Between 1994 and 2014 the *Partido da Social Democracia Brasileira* (PSDB) or the *Partido dos Trabalhadores* (PT) won the presidency: each party always reaching the second round (when such round was necessary). This pattern of polarization between the PT and the PSDB ended abruptly in 2018, but signs of political instability were first noticed in July 2013 with massive street protests ahead of the 2014 World Cup. There was a sense among Brazilians that the government was spending more on stadiums than in health services, education or urban transportation and that corruption was widespread. Meanwhile, the economy started to falter with increases in inflation, unemployment, and public debt. Then president Dilma Rousseff saw her popularity plumet and what was to be an easy reelection pledge, became a very close race.

Despite the adversity, Dilma Rousseff was reelected for a second term in 2014, with a very small margin of 3 percentage points against Aécio Neves, the PSDB candidate. The economy continued its downward trend in 2015 and 2016, making

2. See the PS October 2016 and PS January 2021 issues for the full set of forecasts of American Elections.

it harder for President Dilma to govern. Protesters hit the streets again and after the *Lava-Jato* Operation, a Brazilian *Mani Puliti* of sorts, had uncovered significant bribing schemes in the Brazilian oil giant, Petrobras, that benefitted the PT and its allies. The pressure became unbearable, leading to the impeachment of President Dilma Rousseff in August of 2016. Then Vice-President, Michel Temer of the PMDB (now MDB), took office, terminating a 22-year period of PSDB/PT reign.

The new President, Michel Temer, failed to restore economic growth and, after a year in office, his government was also deeply tarnished by corruption scandals that involved President Temer himself and one of the most important opposition leaders to Dilma, her runner-up contender in 2014, Aécio Neves. Temer faced two consecutive office-removal votes in Congress as a result of his involvement in corruption scandals but survived each time. Temer's ability to govern, however, was severely affected and, in his brief mandate, precious time was lost in defending himself instead of advancing legislation and policies to curb the economic crisis. Temer's popularity, which was never high to start out with, reached historical lows toward the end of his term.

The result of these concomitant and deep economic and political crises was that the two most powerful parties in Brazil (PT and PSDB) and to some extent the PMDB/MDB (Temer's party, a party that had been part of the governing coalition since 1995) were all affected by and blamed for the country's economic and political misfortunes. Dissatisfaction and frustration among the Brazilian public with its political elites was strong and created an ideal power vacuum for Jair Bolsonaro —an obscure and eccentric radical right-wing politician backed by an equally obscure political party (Partido Social Liberal, PSL)— to launch his presidential bid.

Immediately after Dilma's 2014 election, Jair Bolsonaro started a modest campaign for president that heavily relied on social media. He defended a right-wing, socially conservative agenda and made virulent attacks on the PT (Rennó, 2020). Bolsonaro became the spokesperson of *antipetismo* —the rejection of the Worker's Party (PT)— a movement headed up until now by the PSDB (Samuels and Zucco, 2018). Bolsonaro's radical positions against gender politics, homosexuals, and racial policies, coupled with a strong stance on fighting crime and corruption and free market policies resonated well with a dissatisfied and disillusioned population (Rennó, 2020). His incessant campaigning on social media and in person across the country made him a top contender for the 2018 election, to the surprise of most political pundits and elites.

The 2018 presidential election was also the first election after significant political reforms had been adopted (Rennó, 2020). Donations were now more restricted, prohibiting corporations from financing campaigns, spending limits were established by elected office, gender quotas on campaign finance where instituted, party performance clauses were put in place and the official campaign period was reduced in half, from 90 to 45 days. All these factors influenced the impact

of traditional electoral resources in Brazil, like TV and radio advertising and how campaign resources are allocated, more generally.

The 2018 elections were also marked by unprecedented and unexpected events. First, the PT nominated Lula da Silva as his presidential candidate. The problem was that Lula was incarcerated in Curitiba, Paraná, based on allegations of corruption. Surprisingly, Lula led the polls for most of the election, closely followed by Jair Bolsonaro. Lula's candidacy was eventually barred by the Supreme Court and Fernando Haddad became the official candidate for the PT only two weeks before the first round. Lula's popularity was enough to qualify Haddad for the second round.

Second, in the early days of the first-round election, Jair Bolsonaro was stabbed while campaigning. Bolsonaro was hospitalized for a long period of time but eventually survived the attack. During this time, Bolsonaro's popularity skyrocketed, as the press and the other presidential candidates softened their discourse about him (given his frail health situation) while his supporters took full advantage of the situation to portray him as a martyr and savior. Bolsonaro's attack also allowed him to escape from participating in the presidential debates, thus managing to keep a positive image of him among voters. In the end, Bolsonaro handily defeated Haddad in the second-round election, becoming Brazil's 38th President.

Admittedly, the 2018 Brazilian elections were marked by many factors that render it very hard to predict using conventional election forecasting models. First, it was an election with no clear incumbent since President Dilma was removed from office in mid-mandate and President Temer (her then Vice-President) did not seek the office. Both the MDB and the PT could claim credit for their policies while in government, but both were also blamed for the misfortunes of the preceding years. Temer decided not to run, but put his support behind Minister of Finance, Henrique Meirelles. Second, a complete outsider, with no partisan support and very few resources, rode to victory without much difficulty. Third, the campaigning and electoral rules were markedly different than in past elections. And fourth and finally, the attack on Bolsonaro changed dramatically the dynamic of the presidential election. Undoubtedly, the 2018 scenario contrasts greatly with the earlier period from 1994 to 2014 where Brazilian presidential elections have been systematically centered around two opposing forces: the PT and PSDB. Thus, we ask: how do electoral forecast models fare in this adverse scenario?

DATA AND MODELS

Our interest lies in using data from the 1994 to the 2018 Brazilian presidential elections to evaluate three election forecasting models tested in Turgeon and Rennó (2012) over a shorter period. The data come from various sources including

the *Tribunal Superior Eleitoral*[3] for election data, the *Instituto Brasileiro de Geografia e Estatística* (IBGE)[4] and the *Instituto de Pesquisa Econômica Aplicada*[5] (IPEA) for economic data and Fernando Rodrigues's *Poder360* website for polling data.[6] It is worth noting that we are limited in the type of data that we can rely on (and Turgeon and Rennó (2012) did) given the necessity for the data to be available at the subnational state level.

The three models used in Turgeon and Rennó (2012) are based on existing models to predict U.S. and French presidential elections, with slight modifications. The models are parsimonious and have been around for some time. But, more importantly, they make use of data that are available in the Brazilian context (both at the national and subnational levels). Table 1 presents the details about the models, including information about the authors of said models, predictors used in the original and proposed adapted models, and the level of analysis and election years for which the models are estimated.

Table 1. Election Forecasting Models

Models and Authors	Original model	Adapted model (level of availability)	Years
Model 1: Abramowitz (2008)	1. Popularity of the incumbent 2. Second quarter GDP 3. Third term dummy	1. Popularity of the incumbent (national) 2. Real annual GDP growth (state) 3. Third term dummy	1994-2018
Model 2: Campbell (2008)	1. Trial-heat poll 2. Second quarter GDP	1. Trial-heat poll (state) 2. Real annual GDP growth (state)	2006-2018
Model 3: Lewis-Beck et al. (2008)	1. Popularity of the incumbent 2. Unemployment	1. Popularity of the incumbent (national) 2. Real annual GDP growth (state)	1994-2018

Source: Authors.

All three models use the same dependent variable: the first-round vote for the incumbent candidate in the presidential elections, as measured as the percentage of all votes received by the incumbent in each of the 27 states. In 1994, 1998 and

3. The TSE website is http://www.tse.gov.br/internet/index.html.
4. The IBGE website is www.ibge.gov.br/english/
5. The IPEA datasets are available at http://www.ipeadata.gov.br/
6. https://www.poder360.com.br/pesquisas-de-opiniao/

2002, the incumbent party is the PSDB (with Fernando Henrique Cardoso and Jose Serra as candidates); and, in 2006, 2010 and 2014 the incumbent party is the PT (with Lula da Silva and Dilma Rousseff as candidates). As discussed extensively above, 2018 is peculiar in the sense that there is no clear incumbent running for office. One possibility is to consider the PT as the incumbent party because Dilma Rousseff was elected in 2014 although removed from office mid-mandate. Another possibility is to consider the party of Michel Temer —PMDB/MDB— as the incumbent party since it was the party in the presidency at the time of the election. Both the PT, with Fernando Haddad, and the PMDB/MDB, with Henrique Meirelles, had candidates running in the 2018 election. Thus, in theory, we could consider two potential incumbent parties running in 2018, adding another layer of complexity to our forecasting models. We have, however, a theoretical preference for the model with Fernando Haddad (PT) as the incumbent for two reasons. First, the *Partido dos Trabalhadores* (PT) is the party that won the 2014 election and, if Dilma Rousseff had not been removed from office, the PT would have been the official incumbent. In sum, the PT was the legitimate incumbent in 2018, especially given the dubious accusations President Rousseff faced during her impeachment trial. Second, and maybe more importantly, Brazilian politics since 1994 has been structured around the PT and some other competing party (the PSDB from 1994 to 2014 and the PSL with Bolsonaro in 2018 (Duque and Smith, 2019). Thus, the PT has been the central figure of national politics and the party to "beat." The same cannot be said of the MDB (former PMDB), Temer/Meirelles' party. Although the MDB played a supporting role in each and every governing coalition since 1995 —including the one formed by Dilma Rousseff during her second term, before being impeached— the party has never been a serious contender for the presidency (Pereira and Bertholini, 2018). For these reasons, we have a theoretical preference for the model with Fernando Haddad (PT) as the incumbent candidate. In the Appendix (Figure A1), we also present the results using Henrique Meirelles (PMDB/MDB) instead as the incumbent candidate.

