MACROECONOMIC PERFORMANCE AND PRESIDENTIAL APPROVAL: AN ESTIMATOR OF THE POPULARITY FUNCTION FOR BRAZIL

Natália Rodrigues Corado[1]
Geovana Lorena Bertussi[2]
Luis Guilherme Alho Batista[3]

Abstract: This work intended to investigate how economic variables can affect citizens' perceptions of a chief of state's performance. The chosen approach assumed the form of an econometric model designed to serve as a popularity function for Brazil covering the period extending from 1995 to 2019. The results of this empirical analysis substantiate that people's approval of a government are sensitive to variations of the unemployment and inflation rates. This work provided contribution to the literature by virtue of comprising the longest period ever analyzed in works of this kind for Brazil. Moreover, it was also the first time that the impeachment of ex-president Dilma Rousseff was included in an estimation of a popularity function for Brazil. The results obtained revealed that the event exerted a significant impact on Dilma's rate of approval among Brazilian citizens.

Keywords: Popularity Function; Presidential Popularity; Macroeconomic Performance; Unemployment Rate; Inflation Rate.

1 Introduction

The individual citizen has little incentive to be fully informed on the complexity underlying the evolution of a country's main economic variables (FREY; SCHNEIDER, 1978). Consequently, he/she assumes the government has the responsibility and ability to control the economic outcomes and thus holds the President responsible for the economic environment (NANNESTED; PALDAM, 1994). This notion is known as the accountability hypothesis, and it comprises the idea that voters punish or reward presidents for a country's economic performance, both in terms of votes and popularity (EVANS; PICKUP, 2010). Therefore, this study aims to verify whether the accountability hypothesis is appropriate for the Brazilian case when analyzing the approval rate enjoyed by the President of the Republic as the dependent variable.

In Brazil, the literature focuses primarily on electoral outcomes, but very few studies aim to model a popularity function for the country. Thus, this study aims to estimate the impact of important macroeconomic variables on the population's government approval. In addition, the

[1] Economist from the University of Brasília (UnB), Master's degree student in Economics at PUC/RJ. E-mail: corado.natalia@gmail.com and ORCID ID https://orcid.org/0000-0002-8225-4615.

[2] Doctor in Economics from the University of Brasília (UnB), Associate Professor at the Economics Department at UnB. E-mail: geovanalorena@unb.br and ORCID ID https://orcid.org/0000-0001-5929-2536.

[3] Master in Economic Development from the Federal University of Paraná (UFPR), substitute professor at the Department of Statistics at UnB. E-mail: lgabatista@gmail.com and ORCID ID https://orcid.org/0000-0002-8067-9185.

article clarifies how Brazilians, on average, punish their leaders for variations in macroeconomic indicators since it covers the most significant number of presidential terms - due to the natural advantage of being a more recent test - and uses data from three different research institutes. The model, estimated for the FHC, Lula, Dilma, Temer, and Bolsonaro governments, also benefited from including control variables for characteristics inherent to the leader, political scandals, and the so-called "*honeymoon* effect".

In addition to the introduction, this study comprises three other sections. Section 2 reviews the literature dealing with how economic conditions influence voting and, especially, popular approval. Section 3 structures itself around the methods and procedures used for empirical estimation and, finally, section 4 presents the results obtained.

2 Literature Review

2.1 The influence of economic factors on voting for President

The perception that current economic conditions observed by voters can influence their political preferences is entrenched. This simple hypothesis that macroeconomic context influences voting behavior - as well as appearing to integrate the reaction function of politicians - has been tested in light of numerous distinct specifications. However, although diverse, the literature that models electoral choice based on economic performance is consistent in arguing that the voter, when deciding for the continuity of the incumbent or for one of his/her opponents, looks at the country's recent economic performance to build expectations regarding the different candidates. These voters are primarily self-interested and relatively well-informed (FAIR, 1978), and, according to Evans and Pickup (2010), the conventional view holds that, through a desire for accountability, they punish or reward incumbents over their economic performance.

