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Camponesas e Banqueiros na América Latina: uma Abordagem com VARs para Sentimento do Consumidor, Condições Econômicas e Aprovação Presidencial no Brasil

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À minha avó, que nem por um segundo deixou de acreditar em mim.

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Resumo

A teoria do voto econômico alcançou um estágio de seu desenvolvimento em que os pesquisadores estão interessados em testar se os eleitores levam expectativas em consideração ao avaliar políticos, em contraste com percepções retrospectivas. Essa dicotomia foi nomeada, de maneira muito hábil por MacKuen, Erikson e Stimson (1992), como uma entre camponesas e banqueiros; as primeiras avaliariam somente o bem-estar passado e presente, enquanto os segundos estariam primariamente interessados na economia futura. Testamos esses efeitos para o contexto brasileiro, empregando o Índice de Confiança do Consumidor (ICC) disponível a partir dos anos 1990, logo após a adoção do Real como moeda oficial do Brasil, até o presente momento. Os achados apontam para um ligeiro, porém significante efeito, tanto das expectativas quanto das avaliações retrospectivas, sobre a popularidade do presidente. Mais ainda, o efeito positivo das taxas de inflação sobre aprovação é consistente através de diferentes especificações. Estes resultados sugerem que, apesar da (falta de) clareza institucional, alguma racionalidade pode ser encontrada em outros eleitorados, para além do americano. Além disso, as conclusões indicam que a economia política do presidencialismo brasileiro é mediada principalmente pelas taxas de inflação nas décadas recentes, como já foi sugerido por trabalhos anteriores.

Palavras-chaves: Voto econômico; confiança do consumidor; Brasil; inflação.

Abstract

Economic voting theory has reached a stage in its development where researchers are interested in testing whether voters consider expectations when evaluating politicians, in contrast to retrospective perceptions. This dichotomy has been cleverly named by MacKuen, Erikson, and Stimson (1992) as one between peasants and bankers; the former would solely evaluate past and present well-being, whereas the latter would be interested primarily in the future economy. We test these effects for the Brazilian context, employing an Index of Consumer Confidence (ICC) available starting in the 1990s, right after the *real* was adopted as Brazil's official currency and up until the present day. The findings point to a mild yet significant effect of both expectations and retrospections on presidential popularity. Moreover, the positive effect of inflation rates on approval is consistent across different specifications. These results suggest that, regardless of institutional clarity, rationality can be found in electorates of different polities besides the U.S. Additionally, they imply that the political economy of Brazilian presidentialism is mediated mainly by inflation rates in the recent decades, as already suggested by previous works.

Keywords: Economic voting; Consumer Confidence; Brazil; Inflation.

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1 **Introduction**

A relevant theoretical refinement of the theory of an economic vote concerns the subjective lens through which voters evaluate politicians to make voting decisions. The literature on incumbent approval and economic performance (especially for developed countries) has emphasized, among other things, the question of whether voters act primarily as *peasants* or *bankers* when making political choices – that is, whether they focus on the economic conditions up until the present period, in a myopic fashion; or form a raw, primal rendition of rational expectations, due to some anticipation of future economic facts. This would mean that voters process objective economic data into new, more refined information; aside from the well-established effect of these economic indicators themselves on vote choice, the argument presented states that voters also take into consideration the somewhat subjective conclusions they extract from these numbers, based on whatever priorities they hold. Again, these priorities could be split into two categories: perception of the current state of the economy (a peasant sort of behavior, according to this literature) and prognostics about future realizations of the same indicators (the banker's behavior).[1]

MacKuen, Erikson, and Stimson (1992) were the first to use these economic archetypes to categorize voting behavior. The authors propose an inquiry about the degree of sophistication with which the American electorate evaluates economic performance. Studies on economic vote had generally assumed a retrospective thinking model on the part of voters (KIEWIET; RIVERS, 1984), in line with a notion of adaptive expectations – in other words, even though voters do form expectations about the future economy, this would be based solely upon the information available presently, with disregard for economic forecasts, for instance. A more sophisticated voter – the banker –, on the other hand, would incorporate these forecasts into their expectations, in a rational fashion. What profile is predominant in the American electorate is the question the authors intend to answer. For this purpose, they use a time series approach to draw insights from three groups of variables: "(1) objective economic indicators, (2) aggregated economic cognitions, and (3) presidential approval" (MACKUEN; ERIKSON; STIMSON, 1992, p. 599).

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[1] For a thorough, comparative review on the developments of the economic vote literature, see Lewis-Beck and Stegmaier (2000).

What they call *aggregated economic cognitions* is a concept that intends to capture the subjective perceptions the electorate forms about the economy – both retrospective and prospective. In an attempt to convey this notion in a quantifiable way, the authors employ survey data for consumer sentiment in the United States, from the Survey of Consumers collected by the University of Michigan, in particular the Index of Consumer Sentiment (ICS).

The authors argue that the two theoretical categories of voters under scrutiny can be potentially translated into this type of index because both types of behavior described can be implicitly found within the questions of the Michigan surveys – most of which can be clearly divided into regarding expectations or not. That is, some of the questions ask about sentiment concerning the current state of the economy, whereas others ask about expectations regarding the future economy's potential state. In short, the authors' empirical findings suggest that subjective perceptions mediate the economy's effect on evaluations of presidential performance in the U.S. Furthermore, these evaluations seem to be predominantly prospective, in the banker way. These findings would be later reinforced by a revision of the same study a few years later (MACKUEN; ERIKSON; STIMSON, 2000).

Since then, comparative research efforts have been applied to further test and develop this argument, especially for the U.S. case and, less exhaustively, for some developing countries. Such is the case of similar analyses applied to Venezuela (WEYLAND, 1998) and Uruguay (CARLIN; HUNT, 2015). For Venezuela, the author finds evidence of banker-like behavior, similarly, to some extent, to what was found by MacKuen, Erikson, and Stimson (1992) for the U.S. case. For the Uruguayan case, however, the evidence is at least ambiguous – which leads the authors to coin the term "piggybankers", which should embody both kinds of behavior.

Other interesting works include Clarke et al. (2005), who disaggregate their data by gender, to find out that women in the U.S. consistently derive more pessimistic evaluations on economic performance than men; and Acevedo, Fogleman, and Ura (2017), who argue that in the U.S., prospective and retrospective evaluations of the presidential performance are mediated by formal education.

As for the Brazilian electorate, such questions remain unexplored; although there is literature on the economic vote in Brazil – that is, scholars have explored the effects of the macroeconomic environment on the performance of Brazilian politicians, particularly presi-

dents (FERREIRA; SAKURAI, 2013; CAMPELLO; ZUCCO JR., 2016) –, subjective perceptions about the economy still stand to be examined. In other words, considering economic indicators, do perceptions guide Brazilian voters; and if they do, are they predominantly prospective or retrospective?

Thus, there is some room for investigation: we wonder if Brazilian voters consider the "aggregated economic cognitions" tested by MacKuen, Erikson, and Stimson (1992), or what political scientists and economists alike call "sentiment" – *consumer* sentiment, for the case presented. In other words, we would like to gauge the extent to which feelings about the economy affect Brazilian voters' perceptions of the incumbent beyond the effect of the economy itself. More than that, it is a comparative question of importance if these feelings are predominantly retrospective or prospective. Suppose it is true that we have no primary reason to expect a different kind of behavior from the one found for the American case – that is, the banker-like behavior –. In that case, it is also true that the evidence for Latin American countries has led to mixed conclusions. It is not straightforward, therefore, to locate the Brazilian case along the lines proposed by MacKuen, Erikson, and Stimson (1992), and some empirical examination would be required.

It is important to note that this is a different question from whether subjective perceptions devised by voters are in line with the objective reality of the economy – although this question has already been repeatedly addressed, and the results generally point to a relatively impressive prediction power exhibited by consumer sentiment in regard to the economic indicators they relate to.[2] For the inquiries posed by this essay, such power is not of primary relevance. The endgame question we attempt to answer regards the direction at which these perceptions are pointed – if the past or the future –, not their accuracy in contrast to material reality.

The next step in answering these questions is to assess the survey data regarding consumer sentiment available for the Brazilian case. Some attempts at replicating the Michigan surveys have been made. This study works with three of them. The most important one is the *Índice de Confiança do Consumidor* (ICC, or Index of Consumer Confidence), based on the surveys collected by the Trade Federation of the State of São Paulo (henceforward

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[2]MacKuen, Erikson, and Stimson (1992) state the following: "The ICS is known to be responsive to the national economy (...) and usefully augurs the economic future as well" (MACKUEN; ERIKSON; STIMSON, 1992, p. 599).

Fecomercio) since the mid-1990s. These indexes and their uses are discussed in detail in the next chapters. However, two important things about the ICC can be promptly highlighted in this Introduction: a) it closely follows the methodology proposed by the Michigan questionnaires, and, b) the survey covers only the city of São Paulo.

Thus, as is commonly the case when one needs to use observational data, the series from the ICC poses advantages and hindrances as well when it comes to employing empiric measures that represent the concepts in our theoretical models. Regardless, we still believe it is a potentially rich source of information on the hypotheses presented so far, and in general, poses more advantages than the other two, at least for the goals of this study. Again, the argument in favor of employing this index and comparisons between it and the others selected are further developed in the next chapters.

This study aims to undertake an empirical test of the theory to assess if there is evidence, in Brazil, for subjective evaluations dominating material economic indicators when it comes to assessing presidential performance. Secondly, and most importantly, this study also seeks to contribute to the understanding of what level of sophistication Brazilian voters apply to those assessments. The results should have implications for economic voting theory in developing democracies.

This study has five other chapters beyond this introduction. The next chapter presents the peasantry-banking dichotomy in further detail, as first posed by MacKuen, Erikson, and Stimson (1992), and incorporates its theoretical questions into the Brazilian context. Chapter 3 presents the data gathered and develops the methods proposed for the empirical analysis of the research question. Chapter 4 lists the findings of the estimations, and Chapter 5 adds robustness checks to these results. Finally, the conclusion discusses the potential implications of these results for economic voting theory and Brazilian presidentialism.

2 Peasants and Bankers: Economic Anticipation and Political Choice

The question raised by the original *peasants or bankers* paper by MacKuen, Erikson, and Stimson (1992) is a natural development of economic voting theory. It is widely accepted that electoral outcomes are closely related to economic conditions. Furthermore, research seems to strongly indicate that voters form expectations about their future well-being based on the general state of the economy and evaluate political performance accordingly (LEWIS-BECK; STEGMAIER, 2000, p. 186). The notion the authors advance is that voters form rational expectations when evaluating politicians, in a sense that they do not simply incorporate past information into their expectations but also respond to "messages about the future economy" (MACKUEN; ERIKSON; STIMSON, 1992, p. 598); that is, voters would evaluate politicians based fundamentally on what they expect. In other words, if the voter acts as a banker, past well-being would mean little for her evaluation of the president as compared with the dominant effect of expectations.

To submit this idea to an empirical test, MacKuen, Erikson, and Stimson (1992) employ multiple time series from the Index of Consumer Sentiment (ICS) as explanatory variables for presidential approval. This index is calculated based on the Surveys of Consumers collected each month[1] by the University of Michigan, starting in the 1960s. The interviews are conducted by telephone in households across the 48 coterminous United States, plus Washington, D.C. The index and its components range from 0 to 200, where 100 is the neutral point. The series keep being updated to this day and are employed by a wide array of empirical research in both political science and applied economics. (CARROLL; FUHRER; WILCOX, 1994; BLOOD; PHILLIPS, 1995; CURTIN; PRESSER; SINGER, 2000; HOWREY, 2001; DUCH; KELLSTEDT, 2011; KELLSTEDT; LINN; HANNAH, 2015).[2]

Beyond testing the effect of subjective perceptions on approval by using the final index, the authors take advantage of its components, something that is often credited as the

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[1]The authors employ a quarterly version of the series, however. This is because the survey only started to be collected monthly in 1978, before which it was collected "at best" each quarter (MACKUEN; ERIKSON; STIMSON, 1992).

