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Democracy and Social Policies for Inequality Reduction in Brazil:

Representatives Policies' Congruence and Relevance - 1998-2018

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A thesis presented to the University of Brasília's Political Science Graduation Program, as a requisite for the Doctorate in Political Science title.

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REPRESENTATIVES POLICIES' CONGRUENCE AND RELEVANCE – 1998-2018

A thesis presented to the Political Science Graduation Program of the Institute of Political
Science – IPOL of the University of Brasília – UnB.

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Abstract

A long-standing question on the capacity of democracies to reduce inequalities is yet open. Brazil offers a case of study, as a country where socio-economic indicators have significantly advanced for those at the bottom of the social pyramid after the re-democratization. Nevertheless, the current context brings questions on the sustainability of Brazilian democracy to deliver redistributive policies in the long run. The extent to which our political system is capable of responding to redistributive demands is still to be tested, and this work seeks to advance this field. The central question of this research is, 'how responsive are Brazilian Representatives to their constituencies on health and education demands?'. The answer to such a question is sought in the studies of political 'congruence,' under a broader field of political representation studies. It considers individual Brazilian Representatives across 5 Legislatures (51st to 55th, covering 1998 to 2018). It calculates their electoral dependence on unattended populations – measured through weighting socio-economic indicators on health, education, and income on votes at a municipality level – and then comparing it to the weight of proactive legislative production on health and education on the total proactive legislative proposals for each Representative. It adopted a model of beta inflated distribution to measure the correlation of such proportions. It further analyzed the approved proposals over the 5 Legislatures and their characteristics by the proponent. The results point to a significant congruence of education-related policies and dependence on votes from municipalities with high rates of illiteracy, school attendance, poverty, and low rates of infant mortality. I did not find such alignment for health policies, which responded more to the Representative's declared profession than its constituencies' socio-economic characteristics. Responsiveness has decreased over time, while the House saw a progressive change in their aggregated constituencies – which have better health, are more educated, less poor and unequal – and gradually more Representatives have been presenting education and health proposals. Representatives' policy delivery, on the other hand, has been limited to rules and rights, not affecting budgetary expansion overtime, and very much focused on diffusing benefits rather than concentrating them. This corroborates other previous similar studies.

Keywords: Political representation; congruence; democracy; inequality; public policy.

Resumo

A capacidade das democracias de reduzirem desigualdades ainda é uma questão aberta. O Brasil oferece um caso de estudo, como um país em que os indicadores socioeconômicos avançaram significativamente para aqueles que estão na base da pirâmide social após a redemocratização. No entanto, o contexto atual traz questões sobre a sustentabilidade da democracia brasileira para efetivamente implementar políticas redistributivas a longo prazo. A extensão em que nosso sistema político é capaz de responder a demandas redistributivas ainda precisa ser testada, e este trabalho procura avançar nesse campo. A questão central desta pesquisa é 'até que ponto os deputados federais brasileiros respondem aos seus eleitores nas demandas de saúde e educação?'. A resposta a essa pergunta é buscada nos estudos de "congruência" política, localizado em um campo mais amplo de estudos de representação política. Considera-se os deputados federais brasileiros individualmente em cinco legislaturas (51ª à 55ª, abrangendo 1998 a 2018). Calcula-se sua dependência eleitoral de populações não assistidas – medida por meio da ponderação de indicadores socioeconômicos de saúde, educação e renda nos votos em nível municipal – e depois comparando-os ao peso da produção legislativa proativa em saúde e educação nas propostas legislativas proativas para cada representante. Adotou-se um modelo de distribuição beta inflacionada para se medir a correlação de tais proporções. Além disso, analisou-se as propostas aprovadas sobre as 5 legislaturas e suas características por proponente. Os resultados apontam para uma congruência significativa de políticas relacionadas à educação e dependência de votos de municípios com altos índices de analfabetismo, frequência escolar, pobreza e baixas taxas de mortalidade infantil. Esse alinhamento não foi encontrado nas políticas de saúde, que responderam mais à profissão declarada do deputado federal do que às características socioeconômicas dos seus eleitores. A capacidade de resposta diminuiu ao longo do tempo, enquanto a Câmara Federal viu uma mudança progressiva em sua base eleitoral – que tem melhor saúde, maior instrução, menos pobreza e desigualdade – e, gradualmente, mais deputados têm apresentado propostas de educação e saúde. A entrega final da política pública por deputados federais, por outro lado, foi limitada a regras e direitos, não afetando expansão orçamentária, e prioritariamente dispersando benefícios. Isso corrobora estudos prévios de cunho similar.

Palavras-chave: Representação política; congruência; democracia; desigualdade; políticas públicas.

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I. Introduction

I.I. Context and pertinence of the research

Among the range of relevant questions political scientists and other researchers have today, the functionality of democratic systems to reduce the gap between the richest and the poorest is somewhere at the top of priorities. There is an open question on whether democracy is capable of drastically reducing inequalities in the long run. The majority desires that it does, but optimism (or a normative view) is not enough in this debate.

Even though there are more democratic countries today than four decades ago, inequalities remain high globally and within many countries (WID 2019; UNDP 2018). Income inequality has grown in recent times – especially in developed countries with relatively low levels of disparity and consolidated democracies – pulled by income concentration at the very top of the pyramid (Piketty 2014; Milanovic 2016).

Poverty reduction did not necessarily mean social mobility, instead being the result of specific policies to improve the livelihoods of the very bottom above a virtual line. They did not solidly move the poor to a growing "middle class," and, as an effect, poverty is growing back again in many regions (World Bank 2018). This is true for Brazil.

The country's poverty rate has been growing since 2015 (IBGE 2019), as a result of, among other factors, economic slowdown, and higher unemployment (Neri 2018). Inequality and poverty steadily increased since 2015, revealing a definite limit of redistributive policies previously implemented. At the same time, it is reasonable to state that Brazil's social protection system avoided an even bigger social crisis. A growing minimum wage (and, hence, a growing amount of monthly pension grants) helped mitigate the crisis impacts, even though the Conditional Cash Transfer Bolsa Família amount was frozen due to fiscal contingency (Neri 2018).

Lustig et al. (2013) measured the impact of taxation and social spending on redistribution in Brazil, and another five Latin American countries – Argentina, Bolivia, Mexico, Peru, and Uruguay. They separately measured the redistributive or concentrating effect of direct taxation, indirect taxation, direct governmental transfers, and social spending on health and education, starting from a market-level of income inequality. What they found was a positive effect of direct taxation and transfers in inequality reduction, especially in Brazil, Argentina, and Uruguay. Moreover, the most definite impact on the reduction of the Gini

coefficient came from social spending – a 19.6% reduction with regards to the market income Gini coefficient in Uruguay, 21.6% in Brazil, and as high as 24.5% in Argentina.

Silveira et al. (2011) tested the effect of social spending on the Brazilian income inequality measured by the Gini coefficient and found similar conclusions, with one difference regarding the role of indirect taxation (pointed by them as regressive, as opposed to Lustig et al. 2013). According to them, the impact of government health and education spending on the Brazilian market income Gini was a 21.8% reduction. These results point to the prominent importance of spending on health and education, something that is corroborated by other works that cover European and North-American countries, as well as Latin America (Martinez-Vazquez et al. 2011; OECD 2012).