This theory of electoral behavior finds its most prominent resonance in the pioneering article by Kramer (1971), who - from a multivariate time-series analysis for the United States - concluded that decreases in real output imply a decrease in votes for the incumbent President's party, while income growth drives an increase in the number of votes. Kramer's model follows the notion that voting represents a rational decision between alternatives based on relatively costly information to acquire but possible. Therefore, voter behavior is, at least in part, the result of objective economic outcomes under the incumbent party's management and not just the product of loyalties, campaign rhetoric, or *marketing*.

Despite the difficulty presented by the small number of observations, a portion of the literature finds significant results for the causal relationship between economic perceptions - notably, output growth - and voting behavior. For example, Lewis-Beck and Stegmaier (2007)

have cataloged more than 400 studies sharing this conception.[4]. Stigler (1973) is one of the few dissenting voices and concludes that real income does not influence voter choice, even though rising inflation relates negatively to the share of votes garnered by the incumbent President. However, Bloom and Price (1975) argue that problems in his methodology can explain the contradictory result found by Stigler. The author considers only current economic conditions (or with very little *lag*) as a basis for evaluation.

Despite the relative consensus, Bloom and Price (1975) conclude that we need to distinguish the effect of recessions from that of economic upturns. Macroeconomic indicators would play a minor role in the distribution of votes in cycles of prosperity. In these periods, the macroeconomic context's impact would be dominated by more eminently political issues, in particular, party identification. Furthermore, the authors argue that recessionary cycles are not faced with the same level of criticism uniformly. In other words, unsuccessful economic policies are more decisive for independent voters or voters with weak party identification.

Finally, although the United States is the primary setting for this type of testing, Lewis-Beck-Stegmaier (2008) examined the literature for economic voting in Eastern Europe, Latin America, Asia, and Africa. The authors' thorough literature review concludes that economic indicators affect voters' decisions, despite the recent nature of democracy in many of the countries in these regions. Cerda and Vergara (2007) derived, for Chile, evidence that there is a relationship between the increase in unemployment and the decrease in the share of votes for the candidate running for reelection. This relationship has also been tested for Peru (Weyland, 2000; Echegaray, 2005), Poland (Bell, 1997), and Russia (Kim and Sidorenko-Stephenson, 1999). Pacek and Radcliff (1995) also adopted a *cross-national* approach to investigate whether economic issues impact electoral outcomes in eight countries: Botswana, Costa Rica, India, Jamaica, Sri Lanka, Trinidad and Tobago, Uruguay, and Venezuela. The authors find that the economic performance effect is more relevant in positive cycles for this group of countries.

2.2 The influence of economic factors on the presidential approval rate

For the United States, Fox and Phillips (2003) analyze fourteen presidential elections and conclude that the correlation between popularity in the months before the election and votes directed to the incumbent is 79%. Furthermore, the impact of popularity on votes for the incumbent President is statistically significant at 1%. Moreover, literature traditionally approximates the concepts of vote and popularity according to the Accountability Hypothesis, which states that voters hold the government responsible for the economic situation and, consequently, reward - in terms of popularity and votes - the management that responds to their preferences (NANNESTAD; PALDAM, 1994).

[4] McRae(1977), Kiewit (1981), Peltzman (1990), Fox and Phillips (2003) are some of those who support this causality.

However, despite the conceptual similarity, Chappel (1990) sets the trend by stating that one should be careful when treating popularity function and voting function as synonyms. Nevertheless, the author concludes that their responses to some macroeconomic indicators differ significantly: while real GDP is the main variable affecting votes, popularity is primarily influenced by the inflation rate. Moreover, besides price level variation, another variable with high explanatory power for popularity variations is unemployment (FOX, 1997) (SMYTH et al; 1991) (GARMAN; RICHARD, 1989) (GOODHART; BHANSALI, 1970). Behind this empirical difference lies the idea that analyses of popularity are usually anchored in the theory of political business cycles and thus emphasize the short-term *trade-off* between unemployment and inflation (FOX; PHILLIPS, 2003).

In reviewing the specialized literature, Nannestad and Paldam (1994) point out that popularity functions present better adequacy to the data (in the form of R^2) than voting functions. We can consider popularity ratings more spontaneous since they do not reflect a choice between alternatives but rather an evaluation at a certain point in time. Furthermore, the authors argue that it is much less risky to send signals through polls than through voting, which may also elucidate opinion polls' myopic and volatile nature. However, we must consider that the significantly larger number of observations helps explain the better fitting of popularity ratings to the individuals' political behavior.