[2]For complete details on the University of Michigan Survey of Consumers, please visit https://data.sca.isr.umich.edu/.

most critically innovative feature of their paper; by splitting the six questions of the survey between retrospective and prospective ones (see Table 1 below), for which individual series are also available, they are able to test hypothetical answers to the question whether prospective voting behavior has a significant effect over presidential approval, in contrast to the retrospective evaluations accepted as the default criterion so far. That is, they test whether consumer sentiment mediates the effect of the real economy on presidential approval but also to what extent this effect is due to prospective evaluations devised by voters and how much of it is because of retrospective impressions.

Table 1 – Questions selected by MacKuen, Erikson, and Stimson (1992) from the Michigan Survey of Consumers[a]

Type of question	Question wording
Retrospective	1. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago? 2. Would you say that at the present time business conditions are better or worse than they were a year ago? 3. Generally speaking, do you think now is a good or a bad time for people to buy major household items?
Prospective	4. Now looking ahead – do you think that a year from now, you (and your family living there) will be better off financially, or worse off, or just about the same as now? 5. Now turning to business conditions in the country as a whole – do you think that during the next 12 months, we'll have good times financially, or bad times or what? 6. Looking ahead, which would you say is more likely – that in the country as a whole, we'll have continuous good times during the next 5 years or so, or that we will have periods of widespread unemployment or depression, or what?

Source: adapted from MacKuen, Erikson, and Stimson (1992).

[a] Besides this categorization of the questions, the authors propose a division between sociotropic and "pocketbook" judgments as well, something that had already been discussed by previous studies. Sociotropic voting would guard parallels with banker behavior; the same would apply for pocketbook notions and peasant behavior. (MACKUEN; ERIKSON; STIMSON, 1992, p. 597)

The authors discard questions 3 and 5; question 3 "contributes little to our understanding of political attitudes" (MACKUEN; ERIKSON; STIMSON, 1992, p. 599), and question 5 is highly correlated to question 6, so they choose the latter to be included in the models. Therefore, they stick with four measures of the aforementioned aggregated economic cognitions:

a. Personal Retrospections; b. Business Retrospections; c. Personal Expectations; and 4. Business Expectations.

To put the data to work, they employ time series econometric models – an appropriate strategy for targeting the questions posed, since longitudinal data are required to check if consumer sentiment changes affect presidential approval. Nevertheless, however important the findings of their paper – and even more so, the creative innovation embodied in their research design –, there are limitations to the uses the authors make of this strategy.

For instance, they employ Autoregressive Distributed Lag (ADL) models as their main modeling approach for the series, and only include Vector Autoregressive (VAR) analysis in an appendix (as a robustness check on the results). Besides, it can be said that there are two main models in their paper: one that has, as explanatory variables for approval, the objective economic indicators and the ICS; and a second one that includes only the components of the index as regressors, omitting the macroeconomic variables. Even though these indicators lose significance in the first model mentioned, in the face of the ICS, the authors do not further explore the decision to exclude these variables from the subsequent specification, as they do not estimate, in the first place, a model in which approval is explained solely by the ICS.

Regardless, two important findings are suggested by their empirical exercise for the U.S. case. First, the effect of economic performance over presidential approval is mediated by consumer sentiment. Second, prospective evaluations dominate all other consumer sentiment components.

This study significantly advanced theories of economic voting, and has motivated further research to verify if those conditions hold under different circumstances; other measures have been tested in the U.S. and abroad. However, the conclusions are more often than not conflicting. Sometimes such contradictions derive clearly from misspecification issues, but we cannot be sure about it for the whole pool of empirical studies that put the prospective economic voting argument under suspicion (LEWIS-BECK; STEGMAIER, 2000). In any sense, comparative research on the matter is in full development, so it is only natural that we try to replicate this empirical exercise for the Brazilian case.

The title of this section talks about anticipation rather than expectations because we want to avoid the restrictions imposed by traditional rationality principles that political scien-

tists often derive from economic theory.[3] MacKuen, Erikson, and Stimson (1992) had already discussed this point briefly, as they refuse "controversial 'rational expectations' arguments about macroeconomic policy". Instead, we want to test if Brazilian voters consider prospections of the future when evaluating the president and the extent of this effect compared to retrospective and present conditions.

In short, we want to test a. the effect of objective economic variables over presidential approval; b. the same effect, but controlling for consumer sentiment; c. again the same, but separating consumer sentiment that is prospective from that which is retrospective. This is intended to be done using data from *Fecomercio*'s ICC. Before exploring the data, we should discuss how the ICC can be useful for our research purposes, despite its limitations.

2.1 The Case for ICC as a Proxy for Consumer Sentiment

The Index of Consumer Confidence (ICC) is one of many measures that exist that attempts to adapt the Michigan ICS to the Brazilian context. The index has been collected regularly by *Fecomercio* since 1994, and complete time series are available at its website by request, for the ICC, and for its components. The data can also be made available by gender, two age groups, and two income groups.[4]

The ICC is collected by *Fecomercio* based on monthly public opinion polls in the city of São Paulo – which is the largest city in Latin America, with 12.33 million inhabitants according to IBGE, the Brazilian Bureau of Statistics. Some recent attempts at collecting the ICC in other capital cities have been undertaken by other states' chambers of commerce, but these tend to be spotty and irregular. Other indexes cover wider areas of the country, but these were only more recently collected. Such is the case of the two alternative indexes employed by the present study as robustness checks (presented in chapter 5): the *Índice Nacional de Expectativa do Consumidor* (INEC, or National Index of Consumer Expectations), which started being collected quarterly in 2009 by *Confederação Nacional das Indústrias* (CNI, the Brazilian National Confederation of Industry) for the country as a whole; and *FGV Confiança*,

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[3]For a meticulous critique on the uses of individual rationality principles in political science, see Green and Shapiro (1994).

[4]The age groups are $age \leq 35$ and $age > 35$. The two monthly income groups are $income \leq 10$ minimum wages and $income > 10$ minimum wages, monthly.

collected by Fundação Getulio Vargas, which has been collected since 2005 on a monthly basis, and covers the cities of São Paulo, Rio de Janeiro, Belo Horizonte, Salvador, Brasília and Porto Alegre (therefore comprising all five regions of Brazil).

We believe the data for São Paulo to be highly valuable for political science research.[5] For these reasons, we stress that an exercise using ICC measures for Sao Paulo on aggregate national data still has value. First, this exploratory analysis can be used as a first attempt at the potential to use this data to make inferences for economic voting theory in Brazil. Secondly, however, it is not much of an extrapolation to assume that the ICC is an appropriate proxy for consumer sentiment at the national context. According to Wooldridge (2006, p. 286–290), a "good" proxy for a non-observable variable of interest must follow some assumptions; one of them says that the conditional expectation of the omitted variable of interest (in our case, national consumer sentiment) must not vary according to the other covariates, given that the proxy has already been partialled out. In more efficient terms:

$$E(x'|z,x) = E(x'|x)$$

Where x' is the unobserved national consumer sentiment, x is the ICC and z represents the other explanatory variables (in this case, macroeconomic indicators). Of course, even Wooldridge (2006) admits this to be a very strong assumption, one which does not hold in most of the cases. Still, the author argues that there are gains from including an "imperfect" proxy instead of nothing. In the case presented by this study, it is difficult to imagine that national consumer sentiment goes by unaffected by economic conditions. But we theorize that controlling for consumer sentiment in São Paulo should dramatically decrease the effect of economic conditions on national consumer sentiment. We find some support for this assumption in MacKuen, Erikson, and Stimson (1992, 2000): the authors state that the subjective

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[5]We could, on the other hand, solely focus this study on São Paulo, and contrast the ICC with approval and economic variables concerning only the city (or perhaps the state of São Paulo). However, obtaining approval data for regions within the country is troublesome, as public opinion data representative of São Paulo voters is not usually collected at a similar frequency. One common source for executive approval survey data researchers make use of when studying the Brazilian case is the *Centro de Estudos de Opinião Pública* (CESOP); its database comprises hundreds of survey reports on the matter, published by a wide array of survey institutes, sometimes segmented by capital cities. However, most of these are cross-sectional data. If we intended to construct a time series with sufficient time points – for instance, based on data collected by the *Datafolha* surveys for São Paulo –, its frequency would be severely irregular, with many missing points, especially during the 1990s. Besides, the questions change from one survey to another as time goes by, something that has already proven to be an issue in similar studies undertaken in other countries (see, for instance, Lockerbie (1992)).

perceptions of voters – especially expectations – are formed primarily based on economic news and forecasting, not on personal, objective economic circumstances. Economic news is transmitted to the general public mostly in terms of country-wide conditions (such as GDP, inflation rates, unemployment, and interest rates); thus, the information input for the ICC is roughly the same for national consumer sentiment. Since we are dealing with aggregate time series data, idiosyncrasies in individual voters should be averaged out by each other; what is left for analysis is the mean perception of voters in São Paulo. Besides, most of the deep inequalities of Brazil are also present in the city of São Paulo; we feel safe to imply that the behavior of this series is quite representative of the one of national consumer sentiment it-self. If this is true, we should find a strong correlation between ICC and *FGV Confiança*, or between ICC and INEC; or, in time series terms, evident cointegration relationships among these variables.

The graphs in Figures 1 and 2 show, in comparison, the paths followed by each of these indexes and the ICC.