The first model, inspired from Abramowitz (2008) accounts for economic activity, popularity of the incumbent and a dummy for an incumbent party seeking a third term (2002 and 2010). Economic activity is the real annual growth of the GDP from the year preceding the election to the election year, measured at the state level[7]. Unfortunately, the popularity of the incumbent is not available at the state level. Instead, we use a measure at the national level. The polls are from Datafolha and were conducted in August, about two months prior to the election[8]. The model

7. It generally takes a little over two years for state-level GDP to be released by the IBGE. Thus, for 2018, we calculated state GDP by multiplying the state average share of the national GDP (calculated for 2016 and 2017) by the 2018 national GDP.
8. We took the average of the August polls when there is more than one.

is estimated for all 7 elections (1994, 1998, 2002, 2006, 2010, 2014 and 2018), generating 189 observations (27 states over seven years). Given the panel structure of the data (repeated observations, election years, on the same cross section, states), we use random effects GLS with standard errors adjusted for clustering at the state-level[9].

The second model, inspired this time from Campbell (2008), also includes the real annual growth of the GDP from the year preceding the election to the election year (at the state level) as the economic activity measure but adds state-level trial-heat polls. The trial-heat polls are from IBOPE and were fielded in August[10]. Because state-level poll data are only available from 2006, the second model is only estimated for 2006, 2010, 2014 and 2018 election, for a total of 108 observations. Just like in the first model, coefficient estimates are obtained by random effects GLS with standard errors adjusted for clustering at the state-level.

The third and last model, for its part, is inspired from Lewis-Beck, Bélanger and Fauvelle-Aymar (2008). It deviates more from the original model than the first two in that it uses real annual growth of the GDP instead of the unemployment rate as the economic activity measure (for data availability at the state-level). In addition, the model includes the same popularity measure used in the first model. This last model is estimated for all 7 elections (1994, 1998, 2002, 2006, 2010, 2014 and 2018), producing 189 observations, and using, again, random effects GLS with standard errors adjusted for clustering at the state-level[11]. Descriptive statistics about our predictor variables are presented in the Appendix (Table A1).

RESULTS

Predicted vote shares for the incumbent candidates in the first round are presented in Figure 1. Figure 1 also indicates (with a star) the actual vote share received by the incumbent candidate, allowing for a visual assessment of each of our three model specifications. Across all three models, the average within-sample forecasting error is 5.55. Details about the accuracy of the forecast models are presented in Table 2 by model and election. First, it is important to note that *all* forecasts are within-sample forecasts. Just like in Turgeon and Rennó (2012), we find that Model 1 is the most accurate model. Model 1 predicts five of the seven

9. Hausman tests indicate support for the random effects model over fixed effects.
10. We used poll results from July or September, in that order, when no August poll are available. When there are more than one poll for August, we considered the average value.
11. All models were estimated by weighting the data by state population. The model generates a predicted value by year for the incumbent for each of the 27 states, and these are averaged, in turn, to compute the final prediction, accounting again for state population.

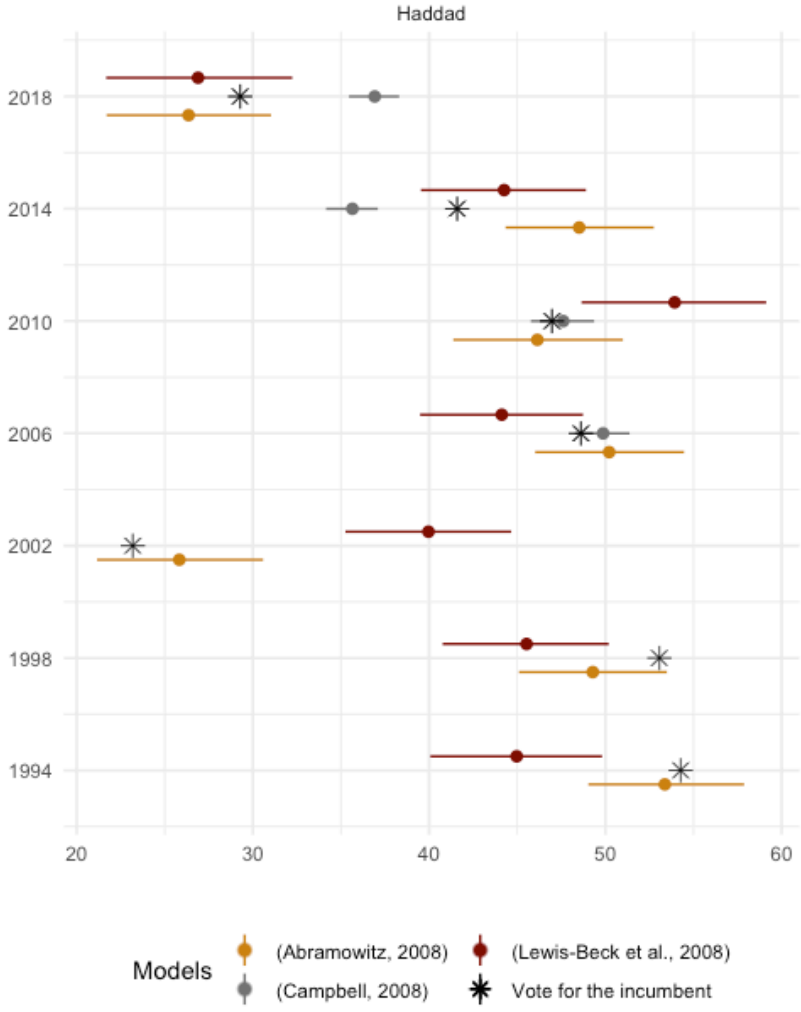
elections within three percentage points, including two within one percentage point (1994 and 2010). This is quite impressive. Model 1 only performs badly for the 2014 when President Dilma Rousseff was seeking reelection with a forecast error of 6.81 percentage points. Interestingly, it performed quite well in 2018 with a forecast error of 2.87 percentage points even though this election represents a break in the PT-PSDB equilibrium that characterized Brazilian presidential elections for over 20 years. Overall, the average forecast error for Model 1 is 2.79 percentage points. Model 2, for its part, comes as the next most accurate model. It predicts nearly perfectly the 2010 election but fails badly at predicting the 2014 and 2018 election. Its average forecast error is one percentage point higher than that for Model 1, at 3.82. Model 2 has an additional downside, it cannot be used to forecast the 1994, 1998 and 2002 elections because trial-heat polls at the state level are not available for these elections. Finally, Model 3 performs poorly with average forecast errors of 7.18 percentage points. Finally, it is worth noting that the addition of the last three elections did not improve the perform of these models, as can be seen by comparing the average forecast error obtained from the 1994-2010 elections. To the contrary, the performance of all three models got substantially worst, especially for models 1 and 3.

Finally, Table 3 presents the coefficient estimates for the three models. For Model 1, we find, as expected, a strong effect for the Third Term Dummy, meaning that candidates/parties seeking a third term lose votes, on average. Economic growth is also statistically significant in Model 1 and has the expected sign: economic growth leads to a larger vote share for incumbent candidates. Economic growth is equally statistically significant in Model 2 and in expected ways but fails to reach conventional levels of statistical significance in Model 3. The Trial-heat variable in Model 2 is statistically significant and, not surprisingly, shows a very strong effect on the incumbent's vote share. Lastly, the popularity of the incumbent in Models 1 and 3 is statistically significant and exert, as expected, a positive effect on the incumbent's vote share. It is worth noting that the addition of the last three elections has proven beneficial. In Turgeon and Rennó (2012), economic growth was not statistically in all model specifications (it is now in two of the three) and the popularity of the incumbent had failed to reach statistical significance in Model 1. In sum, the addition of the last three elections has demonstrated the theoretical value of the three models although it did not improve their forecasting capabilities. It is worth noting that the regression estimates from the 2012 article and the ones presented in Tables 3 are not readily comparable because some of the data from the 2012 have been updated and a few minor errors were found in the original dataset.

In sum, we find that Model 1 outperforms the other models. This finding is important because it suggest that models that rely on the popularity of the incumbent as superior to those that rely on trial-heat polls once the fundamentals of the economy

are also taken into account. As for the uncharacteristically volatile 2018 election, our findings suggest that electoral forecasting models can survive such earthquake elections. The forecasts from both Models 1 and 3 are within 3 percentage points. This is quite surprising given how the 2018 election changed nearly entirely the equilibrium between the PT and PSDB that lasted for over two decades.