By using public opinion data collected monthly or quarterly, the popularity analysis strand allows a deeper and more dynamic analysis of the approval experienced by chief executives. Through analyzing 292 monthly presidential evaluation polls for the United States, Mueller (1970) introduces the popularity function. Using a multiple regression covering data over 24 years, he established variables that would become widespread tools for controlling political factors in research focusing on the effects of macroeconomic variables on presidential approval. These include what he calls the "coalition of the minorities": a president's popularity is expected to show a downward trend as he is forced to act on sensitive issues. Following Mueller's work (1970), it has become customary for *papers* of the genre to control for periods of war, widespread political scandals, and the ruler's personal charisma.

Almost simultaneously, Goodhart and Bhansali (1970) formulate a popularity function for the United Kingdom prime minister's office. Their empirical tests conclude that, in the country, a political party that aims to maximize its approval rate in the polls should seek to position the economy at a point on the Phillips Curve that combines a reasonably low unemployment rate and a relatively high inflation rate. However, once society perceived the rising inflation, the Phillips Curve would tend to shift. Finally, like Mueller (1970), the authors create *dummies* for each President to test whether a leader's personal charisma affects the popularity of his/her party and find small but significant effects.

The two articles mentioned above have paved the way for vast and diverse literature on

the effects of economic variables on government approval. However, Hibbs (1982) breaks new ground technically by formulating - using probit and logit estimation methods - a capital adjustment model applicable to Germany, the United States, and the United Kingdom. In this model, the government's popularity consists of capital stock that depreciates over time under the influence of political and economic events. Following the research area's consensus, Hibbs finds inflation and unemployment to be particularly important variables in explaining variations in popularity.

Macroeconomic effects on presidential approval have been tested for a wide variety of countries and reach statistical significance for most established democracies. For example, Anderson (1995) analyzes five Western European democracies - France, the United Kingdom, Denmark, the Netherlands, and Germany - and testifies that these countries' monthly popularity data are sensitive to the macroeconomic environment. Studies have also been conducted for Italy (Santagata, 1985; Bellucci, 1991) and Spain (Amor Bravo, 1985). Chappel and Veiga (2000) analyzed thirteen developed countries, including Finland, Belgium, Austria, and Denmark.

The literature has produced a considerable number of articles indicating that recent democracies also hold their chief executives accountable for macroeconomic performance. Among the countries subjected to this type of analysis, we can mention Russia (Hesli and Bashkirova, 2001), Argentina (Canton and Jorrat, 2002), Peru (Arce, 2003), Mexico (Buendía, 1996), and Hungary (Fidrmuc, 2000). In addition, Tucker (2001) tests the effect of the economic conditions on approval for former socialist republics: Russia, Poland, Hungary, Slovakia, and the Czech Republic. Finally, in the Brazilian case, Ferreira and Sakurai (2013) conducted an empirical study and found that in both the FHC and Lula administrations, unemployment had a significant influence on fluctuations in presidential approval ratings.

Not only does one observe variety in the countries tested, but also a wide spectrum of variables included in the popularity functions. These, however, presented a lower explanatory power than unemployment, inflation, and even output. McAvoy (2006) introduces foreign policy as an independent variable and finds that it has a greater impact in some periods than others, while economic indicators consistently affect public opinion polls. Geys and Vermeir (2008) estimate the effect of tax burden and changes in tax structure and find that tax policy seems to have influenced the evaluations in the United States. Consumption (Frey and Schneider, 1978), trade balance (Burden and Mughan, 2003), and stock market (Shah and Watts, 2012; Fauvelle-Aymar and Stegmaier 2003) were also tested. However, adding variables that have only recently begun to be measured systematically can increase the popularity function's instability (BELLUCCI; LEWIS-BECK, 2011).