Figure 1 – ICC and FGV*Confiança*, monthly
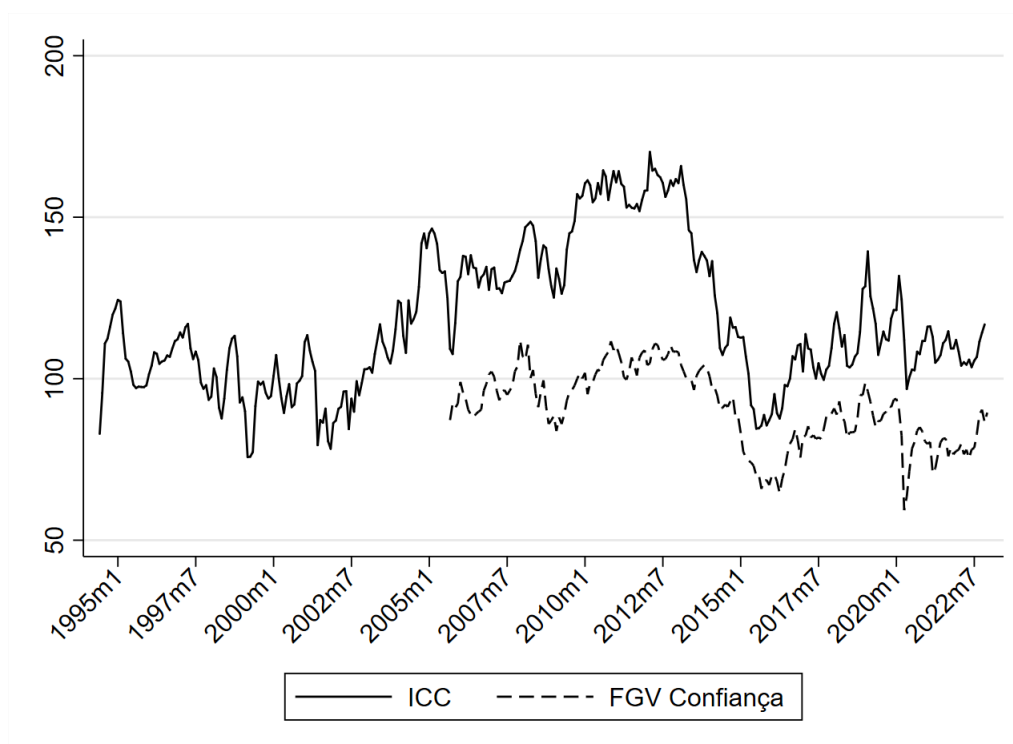
Figure 2 – ICC and INEC, quarterly
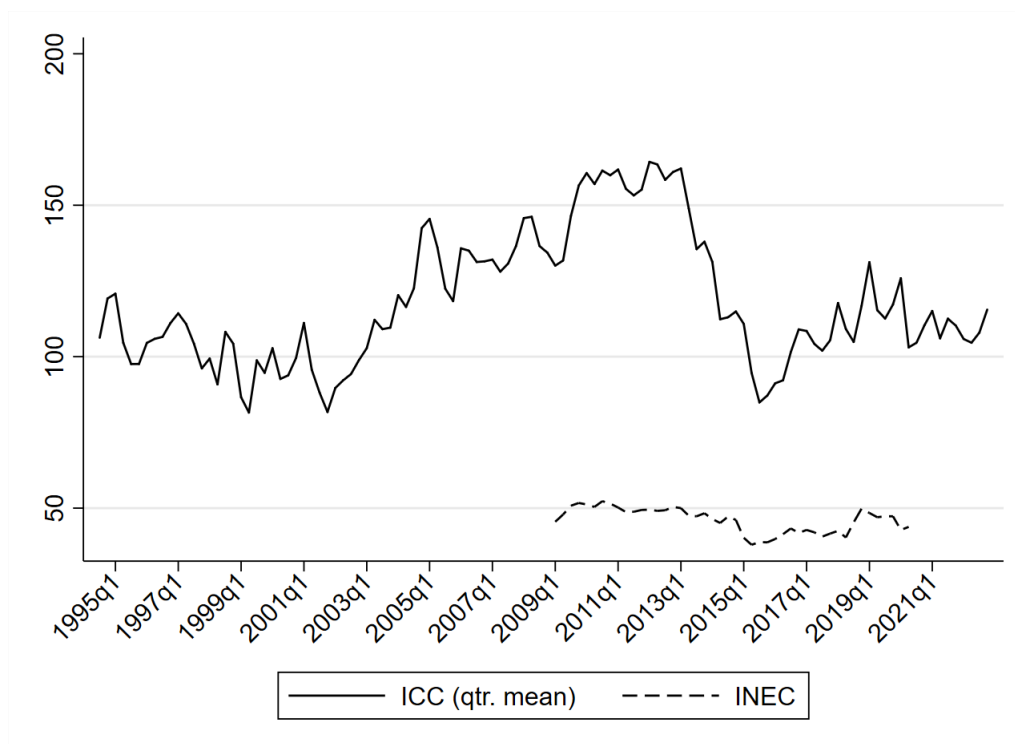
Visually, there are no surprises concerning the parallels among these indexes. But these graphs can be deceiving and lead to false claims about causality (see the canonic works by Yule (1926) and Granger and Newbold (1974)); in order to state that there is some kind of relationship between two or more time series, we must go further and test for cointegration among them, as already mentioned. Indeed, the Engle-Granger tests for cointegration seem to indicate that the null hypotheses of no cointegration should be rejected (see Tables 2 and 3), which adds leverage to our assumptions regarding ICC as a proxy for national consumer sentiment.

Table 2 – Engle-Granger test for cointegration – ICC and FGV *Confiança*

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
$Z(t)$	-5.326	-3.950	-3.366	-3.065

Table 3 – Engle-Granger test for cointegration – ICC and INEC

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
$Z(t)$	-3.607	-4.151	-3.475	-3.140

Note: Critical values from MacKinnon (2010).

In sum, the interpretation for these tests is as follows: a test statistic $Z(t)$ smaller than the critical value means we should reject the null hypothesis ($H_0 =$ no cointegration between the series). This is evident for the first test (Table 2), since $Z(t)$ is smaller than critical values at all significance levels; and less certain for the second test, for which we only reject H_0 at 5 and 10% significance levels. In other words, the ICC and the index from FGV show a close long-term relationship; this relationship is less binding for ICC and INEC as a pair (perhaps because the T for INEC is rather small), but there still exists reinforcing evidence for this relationship. For these reasons, we feel it is safe to assume that the ICC for the city of São Paulo provides meaningful information about the behavior of consumer sentiment at the national level.

Next, we turn to the questions of the survey (Table 4), and why they matter for the present purposes. Clearly, the Michigan surveys have served as the blueprint for the ICC questionnaires, keeping in mind that adaptations have been made in order to better convey the Brazilian case. As Table 4 confirms, the questions can also be separated into two subsidiary indexes, in the same fashion we see applied in MacKuen, Erikson, and Stimson (1992): one for present conditions, called ICEA – *Índice de Condições Econômicas Atuais* (or Index of Current Economic Conditions) and IEC – *Índice de Expectativas do Consumidor* (Index of Consumer Expectations). We will take a closer look at both indexes in the next chapter.

Table 4 – Questions from the *Fecomercio* surveys for the ICC

Type of question	Question wording
Retrospective	1. Thinking about durable goods (TV, sound system, etc.) for the household, do you believe that, generally, now is a good moment for people to buy these goods? 2. Could you say if your family is better off or worse off financially than a year ago?
Prospective	3. Now looking ahead – do you think that a year from now your family will be better off financially, or worse off? 4. Thinking about the economic conditions of Brazil, do you think that during the next 12 months we'll live through good times or bad times? 5. Looking further ahead, would you say that the country as a whole will have, for the next five years, good times, or that we will experience periods of widespread unemployment and depression (bad times)?

Source: kindly shared by *Fecomercio* via e-mail.

Moreover, the ICC has been employed by the Central Bank's Monetary Policy Committee (*Copom*). The monetary authority considers the information transmitted by the index when setting interest rates, which are applied to the nation as a whole. This fact reinforces the importance of the index, not only because of its historical measurement of sentiment since the early 1990s but also because it has an important and direct effect on policy in the national context.

As we have argued, the information embedded in the ICC can provide good insights into voter behavior in Brazil. Because of that, we find the index suitable for this initial attempt at answering the theoretical questions raised by MacKuen, Erikson, and Stimson (1992) and extended to the Brazilian case by this study. It is viable to apply time series methods to the data in order to draw these insights, by following – with proper adjustments – the strategy proposed by the authors. As previously stated, the main legacy of their study is the use of the subsidiary indexes of the ICS as proxies for retrospective and prospective evaluations, and this is what we intend to replicate in the next chapters.

There are a series of methodological steps we need to undertake to infer whether sentiment affects presidential approval. First, we must assess the relationship, if any, between the ICC and presidential approval, controlling for objective economic indicators. Second, we should split the ICC between its two subsidiary indexes and run the tests again, to check if prospective evaluations do dominate the effect of retrospective ones – that is, if the Brazilian electorate behaves as a banker or as a peasant. As a robustness check, we will run checks on the potential effect of different categories of voters/consumers on presidential approval: we want to verify if there are heterogeneous effects of the ICC on the dependent variable – presidential approval – based on gender, income and age, which are the categories available for segmentation of the index.

3 **Data and Methods**

In this chapter, the data are described. Next, we argue in favor of a time-series, vector autoregressive (VAR) approach, as the best available means to assess the direction and magnitude of the dynamic effects we are assuming. In addition, we run Granger-causality tests, to check for temporal precedence within the variables in the models.

3.1 Data

The time series used in this study are quarterly. This is the highest frequency at which executive approval data are available, considering both the time frame we want to cover and the minimum requirements of continuity for Brazil. Besides, data on GDP are made public quarterly by IBGE (*Instituto Brasileiro de Geografia e Estatística*, the Brazilian Bureau of Statistics).

The data employed in this study starts in the first quarter of 1996 and ends in the last quarter of 2019, comprising 96 observations. The main variables of interest are presidential approval, the ICC and its components, and objective economic indicators – which are captured by real GDP growth and inflation rates. We include controls for the presidential term, party affiliation, and atypical domestic events. Each of these variables is presented in detail in the following subsections.

3.1.1 Executive Approval

The presidential approval variable was downloaded from the Executive Approval Project (CARLIN; JONATHAN, et al., 2020). Beyond gross percent approval, the dataset also includes relative and net approval. Relative approval is calculated by dividing the percentage of positive ratings by the sum of positive and negative ratings; net approval is given by subtracting negative ratings from positive ones. For completeness, we present all three series in Figure 3. In our analysis, we only employ gross approval, as this is the commonly accepted variable for positive ratings in this body of studies.

Figure 3 – Presidential Approval, Net Approval and Relative Approval (Brazil)
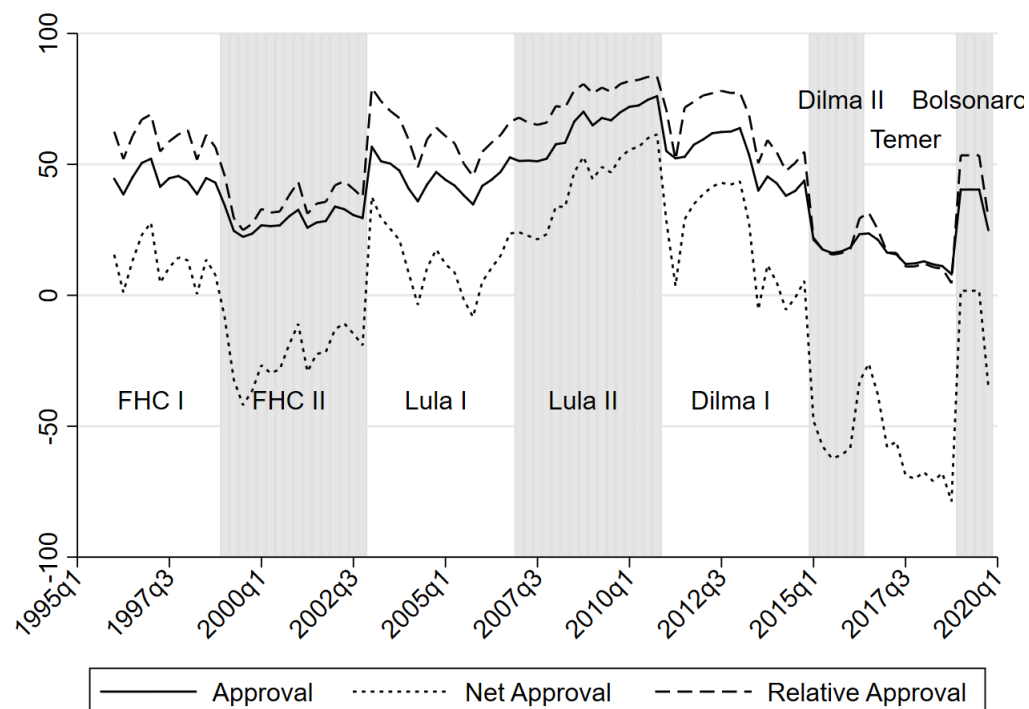
Source: prepared by the author using data from Carlin, Jonathan, et al. (2020).