Figure 1. Forecasts for Brazilian Presidential Elections, by forecast models: 1994-2018 (with Fernando Haddad (PT) as incumbent in 2018)



Source: Authors.

Table 2. Within-Sample Forecasts, by Model and Election

Election year	Vote for the Incumbent (%)	Forecast, in % (Forecast error, in %)		
		Model 1 (Abramowitz, 2008)	Model 2 (Campbell, 2008)	Model 3 (Lewis-Beck et al. 2008)
1994	54.27	53.31		44.99
		(-0.96)		(-9.28)
1998	53.06	49.10		45.52
		(-3.96)		(-7.54)
2002	23.19	25.69		40.04
		(+2.5)		(+16.85)
2006	48.61	50.11	49.82	44.18
		(+1.5)	(+1.21)	(-4.43)
2010	46.97	46.07	47.31	54.08
		(-0.9)	(+0.34)	(+7.11)
2014	41.59	48.40	35.66	44.25
		(+6.81)	(-5.93)	(+2.66)
2018	29.28	26.41	37.06	26.88
		(-2.87)	(+7.78)	(-2.4)
Average (1994-2018)		2.79	3.82	7.18
(SD)		3.65	5.61	9.21
Average (1994-2010)*		1.21	0.13	1.27
(SD)		0.56	-	0.9

*Recalculated results for Turgeon and Rennó 2012 with new data. Values shown here differ from those in Turgeon and Rennó (2012) for two reasons. First, the analyses were conducted using updated data from the IBGE. Second, the authors found a few errors in the original dataset for some state-level values.

Source: Authors.

Table 3. Forecast Models for Brazilian Presidential Elections: 1994-2018

	Model 1 (Abramowitz 2008)	Model 2 (Campbell 2008)	Model 3 (Lewis-Beck et al. 2008)
Real annual GDP growth	0.456*	0.388*	-0.157
	(0.212)	(0.184)	(0.249)
Third term dummy	-19.565**		
	(2.027)		
Popularity of the incumbent	0.238**		0.183**
	(0.021)		(0.025)
Trial-heat poll		0.968**	
		(0.054)	
Constant	46.022**	0.321	43.261**
	(1.788)	(2.312)	(1.941)
R2 (overall)	0.7412	0.9896	0.5785
R2 (within)	0.9721	0.9896	0.9293
N	189	108	189
Log Likelihood	-785.221	-402.229	-824.305
Akaike Inf. Crit.	1,582.442	814.457	1,658.609
Bayesian Inf. Crit.	1,601.892	827.868	1,674.818

Entries are random effects GLS with standard errors adjusted for clustering at the state-level.

*p<0.05 **p<0.01 (two-tailed).

Source: Authors.

CONCLUSION

In this paper, we extended Turgeon and Rennó's (2012) earlier work on forecasting Brazilian presidential elections by incorporating data from the three most recent elections (2010, 2014 and 2018). Our findings show that the addition of recent elections contributes to improve the explanatory power of the electoral forecasting models, that is, their theoretical value, despite the inclusion of an election with a high degree of uncertainty (2018). Interestingly, the addition of the last three elections did not improve, however, their forecasting capabilities. This is true for models that are more heavily based on polls, but also for those with measures of the state of the economy and popularity of the incumbent. The recent 2018 presidential election in Brazil restructured the political landscape. The Worker's Party (PT) remains a central actor, but the PSDB has lost its prominent status as the anti-PT force. The new forces are now centered around Jair Bolsonaro since he defeated Fernando Haddad (PT) in the 2018 presidential election. This earthquake election was surprisingly well predicted by two of our three forecast models.

There remain important problems in using sub-national data to predict national results. First, economic data measured at the state level, as noted earlier, become available only two years *after* the election. To make election forecasts, one must estimate first a state-level measure of economic growth. Second, public opinion data is not systematically available at the state level, shortening the period that such models can use. The tendency is for this second problem to lessen with the passage of time. Also, as the number of elections increase, we will be able to properly incorporate time into our estimations, using not only state-effect, but also time-effect[12]. Also, it would be interesting to compare the forecasts from our models with those from vote intention polls conducted about three months prior to the election. We leave this task for a future update of this paper.

Finally, we are optimistic about our ability to forecast the upcoming 2022 election. First, it is very likely that the 2022 will have President Bolsonaro as the incumbent candidate. Second, the PT remains a very strong political force in Brazil and will certainly present to voters a strong candidate, most likely former President Lula. What might distinguish 2022 from prior elections, however, is the possibility of other credible anti-PT forces to compete for votes (at the expense of Bolsonaro). The center-right PSDB is expected to orchestrate a strong comeback, possibly led by São Paulo Governor João Dória Jr. The latter has gained some popularity since the beginning of the COVID-19 pandemic and has portrayed himself as the loudest critic of the Bolsonaro government. Therefore, there is a strong possibility that the

12. We tested specifications using both state and time-effects, although we do not present the findings here because our data afford only 7 elections, fewer than the minimum suggested by Beck (2001) for panel/time-series-cross-sectional (TSCS) analysis.

2022 will have two strong candidates from the right —Bolsonaro and Doria— competing for votes. Will it be enough for the PT to make a comeback? Only history (and possibly our forecast models) will tell.

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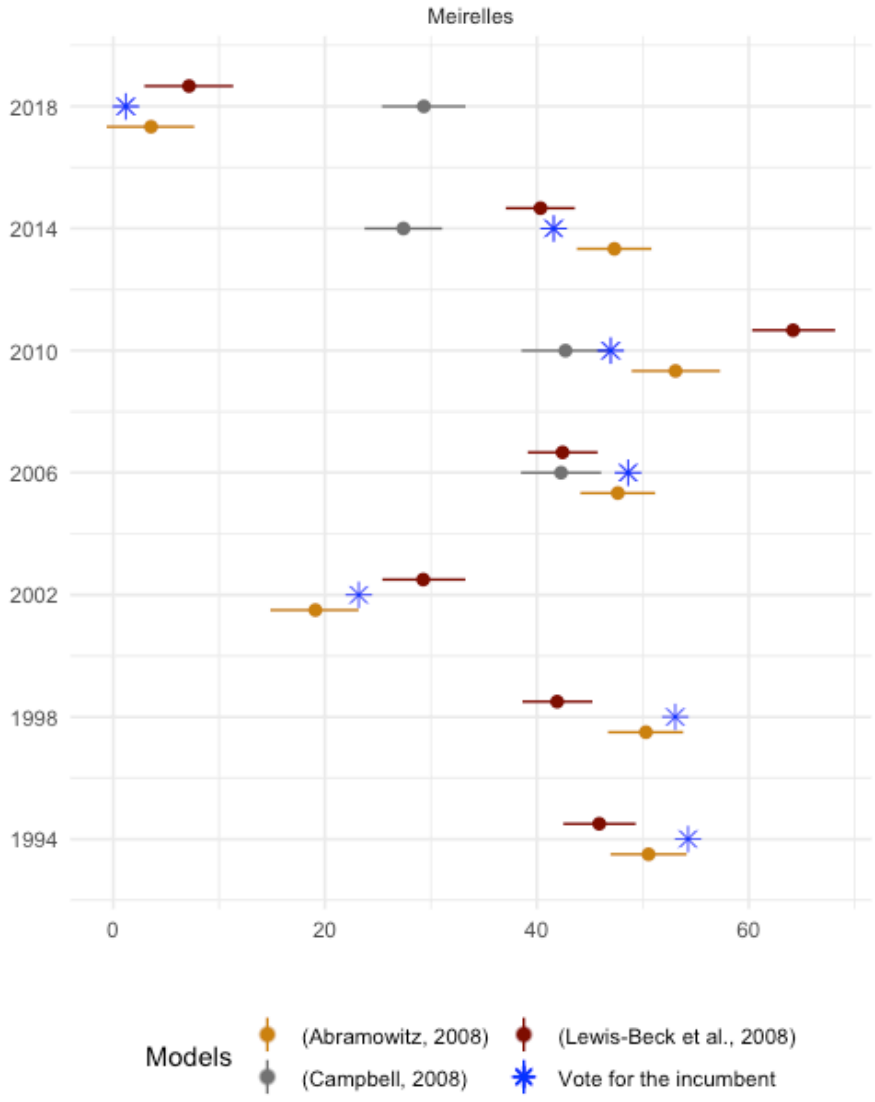
APPENDIX

Figure A1. Forecast Models for Brazilian Presidential Elections: 1994-2018. Scenario: Meirelles (PMDB) as incumbent in 2018



Source: Authors.

Table A1. Descriptive statistics of the predictor variables

	Mean (SD)	N
Real annual GDP growth	2.73 (5.16)	189
Popularity of the incumbent	9.57 (42.6)	189
Incumbent vote	44.4 (17.2)	189
Trial-heat poll	45.0 (14.4)	108

Source: Authors.