In a country with a considerable contingent of poor people like Brazil, social policies and spending have a central redistributive role by avoiding low-income families to use their private resources to go through medical treatment or put their children in school. It does not come as a surprise, therefore, that almost all surveys that investigated Brazilians' perceptions on the role of the State have pointed to majoritarian support to high State intervention through social policies.

Arretche & Araújo (2017) use PSIEM, ESEB and CEM data to point that the support to State social intervention in Brazil, in the 2008-2014 period, fluctuated between 93% and 83% among those whose income was less than one minimum wage, and similarly even among the richest (between 90% and 85%). Datafolha replicated the same questions in 2017 and 2019, and obtained more than 80% of support in all income ranges, corroborating to the previous results (Oxfam Brasil/Datafolha 2017 & 2019). Brazilians broadly rely on the public sector to have access to health and education. Meanwhile, the mainstreamed solutions to the 2015 crisis seemed to counter public opinions' intuition on the role of the Brazilian State.

A Constitutional amendment to limit all federal spending – including social spending on health and education – was approved in Congress, and a major fiscal contingency plan was conducted, from Dilma's and Temer's governments to current Bolsonaro's government. A broad pension reform, debated since Temer's term, was finally approved in 2018 after a fierce dispute for votes within the House of Representatives. While the redistributive effects of such measures are yet to be tested, they clearly walk towards the opposite direction of the expansionist pace from previous decades.

If it is true that Congress approved all those measures, it is also true that it did not come as smoothly as the Federal governments would like them to have come. Representatives calculated risks in positioning themselves in such issues, something that was indicated by the

initial hesitance of Representatives to support, for instance, the pension reform approved in 2019. Also, other relevant proposals are being debated in Congress – like tax reform and administrative reform – that will require the same sort of decision from Legislators.

This context opens space for a more in-depth debate on the responsiveness of Brazilian Representatives. By looking at a historical set of data, this research sought to contribute to the understanding of the behavior of Representatives over the last 20 years. It aims to help to explain the role of the House of Representatives in producing redistributive policies, which gains relevance in the context of structural reforms being pushed in Congress.

I.II. Democracies and redistribution

Many scholars have tested the reach of governments to deploy redistributive policies. A line of research was opened by Meltzer & Richards (1981), who, by explaining the size of governments, ended up proposing a general equilibrium theory in which democratic systems with universal suffrage create incentives for social policies (and hence for a larger State) on the proportion that the decisive voters' income is lower than the general mean income. Such theory was explored by later research that shows a relevant causal connection between low-income voters and the presence of redistributive policies (Lindert 1994; Acemoglu & Robinson 2000; Acemoglu et al. 2008; Doucouliagos & Ulubaşoğlu 2008; Martinez-Bravo et al. 2012; Tavares & Wacziarg 2001). In sum, there is inertia towards redistribution in countries with a large contingent of poor people – like Brazil, for instance.

Acemoglu et al. (2015) sustain that the political system, if designed under a universal suffrage democracy, tends to work towards an increase in public policies, having particular effects upon secondary schooling. On the other hand, it does not necessarily mean it will result in income inequality reduction. There are other determinant aspects for a democracy to implement redistributive policies effectively, for example, previous economic transformation, land concentration, previous level of inequality, and political capture of democratic institutions (Acemoglu et al. 2015).

These analyses aimed at the whole democratic system and its theoretical and practical capacity to respond with redistribution. It takes more nuance to assess the incentives parts of the system have to push for redistributive policies.

In this sense, Esping-Andersen (1985), for instance, added another condition for democracies to reduce inequalities, drawing conclusions towards the need of a pro-

redistributive government (contextually, composed by left-wing parties) to respond to the equilibrium theory. Partisan politics is also essential for the redistributive policies outputs according to Bradley et al. (2003), whose empirical research concludes that a "*leftist government very strongly drives the redistributive process directly by shaping the distributive contours of taxes and transfers and indirectly by increasing the proportion of GDP devoted to taxes and transfers*" (Bradley et al. 2003, p. 225).

In Brazil, the democracy vs. redistribution debate remains open. Since the re-democratization, in 1985, the country went through different political moments, with different orientations regarding the role and size of the State. A close look at the different national governments can enhance their pro-market vs. pro-State oriented policies, but a look from further away will show a steady three-decade growing State and institutionalization of recently existent public policies (Souza 2017).

From 1988 to 2014, there was a robust movement of poverty reduction and, as of 2004, steady signs of inequality reduction (Ipea 2019). Although the notion that income was redistributed in Brazil was rightfully challenged through the use of tax authority data of the wealthiest Brazilians (Medeiros et al. 2015; Morgan 2018), there is little doubt that there was progress regarding work income redistribution and access to public services (Arretche 2015). In a broader sense, even though the Brazilian elite did not drastically lose their share of the national income even after the 1964-1985 dictatorship (Souza 2016), Brazilians increased access to income sources (from work or the State), to housing infrastructure and education and health (Arretche 2015). As a result, they improved their life conditions (UNDP 2018).

Arretche (2018) argues that there have been two main drivers for redistribution in Brazil: (i) the new Federal Constitution and (ii) the proper operation of our democracy, which secured Constitutional rights. The first argument is based on the consensual importance of the fact that the 1988 Constitution included a massive population that was out of the then incipient Brazilian welfare state, despite the incentives it created for regressive social spending (Medeiros 2001). Before 1988, access to public health and education was limited to those with a work card, a small percentage of the families whose sponsor was formally employed. Overthrowing such barriers and universalizing access to public services was indeed perhaps the single most inclusive policy in recent Brazilian history.

The second aspect of Arretche's argument - a functioning democracy that both avoided social policies' retraction and eventually expanded them - needs yet to be better tested and understood. The initial condition for a confirming hypothesis – broad support for redistributive policies in Brazil – seems to exist (Reis 2001; Arretche e Araújo 2017; Oxfam Brasil/Datafolha

2017 e 2019). Rennó & Pereira (2013) argue that the high social inequality observed in the military period led to intense pressure for redistributive policies on subsequent democratic governments and, even among the "losers" of reducing inequalities, there is strong support for the redistributive agenda, although public policy priorities vary across social strata (Rennó and Pereira 2013; Lamounier 1987).

That strong demand by the voters has an impact on the electoral results. Empirical studies have shown the electoral support to social policies and the incentives a politician has to implement them to get re-elected in Brazil. The conditional cash transfer program Bolsa Família and its relationship with the electoral dynamic is perhaps one of the best-studied cases: its implementation was so successful from the electoral point of view that it shifted President Lula's electoral bases from a South and Southeast-dominated one to a Northeast-dominated one in-between 2002 and 2006 elections[1] (Zucco 2008; Terron & Soares 2010; Licio et al. 2009; Hunter & Power 2006; Corrêa & Cheibub 2016). There is also evidence that State and local governments tend to increase social investments in order to get re-elected or to obtain higher approval rates (Cavalcante 2015; Noaves & Mattos 2010; Nakaguma & Bender 2006), sustaining the argument of a functioning democracy towards social spending.

When it comes to the Legislative branch, there has been empirical evidence of the role of Representatives in proposing collective benefits rather than concentrated benefits, despite the institutional incentives for Legislators to deliver policy and spending to their voters in order to improve chances for re-election (Lemos 2001). There have also been positive outcomes from the impact on the ground of pork distribution by Representatives (Rennó & Pereira 2013).