3.1.2 ICC, ICEA and IEC

Figure 4 presents the ICC itself. Figure 5 shows the two subsidiary indexes as well – the ICEA and the IEC, which represent current economic conditions and consumer expectations, respectively.

Next, in Figures 6, 7 and 8, we present the ICC segmented using the three dichotomous categories made available by *Fecomercio*: gender, income and age. Income is divided into below and above ten minimum wages; age is split between less and more than 35 years old.

Figure 4 – Index of Consumer Confidence (ICC) in São Paulo city
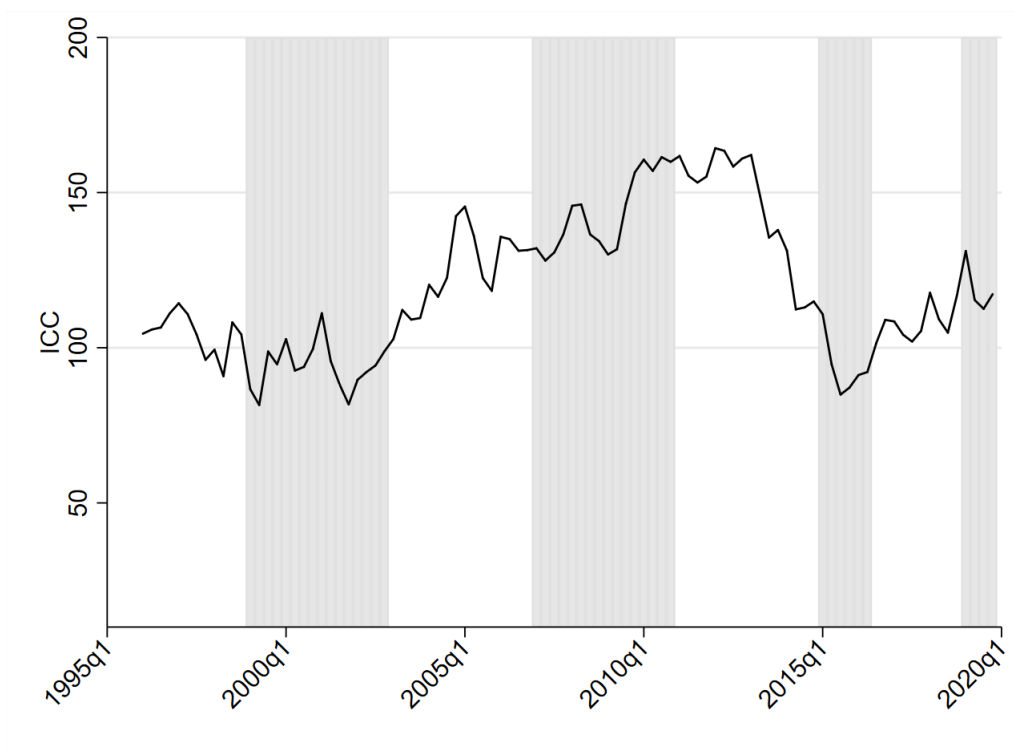
Source: *Fecomercio*; prepared by the author.

Figure 5 – ICC and its two components
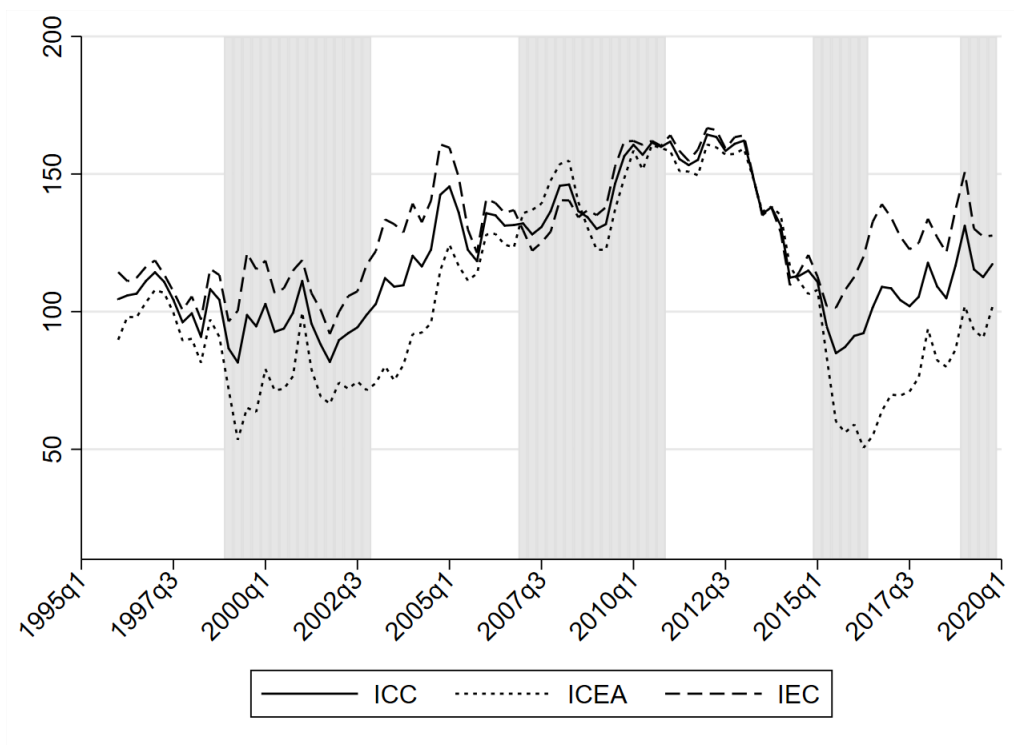
Source: *Fecomercio*; prepared by the author.

Figure 6 – ICC, segmented by gender
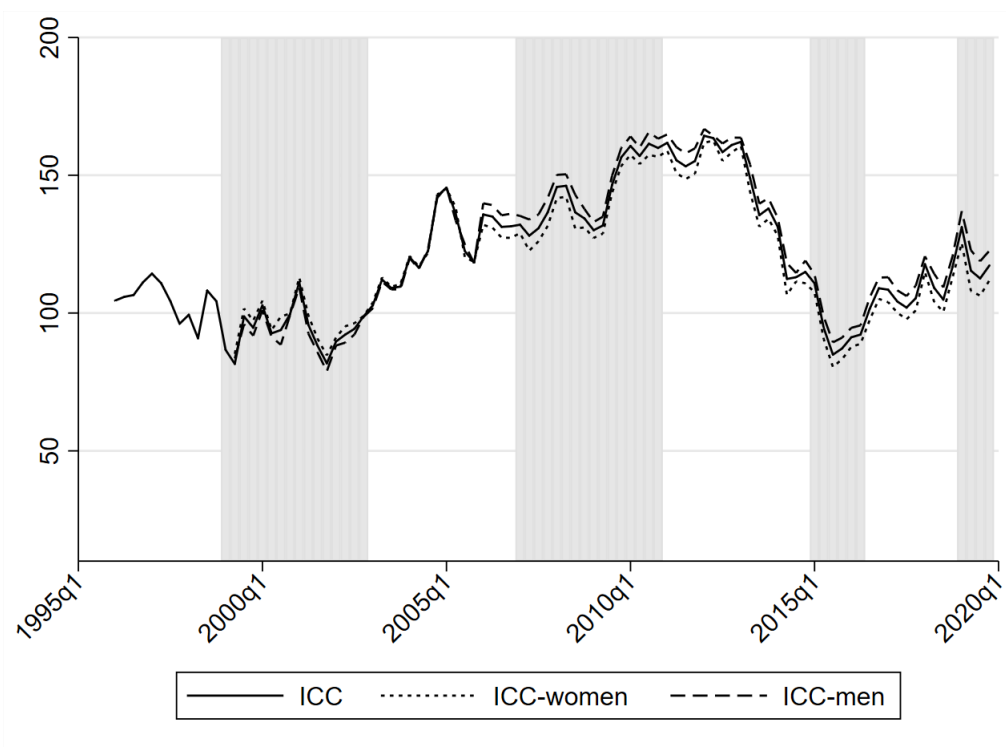
Source: *Fecomercio*; prepared by the author.

Figure 7 – ICC, segmented by two income groups
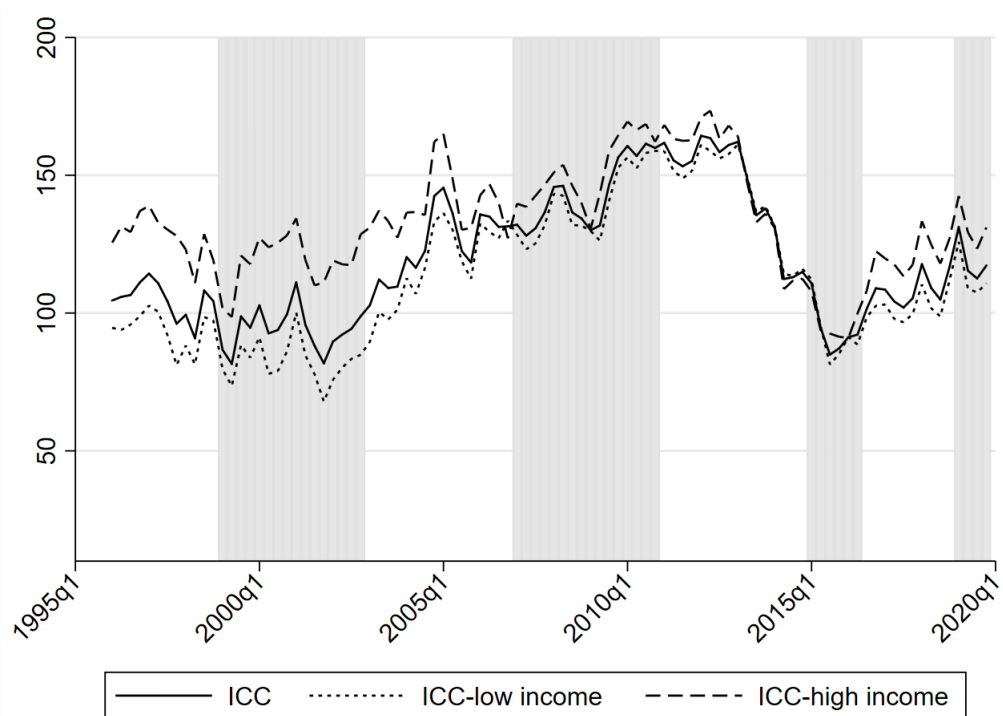
Source: *Fecomercio*; prepared by the author.