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CONSERVAR Y DISPONIBILIZAR TREINTA AÑOS DE OPINIÓN PÚBLICA: LECCIONES APRENDIDAS DEL CASO URUGUAYO

PRESERVING AND MAKING PUBLIC THIRTY YEARS OF PUBLIC OPINION: LESSONS LEARNED FROM THE URUGUAYAN CASE

PRESERVAR E DISPONIBILIZAR TRINTA ANOS DE OPINIÃO PÚBLICA: LIÇÕES DO CASO DO URUGUAI

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Uruguay

Resumen
América Latina tiene una larga trayectoria de estudios de opinión pública; las encuestas son una herramienta utilizada de forma frecuente para conocer las opiniones, actitudes y comportamientos de los ciudadanos. Sin embargo, a menudo éstos se mantienen privados, siendo inaccesibles para investigadores y tomadores de decisiones. Asimismo, las consultoras responsables enfrentan desafíos particulares para hacer disponibles los datos. Esta nota muestra un posible camino. En él describimos la experiencia del Laboratorio de Opinión Pública y Redes Sociales (LOPReS) de Uruguay, un ejemplo de interseccionalidad entre academia, sector privado y financiamiento público, que permitió la liberación de más de 200 encuestas de opinión pública realizadas entre 1993 y 2020. Asimismo,

reflexionamos sobre tres importantes lecciones aprendidas a partir del proyecto: la relevancia de la construcción de vínculos de confianza, la generación de incentivos para la colaboración y la importancia del financiamiento. El caso sirve de ejemplo para analizar estrategias que permitan la apertura de información, con la participación de diversos actores trabajando de forma colaborativa y sus oportunidades para la investigación.

Keywords: historical archive; public opinion; public data; surveys; Uruguay

Abstract
Latin America has a long history of public opinion studies, surveys are a frequently used tool to understand citizens' opinions, attitudes and behaviors. However, these are often private information, being inaccessible to researchers and policymakers. In addition, pollesters face particular challenges in making data available. This article shows a possible path by describing the experience of the Laboratory of Public Opinion and Social Networks (LOPReS) of Uruguay. The LOPReS is an example of colaboration between academia, the private sector and public financing, which allowed the dissemination of more than 200 public opinion surveys carried out among 1993 and 2020. We reflect on three important lessons learned from the project: the relevance of building trusting bonds, the generation of incentives for collaboration, and the importance of financing. The case serves as an example to analyze strategies that allow the openness of information, with the collaboration of various actors working together and the research opportunities that emerge from the results.

Palavras-chave: arquivo histórico; opinião pública; dados públicos; pesquisas; Uruguai

Resumo
A América Latina tem uma longa história de estudos de opinião pública; as pesquisas são uma ferramenta frequentemente utilizada para conhecer as opiniões, atitudes e comportamentos dos cidadãos. No entanto, estes são muitas vezes mantidos em sigilo, sendo inacessíveis a pesquisadores e tomadores de decisão. Da mesma forma, as empresas responsáveis das pesquisas enfrentam desafios particulares na disponibilização de dados. Esta nota mostra um caminho possível. Nele, descrevemos a experiência do Laboratório de Opinião Pública e Redes Sociais (LOPReS) do Uruguai, exemplo de interseccionalidade entre academia, setor privado e financiamento público, que permitiu a divulgação de mais de 200 pesquisas de opinião pública realizadas entre 1993 e 2020. Da mesma forma, refletimos sobre três importantes lições aprendidas do projeto: a relevância de construir laços de confiança, a geração de incentivos à colaboração e a importância do financiamento. O caso serve de exemplo para analisar estratégias que permitem a abertura de informações, com a participação de diversos atores trabalhando de forma colaborativa e suas oportunidades de investigação.

INTRODUCCIÓN

La medición de la opinión sobre asuntos políticos y sociales tiene una larga trayectoria en Uruguay, siendo líder en la región en producción de datos de calidad. Las primeras encuestas de opinión pública sobre temas políticos y electorales en Uruguay de las que existe registro datan de 1958 generando incluso una fuerte

presencia en los diarios de la época hacia fines de la década del 1950 y 1960 (Aguiar, 2000). No obstante, la recolección sistemática de datos de opinión pública se consolidó en el país en la década de 1990 tras el retorno a la democracia, bajo el impulso de empresas de mercado de capital nacional. Estas empresas, con el paso de los años, fueron ganando renombre internacional, expandiendo incluso sus actividades a otros países de la región sur del continente como Argentina, Bolivia, Chile y Paraguay.

Sin embargo y como ha sido la constante en la región, dado que este proceso de afianzamiento de la investigación en opinión pública por consultoras privadas ha sido el *modus operandi* en América Latina, estos datos de opinión pública permanecieron como patrimonio exclusivo de las empresas encuestadoras, siendo prácticamente inaccesibles para académicos, periodistas y público en general (Bogliaccini, García Sánchez, y Queirolo, 2022). Por lo tanto, el único acceso a microdatos de opinión pública en América Latina suele ser a través de los datos provenientes de proyectos de opinión pública regionales e internacionales (Latinobarómetro, Barómetro de las Américas, Encuesta Mundial de Valores, etc.) o generando datos propios —opción que suele estar fuera del alcance de los investigadores—. Estos proyectos tienen un inmenso valor para la investigación en opinión pública latinoamericana y han permitido la producción académica en temas muy importantes como actitudes hacia la democracia, representación política y resultados electorales entre otros.

A pesar de las fortalezas de estos proyectos —por ej. la facilidad para realizar comparaciones entre países y sus altos estándares metodológicos—, los mismos también presentan algunas limitaciones: tienen un espacio limitado para incluir preguntas por lo que muchos temas relevantes para investigadores no son incluidos o lo son de forma esporádica; los datos son en —el mejor de los casos— anuales, por lo que limita los análisis temporales y el estudio de cambios en actitudes a raíz de fenómenos puntuales; tienen una escasa cobertura de temas locales (medidas o políticas púbicas tomadas por el gobierno, desempeño de gobernantes claves, popularidad de líderes políticos locales, etc.), y su fecha de realización no siempre puede ajustarse a eventos políticos importantes como elecciones. Esto ha generado, en Uruguay y la región, que el desarrollo de la opinión pública como disciplina académica se viera rezagada respecto de los desarrollos que tuvo en Estados Unidos o Europa en el mismo período. No obstante, esta descripción general, existen algunas excepciones de estudios, por ejemplo tesis doctorales (Echegaray, 1996; Queirolo, 2013; Tagina et al., 2013), que utilizan datos de opinión pública proporcionados por consultoras locales. Este tipo de trabajos son en general esfuerzos aislados con bases de datos puntuales sobre las que otros investigadores no tienen acceso para replicar estudios o no se cuenta con series temporales de mayor alcance para observar tendencias de mediano plazo.

Las propias empresas generadoras de datos de opinión pública, en parte por las dinámicas de oferta y demanda de información generalmente asociada a la coyuntura político-electoral, presentan ciertos desafíos. Primero, no suele existir un trabajo de armonización de la información a nivel individual en bases de datos que permitan comparaciones a través de los años. En general se conservan datos históricos a nivel agregado de variables relevantes sobre comportamiento electoral, pero no tienen los microdatos armonizados en series de tiempo. Es bastante frecuente que, ante el pedido de acceso a datos que reciben de algún investigador nacional como extranjero, las empresas tengan que recurrir a revisar viejos informes para extraer estas frecuencias agregadas o consultar una por una las bases de datos, lo cual transforma la respuesta en un trabajo costoso para la empresa, por lo que muchas veces se termina negando la información. Segundo, temas como el apoyo a políticas públicas, posicionamientos ideológicos sobre asuntos sociales, o actitudes hacia partidos políticos, no se repiten lo suficiente en el tiempo como para observar ciclos o cambios en las opiniones, o se ha variado considerablemente en la forma de preguntar generando series que no pueden ser estrictamente comparables. Tercero, estas empresas no siempre han desarrollado prácticas de conservación de los datos consistentes a través del tiempo. Esto último ha generado que el acervo de datos de cada empresa esté almacenado en formatos y tecnologías muchas veces obsoletas, o falten datos o cuestionarios que permitan identificar correctamente lo que se ha almacenado.

Uruguay, al igual que el general de la región, no generó en estas décadas alianzas estratégicas entre universidades u otros centros académicos, y el estado para la creación de proyectos de recolección sistemática de datos. Esto ha significado que, a pesar de la existencia de diversos esfuerzos por parte de grupos de académicos en distintos lugares, no exista un acervo de datos público recolectados en forma sistemática.

Esta situación cambia a partir de la creación del Laboratorio de Opinión Pública y Redes Sociales (LOPRes[1]) del Departamento de Ciencias Sociales de la Universidad Católica del Uruguay (UCU)[2]. El LOPReS parte de un cuidadoso proceso de acuerdos con dos empresas consultoras de larga trayectoria en el medio —CIFRA González, Raga & Asociados (en adelante CIFRA), y Opción Consultores (en adelante Opción)—, y la exitosa postulación conjunta a financiamiento por parte de la Agencia Nacional de Investigación e Innovación (ANII)[3]. Esta asociación virtuosa ha permitido hacer público el primer acervo de datos de opinión pública en Uruguay.