Another interesting result shared by many is the public opinion asymmetry. Mueller (1970) states that individuals tend to punish heads of state for bad economic policy decisions,

but there is no equivalent tendency to reward them for good decisions. The idea that negative economic performance impacts more than positive economic performance has found support in further research. Lau (1985) provides a possible explanation: people are more strongly motivated to avoid costs than pursue gains. In addition, negative news holds more appeal to the public. Soroka (2006) investigates, using an *autoregressive distributed lag* (ADL) model, that the mass media respond asymmetrically to economic information and, consequently, so does the public.

Moreover, voters do not respond homogeneously to the macroeconomic environment. Individuals' responses - on the contrary - tend to vary significantly due to their party affiliations, which reflect different perceptions and interpretations of relevant economic events (HIBBS, 1982). For example, Fox and Phillips (2003) found that in the United States, unemployment seems to have a stronger influence on voter behavior in Democrat administrations. Whereas under Republican management, voters exhibit a relatively more inflation-averse behavior. Furthermore, Kirchgassner (1991) supports with empirical evidence the idea that individuals who voted for the incumbent President tend to have, *ceteris paribus*, a more positive perception of the economic arrangement than individuals who voted for opposition candidates.

2.3 Theory of Political Cycles and the myopic electorate

Given that the individual citizen has little incentive to be fully informed regarding underlying economic conditions beyond the ruler's control, he/she holds the government responsible for the outcomes and assumes that the government can control macroeconomic variables. Voters' opinions translate into votes at the ballot box - whether they are satisfied with their performances - and, in this way, the government reacts to changes in popularity ratings since these represent indicators of potential future electoral outcomes (FREY; SCHNEIDER, 1978). Popularity is still of great relevance to a president since his/her evaluation in the public eye is strategically important for maintaining his/her power (NEUSTADT, 1960). Edwards (1980) quantitatively reinforces this notion by indicating that in the United States, variations in congressional support for a president are systematically influenced by popularity polls.

Given that public opinion matters to the ruler, they consider it when designing economic policies. According to Frey and Schneider (1978), when the President is concerned with the outcome at the ballots, he/she tends to strive towards exerting influence on the economy in the pre-election period to maximize his/her reelection chances. This idea finds its origin in the Theory of Political Cycles established by Nordhaus (1975), anchored on the Phillips Curve. Thus, the government stimulates aggregate demand before the elections to exploit the decrease in unemployment at the expense of a small rise in inflation. However, after the election period, inflation expectations solidify, and the ruler needs to implement contractionary policies to curb rising prices.

MacRae (1977) demonstrates that - provided the government presents vote-losing minimizing behavior when faced with a dynamic *trade-off* between inflation and unemployment - there is potential for the presence of a politically motivated business cycle in a democratic society. However, the author emphasizes that this business cycle can only be sustained if the electorate is said to be myopic. A myopic electorate forms its evaluations of a government's performance based only on recent events. Therefore, they would not be able to present a prospective vision, that is, to perceive the consequences of current economic policies (CHAPPELL, 1983).

Articles have already tested the hypothesis that voters are *forward-looking*. They consider expected inflation and unemployment (SMYTH et al, 1994) (CHAPELL, 1983). Rogoff and Sibert (1988) go further by incorporating the rational expectations hypothesis and analyzing unemployment and inflation as the driving variables of policy cycles. However, while reviewing over 400 articles in the economic voting and popularity literature, Lewis-Beck and Stegmaier (2013) conclude that most present voters as myopic, with typical one-year memories. Nevertheless, the prevalence of articles that model naive voters does not allow us to definitively reject the sophisticated voter hypothesis.

3 Methods and Procedures

3.1 Obtaining the data and defining the variables

This study aims to estimate a popularity function for Brazil for the period from 1995 to 2019. For that purpose, it establishes the presidential approval rate as the dependent variable and, as explanatory variables, it adopts unemployment, inflation, "*honeymoon* effect", "mensalão scandal", "*impeachment* of President Dilma Rousseff", and *dummies* for each term of office. We collected the President's approval rate data from three institutions: Datafolha, Ibope, and CNT. These institutions ask respondents to evaluate the President's performance as i) excellent/good, ii) regular, or iii) bad/terrible. As Ferreira, Oliveira, and Sakurai (2011) did, we defined the approval considered in this study as the sum of the concepts excellent/good and regular.