Figure 8 – ICC, segmented by two age groups
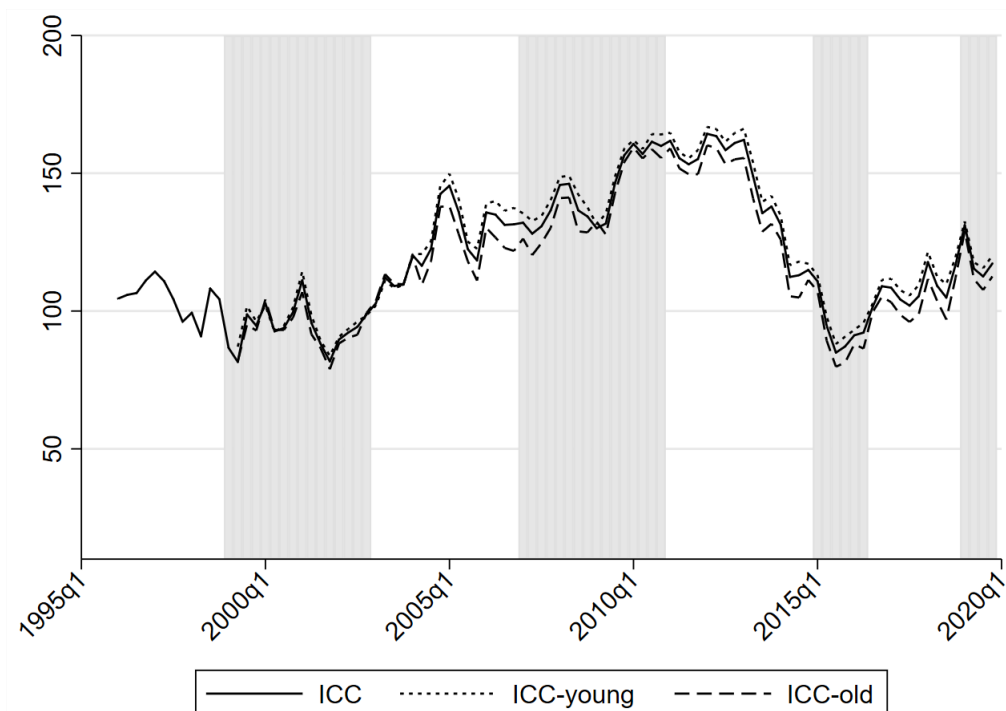
Source: *Fecomercio*; prepared by the author.

The indexes for men and women are in line with the evidence found by Clarke et al. (2005) for the United States: indeed, women in São Paulo consistenly evaluate economic conditions with a slighly more pessimistic lens than men. Or, more than that, one could argue that obvious gender inequalities – in income and workload in the household, for instance – justify a worse perception of the world around women.

The difference between the two income groups is in accord with what one would expect as well. People who must live under stricter budget constraints should, of course, feel generally more worried about the current state of the economy and their expectations for the future about it.

What is somewhat surprising is the difference between the perceptions of the two age groups. Younger people demonstrate a slightly better outlook on the economy than the older ones. This is counterintuitive because, in general, income grows with age; this is especially true considering the Brazilian pension system rules before 2020. Younger people normally face more challenging circumstances and uncertainty. However, the data shows that

the younger group consistently have a more positive evaluation of the economy than the older one.

3.1.3   Selected Economic Indicators

To represent actual economic conditions, we include in the analysis the series for real GDP growth and inflation rates relative to the IPCA (*Índice Nacional de Preços ao Consumidor - Amplo*, a national consumer prices index), both made available by IBGE. Figure 9 shows the series for GDP growth each quarter, deseasonalized and in an index scale (1995 is the baseline year); and Figure 10 presents the inflation rates for the period.

Figure 9 – GDP growth rate (%), 1995 prices
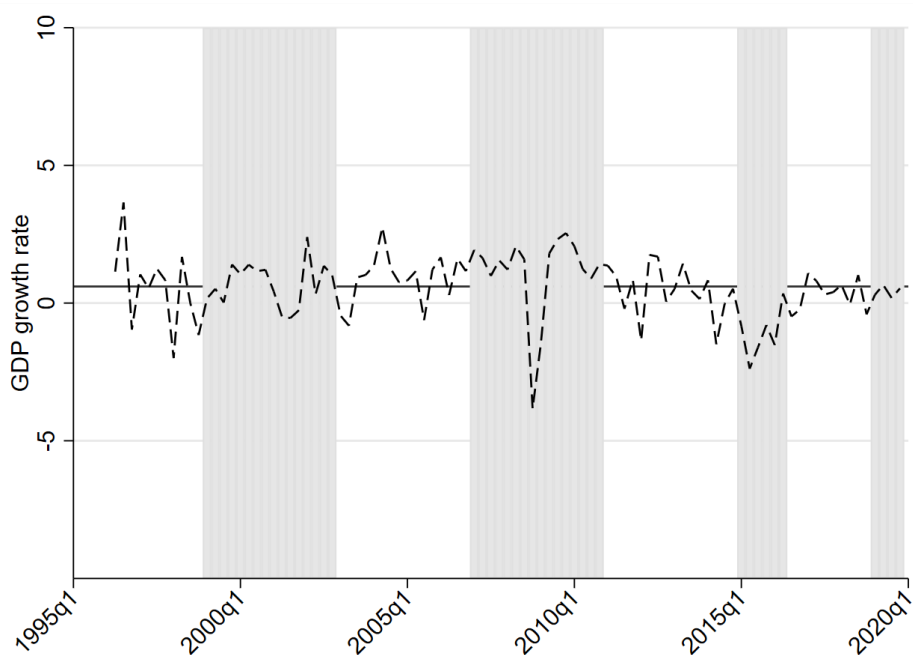
Source: IBGE; prepared by the author.
Note: solid line marks the mean value.

Figure 10 – Inflation rate (IPCA variation, %)
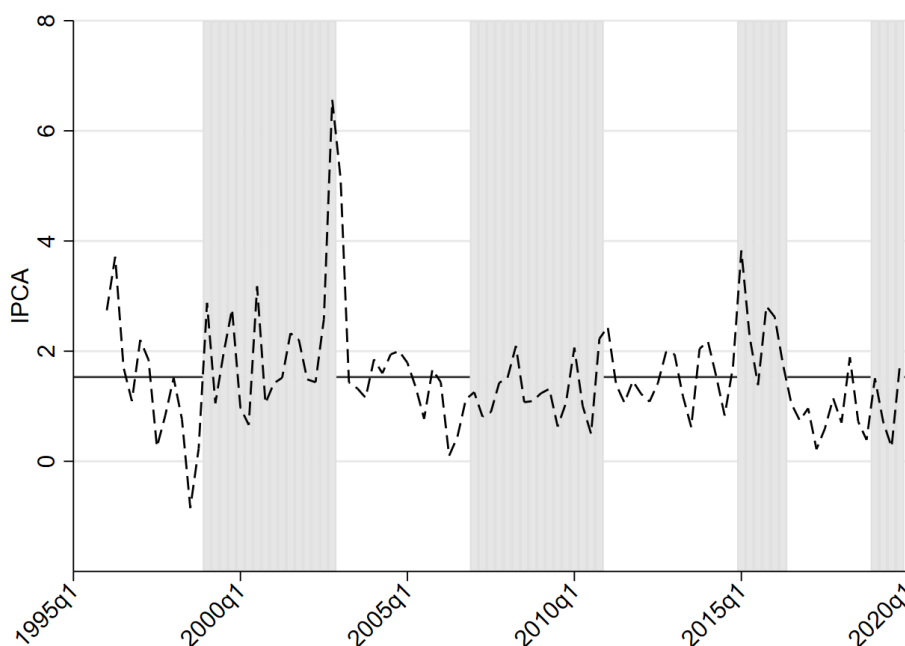
Source: IBGE; prepared by the author.
Note: solid line marks the mean value.

3.1.4 Additional Controls

In line with the studied literature, we add dummy controls for each presidential term, party affiliation, and some atypical domestic events. The control for events captures the following facts: the *apagão* crisis, a general, wide shortage of electrical power which is understood to have deeply affected Fernando Henrique Cardoso's popularity by the end of his last term (2001q3; 2001q4; 2002q1); the publicization of the *mensalão* scandal by the press (2005q2; 2005q3; 2005q4); street protests in 2013, demanding cheaper bus fares – which, a few days later, led to general revolt across the country, regarding life conditions, corruption scandals and, a little less, the FIFA World Cup which was about to take place in Brazil in 2014 (2013q2); and finally, Dilma's impeachment, starting with the acceptance, by the lower congress house, of the denouncements against her, and ending with her effective removal from the presidential chair (2015q4; 2016q1; 2016q2; 2016q3).

3.2 Methods

A time series approach is the optimal choice in the present case for some reasons. First, a static evaluation of these variables would be essentially wrong (or at least incomplete) since it is reasonable to assume that past occurrences of the data affect its present values, however volatile these variables might be. Secondly, a cross-section analysis – even if we could devise a research design with it that would make sense regarding our research purposes, which seems little feasible – would not be able to account for variation over time, trends and seasonality, which are relevant aspects of the phenomena we are investigating. Finally, this is the common approach to questions of the sort presented by this study, at least at the national level (MACKUEN; ERIKSON; STIMSON, 1992, 2000; FERREIRA; SAKURAI, 2013; SILVA, 2017). By taking this path, we intend to complement and polish the evidence already available for the Brazilian case, and, in a broader sense, add contributions to the existing body of comparative studies on economic vote.

We follow the intuition presented by the original MacKuen, Erikson, and Stimson (1992) study when devising the models to be estimated, except that they only include vector autoregression (VAR) analysis in an appendix. In contrast, we chose it to be our primary econometric strategy. This is because we do not want to attribute any *a priori* direction for the effects but rather model everything as endogenous. Vector autoregression is one of the methods developed by econometricians to model two or more time series that possibly cause each other simultaneously – that is, we first assume that all the variables in the model can be endogenous (SIMS, 1980). Only after running the VARs, we can run Granger causality tests so that we can determine temporal precedence from one variable to another. In short, a variable X_t "Granger"-causes Y_t if Y_t can be better predicted when including information on X_{t-1} than when not doing so (GRANGER, 1969).

Before presenting the VAR results, we briefly discuss possible nonstationarity issues in the series in the next subsection. For tackling these potential issues, we run Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests for stationarity. If one or more of the series seem to be non-stationary, we apply first differences and rerun the tests. After successfully adjusting for non-stationarity, we model the VARs to be estimated, the results of which are presented in the next chapter.

3.2.1   Unit roots and stationarity tests

The behavior of each series employed by this study can be visualized in the figures presented in section 3.1. At first glance, nothing unusual can be seen in the figures. However, we must also test for the presence of unit roots and the null hypothesis of nonstationarity.

First, for each series, we run Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests, to check the null hypothesis of stationarity. The only series to present mixed results – for different lag lengths – is the approval one; so we proceed to run unit root tests for this one based on different lag lengths. The results of the Dickey-Fuller and DF-GLS tests point to the existence of a unit root in this series. So we apply first differences to it, and rerun the KPSS test. This time, we cannot reject the null of level stationarity. The KPSS tests for the other series present more straightforward results, which are listed in Table 5. When the results point to nonstationarity, we re-run the tests with the variables in first differences. In summary, the series for approval and the ICC and its components are nonstationary. For this reason, we employ the first differences in the models. The economic variables are stationary, which is expected since they are rates.

These results are of interest not only because we must apply the appropriate treatment to each series before working with them, but also because – when assuming endogeneity for all series, such as is the case here – we must consider the existence of cointegration, and test for its existence, in which case we should estimate a vector error correction model (VECM) instead of the VAR. However, Engle-Granger cointegration tests for the variables show no sign of such a relationship. Moreover, even if there was evidence for cointegration, the VECM implies a long-run relationship, which makes little sense for the theoretical argument presented by this study. In other words, we are trying to estimate a short-run, volatile relationship among variables; thus, a VECM strategy would be somewhat inappropriate.