1. LOPReS (2022). https://www.laboratorio-opres.com/
2. El LOPReS es co-dirigido por Juan Bogliaccini y Rosario Queirolo, y tiene como investigadores asociados a Eliana Alvarez y Martín Opertti. La página web del laboratorio es: https://www.laboratorio-opres.com
3. Fondo Sectorial de Datos FSDA 1 2018 1 154765.

Clave en este proceso de construcción conjunta del acervo público ha sido también el ROPER Center de la Universidad de Cornell, centro que cura los datos y los pone a disposición de académicos de todo el mundo. El acervo cuenta con 27 años de opinión pública con datos mensuales, entre 1993 y 2020.

En esta nota de investigación presentamos el proceso de gestión y desarrollo del proyecto LOPReS, la construcción del acervo nacional de datos de opinión pública uruguaya, y una reflexión sobre las principales lecciones aprendidas en el mismo, esperando que sirva de inspiración y hoja de ruta para interesados en el acceso y conservación de datos históricos en la región y el mundo.

CONSTRUYENDO UN ARCHIVO NACIONAL DE OPINIÓN PÚBLICA

El anhelo de contar con un archivo nacional de opinión pública ha sido compartido por académicos y encuestadores por al menos dos décadas. Sin embargo, las dificultades de coordinación, de fondos para llevar a cabo el proyecto y, sobre todo, la reticencia a hacer público los datos históricos de forma unilateral por estas empresas, había dificultado avanzar al respecto. En el marco del LOPReS se lograron avances decisivos en todos estos frentes. En materia de financiamiento se obtuvo un fondo de la ANII, al tiempo que se llegó a un acuerdo marco con el ROPER Center para curar los datos y ofrecerlos en forma gratuita a investigadores, tomadores de decisiones públicas, estudiantes, periodistas y cualquier interesado que desde Uruguay acceda a través del portal de la propia ANII. La participación del ROPER Center fue clave para el logro de acuerdos preliminares con CIFRA y Opción para poder postular conjuntamente al fondo ANII.

El LOPReS ofreció a cada empresa participante la devolución de una base de datos longitudinal con todos sus propios datos. Esta base longitudinal, armonizada, no está disponible para el público en el ROPER Center, aunque largas series históricas y armonizadas pueden ser extraídas a partir de los datos que sí están disponibles [4]. Este punto fue clave en el acuerdo preliminar dado que generaba un bien a las empresas a cambio de sus datos. Como adelantáramos en la introducción, el curado de los datos por parte de las propias empresas era rudimentario, por lo que en todos los casos el uso de los propios datos históricos era o bien altamente costoso en términos de procesamiento, o directamente no posible. Por esto, este *quid-pro-quo* con las empresas consultoras fue un hito fundamental para poder llegar al acuerdo final.

El trabajo con los datos de CIFRA y Opción duró un año, en el que dos investigadores del LOPReS estuvieron abocados de forma exclusiva al proyecto. Los

4. Roper Center (2022). https://ropercenter.cornell.edu/public-opinion-polls-uruguay

datos finalmente disponibles corresponden a 253 encuestas de opinión pública en Uruguay, entre 1993 y 2020. La liberación de los datos tiene un *moving wall* (período entre realización y liberación) de 5 años. Es decir, deben pasar 5 años desde la realización de la encuesta hasta su liberación al público. Las encuestas incluyen preguntas sobre política nacional, evaluaciones económicas y políticas, opiniones sobre políticas públicas, variables de comportamiento electoral, variables sociodemográficas, entre otras. Las bases de datos no contienen ponderadores.

El impacto del proyecto a nivel nacional en términos de generación de un bien público para la academia y la política pública es importante. Como modo de valorarlo, el lector puede considerar que antes de hacer disponibles las bases de datos en el marco del proyecto LOPReS, Uruguay disponía de alrededor de 35 encuestas de opinión pública para el período entre 1995 y 2020, todas ellas elaboradas en el marco de proyectos internacionales comparados, como por ejemplo el Latinobarómetro, el Barómetro de las Américas y la Encuesta Mundial de Valores. Todas las anteriores son encuestas que, aunque tienen la ventaja comparada de hacerse en la región, no permiten contar con mediciones mensuales (como máximo tienen una frecuencia anual) y por un problema de espacio, cuentan con una variedad menor de temas y preguntas.

El desafío pendiente una vez finalizado el proyecto sigue siendo para Uruguay (y América Latina en general) poder contar con una encuesta regular de opinión pública que indague en forma permanente sobre preferencias de política pública, actitudes hacia partidos políticos, percepciones sobre el funcionamiento del país, etc., y al mismo tiempo incluya cuestiones coyunturales de la política nacional. Es necesario, como este proyecto lo atestigua, financiamiento y coordinación. Existen varios caminos a seguir de encuestas regulares en países como Estados Unidos o Reino Unido, pero es necesaria una alianza permanente entre estado y la academia, para contar con los fondos y el *expertise* necesarios para que un proyecto así pueda alimentar la investigación en el largo plazo.

LECCIONES APRENDIDAS

Acercamiento novedoso

La mayoría de las empresas encuestadoras que miden la opinión pública en Uruguay, y seguramente podemos decir lo mismo de otros países de la región, consideran relevante hacer públicos sus datos, saben que tienen un valor histórico muy grande, que no es privativo de quien los recolectó, y que le deben a los ciudadanos devolver esa información para que sea utilizada para mejorar la toma de decisiones de política pública y la investigación científica. Como dice Mariana Pomiés, directora de CIFRA «es importante que los tomadores de decisiones de

política pública puedan tomar decisiones con la foto de hoy, pero mirando la foto del pasado» (LOPReS, 2021). Adriana Raga, directora de Cifra resalta la importancia que tiene «para entender el mundo, el mundo está cambiando muy rápido, y si tenemos datos sobre más países podemos ir viendo quiénes cambian más y quiénes menos, y porqué» (LOPReS, 2021). Rafael Porzecanski, director de Opción, plantea que sumarse al proyecto les permite «ponerse a tiro con otros proyectos internacionales que tienen disponibles los microdatos» (LOPReS, 2021).

Sin embargo, la creación de un acervo público de datos de opinión pública suele ser una tarea muy costosa para las encuestadoras, ya que armonizar los datos que actualmente tienen en distintos formatos, o generar un archivo donde sea sencillo la identificación de preguntas y variables a través de los años, es un trabajo para el que necesitan muchos recursos, principalmente con los datos históricos. El costo no es la única barrera, también la desconfianza inhibe las buenas intenciones. Por un lado, las empresas encuestadoras suelen tener desconfianza de las críticas que puedan recibir a sus datos, por otro lado, desconfianza de perder el control sobre los datos que ellos recolectaron. La confianza que se pueda generar entre las empresas y quienes desde la academia se dedican a la investigación en opinión pública para generar un acervo público nacional es fundamental. En el caso de nuestro proyecto, la confianza entre el equipo de investigación y las empresas existía desde antes, fruto de años de trabajo en conjunto, colaborando en distintos proyectos.

También es necesaria la maduración de equipos académicos dentro de las universidades que se planteen hacer sinergia con las empresas encuestadoras, buscando fondos para el financiamiento de la construcción del acervo. LOPReS se benefició de la agregación e intercambio de ideas de investigadores del Departamento de Ciencias Sociales de UCU. Los vínculos internacionales que los equipos académicos ofrecen son cruciales. Las redes internacionales con investigadores de otras partes del mundo han sido centrales, principalmente con el Roper Center.

La Agencia Nacional de Investigación e Innovación (ANII) ha sido fundamental por el financiamiento al proceso de construcción del acervo público, ya que permitió destinar recursos a muchas horas de asistentes de investigación que trabajaron intensamente en la depuración, recuperación y armonización de las bases de datos para poder hacerlas públicas.

Generación de incentivos

Las barreras para la construcción del acervo público por parte de las encuestadoras, ya sea el alto costo como la desconfianza, tienen que ser derribadas. En la sección anterior describimos cómo la barrera del costo se elimina con financiamiento, y la de la desconfianza construyendo una red de colaboración. Sin embargo,

también generamos algunos incentivos positivos para estimular la participación en el proyecto.

El principal incentivo es realizar un trabajo que las propias empresas generalmente no tienen hecho: se le devolvió a cada empresa sus datos armonizados, lo cual les permite generar series de tiempo con datos individuales. Agustín Bonino, director de Opción, describe este incentivo de la siguiente manera: «es un valor agregado para las empresas que participamos porque nos hizo trabajar en una mayor sistematización de las bases de datos que muchas veces se van acumulando en la operativa, y adaptarnos a un proyecto de este tipo genera mayor estandarización; también genera un beneficio para la empresa» (LOPReS, 2021).

En segundo lugar, es revalorizar el trabajo que las empresas realizan y darles visibilidad como generadores de esta memoria histórica. Como dice Peter Enns, director del Roper Center, «es bueno para quienes recogieron los datos, pusieron un gran esfuerzo y tiempo en ello, y ahora su trabajo está disponible, los nombres de las organizaciones están disponibles, y la voz de la gente se mantiene viva» (LOPReS, 2021). Desde la creación del acervo, las encuestas de Cifra y Opción podrán ser usadas y citadas por todos quienes las consulten.