Turning to the arguments that challenge the idea of a functioning democracy towards redistributive policies, the Conditional Cash Transfer Programs' focalized nature created a negative response from those who were not beneficiaries (Corrêa 2015; Corrêa & Cheibub 2016), possibly sowing rejection among the middle class and incurring in losing votes. It is reasonable to say that such a targeted policy created o more subjective and broad rejection, which could have affected the support for pro-poor policies in the long run. Moreover, there is extensive empirical evidence that Mayors lose votes in-between elections even if they use their local power to increase spending (Brambor & Ceneviva 2012; Titiunik 2011; Barreto 2009), suggesting that the voter does not necessarily reward a pro-social spending politician.

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[1] Strong electoral support to incumbent governments among beneficiaries of conditional cash transfer grants were also observed in other Latin American countries (Manacorda et al. 2011; Baez et al. 2012), reinforcing the thesis of electoral retribution to redistributive policies.

Looking at Representatives, Lemos (2001) points to a limited capacity of Congress to interfere in public resources' transfers, confirming the hard control of the Executive on spending. Administrative control was found to be high in general: among the approved proposals in the ten years after first direct election to president, the dominance rate of the Executive over the Legislative was 84% (Figueiredo et al. 1999). This s especially relevant as we are currently witnessing a revision of many of the policies that were key for redistribution in Brazil, through changes led by successive governments and voted by Senators and Representatives, as mentioned before.

In short, the CCT Program's backlash, the struggle for mayors to keep political capital, the suggested dominance of the Executive branch overspending and the change in the winds in the federal level policymaking are indicators that Arretche's (2018) second argument could be missing longer-term indications of a misfunctioning democracy. Understanding the level of responsiveness of Representatives, therefore, is essential as part of a broader analysis of the capacity of Brazilian democracy (and its institutions beyond the Presidency) to adequately respond with redistributive policies.

I.III. The research question, hypothesis, methodology, and results

The central question this work seeks to answers is "how responsive are Brazilian Representatives to their constituencies' context on health and education?". Such a question deserves an initial explanation to guide the reading of the following chapters.

By "responsive," I am interested in knowing Representatives' policy production (be it finally approved or not) as a function of their constituents. In other words, policy production – here understood as the proportion of health or education-related legislative proposals on a Representative's universe of proposals – is the explained variable, the way a Representative manifests his or her responsiveness towards his or her voters on the ground.

The primary independent variable to be tested is "constituencies' context," meaning the socio-economic reality in where Representatives' voters are embedded. For that, I use the weight of a municipal indicator on a Representative's votes within the same municipality, aggregating the total weighted votes for a context-influence measure. There are eight adopted indicators for such measure: life expectancy, infant mortality at age 1, elderly ratio, average years of schooling, school attendance for children aged 6 to 17, illiteracy rate, poverty rate, and inequality rate.

Here I flag an innovative approach to this research. While congruence studies have been seeking to measure the alignment of voters' attitudes, Representatives' attitudes, and Representatives' policy (usually measured by roll-call voting), the current work does not focus on attitudes, but on context. It also does not focus on roll-call voting but policy proposals.

The choice for a contextual analysis of voters has a value per se since it measures how Representatives understand and respond to the very reality of his or her voters. It also allows for in-depth and robust analysis across Legislatures and at a municipal level, which would be almost impossible considering the available data on Brazilians' attitudes. At the same time, as will be discussed further, context cannot be automatically used as a *proxy* for attitudes, considering that people perceive reality differently and give different values to what is or not urgent. It means that the explanatory capacity of the analysis has to be perceived within limits.

The choice for policy proposals over roll-call voting is justified on the control a Representative has of the agenda. Policy proposals do not depend on anything but the will of the Representative to put them out, having great value to identify a Representative's set of priorities. By doing so, I assume that we can identify a Representative's set of positions, to the extent that thematic priorities can explain it. On the other hand, the counter-incentives for Representatives to hold themselves accountable through policy are overwhelming, given the low rate of project approval, as further discussed. Moreover, the orientation of the proposals – whether pro or against spending and rights – are not analyzed for the congruence analysis, also setting a clear explanatory limit.

Methodological challenges are mitigated by choice of the themes through which responsivity is measured: health and education. Those are two of the leading national priorities as indicated in systematic surveys (Datafolha 2018), and hence are expected to push Representatives to respond, depending on the context of his or her constituencies in terms of access to health educational public services. Besides that, it is reasonable to believe that a general majority of policy proposals in the studied period are pro-rights or pro-spending.

The central hypothesis of this study is the existence of congruence between context and legislative behavior. Under such hypothesis, I draw other two subsidiary hypotheses: (i) Legislators reduced their level of priority on health and education proposals as Brazil advanced such indices over time and reasonably homogenous across municipalities; (ii) Legislators' new laws on health and lost relevance over time for the same reason.

In order to test that, this work considered individual Brazilian Representatives across 5 Legislatures (51st to 55th, covering 1998 to 2018), calculating their electoral dependence on unattended populations and comparing it to the weight of proactive legislative production on

health and education on their total legislative production. It further analyzed the approved proposals over the 5 Legislatures and their characteristics by the proponent.

The results point to a significant congruence of education-related policies and dependence on votes from municipalities with high rates of illiteracy and low-income. Such alignment was not found for health policies, which responded more to the Representative's declared profession than its constituencies' socio-economic characteristics. Responsiveness has decreased over time, and the House of Representatives saw a progressive change in their aggregated constituencies – which have better health, are more educated, less poor and less unequal. Counter-intuitively, more Representatives have been presenting education and health proposals from Legislature to Legislature, while Representatives' policy delivery has been limited to rules and rights, not affecting budgetary expansion overtime. These results partially confirm the initial hypothesis of responsiveness of Representatives – particularly to the education agenda as a function of more impoverished and more illiterate constituencies. On the other hand, it disconfirms the hypothesis that the agenda would fade as socio-economic indicators advance – there are more proposals on health and education (and more Representatives presenting them) than before. Overall, it points to the symbolic role of Representatives' policy-making on health and education.

I.IV. Structure of the thesis

This work is divided into five chapters. After this introduction, I begin by reflecting on the theoretical and empirical pathway on political representation and responsiveness, introducing some of the main findings of the most relevant congruence studies, presented in **chapter 1**.

Following that, I bring this debate to the Brazilian institutional context – particularly the Brazilian House of Representatives – trying to find the incentives and counter-incentives to a congruent parliamentary behavior towards their voters – all described in **chapter 2**.

In **chapter 3**, I subsequently start the empirical portion of this paper. I begin by describing the overall methodology and initial criteria and results drawn from descriptive statistics on (i) Representatives' constituencies over time, and (ii) the House of Representatives' and the Representatives' agendas on health and education over time. Following that, I explain the adopted congruence model – inflated beta distribution model to measure the correlation of proportions.

Chapter 4 dives into a different database, composed only by the approved proposals – new laws – originated in the studied period of the five Legislatures (excluded previous proposals). I first describe my methodology and the codebook created to classify the proposals, then presenting the results of such analysis.

Finally, in **chapter 5**, I summarize the conclusions of the empirical research outputs, reflecting what they mean in light of the adopted theory. I also point to future opportunities to expand congruence research, which were not explored in this work.