Table 5 – Unit root and stationarity tests for the main series

Variable	Test	Null hypothesis	Results
$Approval_t$	KPSS	The series is level stationary.	Mixed
	Dickey-Fuller	The series has a unit root.	We cannot reject the null at any significance levels.
	DF-GLS	The series has a unit root.	We cannot reject the null at any significance levels.
$Approval_t - Approval_{t-1}$		The series is level stationary.	We cannot reject the null at any significance levels.
GDP growth	KPSS		We cannot reject the null at the 5% significance level.
Inflation rate		The series is trend stationary.	We cannot reject the null at any significance levels.
ICC_t			We reject the null at all levels.
$ICC_t - ICC_{t-1}$			We cannot reject the null at any significance levels.
$ICEA_t$			We reject the null at all levels.
$ICEA_t - ICEA_{t-1}$			We cannot reject the null at any significance levels.
IEC			We reject the null at all levels.
$IEC_t - IEC_{t-1}$			We cannot reject the null at any significance levels.

4 Results

This chapter conveys the results from the VAR estimations for the models proposed, as well as the Granger causality tests results for the variables selected.

4.1 Vector Autoregression (VAR) analysis

Firstly, we regress approval together with the economic variables to check if presidential popularity responds to objective macroeconomic numbers in the period analyzed. Then we add the ICC to the estimation to check if consumer sentiment significantly mediates the economy's effects on approval. The third model estimated, alternatively, regresses approval against the two components of ICC – ICEA and IEC –, besides the economic variables. The exogenous controls mentioned in section 3.1.4 are also included in each estimation.

For all the models estimated in this section, we first include summary results on Granger causality tests to infer the temporal order of the variables and more comprehensively understand the regression outputs.

The first, simpler model we run comprehends first differences of approval, real GDP growth and inflation rates, with five lags, following information criteria for lag length. In short, the VAR for model 1 can be expressed by equations 4.1, 4.2 and 4.3:

$$
\begin{aligned}
\Delta approval_t = \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} \\
+ \Delta approval_{t-4} + \Delta approval_{t-5} + \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} \\
+ \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} + \Delta\%GDP_{t-5} + inflation_{t-1} \\
+ inflation_{t-2} + inflation_{t-3} + inflation_{t-4} + inflation_{t-5}
\end{aligned}
\tag{4.1}
$$

$$
\begin{aligned}
\Delta\%GDP_t = \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} \\
+ \Delta\%GDP_{t-5} + \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} \\
+ \Delta approval_{t-4} + \Delta approval_{t-5} + inflation_{t-1} \\
+ inflation_{t-2} + inflation_{t-3} + inflation_{t-4} + inflation_{t-5}
\end{aligned}
\tag{4.2}
$$

$$
\begin{aligned}
inflation_t = inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4} \\
+ inflation_{t-5} + \Delta approval_{t-1} + \Delta approval_{t-2} \\
+ \Delta approval_{t-3} + \Delta approval_{t-4} + \Delta approval_{t-5} + \Delta\%GDP_{t-1} \\
+ \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} + \Delta\%GDP_{t-5}
\end{aligned}
\tag{4.3}
$$

The Granger causality test results for this VAR are reported in Table 6. Values in the second column correspond to the probabilities of no causal effect. We omit the results for the other orderings for simplicity since they are trivial.

Table 6 – Granger causality Wald test results for model 1

Equation	Excluded	chi^2	df	Prob. > chi^2
	$\Delta\%GDP_t$	2.5148	5	0.774
$\Delta approval_t$	$inflation_t$	18.932	5	0.002
	All	19.89	10	0.030

According to these results, inflation rates do Granger-cause approval; that is, the former have a temporal precedence over the latter. Now we effectively turn to the VAR estimation results (again, for simplicity, we only include the results for the assumed causal direction, based on the Granger causality tests), as reported by Table 7:

Table 7 – VAR estimation: model 1 - $\Delta approval_t$ as the dependent variable

	Coefficient	Standard Error	z	P >|z|	95% Conf. Interval	
$\Delta approval_{t-1}$	-0.372578	0.090191	-4.13	0.000	-0.5493491	-0.1958069
$\Delta approval_{t-2}$	-0.4201376	0.0886836	-4.74	0.000	-0.5939543	-0.2463209
$\Delta approval_{t-3}$	-0.3284954	0.1023597	-3.21	0.001	-0.5291167	-0.1278742
$\Delta approval_{t-4}$	-0.2434118	0.0997951	-2.44	0.015	-0.4390066	-0.0478171
$\Delta approval_{t-5}$	-0.4689003	0.0975067	-4.81	0.000	-0.6600099	-0.2777907
$\Delta\%GDP_{t-1}$	0.4319477	0.4696376	0.92	0.358	-0.488525	1.35242
$\Delta\%GDP_{t-2}$	0.4328904	0.5197055	0.83	0.405	-0.5857137	1.451495
$\Delta\%GDP_{t-3}$	0.4630017	0.5789413	0.80	0.424	-0.6717024	1.597706
$\Delta\%GDP_{t-4}$	-0.2021069	0.5322945	-0.38	0.704	-1.245385	0.8411711
$\Delta\%GDP_{t-5}$	-0.1731205	0.4564297	-0.38	0.704	-1.067706	0.7214653
$inflation_{t-1}$	2.414766	0.7121549	3.39	0.001	1.018968	3.810564
$inflation_{t-2}$	-0.2149757	0.7841445	-0.27	0.784	-1.751871	1.321919
$inflation_{t-3}$	1.97905	0.7842849	2.52	0.012	0.4418798	3.51622
$inflation_{t-4}$	-0.4692902	0.7614755	-0.62	0.538	-1.961755	1.023174
$inflation_{t-5}$	0.242679	0.6840827	0.35	0.723	-1.098098	1.583456
FHC II	-4.54094	2.678761	-1.70	0.090	-9.791216	0.7093357
Lula I	6.030796	1.942489	3.10	0.002	2.223587	9.838006
Lula II	11.72062	2.18902	5.35	0.000	7.43022	16.01102
Dilma II	-8.143028	2.720842	-2.99	0.003	-13.47578	-2.810275
Temer	2.46995	6.271967	0.39	0.694	-9.82288	14.76278
PSDB	5.276974	6.497981	0.81	0.417	-7.458834	18.01278
PT	-1.703006	6.46673	-0.26	0.792	-14.37756	10.97155
PSL	24.04918	6.631992	3.63	0.000	11.05072	37.04765
Events	1.377805	1.841599	0.75	0.454	-2.231663	4.987273
Constant	-9.774144	5.870965	-1.66	0.096	-21.28102	1.732735

These preliminary results are interesting: at the 5% significance level, approval is not influenced by real GDP growth; but most surprisingly, inflation rates have a positive effect over approval (at lags 1 and 3). Or not surprising at all, if we consider what Abranches (2018) postulates about Brazilian presidentialism: conflicts of interest and redistribution are coped with by the president using inflation as a tool for accommodating multiple demands (ABRANCHES, 2018, p. 357). These results from the estimation of model 1 are in line with this proposition: by producing inflation, however harmful it might be for the real economy, the executive arranges, at some degree, the conflicting demands of society, which in turn should produce short-term satisfaction.

The effect of the dummies, especially for presidential term, cannot be disregarded. This part of the results reinforces the findings – and the questions that remain in the end – of Ferreira and Sakurai (2013), who argue that "charisma" or "personal effects" stand as the main source of variability in presidential approval. This leaves room for a deeper investigation on the psychological aspects of voter behavior, as these personal effects seem to trump that of the continuous variables employed here.

Next, we reestimate the same model, but this time including ICC as an endogenous variable. By doing so, we intend to measure the mediating effect of consumer sentiment over approval, while still controlling for real economic conditions. Model 2 can be summarized by the following equations:

$$
\begin{aligned}
\Delta approval_t = {} & \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4} \\
& + \Delta approval_{t-5} + \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} \\
& + \Delta\%GDP_{t-5} + inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4} \\
& + inflation_{t-5} + ICC_{t-1} + ICC_{t-2} + ICC_{t-3} + ICC_{t-4} + ICC_{t-5}
\end{aligned}
$$

$$(4.4)$$

$$
\begin{aligned}
\Delta\%GDP_t = {} & \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} + \Delta\%GDP_{t-5} \\
& + \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4} \\
& + \Delta approval_{t-5} + inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4} \\
& + inflation_{t-5} + ICC_{t-1} + ICC_{t-2} + ICC_{t-3} + ICC_{t-4} + ICC_{t-5}
\end{aligned}
$$

$$(4.5)$$

$$
\begin{aligned}
inflation_t = {} & inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4} + inflation_{t-5} \\
& + \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4} \\
& + \Delta approval_{t-5} + \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} \\
& + \Delta\%GDP_{t-5} + ICC_{t-1} + ICC_{t-2} + ICC_{t-3} + ICC_{t-4} + ICC_{t-5}
\end{aligned}
$$

$$(4.6)$$

$$\begin{aligned}
\Delta ICC_t = \Delta ICC_{t-1} + \Delta ICC_{t-2} + \Delta ICC_{t-3} + \Delta ICC_{t-4} + \Delta ICC_{t-5} + \Delta approval_{t-1} \\
+ \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4} + \Delta approval_{t-5} \\
+ \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} + \Delta\%GDP_{t-5} \\
+ inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4} + inflation_{t-5}
\end{aligned}$$

$$(4.7)$$

Again, we report results for the Granger causality tests (the numbers in the second column are the probabilities of no causal effect, as usual), followed by the VAR estimation results.

Table 8 – Granger causality Wald test results for model 2

Equation	Excluded	chi²	df	Prob. > chi²
	$\Delta\%GDP_t$	4.4377	5	0.488
$\Delta approval_t$	$inflation_t$	24.051	5	0.000
	ΔICC_t	15.086	5	0.010
	All	38.348	15	0.001

Inflation rates stand the second round of Granger causality testing; besides, the ICC shows a somewhat high probability of Granger-causing approval, which suggests a similar effect of ICS as described by MacKuen, Erikson, and Stimson (1992). Table shows the estimation results of the VAR including all four variables (where differenced approval is, again, the endogenous variable).