OPORTUNIDADES PARA LA INVESTIGACIÓN

La creación de un archivo nacional de opinión pública abre numerosas oportunidades para la producción académica en esta área. Describimos brevemente algunas de estas oportunidades para ilustrar el valor de la recuperación y el libre acceso a estos datos.

En primer lugar, los datos liberados por el proyecto permiten conocer actitudes y opiniones de los uruguayos respecto a una gran diversidad de temas de los que se contaba con nulos o casi nulos datos públicos. A modo de ejemplo, existen preguntas sobre distintos referéndums votados en el período, la política económica del gobierno, el desempeño de ministros, atributos de candidatos presidenciales y políticas públicas específicas.

Las preguntas sobre políticas públicas en concreto son una muestra del valor de estos datos. En la década de 1990 James Stimson creó el *Policy Mood*, una medida central en el estudio de la opinión pública estadounidense que sistematiza las preferencias por políticas públicas de los ciudadanos a lo largo de una dimensión (liberal-conservador o izquierda-derecha) y es fundamental para el estudio de la correspondencia entre las preferencias de los ciudadanos y las políticas públicas (Stimson, 2018). Esta medida se crea a partir de la opinión de los ciudadanos sobre distintas políticas públicas, y fue estimada casi exclusivamente para Estados Unidos y unos pocos países europeos debido a que necesita una importante cantidad de preguntas administradas de forma regular en el tiempo. Los datos liberados por

las consultoras Cifra y Opción fueron fundamentales para lograr una primera estimación del *Policy Mood* en Uruguay y una de las primeras en América Latina. Junto a los datos de proyectos de opinión pública regionales, se lograron encontrar 78 preguntas sobre preferencias por políticas públicas en Uruguay administradas 295 veces (Álvarez, Bogliaccini, Enns, Opertti, y Queirolo, 2021).

A su vez, estas preguntas están disponibles a nivel individual, lo que permite a los investigadores o interesados gran flexibilidad para desagregar las variables de interés por otras variables socio-demográficas o políticas, la creación de índices o la aplicación de técnicas estadísticas más sofisticadas.

En segundo lugar, la gran cantidad de encuestas y su asiduidad permiten construir series de tiempo de preguntas que fueron administradas regularmente. Algunos de los temas indagados de forma sistemática por las consultoras de opinión pública locales están presentes también en los proyectos de opinión pública internacionales, como percepciones sobre la economía, evaluación del desempeño del presidente o la intención de voto. En estos casos, los datos liberados permiten ampliar considerablemente estas series facilitando otros tipos de análisis. Por ejemplo, la serie de evaluación del presidente con acceso a microdatos disponible previo al proyecto —disponibles en Latinobarómetro y LAPOP— era de 29 encuestas, mientras que el archivo producto del proyecto agregó mas de 200 mediciones.

Asimismo, algunas de las preguntas regulares de las encuestas del archivo nacional de opinión pública son de particular valor al no ser preguntadas por las encuestas disponibles anteriormente —o al menos no de forma regular— como la popularidad de los líderes políticos locales, la identificación partidaria o la aprobación de jefes de gobierno subnacionales. Al hacer disponible datos sobre temas de los que previamente no se contaban —o solo de forma puntual— se abren nuevas agendas de investigación sobre la opinión pública uruguaya y permiten compararla con otros países de la región y el mundo.

REFLEXIONES FINALES

En esta nota hemos descrito el trabajo a partir del cual el LOPReS logró hacer disponible para investigadores, tomadores de decisiones de política pública y público en general datos de casi treinta años de opinión pública en Uruguay. La liberación de los microdatos de 235 encuestas fue producto de la conjunción entre el trabajo de académicos, empresas consultoras y el financiamiento público.

La experiencia del LOPReS muestra la relevancia de la coordinación entre los tres actores para conseguir el producto esperado. Primero, es importante contar con equipos académicos maduros, con trayectoria en el análisis de la opinión pública y con vínculos a nivel nacional e internacional que permitan la generación de acuerdos de trabajo. Segundo, la colaboración con el sector privado es posible en

la medida que se genere un vínculo explícito de confianza y se ofrezcan incentivos visibles. Los microdatos son el resultado de muchos años de trabajo por parte de las empresas consultoras, por lo que los equipos de investigación deben trasmitir la gran responsabilidad que implica hacer pública esa información. El financiamiento es el tercer elemento central. El trabajo de curación de datos históricos es largo y técnicamente complejo. Las agencias nacionales dedicadas al impulso de la investigación tienen el rol de generar instrumentos de apoyos específicos para mejorar las oportunidades de hacer disponibles estos datos. Sin este apoyo, estos tipos de proyectos no son posibles.

Los resultados del LOPReS sugiere que la apertura de esta información es de enorme potencial para las agendas de investigación en ciencias sociales y otras áreas. Los datos incluyen una enorme cantidad de temas no explorados hasta el momento. La liberación de microdatos, y su gran asiduidad, permiten a los investigadores aplicar otras técnicas más demandantes en datos que dan paso a una investigación en opinión pública rigurosa y diversa.

El proyecto relatado en esta nota no es una excepcionalidad uruguaya. Por el contrario, en América Latina ya existen equipos académicos capaces de implementar este tipo de iniciativas, empresas encuestadoras con años de trayectorias e instituciones financiadoras. Las bases para la construcción de más acervos históricos de datos de opinión pública ya existen. De aquí en adelante, resta diseñar las estrategias para lograrlo. El caso uruguayo es prueba de esto.

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RESEÑAS

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Carew Boulding and Claudio A. Holzner (2021). *Voice and Inequality: Poverty and Political Participation in Latin American Democracies*. New York: Oxford University Press, 2021. 244 pages. ISBN: 9780197542149. DOI: 10.1093/oso/9780197542149.001.0001

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There is so much to like about Voice and Inequality, an example of conscientious and systematic research looking at the level and factors that explain poor citizens' political participation in Latin America. Carew Boulding and Claudio A. Holzner embark in a detailed analysis to disentangle whether there is a gap in the level of political participation by different levels of wealth in the region and by types of participation. The contribution of this book is major: It shows that poor citizens tend sometimes to participate more than better off individuals, while it looks at contextual and individual factors that explain participation in a truly comparative enterprise. The theory and evidence presented advance our understanding of the way citizens participate in young and unequal democracies while providing a framework to study other regions of the world.

The book presents a comprehensive approach to the study of political participation. First, it looks at three different activities that citizens can engage in: voting, contacting government officials, and protesting. Secondly, it looks at a range of different factors that can explain different levels of political participation, both political and non-political. Thus, the theoretical framework builds on, and advances, key studies of political participation that had looked beyond politics to understand people's political engagement from a comparative perspective by seriously evaluating the impact of civil society in the health of citizens' participation (e.g., Verba et al., 1978). Moreover, the theory problematizes the effect of political parties in mobilizing voters by looking at the incentives these parties might have depending on their characteristics and context. Finally, the quality of democracy will influence people's ability to engage in politics, and it will be greater for those with less resources (i.e., poor citizens.)

Boulding and Holzner test their theory using data from the Latin American Public Opinion's (LAPOP) AmericasBarometer, a study that has been carrying out

surveys every two years in the Americas since 2004/05. The authors rely in surveys for 18 Latin American countries between 2006-2014 to evaluate patterns of political behavior among poor citizens and compare them to non-poor individuals.

The book not only contributes to the theoretical understanding of the topic, but it also advances methodological approaches to the study of participation. For example, the authors propose a statistical model of political participation that relies in a multi-level approach allowing to look at both individual and contextual characteristics. The authors run separate models for poor people differentiating the social process that poor and non-poor individuals go through their lives an approach that was firstly introduced by the analysis of gender differences in political participation (Burns et al., 2001). That method allows the researchers to test their argument by looking specifically at lower-income respondents and compare them with the rest of the sample, strengthening their conclusions.

A key issue is the differentiation of poor and non-poor citizens for the analysis. Boulding and Holzner discuss the inadequacy of relying on self-report income levels, as there are many respondents who do not answer the question or whose answer might not be accurate. Moreover, the poverty line might vary from country to country, so it is crucial to rely on a comparable measurement of poverty across the 18 polities. The authors take advantage of the surveys' inclusion on questions of asset ownership to calculate each respondents' wealth, based on an index developed by Abby Córdova (2009), and divide respondents in quintiles concentrating on the lowest quintile to understand the patterns of political participation of the poorest people in the region. The decision to focus on the lowest 20% of the population in terms of wealth is backed by reports from international organizations on the level of poverty through that period (i.e., World Bank). Moreover, limiting the analysis to the lowest quintile guarantees that the analysis captures people living in conditions of poverty across the region. The authors also run robustness checks by including either all the sample in the analysis or modifying the measure of poverty to include the bottom 40% respondents in terms of wealth.

Boulding and Holzner conceptualize political participation as «those activities that are intended to influence the selection of government officials and to influence the decisions and actions they take» (25). This definition allows them to look at voting and other activities, such as contacting politicians or government officials and protesting. As the authors explain the selection of types of participation is constrained by the survey instrument, as the questions had to appear in the questionnaire through the duration of the study. The study shows the importance of including diverse types of activities independently, as citizens face different obstacles and incentives to engage in each activity, as well as creating an index following the tradition of previous participation studies (i.e. Verba et al., 1995).