In the end, I present my Bibliographical **References** and some **Annexes** to support the data and methodology presented in this work.

1. Theoretical and applied research on representation and congruence

A landmark philosophical treaty on representation was written by Hannah Pitkin in 1967, with her "The Concept of Representation." There, she classifies representation in three basic categories – "formalistic," "descriptive," and "substantive"–, a useful exercise to set the ground for further empirical research.

The first category, the "formalistic view" of representation, is the one set on paper, in the law or Constitution. According to her, "[i]t defines representing in terms of a transaction that takes place at the outset before the actual representing begins" (Pitkin 1967, p. 39). One step ahead of such view is the "descriptive" or "symbolic" representation, which aims to measure representation based on how close a set of Representatives is of a microcosm of the broad group of people it represents (the population of a city or a nation, for example).

A third view, upon which Pitkin finally relies on, is the "substantive representation." While the formalistic view does not base itself on actions, and the descriptive representation means "standing for," the substantive representation means "acting for." The "action" on behalf of the best interest of those represented is critical in her definition of representation[2], a standard used in many pieces of political science empirical research, including this one.

Representative governments broadly and historically defined election as their model to select Representatives, as opposed to drawing (Manin 1997). Elections, therefore, serve as a process to build legitimate governments, and is the mechanism through which voters demand (or not) "substantive representation."

Voters cast their votes based on both the expectation they have on their candidate's future actions and the assessment they make of the candidate's last mandates' actions (or any past event related to her). These are respectively what Manin et al. (1999) called the "mandates view" (expectations about the future) and the "accountability view" (assessment of the past).

Newly elected officials have incentives to deliver what they promised in their campaigns – in other words, fulfill the "mandates view." Part of these incentives is due to the "accountability view." Another part is due to the reliability a politician wants to have in the longer-term, be it for the next elections or its other political activities (Downs 1957). Having plans for re-election, therefore, is very important to ensure the "mandates view," as it ensures

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[2]. This is one of the aspects. Her conclusion of representation is that it should be understood quite broadly. She summarizes: *"The Representative must act independently; his action must involve discretion and judgment; he must be the one who acts. The represented must also be (conceived as) capable of independent action and judgment, not merely being taken care of. And, despite the resulting potential for conflict between Representative and represented about what is to be done, that conflict must not normally take place."* (Pitkin 1967, p. 209)

the existence of an "accountability view." There are other conditions for the existence of operating accountability, such as the capacity of voters to retribute or punish their candidate in the next election, depending on her performance during her mandate and the set of institutional rules for election, cabinet formation, and policymaking.

This is all presumed to work if there is interest from voters to hold their Representatives accountable to all matters. Full representation under a normative frame would require high involvement of the voter and high degree of response of the Representative. In practice, on the other hand, voters are interested in giving discretionary political space to their Representatives, mainly because the complexity of many issues makes it costly for voters to follow them carefully or simply do not allow popular understanding (Stokes 2004).

Empirical "congruence" studies – those that measure the connection between voters and Representatives – have been pushing the boundaries for such understandings. Many scholars tested the responsiveness of Representatives, as well as other required elements for it to happen. In the next sessions, I try to explore it in further detail.

1.1. Measuring responsiveness through congruence

Carreirão (2015) rightfully argues that congruence does not fully cover the measurement of representation, calling attention to the "descriptive" measurement (i.e., number of women in the cabinet or Congress) and the level of response to minorities of a political system. On the other hand, congruence is indeed a useful way of measuring representation, given its capacity to identify a central element in any democracy – levels of responsiveness of Representatives towards their voters.

Empirical studies on political representation in the 50s and 60s fundamentally changed this field of research from a normative approach to one that considers behavior, institutions, and the outcomes of variances in these two components. In this sense, Miller & Stokes (1963) developed a seminal piece of research that aimed at measuring congruence between voters' attitudes, their Representatives' attitudes as well as their policy options (through their voting decisions regarding particular bills). The results pointed to a higher correlation for some issues compared to others, suggesting there are different levels of political priorities amongst voters.

A similar result was reached by Soroka and Wlezien (2010), who used the term "degree" to differentiate levels of priorities for voters, which causes different levels of responses of the federal government in terms of public spending in a variety of areas. In both cases, the authors

tried to measure "congruence," a well-set measure of political representation, which fits the "acting for" normative approach of Pitkin (1967).

The landscape of applied research on the field suggests there is a wide variety of possibilities in the relationship between the represented and the Representatives. Congruence could happen in different forms, through different subjects and differently in different moments within the same form and subject.

The mentioned Miller & Stokes (1963) paper measures three kinds of connections: (i) the one between voters' attitudes and Representatives' attitudes; (ii) the one between voters' attitudes and the policies actually implemented by their Representatives (in this case, their vote positions in particular subjects); and (iii) the one between Representatives' attitudes and their legislative behaviour. This is a useful model to unfold in light of further empirical research on how voters and Representatives develop their attitudes, as well as how Representatives take policy decisions.

Figure 1 summarizes Milles & Stokes model, with a suggested set of underlying variables for each of the steps taken in the congruent behavior. In the next three sub-sessions, I try to dig a bit deeper into this developed model of analysis, connecting it to my further object of research, which is the relation between "contextual socio-economic influence" and "Representatives' policy decisions."

Figure 1. The flow of congruence and interconnections

Voters' attitudes	→	Representatives' attitudes	→	Representatives' policy decisions