Table 9 – VAR estimation: model 2 - $\Delta approval_t$ as the dependent variable

	Coefficient	Standard Error	z	P >|z|	95% Conf. Interval	
$\Delta approval_{t-1}$	-0.36558	0.088815	-4.12	0.000	-0.5396543	-0.1915058
$\Delta approval_{t-2}$	-0.3289932	0.0898149	-3.66	0.000	-0.5050272	-0.1529591
$\Delta approval_{t-3}$	-0.2544949	0.1043393	-2.44	0.015	-0.4589961	-0.0499936
$\Delta approval_{t-4}$	-0.2658726	0.100943	-2.63	0.008	-0.4637172	-0.0680281
$\Delta approval_{t-5}$	-0.4725099	0.0981887	-4.81	0.000	-0.6649562	-0.2800635
$\Delta\%GDP_{t-1}$	0.7631471	0.4645895	1.64	0.100	-0.1474315	1.673726
$\Delta\%GDP_{t-2}$	0.4948193	0.5585623	0.89	0.376	-0.5999428	1.589581
$\Delta\%GDP_{t-3}$	0.6062678	0.6304297	0.96	0.336	-0.6293518	1.841887
$\Delta\%GDP_{t-4}$	-0.0458888	0.5498522	-0.08	0.933	-1.123579	1.031802
$\Delta\%GDP_{t-5}$	-0.2922406	0.4576573	-0.64	0.523	-1.189232	0.6047512
$inflation_{t-1}$	2.867273	0.6824821	4.20	0.000	1.529633	4.204913
$inflation_{t-2}$	-0.4145512	0.7505505	-0.55	0.581	-1.885603	1.056501
$inflation_{t-3}$	1.736496	0.7554631	2.30	0.022	0.2558155	3.217176
$inflation_{t-4}$	-0.3886442	0.7172486	-0.54	0.588	-1.794426	1.017137
$inflation_{t-5}$	-0.029405	0.6542276	-0.04	0.964	-1.311668	1.252858
ΔICC_{t-1}	0.0795184	0.0788493	1.01	0.313	-0.0750234	0.2340603
ΔICC_{t-2}	-0.1526224	0.0806849	-1.89	0.059	-0.310762	0.0055172
ΔICC_{t-3}	-0.0779033	0.0833593	-0.93	0.350	-0.2412846	0.085478
ΔICC_{t-4}	0.148008	0.0822027	1.80	0.072	-0.0131063	0.3091223
ΔICC_{t-5}	-0.1695805	0.0755166	-2.25	0.025	-0.3175903	-0.0215708
FHC II	-4.935309	2.495502	-1.98	0.048	-9.826403	-.0442138
Lula I	6.521301	1.894128	3.44	0.001	2.808878	10.23372
Lula II	11.45289	2.067979	5.54	0.000	7.399722	15.50605
Dilma II	-8.248454	2.605862	-3.17	0.002	-13.35585	-3.141059
Temer	7.978333	6.16878	1.29	0.196	-4.112253	20.06892
PSDB	10.83571	6.340619	1.71	0.087	-1.591677	23.26309
PT	3.671592	6.309223	0.58	0.561	-8.694257	16.03744
PSL	29.85776	6.547481	4.56	0.000	17.02493	42.69059
Events	1.637363	1.750372	0.94	0.350	-1.793303	5.06803
Constant	-14.84727	5.775441	-2.57	0.010	-26.16692	-3.527609

Table 9 reinforces the picture presented by model 1: the first and third lags of inflation rates have a positive, significant effect on presidential approval. GDP growth rates gain a little significance at the first lag. Most importantly, the second, fourth and fifth lags of the first difference of the ICC show some significance, although only the fourth lag has the expected direction. These results should not discourage further investigation; quite the contrary, since the p-values for these lags are not high. We can try something different by splitting the ICC into ICEA and IEC, in order to check if consumer sentiment indeed has no effect on presidential approval, or if it is a matter of detailing what is captured by the index. Rewriting the regression equations leads us to equations 4.8–4.12 for model 3:

$$\Delta approval_t = \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4}$$
$$+ \Delta approval_{t-5} + \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4}$$
$$+ \Delta\%GDP_{t-5} + inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4}$$
$$+ inflation_{t-5} + \Delta ICEA_{t-1} + \Delta ICEA_{t-2} + \Delta ICEA_{t-3} + \Delta ICEA_{t-4}$$
$$+ \Delta ICEA_{t-5} + \Delta IEC_{t-1} + \Delta IEC_{t-2} + \Delta IEC_{t-3} + \Delta IEC_{t-4} + \Delta IEC_{t-5}$$

$$(4.8)$$

$$\Delta\%GDP_t = \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} + \Delta\%GDP_{t-5}$$
$$+ \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4}$$
$$+ \Delta approval_{t-5} + inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4}$$
$$+ inflation_{t-5} + \Delta ICEA_{t-1} + \Delta ICEA_{t-2} + \Delta ICEA_{t-3} + \Delta ICEA_{t-4}$$
$$+ \Delta ICEA_{t-5} + \Delta IEC_{t-1} + \Delta IEC_{t-2} + \Delta IEC_{t-3} + \Delta IEC_{t-4} + \Delta IEC_{t-5}$$

$$(4.9)$$

$$inflation_t = inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4} + inflation_{t-5}$$
$$+ \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4}$$
$$+ \Delta approval_{t-5} + \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4}$$
$$+ \Delta\%GDP_{t-5} + \Delta ICEA_{t-1} + \Delta ICEA_{t-2} + \Delta ICEA_{t-3} + \Delta ICEA_{t-4}$$
$$+ \Delta ICEA_{t-5} + \Delta IEC_{t-1} + \Delta IEC_{t-2} + \Delta IEC_{t-3} + \Delta IEC_{t-4} + \Delta IEC_{t-5}$$

$$(4.10)$$

$$\Delta ICEA_t = \Delta ICEA_{t-1} + \Delta ICEA_{t-2} + \Delta ICEA_{t-3} + \Delta ICEA_{t-4} + \Delta ICEA_{t-5}$$
$$+ \Delta approval_{t-1} + \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4}$$
$$+ \Delta approval_{t-5} + \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4}$$
$$+ \Delta\%GDP_{t-5} + inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4}$$
$$+ inflation_{t-5} + \Delta IEC_{t-1} + \Delta IEC_{t-2} + \Delta IEC_{t-3} + \Delta IEC_{t-4} + \Delta IEC_{t-5}$$

$$(4.11)$$

$$\Delta IEC_t = \Delta IEC_{t-1} + \Delta IEC_{t-2} + \Delta IEC_{t-3} + \Delta IEC_{t-4} + \Delta IEC_{t-5} + \Delta approval_{t-1}$$
$$+ \Delta approval_{t-2} + \Delta approval_{t-3} + \Delta approval_{t-4} + \Delta approval_{t-5}$$
$$+ \Delta\%GDP_{t-1} + \Delta\%GDP_{t-2} + \Delta\%GDP_{t-3} + \Delta\%GDP_{t-4} + \Delta\%GDP_{t-5}$$
$$+ inflation_{t-1} + inflation_{t-2} + inflation_{t-3} + inflation_{t-4} + inflation_{t-5}$$
$$+ \Delta ICEA_{t-1} + \Delta ICEA_{t-2} + \Delta ICEA_{t-3} + \Delta ICEA_{t-4} + \Delta ICEA_{t-5}$$

$$(4.12)$$

First, again, we present the Granger causality tests for model 3 just described above:

Table 10 – Granger causality Wald test results for model 3

Equation	Excluded	chi²	df	Prob. > chi²
	$\Delta\%GDP_t$	7.8976	5	0.162
$\Delta approval_t$	$inflation_t$	28.772	5	0.000
	$\Delta ICEA_t$	12.313	5	0.031
	ΔIEC_t	12.166	5	0.033
	All	54.068	20	0.000

Again, approval is temporally preceded by inflation rates. But we are interested in the components of consumer sentiment. Strikingly, both ICEA and IEC – in first differences – have a very high chance of Granger-causing approval, as shown by both p-values, 0.031 and 0.033 (which indicate the probability of wrongfully rejecting the null hypothesis of no Granger causality).

Table 11 – VAR estimation: model 3 - $\Delta approval_t$ as the dependent variable

	Coefficient	Standard Error	z	P >|z|	95% Conf. Interval	
$\Delta approval_{t-1}$	-0.355114	0.0856129	-4.15	0.000	-0.5229123	-0.1873157
$\Delta approval_{t-2}$	-0.3629979	0.0865733	-4.19	0.000	-0.5326784	-0.1933174
$\Delta approval_{t-3}$	-0.3062582	0.100615	-3.04	0.002	-0.50346	-0.1090565
$\Delta approval_{t-4}$	-0.2735821	0.09667	-2.83	0.005	-0.4630519	-0.0841124
$\Delta approval_{t-5}$	-0.5197415	0.0943737	-5.51	0.000	-0.7047104	-0.3347725
$\Delta\%GDP_{t-1}$	1.017262	0.460795	2.21	0.027	0.1141204	1.920404
$\Delta\%GDP_{t-2}$	0.8332489	0.5891248	1.41	0.157	-0.3214145	1.987912
$\Delta\%GDP_{t-3}$	0.9124379	0.6582148	1.39	0.166	-0.3776394	2.202515
$\Delta\%GDP_{t-4}$	-0.0317261	0.5535645	-0.06	0.954	-1.116693	1.05324
$\Delta\%GDP_{t-5}$	-0.3432845	0.4434227	-0.77	0.439	-1.212377	0.525808
$inflation_{t-1}$	2.949188	0.6763937	4.36	0.000	1.623481	4.274896
$inflation_{t-2}$	-0.3013434	0.7246004	-0.42	0.678	-1.721534	1.118847
$inflation_{t-3}$	2.436368	1.7533022	3.23	0.001	0.9599226	3.912813
$inflation_{t-4}$	-0.208418	0.6958134	-0.30	0.765	-1.572187	1.155351
$inflation_{t-5}$	0.5742264	0.6706282	0.86	0.392	-0.7401808	1.888634
$\Delta ICEA_{t-1}$	-0.0077401	0.091132	-0.08	0.932	-0.1863555	0.1708752
$\Delta ICEA_{t-2}$	0.0267211	0.083275	0.32	0.748	-0.1364949	0.1899372
$\Delta ICEA_{t-3}$	-0.0487779	0.0815015	-0.60	0.550	-0.2085178	0.110962
$\Delta ICEA_{t-4}$	0.2758789	0.0809191	3.41	0.001	0.1172804	0.4344775
$\Delta ICEA_{t-5}$	-0.004145	0.0851522	-0.05	0.961	-0.1710402	0.1627501
ΔIEC_{t-1}	0.0934786	0.0896037	1.04	0.297	-0.0821414	0.2690986
ΔIEC_{t-2}	-0.1728019	0.0883569	-1.96	0.050	-0.3459782	0.0003745
ΔIEC_{t-3}	0.0210271	0.0894442	0.24	0.814	-0.1542802	0.1963345
ΔIEC_{t-4}	-0.123898	0.090074	-1.38	0.169	-0.3004398	0.0526438
ΔIEC_{t-5}	-0.1527517	0.0898993	-1.70	0.089	-0.3289511	0.0234478
FHC II	-4.929682	2.377149	-2.07	0.038	-9.588809	-0.2705544
Lula I	5.250426	1.852704	2.83	0.005	1.619192	8.88166
Lula II	12.54421	2.000632	6.27	0.000	8.623042	16.46538
Dilma II	-7.863599	2.552356	-3.08	0.002	-12.86612	-2.861074
Temer	6.146717	5.902785	1.04	0.298	-5.42253	17.71596
PSDB	8.417076	6.085887	1.38	0.167	-3.511043	20.34519
PT	0.7616609	6.072094	0.13	0.900	-11.13943	12.66275
PSL	27.43286	6.25848	4.38	0.000	15.16646	39.69925
Events	1.84863	1.66166	1.11	0.266	-1.408163	5.105423
Constant	-14.72515	5.508051	-2.67	0.008	-25.52073	-3.929567

This is where we leap forward and proceed to estimate the complete VAR described by the last series of equations – with approval, the economic variables, and the two consumer sentiment components (see Table 11 above).

The results presented in Table 11 tell a more detailed, compelling tale. The first lags of GDP growth and inflation rates have positive, significant effects on approval ratings. The aggregated economic cognitions, represented by first differences of IEC e ICEA, despite showing signs of Granger-causality over approval, have significant effects only at the fourth lag (for ICEA) and the second lag (for IEC); the direction of the latter is the opposite of what we should expect. This gives room for more speculation about what drives the Brazilian electorate's approval of the president regarding economic conditions and adds something to the body of research on economic vote theory. These results are discussed in detail in the next chapter.

For this VAR model, impulse-response functions (IRFs) and forecast error variance decompositions (FEVDs) are available in the appendix at the end of this study, and these show us the actual effect of one variable over another. Impulse-response functions show the effect of one shock (impulse) at a given period t and how it propagates along time (response); the forecast error variance decomposition, on its turn, has the ability to highlight how much of the variance in forecasting error is due to one given exogenous shock.