There are several important findings that advance the comparative research in political behavior, in general, and participation, in particular. For example, by

looking at types of participation and at the index a puzzle arises: poor people tend to participate at the same level or more than better off individuals, except for voting. Furthermore, poor people tend to contact more government officials and there is no difference in terms of the probability of protesting. The difference in voting behavior disappears when we consider potential clientelistic relationships. Latin America is a region where patron-client relations have been more the norm than the exception and it has been widely researched (e.g. Auyero, 2001; Gay, 1998; Hilgers, 2012; Magaloni, 2006; Nichter, 2018; Stokes et al., 2013; Szwarcberg, 2015, etc.) Voice and Inequality shows that clientelistic relations can have a positive outcome on poor individuals' engagement with politics, as they become socialized and learn how to contact government officials to solve their problems. In polities where electoral competition is high, clientelism can be beneficial for poor citizens as they have more bargaining power. Moreover, the survey evidence shows that clientelism not only reaches the 20% poorest individuals but those who in higher quintiles and sometimes the percentage of non-poor individuals who report being offered something in exchange for their vote is higher than among the poor (i.e., Chile, Costa Rica, Nicaragua, El Salvador, and Honduras.) This is a counterintuitive finding, as the literature general agreement is that the most likely targets of vote buying practices are the poor.

Boulding and Holzner problematize the approach to study the effect of political parties' mobilization efforts by considering that parties will mobilize poor voters if they have incentives to do so (i.e., stiff electoral competition) and the organizational capacity to do it. Moreover, the authors differentiate between mass-based and elitist parties and show that, regardless of the parties' ideologies, the former will tend to engage more often their supporters than the latter, which will engage them during elections. The impact of parties' mobilization strategies is stronger in cases where there is not compulsory vote. Therefore, the participation gap in terms of voting between the poor and the non-poor diminishes where elections are competitive and there is a presence of mass-based electoral parties, which have the networks and motivation to mobilize the support of the poorest in society. Parties work with community organizations, which are crucial to decrease the costs of engaging in politics by providing relevant political information to their members and serving as nodes of contact between candidates, parties and government officials.

There are two fascinating findings in term of ideology. First, the lack of relationship between social class and ideology as poor and non-poor respondents' ideological distribution is similar in terms of support for the right and left. The authors discuss the difficulties in measuring ideological preferences in the region (e.g., in some countries people could suffer tough repercussions if they supported the left, parties' ideological shift, etc.) in contrast with established democracies. Research has shown that it might be useful when studying Latin American to include other type of questions to organize voters ideologically, or to rescale the survey items, when

such questions are available in the survey (e.g., Saiegh, 2015; Zechmeister, 2006, etc.) This is a challenge for studies of ideology in developing democracies, where the meaning of labels are not widespread shared as in consolidated democracies.

Furthermore, the second intriguing ideological finding has to do with the left turn in Latin America since the late 1990's with the electoral triumph of Hugo Chávez in Venezuela. Previous research would expect that left-leaning governments might increase the level of participation of the poorest citizens. The problem with this expectation is that it is based in developed democracies, polities that count with established political party systems in which left parties tend to have strong connections to labor movements and unions.

The authors distinguish the Latin American political parties by ideology by using and updating the classification developed by Baker and Greene (2015) in which ideology goes from 1 (extreme left) to 20 (extreme right.) The authors classify the governing parties in the region in three categories: extreme left (1-4.9), moderate left (5-9.9), and right of center (10-20.) The findings are surprising, while poor people are more active in polities governed by a populist/radical-left party, better off individuals are also quite active, thus a gap remains related to wealth and political activities. The scenario for polities governed by left-center or right-center parties is the opposite, wealth is negatively correlated to levels of political participation.

Why is wealth and participation positively related in countries with a populist/radical-left government? The authors argue and show the effect of different factors to explain this finding. First, populist/radical-left parties tend to be more personalistic than mass-based. Second, in these countries the quality of democracy tends to diminish, which means a decrease in opportunities for citizens to organize and participate, an executive that has more unchecked power, as well as less competitive and regulated elections. In this scenario, the costs for the poor to participate increase, as the ability of community organizations to influence parties and the government decreases, political parties become weaker and have less incentives to mobilize the poor as elections are less competitive. In contrast, better off individuals have the resources to protest and vote in these regimes, which means that their participation is higher than that of the poor. It would be interesting to find out if there were any differences between moderate and extreme right parties, although the hypothesis was about left-wing parties. This research opens a new area to explore both the effects of ideology and party organization on citizens' political behavior.

This book is a must read for scholars of political behavior regardless of the region of interest. Even for researchers interested in developed democracies, this book debunks beliefs that used to be unquestioned, like the political apathy of the poor. The book shows that the poorest citizens can be more engaged in politics if the conditions are suitable. This book also warns about what can happen when popular, left-leaning politicians come into office and threaten democratic institutions

therefore potentially increasing the gap of political participation by wealth, as participation becomes more costly. The case of Mexico came into mind, as we can see many of the elements the authors find when populist/radical-left governments come into power. First, the new government came into office with a wide-spread support, as López Obrador received the most votes from each social class in comparison with his opponents (Aguilar, 2019). Second, we can see the weakening of political parties, weakening of democratic institutions, increase protests from better off citizens, etc. The framework of Voice and Inequality help us to understand what can happen and why it could happen in this case and others.

In sum, Carew Boulding and Claudio A. Holzner propose and evaluate a holistic theory of political participation focused on the poor, with the potential to apply it other segments of society. The authors carry out a meticulous and rigorous analysis to test their arguments, taking advantage of an ambitious public opinion project, the AmericasBarometer, to produce an outstanding piece of research. Voice and Inequality expands and challenges our knowledge of the relationship between the contextual and individual factors that explain the political participation of the poor while setting a high standard for research to come on the topic in the future.

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Daniela Campello and Cesar Zucco. *The Volatility Curse: Exogenous Shocks and Representation in Resource-Rich Democracies.* Cambridge: Cambridge University Press, 2021. 240 pages. ISBN: 978-1-108-84197-5.

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What is the impact of the world economy on democratic representation? In the global wave of economic openness over the last half century, international economic conditions have influenced both domestic economic factors —growth, employment rate, and inflation— and government's policies. Without exception, both developing and developed countries are affected by globalization, but developing countries with unstable economic structures and political institutions are more susceptible to international economic shocks. In this context, Campello and Zucco (2020) delve into how the exogenous economic factors are associated with presidents' success, focusing on Latin American democracies.

The central thesis of the book is that the efficacy of economic voting for producing better representation is limited in emerging democracies which are exposed to economic volatilities derived from global economic conditions. Specifically, when voters cast an economic vote, they ascribe *both* exogenous economic conditions *and* domestic economic performance to the incumbent's competence. This is because it is difficult for voters to evaluate the presidents' responsibility on the domestic economy while discounting international economic outcomes beyond the government's control. The authors refer to this as the «volatility curse» — the incapacity to judge and compare of government's capacity on the basis of the economy.

To examine propositions derived from this theoretical puzzle, Campello and Zucco (2020) rely on commodity prices and international interest rates as key indicators of exogenous economic fluctuation. To be specific, incumbents get rewarded based on luck, not merit, amid a good world economy—high commodity prices and low international interest rates. Economic voting, thus, might be an unprofitable instrument for ensuring electoral accountability in emerged democracies with volatile economic structure derived by exogenous economic shocks and weak political institutions.

In the following session, I review how Campello and Zucco (2020) conceive of the relationship between economic volatility, citizen's capacity, and presidents' success, briefly summarizing each chapter. Since the authors develop a multi-pronged research design based on distinct indictors that show the exogenous economic fluctuation, in turn examining their hypotheses via different dependent variables, methods, and datasets in each chapter, it is worth noting the diverse strategies and implications of each chapter. In addition, by discussing each chapter, we can identify factors that should be part of the future research on economic voting in developing countries.

First, Campello and Zucco build on extant critiques that suggest economic voting as a typical tool for achieving representation has key limitations in developing countries (4). Hitherto most of theorizing about the link between economic performance and incumbent support considers four discrete dimensions: sociotropic (Kinder & Kiewiet, 1979, 1981; Lewis-Beck, 1986, 1990) or egocentric, which reflect the types of economic conditions that voters consider; and retrospective or prospective (Lewis-Beck & Paldam, 2000; Nannestad & Paldam, 1994), which deal with the temporal reference point of voters' economic evaluations, past or future. The previous studies mentioned above mainly take account of developed countries with stable domestic economic structures and robust political institutions. Some recent studies assert that economic voting in developing countries is conditioned on aspects of the political and economic contexts (Carlin et al., 2018; Singer, 2013; Singer & Carlin, 2013).