Despite using three different sources, this type of study for Brazil faces a scarcity of observations. Only one of these institutes - Ibope - conducts its surveys regularly. Then, for each month, we calculated the average approval rates obtained by the three institutes and, for the months in which none of them conducted surveys, we carried out linear[5] interpolation to fill

[5] We performed the linear interpolation in the R software using the na.approx() function. This type of interpolation is described as:

$y = y + k(x + x_1)$, where $k = (y_2 – y_1)/ (x_2 – x_1)$; x_{12} and $y_1<y<y_2$.

In the formula, y is the interpolated value, and x is the point in time of the interpolated value. In turn, y_1 and x_1 are the coordinates of the gap start point, and y_2 and x_2 are the coordinates of the gap endpoint (Junninen et al, 2004).

in the missing values.

After reviewing nearly 25 years of the fruitful literature on the voting function and popularity function, Lewis-Beck and Stegmaier (2013) state that the most relevant economic variables for this type of model are unemployment and inflation, which the authors call "the big two". Thus, it was opted to adopt unemployment and inflation (measured by the National Consumer Price Index - IPCA) as the model's explanatory economic variables. The unemployment rate (IBGE, 2019) and IPCA (IBGE, 2019) historical series have monthly periodicity and extend from December 1994 to October 2019, totaling 299 observations.

As mentioned in section 2, most studies of this kind model the electorate as myopic: they form their evaluations of a government's performance based only on recent events. This study will follow the specialized literature consensus and adopt this hypothesis. We also made this decision due to the inexistence of expectational data for the unemployment rate in Brazil. Therefore, we included the economic variables in the model with a one-month lag.

The "*honeymoon effect*" is understood as the initial period of government in which the President, theoretically, would enjoy greater goodwill from the electorate and, therefore, would have better acceptance for his/her decisions (GEYS; VERMEIR, 2007). As defined by Carrión (1998), Fox and Phillips (2003), and Enkelmann (2012), the *honeymoon* variable indicates the value 12 for the first month of the first year in office and decreases until indicating the number 1 for the twelfth month. For all other years in office, it assumes a value of 0. It should be noted that, after testing different specifications for the variable, we decided to insert the *honeymoon* effect only for the first terms of each President. This decision finds resonance with the perception that a ruler begins a second term with an approval legacy from the previous term, which generally, in the analyzed period, eroded the ruler's political capital.

Mueller's (1970) seminal paper established guidelines for estimating popularity functions. Among the most widespread[6], we can point to the use of *dummies* to control the idiosyncratic characteristics of each ruler, which the author calls "personal charisma". Ferreira and Sakurai (2013) used *dummies* for the FHC administration and the Lula administration in their model for the Brazilian case. Following this already established trend in the specialized literature, we also inserted *dummies* for each chief executive.

Finally, we also chose to control for primarily political factors of wide repercussion and with possible impact on the presidential approval rate: the Mensalão scandal and the *impeachment* of Dilma Rousseff. This decision was influenced by Hibbs' (1982), and Chappel's (1990) studies for the United States, which included control variables for the Vietnam War and the Watergate scandal in their estimations. The variable used to represent the Mensalão was defined as a *dummy* that takes the value 1 from May to December 2005 and 0 for all other

[6] Fox and Phillips (2002), Geys and Vermeir (2008), and Chappel (1990) are other studies that have used variables of this type in the specification of their models.

months. According to Luís Felipe Miguel (2007), during these eight months, Mensalão received the most coverage in the Brazilian media. From 2006 on, the political crisis no longer dominated the editorials, and the media attention to the scandal cooled down. To define the variable representing the *impeachment* of Dilma Rousseff, we included a *dummy* with a value of 1 for the months from December 2015 to April 2016. December 2015 represented the beginning of the Chamber of Deputies process (G1, 2015), and April 2016 comprised the last full month of the former President at the head of the Brazilian Executive (G1, 2016). We selected these two political episodes because of their wide repercussion and importance for Brazil's recent history.