5 **Conclusion**

The discussion proposed by this study aimed at shedding light on economic voting behavior by the Brazilian electorate. Particularly, we were interested in investigating whether the voter in Brazil thinks prospectively when evaluating economic performance by the president; that is, we intended to test the central hypothesis that this voter acts as a banker, in the terms postulated by MacKuen, Erikson, and Stimson (1992). The results from the estimations run in the previous chapter suggest important insights to be further advanced on this front.

The central finding from the models is the significant effect of both prospective and retrospective evaluations over presidential popularity. These results suggest some degree of sophistication embodied in political judgments by these voters. Even though there is evidence for temporal precedence from retrospective evaluations over presidential approval, prospective evaluations do not shy in front of this effect; the variable for this kind of cognition – the IEC component of the ICC – seems to Granger-cause approval with the same strength as the retrospective component. This is reminiscent of what is argued by Carlin and Hunt (2015) for the Uruguayan case.

This is important because, firstly, the evidence on the matter is still mixed, especially for developing countries. Secondly, before running the empirical tests presented by this essay, we could have been led to believe that prospective voting behavior goes undetected in Brazil – as young, fragmented democracies tend to be regarded as troublesome by the literature, among other things, in terms of the quality of assessments evoked by the electorate (POWELL JR.; WHITTEN, 1993). The evidence brought up by the exercises we ran does not support such conclusions, at least not in full terms. The positive, significant effect of economic anticipation on presidential popularity, even when controlling for the economy itself, allows for a little more than that. Without regard for the quality or accuracy of such anticipations, we know that, to some extent, the Brazilian voter keeps an eye on the near future. In short, she might not be a banker at heart, but at least we know that she does not respond to the political economy fully as a peasant.

In addition to that, a future task for the researcher is to look at the drivers of these expectations, as well as the precision of the forecasting provided by them. MacKuen, Erikson,

and Stimson (1992, 2000) had already suggested the primary importance of investigating the role of information in political economy, in light of economic voting theory. The argument presented here only reinforces that political science research must seek to understand these additional effects, as the quality and democratization of information play a central role in political choice.

Also, of course, one cannot ignore the substantial findings concerning the economic variables in the models estimated. The GDP growth coefficients, when significant, present a picture that is not exactly novel to the literature; but, quite strikingly, the effect of inflation rates on popularity is consistently positive and significant, across different specifications. Such evidence corroborates the argument proposed by Abranches (2018, p. 360), according to which antagonizing political forces in Brazilian presidentialism have been historically juxtaposed by inflation mechanisms. In other words, accommodating such conflicting interests could, in turn, produce a positive effect on presidential popularity, at least in the short run. This is of utmost interest to Brazilian political science, as Abranches' propositions guide many inquiries seen in recent research, starting with his pivotal work on *presidencialismo de coalizão* (coalition presidentialism) (ABRANCHES, 1988).

Expectations are key incentives for political activity. This seems to be a phenomenon that crosses borders, regardless of economic and political development levels. Thus, expectations and their effects must be considered carefully, by researchers, politicians, and voters: as MacKuen, Erikson, and Stimson (1992, p. 607) suggest, prospective behavior does not necessarily mean quality of democracy, as its effects can be manipulated or self-fulfilling, or both. Nevertheless, it indeed tells something about our potential capabilities as citizens and therefore voters. The Brazilian voter seems ready to take into account all the facts that matter; improving the political environment around her – including, but not only, the quality of the information distributed – is a task of another degree, but it is one that looks easier if we know that the electorate is able to look ahead, as much as any other electorate abroad.

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Figure 11 – A APPENDIX: Impulse-response functions of VAR model 3
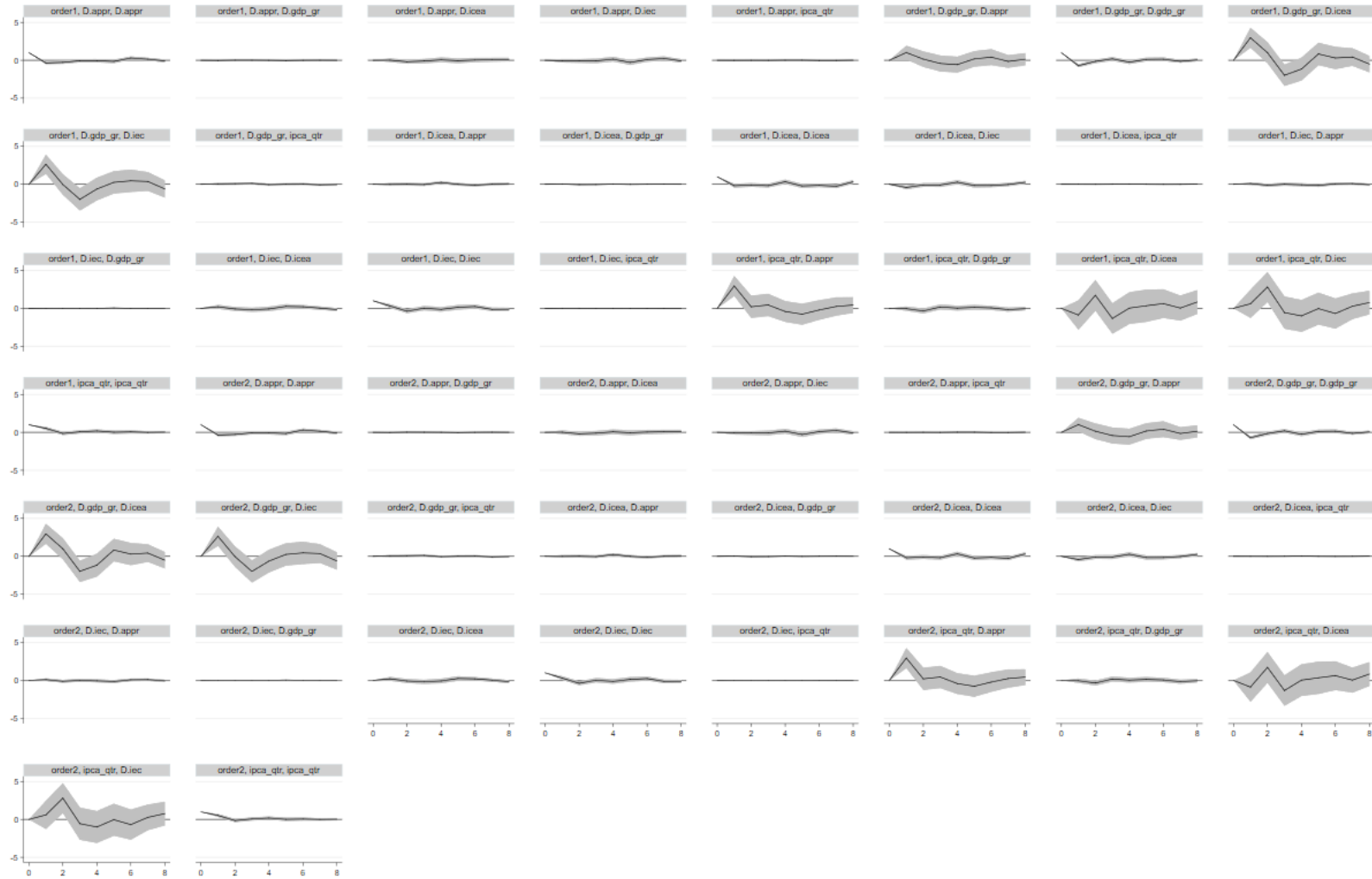
95% CI ——— impulse-response function (irf)

Figure 12 – B APPENDIX: Forecast error variance decomposition for VAR model 3
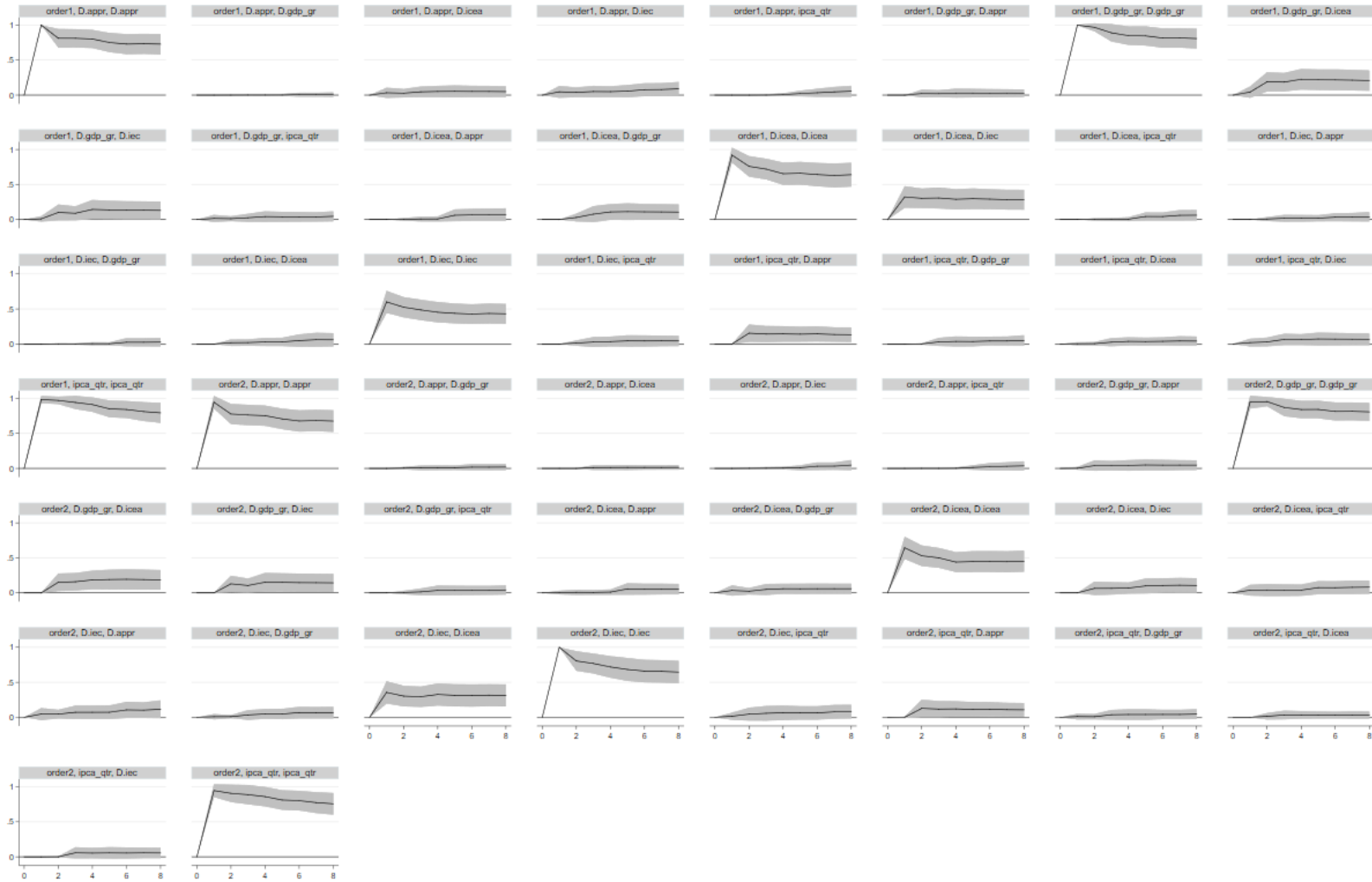
95% CI — fraction of mse due to impulse