Access to political information		Representatives' personal background		Party orientation
Level of education		External immediate context		Institutional context
Contextual socio-economic influence				
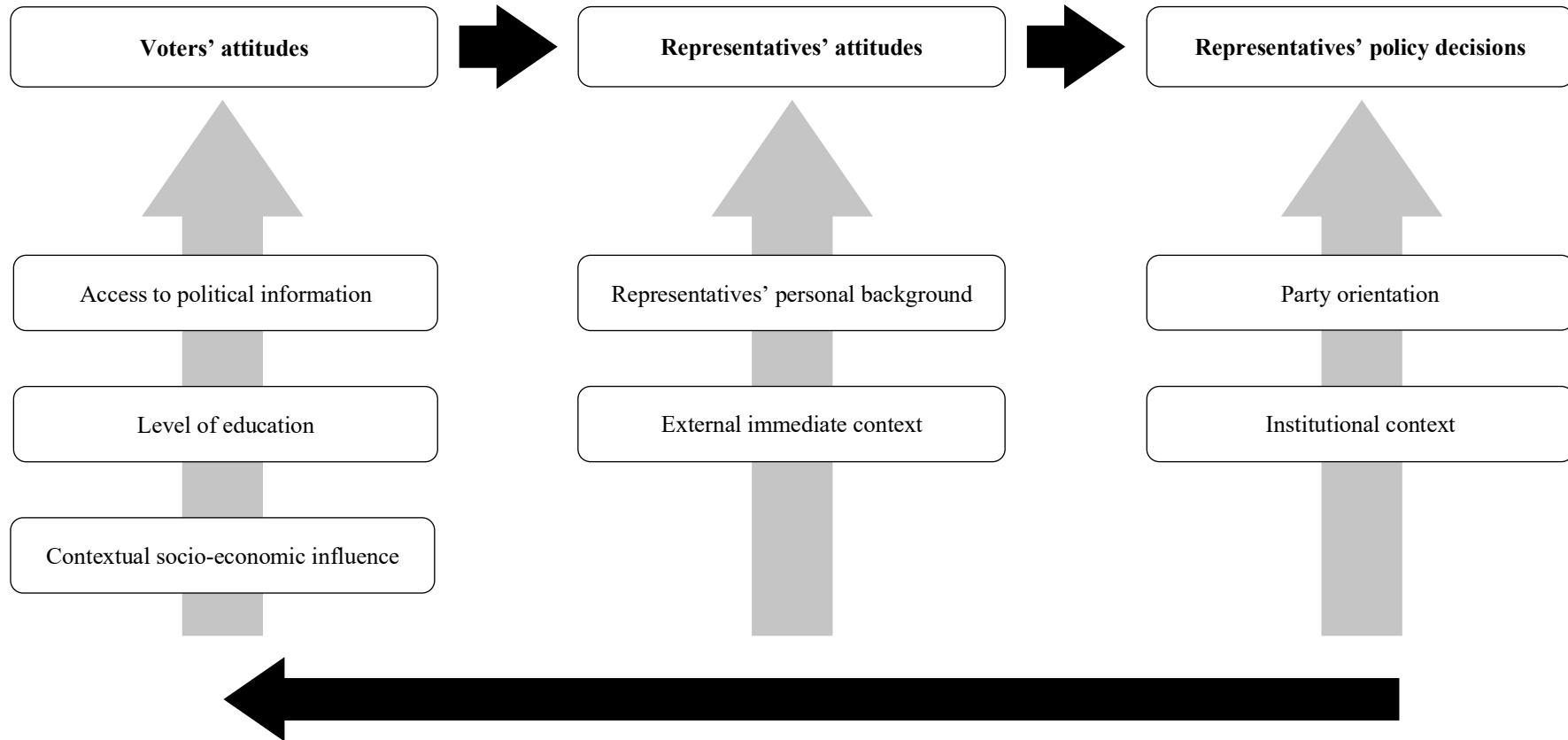
Source: Prepared by the author, based on the revised literature

1.2. Voters' attitudes

In a normative approach, the voters' attitudes are the source of political decisions. The definition of how voters position themselves regarding particular issues is multifactorial, but it is reasonable to argue, based on existing literature, they depend on at least three very different and identifiable drivers: *1. their access to political information*, *2. their levels of education* and *3. their contextual socio-economic influence* – basically the in which reality they are embedded, which is the main object of this work.

When it comes to *1. political information*, there is extensive evidence that the voters' behavior is significantly affected by its access (Bennett 1989; Lupia 1994; Carpini & Keeter 1996; Turgeon & Rennó 2010), although people usually have very little knowledge about politics and policy[3] (Bennett 1989; Converse 1964; Lupia 1994; Carpini & Keeter 1996).

Bennett (1989) uses a historical data series from 1960 to 1984 to show that the overall level of political information is low in America and that, despite the increased levels of education over time, political information was more significant in the 1960s than in the 1980s. In Brazil, Rennó (2007) analyses the distribution of political information in two Brazilian cities in the run-up of the 2002 national elections, pointing the effect of gender, race, and income inequalities in lower access of information by women, people of color and people in low-income suburbs.

The implication of low access to political information is not necessarily a disconnection between voters and their Representatives (what would suggest low responsiveness). There is a series of studies that point to low or no implication of lack of political information, mainly because voters are capable of using other ways to have informed attitudes on politicians and policies (Bowler & Donovan 1998; Lupia 1994; Lupia & McCubbins 1998). Informational shortcuts - such as political parties (Campbell et al. 1967), "mediating agencies" (Miller & Stokes 1963), credible agents (Lupia & McCubbins 2000; Soroka and Wlezien 2010) and the local context (Huckfeldt e Sprague 1995) - work well and reduce the cost of accountability. Besides that, political

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[3]. Delli Carpini & Keeter (1996) define political information as the level of knowledge of factual information. Bennet (1989) uses the same concept, focusing on cabinet formation or distribution of seats in Congress to measure political information.

competitors tend to follow Representatives' actions very carefully, serving as watchdogs in service of the represented population (Fenno 2003).

Political information arrives at the population in different ways. Media reports were assumed to be the official source of information in the initial studies (as seen in Bennett 1989), but much of the voters' attitudes are formed out of relatives', friends' and coworkers' opinions, as well as political parties (Lupia 1994). Fenno (2003) argues that the Representative himself or herself delivers a considerable share of the political information his or her constituency has, given the level of information to which he or she is subject and the necessity of the Representative to explain his or her decisions when they seem to be misaligned with the constituency's expectations[4].

In Brazil, until recently, the TV open and mandatory electoral propaganda had a high impact on voters' decisions, as well as relatives' and friends' advice (Baker at el. 2002). Evidence of recent elections show that this has been changing, in Brazil and elsewhere, with the rise of social media channels over the last ten years. Virtual social network channels offer a common ground for media outlets, candidates, and social movements to present their information, while voters equally search for traditional reporting and influencers' opinions (Himelboim et al. 2013; Hemphill et al. 2013; Lassen & Brown 2011). Automation of virtual channels has been used to spread political messages through individual channels (Bradshaw & Howard 2018; Kollanyi et al. 2016; ITS 2018), suggesting impacts on voting behavior that still need to be unfolded in future studies.

Ideology plays a role when voters are processing information, although it depends on political cognitive complexity (Luskin 1987), more evident in social elites (Inglehart & Klingemann 1976) and not necessarily a conscious driver in the majority of the voters' minds (Oliveira & Turgeon 2015). On the other hand, attitudes are found to be influenced by contextual information available at the decision-making moment (Zaller 1992; Zaller & Feldman 1992).

In sum, although there is a clear impact of political information on voters' attitudes. It matters how such information arrives – its channel –, as well as the ideology,

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[4] The Pension reform debate in Brazil is an iconic example of this counter-flow of information. Since 2016, the then Michel Temer's government started a series of pieces of propaganda to explain the positive economic overall impacts of the reform, a strategy that was conducted by elected president Jair Bolsonaro along 2019. According to Datafolha surveys, rejection of the reform was significantly reduced.

socio-economic conditions, and the immediate context of the receptor of the information. Nevertheless, contrast is attenuated by informational shortcuts.

Another influencing factor of the voter's attitudes is his or her *2.level of education* (Schlegel 2013). The general assumption, broadly supported by empirical studies, is that higher levels of education have positive effects on political participation, voting turnout, support to democratic institutions and democracy as a preferable political regime (Wolfinger and Rosenstone 1980; Rosenstone & Hansen 1993; Verba et al. 1995). Participation and voting (especially where it is not mandatory) is highly correlated with educational levels, according to a series of research in the field (Berinsky e Lenz 2011; Campbell et al. 1960; Hillygus 2005; Nie et al. 1996; Wolfinger & Rosenstone 1980). Higher education levels allow citizens to achieve higher cognitive skills to communicate constituency's demands to their Representative (Verba 1995). Levels of cognition affect not only the voters' attitudes but the whole public debate (Almond & Verba 1963; Dahl 1989).