In addition to critiquing existing economic voting models, Campello and Zucco pay more attention to the quality of economic voting, emphasizing the public's capacity to evaluate presidents' competence. In chapter 2, the authors argue that economic vote is ineffective as an instrument to sanction and select the governments in developing democracies where exogenous shocks, not policymaking, play an essential role in the determinants of public welfare. Even if exogenous shocks are far more relevant to public welfare than government policies, economic voting in such contexts rewards the incumbent based on other factors at work rather than on any result of government action. Ultimately, the more volatility exogenous shocks have on voter welfare, the noisier the heuristics derived from economic outcomes become, and the less capacity voters to evaluate incumbent competency. Overall, this weakens the quality of representation.

In chapter 3, the authors test several observable implications of their theory. They begin by showing that the fluctuation of trade and net financial flows is associated with domestic economic growth (55-56), which affects citizen welfare through direct —employment rate and wages— and indirect —fiscal policies— mechanisms (53). Next, they show that the volatility of economic growth rates in Latin America was higher than that of developed democracies over the forty-year period (57-60). Lastly, they demonstrate that economic voting is not contingent on the levels of exposure to exogenous shocks. Thus, even under the conditions

that world economy noise blurs the relationship between public welfare and government policy, voters in Latin American democracies cast an economic vote, taking into account domestic economic growth (65-68). Regardless of why domestic economy behaves as it does, economic growth rates remain positively related to incumbent reelection.

The authors introduce a novel measure of exogenous economic shocks, the 'good economic times' (GET) index in chapter 4. Its two indicators— commodity prices and international interest rates —are both beyond leaders' control and, thus, plausibly exogenous from any action of developing countries. The major analytic advantage of the GET index is that it allows the authors to avoiding endogeneity issues and to better establish causality between world economy and presidents' success. Furthermore, since raw materials exports play a critical role in economic structure in Latin American countries with abundant resources, the fluctuation of commodity prices and international interest rates captured by the GET index are directly associated with economic growth. That is, economic growth of many Latin-American democracies is consistent with high commodity prices and low international interest rates. In this regard, using GET index as a proxy for exogenous economic conditions to support the thesis —that fluctuation in the global economy prompts the volatility of domestic economics, which affects citizens' assessment of the incumbent— is reasonable.

However, since each country has different economic structures, commodity prices and international interest rates do have not identical effects across all Latin American economies (81). To overcome the limits derived from various economic structures by countries and verify the effects of exogenous conditions that GET captures on domestic economic growth, the authors mainly focus on 'low-saving-commodity-exports' (LSCE) countries. Countries classified as LSCE serve as commodity exporters, furthermore, receive substantial financial inflows, which bear on commodity prices (82). In order to define LSCE economies, the authors use two indicators: the share of commodity exports of the total value of exports; and yearly debt service obligations divided by the total value of exports (84).

Although it is reasonable to examine the economic structure of Latin American countries based on these two indicators, classification of LSCE economies raises doubts about the criteria. That is, the criteria upon which the countries were designated LSCE economies are ambiguous (see the shaded area of Figure 4.2, page 85). For instance, as the authors noted in the book, Paraguay was excluded from LSCE economies because commodity exports account for an absolute share of total exports, but international interest rates hardly affect the domestic economy (84). On the other hand, Brazil and Uruguay, where commodities and debt services respectively account for about 0.4 of total exports, are designated as LSCE countries (85). By further clarifying the proportion of commodities and debt service in total exports, arbitrariness in defining LSCE countries can be reduced.

Besides, Campello and Zucco tried to depart from the critiques in terms of economic transition (Carlin & Hellwig, 2020) by examining the trait that the economic structure related to the way of integration into the global economy is a long-term process (85-86). According to the authors, countries called the maquila economic model, which seek to attract foreign investment, maintained this economic structure since early democratic periods. The maquila economies have not transitioned toward LSCE economies over several decades. On the other hand, considering the variation over time indicated in Figure 4.2, some countries in LSCE economies —Brazil, Argentina, Chile, and Peru— could possibility to fall in the maquila model economies in accordance with the criteria. To designate LSCE countries as static indicator, it is necessary to consider other factors which affect economic structures or explain the criteria—a merged ratio between debt service of total exports and share of commodity exports.

On the basis of several observations and GET index, Campello and Zucco established intriguing causal relationships between the world economy and presidents' success. They argue that exogenous conditions captured by GET affect the economic outcomes of LSCE countries, which in turn affect the incumbent success. To the extent that this argument is general, it should extend beyond elections to presidential popularity. To support these claims, the authors examine hypotheses by using the GET index as the key explanatory variable in a model predicting reelection, in chapter 5, and presidential popularity, in chapter 6.

The model in chapter 5 tests the hypothesis that GET has a positive influence on the probability that the incumbent is reelected or that the candidate supported by the incumbent president is elected, controlling for the ideology of the outgoing government, reelection rules, and political risk. As a main result, they find that GET has the expected impact: electoral success was higher during periods when commodity prices were high and international interest rates were low under the opposite conditions. In chapter 6, the authors examine the proposition that presidents who govern during beneficial world economic conditions are much more popular than those in office during bad times while controlling honeymoon, lame-duck, and democratic transition periods. Their analyses revealed that, on average, GET plays a positive role in presidential popularity across LSCE economies. A closer look at the results by country shows that exogenous factors do not affect presidential popularity as anticipated in Chile and that, in Peru, short-term effects are insignificant. Authors explore these two anomalous results in short case studies.

This research design, which mainly focuses on the relationship between the total effect of GET and presidents' success, brings about some questions. First, I have doubts about the assumption on which the theory is based; «the variance of other relevant factors —among them government policies— be similar across countries (53).» According to figure 6.6 (160), the countercyclical fiscal rules of Chile successfully relieve the exogenous shock caused by boom-and-bust cycle.

Most LSCE countries, such as Chile, might have adopted policies, regulations, or laws appropriate to their economic structure to alleviate the impact of the international economy, but may not have effectively buffered the fluctuation of the world economy. Differences in the effectiveness of fiscal, redistribution, and financial policies between countries might lead to deviation in the level of the total effect of exogenous fluctuation on presidents' success. Thus, subsequent research needs to examine the role of governments' policies between the exogenous economic shock and presidents' success.

In a similar vein, I question why the authors do not take economic policies into account as another determinant of presidents' success. The government's response to international economic conditions via economic policy might be another determinant of presidents' success (Zucco & Campello, 2020, p. 804). It is questionable that a simple estimation of the impact of GET on reelection and presidential popularity would capture the influence of this factor as well. For instance, in the 1990s several Latin American countries implemented tariff-equilibrium (or export subsidization), but had widely different results due to differences in the consistency of policy implementation, government regime, and predictability of policy (Rodrik, 1995). Therefore, to examine strictly the overall effect of GET on presidents' success, it would seem necessary to control for this alternative path as an intervening factor, or to include the interaction between domestic economic volatility and economic policies derived from the fluctuation of the world economy in the analysis.

In the previous chapters, Campello and Zucco verified that exogenous economic factors beyond the governments' control influence the public's evaluation of the president. Chapter 7 explores the determinants of misattribution that occurs when citizens do not discount exogenous shocks. According to their argument, voters have little ability to access accurate information that allows them to identify exogenous shocks, thereby misattributing responsibility for domestic economic outcomes. To support the claims, the authors conducted survey experiments in Brazil and Ecuador. In both countries respondents got information about the country's relative economic performance and the impact of oil or commodities prices fluctuation. As a result, citizens' misattribution is caused by not only information access problems but also by prior knowledge and preference of presidents. In particular, sophisticated voters take into account knowledge on relative performances in previous years prior to evaluating economic performance on the basis of information (177-178). Besides, negative sentiment of Brazilian president Lula has an influence on voters' misattribution on economic performance (190).

Furthermore, in chapter 8, the authors investigated the incumbent leaders' behavior influenced by voters' misattribution. According to their tests, unlike voters, incumbent leaders are aware of the impact of exogenous conditions on domestic economic outcomes; in turn, they can predict competitiveness in the subsequent elections. Thus, the authors suggest that the high certainty of the election results

might lead presidents to neglect to maximize public welfare, which could lead to increased corruption and resource wastage.

The findings in chapter 7 —evaluations of responsibility for economic outcomes pertain to the level of information access, affective judgement, and the level of political sophistication— indicate the necessity to take account of economic policies as a response to exogenous shocks in research design. This is because the factors that drive the misattribution of responsibility for economic outcomes are also related to assessing the accountability and capability of government economic policies. Besides, as argued in chapter 8, to verify whether the high certainty of election results is significantly related to public welfare or redistribution policy, the government's ideology should be considered as well.

This brief review does not contemplate all the many theoretical and methodological contributions of the book, and furthermore, the issue I have raised in this review do not unduly undermine these contributions. Clearly, Campello and Zucco have extended and enriched the study of economic voting by exploring the 'volatility curse.' The notion that unpredictable exogenous conditions grant good luck to incompetent incumbents demands more attention as economic voting studies continue to expand beyond their origins in the United States and Europe. Thanks to Campello and Zucco's creative measure of exogenous economic conditions, scholars can begin this work immediately. In all, by focusing our attention on the quality of economic voting, this book should come to play an essential role in theories of voting behavior, presidential popularity, and Latin American politics.

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