3.2 Estimated model

Accordingly, we estimated the following model using the Ordinary Least Squares Method (OLS):

$$ap_t = \beta_0 + \beta_1\, desemp_{t-1} + \beta_2\, IPCA_{t-1} + \beta_3\, dummy_{FHC} + \beta_4\, dummy_{LULA} + \beta_5\, dummy_{DILMA} + \beta_6\, dummy_{TEMER} + \beta_7\, honeymoon + \beta_8\, mensalão + \beta_9\, impeachment + u_t$$

The President's approval rate gives the dependent variable observed monthly and represented by ap_t. We lagged the variables for unemployment and inflation (IPCA) to support the myopic electorate hypothesis, and $desemp_{t-1}$ and $IPCA_{t-1}$ represent them. We omitted the *dummy* variable for the Bolsonaro government because we defined it as the reference *dummy* for the representation of presidential terms.

4 Results and Discussion

Table 1 shows the results. The economic variables presented the expected signs according to the literature exposed in section 2. The negative and statistically significant at 1% coefficients on unemployment and inflation are in line with that examined by Lewis-Beck and Stegmaier (2013) in nearly 400 papers on the subject for various countries.

The "*honeymoon*" variable presented statistical significance and positive sign, a conclusion also obtained by Geys and Vermeir (2008) and by Fox and Phillips (2003) in estimations for the United States. Among the *dummies* inserted in the model to control for each ruler's personal and idiosyncratic characteristics, only those referring to the Lula and Temer administrations proved to be significant. However, only President Lula seems to have enjoyed an increase in approval due to his terms in office's characteristics. President Temer's approval rating decreased due to the government's characteristics compared to the Bolsonaro administration, defined as the reference *dummy*.

The mensalão variable failed to reveal statistical significance, which coincides with the Datafolha institute's perception that the scandal did not materially damage former President

Lula's popularity (DATAFOLHA, 2005). Pedro Mundim (2014) attributes the maintenance of Lula's approval during the Mensalão scandal to the economy's good performance and the income transfer programs, expanded and updated at that time.

However, the *impeachment* process faced by Dilma Rousseff had a deleterious effect on the former President's popularity since the coefficient for this process presented a negative sign and significance at 1%. It is this political event's first inclusion in the estimation of a popularity function for Brazil, and the fact that the coefficient reached statistical significance corroborates the importance this process has for recent political history.

Table 1 – Model Estimation

Dependent Variable: Approval Rate		
Explanatory Variable	**Estimated Coefficient**	**Standard Error**
Inflation	-5.2***	1.4
Unemployment	-4.9***	0.4
FHC Dummy	-5.8	4.2
Lula Dummy	17.6***	3.8
Dilma Dummy	-5.1	4.4
Temer Dummy	-19.6***	3.6
Honeymoon	1.5***	0.2
Mensalão	-3.4	3.7
Impeachment	-19.8***	4.9
Constant	111.2***	5.9
Observations	299	
R2	0.8	
Adjusted R2	0.8	
*Note: *p<0.1; **p<0.05; ***p<0.01*		

Source: Own elaboration.

5 Conclusion

A government's approval rate represents an indicator of potential future electoral outcomes and, as such, can help guide a ruler's decisions. Moreover, the popularity enjoyed by a president is strategically decisive for his/her ability to articulate and freedom of action. Thus, the attempt to elucidate how citizens respond to the developments of a term of office in terms of approval is a relevant question.

We structured the core of the article around the estimation of a popularity function for Brazil. From the results obtained, we were able to conclude, for the analyzed period, that increases in the unemployment rate and the inflation rate, on average, tend to negatively affect the presidential approval rate. Therefore, we conclude that macroeconomic variables play a relevant role for citizens to formulate their perceptions regarding the government's performance.

Furthermore, the results allowed us to conclude that Brazilian presidents benefit from the so-called "*honeymoon* effect", which consists of the initial period of government in which the head of the executive branch enjoys greater popularity. When controlling for the specific characteristics of each President, only President Lula seems to have benefited from an increase

in the approval rate due to characteristics intrinsic to his government. Finally, the *impeachment* of President Dilma Rousseff appears to have had a major negative impact on his popularity, while the Mensalão failed to dent President Lula's popular approval in any serious way.

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