On the other hand, there is a handful of studies that point to a limited positive effect or a more complex relation between formal education and political behavior. One main criticism is the fact that positive empirical evidence is usually supported to cross-sectional correlation, instead of dynamic analysis (Acemoglu et al. 2005; Schlegel 2013). Brody (1970) pointed out that political activation indicators fell over the previous decades despite the higher education levels of Americans. Acemoglu et al. (2005) use a dynamic analysis in a set of countries, between 1970 and 1995, to show that Freedom House indicators do not correlate with more average years of education.

In Brazil, Schlegel (2013) analyzed a 17-year period, concluding there is a relatively low correlation between education and support to democracy, participation, or trust in the institutions along the time – these being the three tests he carried out. However, he also found a significant correlation in cross-section analysis between university education and political participation, which was later corroborated by Dias & Kerbauy (2015). If a Brazilian has university education, chances are higher that he or she would turn up should the vote be optional, that he or she would remember his or her candidate, and that he or she would agree that "democracy is the best form of government", as asked in the traditional surveys (Dias & Kerbauy 2015). In sum, education is an essential factor for voters' attitudes, but there is a roof of how much influence it exerts, and it is not enough for more informed behavior.

Together with information and education, the environment where a voter is embedded plays a significant role. The *3. contextual socio-economic influence* originated in what surrounds the population of a particular city or suburb matters in terms of what a voter expects his or her Representative to deliver once in office. Scholars that study electoral geography are a good starting point for a revision on contextual influence over voters.

Johnston (1986) studies the 'neighborhood effect,' defined by him as "the concentration of votes for a party in a place which is greater than expected." If a district or a country has all its socio-economic characteristics evenly distributed, there would not be any neighborhood effect. When it exists, there is an underlying justification for that, based on an "issue space" explanation, as outlined by him:

> "1. Each society has one or more cleavages within it, reflecting the major political issues and the attitudes of individuals to them. 2. Political parties exploit these cleavages by developing policy manifestoes which locate them at a particular point of the 'issue space' into which the cleavages are mapped. 3. Individual voters identify the parties closest to them in the 'issue space,' and vote accordingly." (Johnston 1986, p. 41)

The most common example of 'issue space,' he continues, is "class" cleavages[5]. Low-income workers tend to vote for the left, while top incomes vote for the right, a dynamic that plays out on the geographic space of the analysis. For this work, the socio-economic indicators on health, education, poverty, and inequality would constitute 'issue space,' and Representatives would respond differently depending on the 'neighborhoods' they would have in their electoral bases.

In line with Jonhston, Przeworski (1974) argues that *"as soon as one admits that context can modify individual behavior, it becomes apparent that various rules of inference can be legitimate"* (Przerworski[6] 1978, p. 45). Checking whether people are conscious of what surrounds them when forming their voting attitudes, Hjorth et al. (2016)

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[5] Johnston (1986) points to another explaining factor of party vote concentration - the party's manipulation of information to specific cohorts of voters. In this case, it would mean that political information would have a much heavier weight than social and economic context on voters' decision, and that is a possibility for which the current work does not test, despite the positive results found for the impact of context on behavior, as further discussed.

[6] Przeworsky (1974) lays down a fundamental original debate around contextual analyses: the ecological fallacies. He first mentions the series of criticism around the use of aggregated data in inference - a consequence of the mainstreaming of behavioral analysis in political science - to then conclude that those critics were excessive.

found that a population's perception of local context is significantly accurate. Other researches have no doubt in placing ecological analyses in the Political Scientists' toolkit box (Agnew 1996; Enos 2015).

The effect of context on voters' behavior is a debate that is also advanced in 'economic vote' studies. The seminal work of Downs (1957) proposed an evaluation of voting decisions based on the expected utility of having a Representative to the detriment of another. There is, of course, expected rational behavior of the voter, which was later extensively debated and related to educational and informational levels (Downs 1957; Fiorina 1981).

Grounded on the assumption that aggregated data will make the group closer to the expected collective rational behavior[7], there is a line of empirical studies that show a close relationship between the socio-economic infrastructure and the decision to vote, especially in retrospect rather than in anticipation (Kramer 1971; Goodhart & Bhansali 1970; Mueller 1970).

Comparative studies have found that the weight of economic conditions is significant. Powell & Whitten (1993) analyze 100 countries across the globe to find that inflation rates and unemployment affect elections – although differently in different political contexts regarding the ideological orientation of incumbent parties, electoral base, and clarity of political responsibility. Looking to a set of Latin American countries, Remmer (1991) found that the 1980's economic crisis in the region led to higher partisan rotation in power, and the growth of centrist parties – indicating a movement of voters to more moderate attitudes.

In Brazil, there is a vast body of evidence showing the influence of the economy in voter's attitudes. Former president Fernando Henrique Cardoso election in 1994 and reelection in 1998, were highly related to his monetary program "Plano Real", which was successful in containing inflation to historic-low levels and hence had high rates of approval by the vast majority of the population (Mendes e Venturi 1994; Figueiredo 1994; Carreirão 1999). Lula's reelection in 2006 counted on a rewarding vote from the poorest, who saw an increase in their average income as a result of an increase in the minimum

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[7] Downs (1957) explains that "we do not take into consideration the whole personality of each individual when we discuss what behavior is rational for him. We do not allow for the rich diversity of ends served by each of his acts, the complexity of his motives, the way in which every part of his life is intimately related to his emotional needs. Rather we borrow for the traditional economic theory the idea of the rational consumer. Corresponding to the infamous *homo economicus* which Veblen and others have excoriated, our *homo politicus* is the "average man" in the electorate, the "rational citizen" in our model democracy." (P. 7)

wage and unemployment reduction (Hunter & Power 2007). It also had an expanded constituency – particularly the top of the economic pyramid – thanks to the good economic performance of his first mandate (Canêdo-Pinheiro 2015). More recently, Fernandes & Fernandes (2017) found that municipal economic growth is closely related to the voting decision on incumbent candidates, for both municipal and federal elections. Those are findings that corroborate Rennó & Spanakos (2006) conclusions that, in Brazil, the retrospective vote is more important than the prospective one.

The electoral geography literature, as well as the economic vote one, serves as a critical theoretical framework for this thesis. The central hypothesis – of the existence of responsiveness of Brazilian Representatives to their voters' contexts – is grounded in the notion that context matters a lot to voters, therefore mattering a lot to Representatives. In **chapters 3** and **4**, I will revisit the hypothesis from an empirical standpoint, interpreting the results through the lenses of the theory presented above.

I now move to the second step of the model proposed by Miller & Stokes (1963).

1.3. Representatives' attitudes

As shown in **Figure 1**, other parts of the chain influence the production of responsive policies. Having delved into the voters' attitudes, I now turn to the other parts of the chain – the Representatives' attitudes and final policy decisions.

Representatives have their own beliefs. Intuitively there should be great alignment between the Representative set of values and attitudes and those of his or her voters for congruence to exist and, hence, for responsiveness and representation to be enabled. There are, however, a variety of surveys that reveal otherwise.

Miller & Stokes (1963) point to the existence of a great variety of attitudes' congruence, depending on the policy issue. According to their empirical research, the connection on civil rights was much higher than in social welfare policies, and very low on foreign policies, for example (Miller & Stokes 1963). Barret & Cook (1991) found significant congruence between Representatives' attitudes and their voting behavior on social welfare policies for the 58 Representatives they surveyed. More recently, Matsusaka (2017) found a strong correlation between roll-call voting and the Representatives' own beliefs in U.S State-level Legislatures, which explained 71% of the voting on issues where there was attitudes' misalignment.

In Brazil, there is little research on this type of congruence, featuring a few recent surveys. In 2015, Datafolha Institute conducted a survey that showed a more liberal parliament than the general aggregated constituents' attitudes on the moral agenda, while Representatives are more market-led than their voters (Datafolha 2015). Other surveys tried to map Representatives' attitudes on drug policies (Elias & Fiore 2016), women policies (CFEMEA 2009), and religion (Cerveira 2011).

When forming its opinion on issues, there are at least two drivers that could play a decisive role in the Representative's attitudes – *1. his or her background* and *2. immediate external context*. A third driver could be included, which is the Representative's access to information. That could be assumed to be distributed somewhere between his or her background and the external influence, given some policy, proposals tend to be increasingly discussed when it is closer to be decided. In other words, I assume politicians have very high access to information, especially in times of decision making[8].

First, *1. Representatives' personal backgrounds* matter. They help voters manage the expectations and credibility of their candidates, as well as align policy positions prescriptively. Shugart et al. (2005) found that the greater the district is, the more critical it is for voters to know personal information about their candidate as a shortcut for defining their vote, which includes his or her profession, place of birth and personal history. Mansbridge (2009) points out that the anticipation of conflict on policymaking spurs candidates with an aligned background with their constituencies.

Such a connection is particularly evident on identity politics' analyses. Researchers have found that black politicians with black constituency tend to vote more congruently with them than white politicians with a black constituency (Herring 1990). Likewise, women tend to represent pro-women agenda than men better, as pointed in several empirical studies (Lovenduski & Norris 2003; Paxton et al. 2006; Chattopadhyay & Duflo 2004; Wang 2013; McEvoy 2016). But not only identity plays a role - but a professional background also does.

Professions define a big deal of the Representatives' attitudes, the spaces they occupy in institutions, and hence their policymaking. In Brazil, Agrarian Engineers,

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[8] It is also arguable that the way Representatives interpret their constituencies affect their judgment on issues. Although politicians tend to be suitable thermometers of the public opinion, their processes of interpretation very carefully measure the risks implied in misunderstanding changes in voters' attitudes (Fenno 2003).

Veterinarians, Agricultural Technicians, and Agribusiness Entrepreneurs are highly correlated to the Agriculture Commission in the House of Representatives and agricultural-related policies themselves (Ricci & Lemos 2004; Georges 2015).

In this research, I test Representatives' prioritization of health and education in their proactive agenda as a response of their profession – one of the relevant background features as suggested in the revised literature. I find that Representatives with a background in health-related professions (physicians, nurses, pharmaceutical specialists, etc.) tend to prioritize significantly the health agenda in their policy-making compared to non-health professionals. This is also true for education, although context explains better.

Other kinds of backgrounds also matter, for example, religion (Collins 2011; Witt & Moncrief 1993) and place of birth (Shugart et al. 2005). In other words, there is both an expected (by the voters) and an inertial background-driven behavior of Representatives, and that is an essential issue in congruence models.

Another critical driver for Representatives' attitudes and actions is his or her *2. external immediate context*. It is connected to both Representatives' backgrounds and interpretation of voters' attitudes and can affect changing the way. Representatives think and act over an issue. The studies on the responsiveness of parliamentarians to media coverage are particularly helpful in this regard.

Findings of empirical studies reveal that Representatives do respond to the news, particularly closer to election cycles (Arceneaux & Johnson 2015). Also, external situations get responses when surfaced by the media in newspaper reading constituencies (Besley & Burgess 2001), and increased exposure of specific events boost specific pieces of legislation that were deprioritized in the legislative agenda before the event happened and was reported by the media (Campos 2009).

Not only media coverage has a strong effect, but also significant external events. In the US, Asher & Weisburg (1978) found that congressional voting change responds to, among other drivers, issue evolution, in a gradual manner. Besides a slow-motion changing reality, disruptive events often change the course of attitudes and policies, as seen in Brazil, in 2013[9].

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[9] In that year, protests spurred a different legislative agenda than previously seen, with a particular change in anti-corruption and pro-public services proposals' priorities. The case of the Constitutional Amendment 37 is iconic: this piece of legislation sought to limit investigation powers of the Public Prosecution Office and was going to pass, a tide that changed after the June 2013 protests. During the demonstrations, the number of protesters showing support to "PEC 37" made the parliament turn its majoritarian position upside down.

In terms of mapping and identifying changes in representatives' attitudes, the literature on political science is not as extensive, particularly in Brazil. It poses a challenge in terms of conducting congruence studies that consider this essential element of the chain, and it offers opportunities for further studies.

For this study, I selected one critical defining element of Representatives' attitudes, which is his or her profession. In my model, it is an independent variable, which, together with context, is set to explain Representatives' levels of priority for health and education proposed policies. However, there are other influencing factors around the policymaking process (here understood in a broader sense than in my model), which deserve attention, as follows.

1.4. Representatives' policymaking

There is a robust cohort of studies that consider the Representatives' actions - roll-call voting, legislative proposals, pork-barrel, and speeches – what I call Representatives' policymaking in **Figure 1**. For this, a Representative's *1. party orientation* plays a significant influence, as his or her *2. institutional context.* Other political drivers, like *ad hoc* negotiations, are essential in the case of voting or other reactive ways of policymaking – which are not the kinds of policies considered in this work. The pursuit of re-election also plays a role, as already mentioned and overwhelmingly tested (Leoni et al. 2003; Pereira & Rennó 2007).

Party lines influence voting behavior. Empirical studies in Western democracies show that partisan discipline is often dominant in policy decisions that imply misalignment between constituencies and parties (Mitchell 1999; Carey & Reynolds 2007). Grossman & Helpman (2005) find that parties deploy pork-barrel resources to create incentives to discipline. Pearson (2015) shows the existence of tension on U.S. Parliament party leaders, who want to keep the partisan discipline to ensure policy approval (or blocking) at the same time that they want to ensure a majority, which depends on 'parochial' legislative work.

In Brazil, leftist parties ensured great discipline on voting decisions even before the 1988 Constitution (Mainwaring & Linán 1997), an operating model that was adopted by other parties by the centralization of powers in party leaders in Parliament (Figueiredo

& Limogi 2000; Carey 2003). Connected to that, being part of governing coalitions imply in greater discipline with governmental lines (Amorim Neto 2000).

In this sense, parties play a central role in defining policy. The tension described by Pearson (2015) is a central one in this case – to whom should a Representative be more faithful? Although the answer is not always straight-forward, there is some consensus on the need to broadly respond to constituencies in order to get re-elected (Mayhew 2004; Fenno 2003), if that is the objective.

The other influencing factor on a Representative's policy decision is his or her *2. institutional context.* The regime (whether presidential or parliamentarian), as well as the existence of a federalist State or not, and the electoral rules, are game-changers (Soroka & Wlezien). The party system and party identification – which in turn are very much to the previous characteristics – also play a role (Manin 1997). I refer to this debate in **chapter 2**, where I discuss more in detail the Brazilian characteristics around a Representative's policymaking.

In retrospect, I argue that the flow of responsiveness is more elaborate than suggests any single study on the topic[10]. In fact, there is a lot of research on the different linkages of such flow that must be included to compose a bigger picture of how congruence works, as summed in **Figure 1**.

For this particular work, the background theories and applied research on the economic vote and the contextual impact on voters' attitudes are particularly important. Equally, the debate on party vs. individual orientation, as well as the institutional context that drives Representatives' policy decisions is a central one. In the end, this work assesses this exact connection: voters' attitudes, measured by context, to Representatives' policymaking, measured by issue alignment to context, under a given set of institutions that compose the House of Representatives and its election.

In the next chapter, I move from a broader debate on responsiveness that aimed at framing the empirical research here presented to the specific debate on Brazilian institutions and the House of Representatives – the objective of the empirical research.

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[10] Distortions to the normative route of congruence are another element that offers more complexity in studies of policy responsiveness. There is a full body of research that found the influence of campaign funding in Representatives' lack of responsiveness to public opinion (Samuels 2001; Langbein & Lotwis 1990). Others study the role of patronage in offering counter-incentives to meaningful representation (Ortega & Penfold-Becerra 2008; Robinson & Verdier 2003; Calvo & Murillo 2008). These are crucial elements that are not measured in this work. For instance, it would be essential to understand the role of campaign financing on health and education policymaking in a future study.

2. Incentives and counter-incentives to responsiveness

Brazil's electoral system creates incentives for a personal vote (Carey & Shugart 1995; Nicolau 2002). It is composed by an absolute majority vote through a two-round system for the Executive branch in all three levels of the federation (except for municipalities in which the population is no bigger than 200 thousand people, in which case it is a one-round first-past-the-post system). For the Federal Senate, it is the first-past-the-post system, and for the House of Representatives, State Parliament, and Local Parliament, the system is through a proportional representation of political parties with an open list.

Mandates are four years long for the chief of the Executive branch, Federal Representatives, State, and local legislators. Senators have an eight-year-long mandate, with a two-thirds vs. one-third of the Senate election cycle. There is no limit in the number of terms of legislators, while the chief of the Executive is allowed to be re-elected only once in a role.

This work focuses on the House of Representatives, and the Representatives themselves. The expected effect of the Brazilian institutions on Representatives' behavior is high responsiveness, with the prevalence of a parochial response trough pork and clientelist relations, rather than through policy. Although it suggests a strong Representative-voter connection, it challenges my central hypothesis – the existence of policy responsiveness to context – and the two subsidiary ones – a reduction of policy proposals as an effect of social progress, as well as a change in the approved proposals as an effect.

I now turn my attention to the institutional debate, grounding it in the Brazilian institutions that influence the Representatives' choices and the expected responsivity of them.

2.1. Political institutions: incentives and counterincentives to responsiveness

Soroka and Wlezien (2010) list three issues that deserve attention in the institutional context – (i) the horizontal share of power (presidential vs. parliamentary);

(ii) the vertical share of power (federalism vs. unitarism); and (iii) a country's political system.

Regarding (i) the horizontal share of power, presidential regimes tend to respond better to the public opinion than parliamentarian regimes. This happens because of the checks and balances provided by the separation of powers, which pushes the whole system to be more responsive by the correction of unpopular measures. Direct elections for the executive branch also play an important role in increasing the responsivity of presidential regimes.

When it comes to (ii) the vertical share of power, federalist structures burrs roles and responsibilities, decreasing responsivity of the political system: *"Federalism increases the number of different governments making policy and thus makes less clear what 'government' is doing"* (Soroka & Wlezien 2010, p. 49). Also, there is the fact that political response to public demands costs more under a federalist State, given the overlap of responsibilities and the impact of a federalist arrangement on the broad political negotiations and cabinet formation (Franzese & Abrucio 2009).

As far as (iii) the political system goes, proportional representation offers better bilateral responsiveness through widening representation (Soroka & Wlezien 2010), despite lower agility in policymaking, as well as the possibility (depending on other regulations) of the existence of a significant number of political parties, which in turn reduces political contrast and the capacity of voters to identify roles and responsibilities in coalitions and in the broader decision making process.

Considering the Representatives' incentives and counter incentives in Brazil, there is a more nuanced analysis that needs to be made, as summarized in **Table 1**. Carey & Shugart (1995) point that Brazil's (i) proportional vote under an open list, together with (ii) the rule of the distribution of seats – through coalitions' total amount of received votes –, (iii) the option for casting votes on individuals rather than parties or coalitions and (iv) the magnitude of the district create incentives for a reasonably personalistic vote.

While the open list reduces partisan control over the candidates (and hence the ideas and policies they support), the expected effect is an increased individual responsivity. The dependence of Representatives on other partisan (or coalition) votes to get elected balances such incentive. Large districts increase competition, therefore pushing Representatives to respond as much as possible to their constituencies in order to get re-elected. Such a response, however, tends to be through direct benefits (be it pork-barrel or local services and patronage) rather than policy.

Nicolau (2002) points the way the vote is counted as an unpredictability factor for candidates for the House of Representatives. There is fierce intraparty competition to be at the top of the list, while the number of competitors is relatively large (Ames et al. 2008). Candidates, therefore, have incentives to be responsive through ways that make them remembered, especially given that Brazilians forget fairly quickly for whom the vote in the House[11]. Credit claiming is, in such a competitive and uncertain scenario, highly relevant.

Table 1. Institutions for the composition of the House of Representatives and their effects on responsiveness

Institution/context	Direct effects	Effect on responsiveness
The proportional electoral system with an open list	More plural aggregation of demands and less partisan control	Increased individual responsiveness
Large districts	Increased competition but reduced accountability	Increased responsiveness through individualistic actions, not through policy
Open party system with low barriers to new parties	Multiplication of political parties and lack of ideological clarity among voters regarding the spectrum;	Decreased responsiveness for lack of clarity on what the party stand for
	Broader coalitions and lack of clarity of who is government and who is not	Decreased responsiveness of political parties and public agents as voters cannot identify who is in charge.
	High electoral competitiveness and high rate of turnover in the Parliament, as voters cannot relate to candidates and parties.	Increased responsiveness as Representatives work to be remembered and voted for in the next elections.
Open electoral coalitions	Low partisan identification; low ideological identification; the unpredictability of the results	Decreased responsiveness in broad policymaking, but increase parochial responsiveness
Federalist structure	Lower clarity of who is responsible for different branches of policies	Decreased responsiveness of Representatives and public agents as voters cannot identify who is in charge

Source: Prepared by the author based on the revised literature

Another set of institutions that shape Representatives' responsivity are those related to the creation of new political parties. The door for new parties in Brazil has been

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[11] ESEB data from 2002 show that just one month after the election, 34% of voters have forgotten who voted for federal deputy, while it was 3% for governor, and 1% for president in the same period (Ames et al. al. 2008).

quite open, with a generous barrier clause and no requirement for verticalized coalitions (TSE 2019), at least until the 2017 electoral reform. During the democratic opening, in the decade of 1980, there was a fantastic increase in the number of political parties, which leaped from 5 to almost 30 (Ferreira et al. 2008). No significant changes in such rule made this number reach 35 as for today (TSE 2019).

The effect of a diverse partisan landscape is the fragmentation of Congress, which in turn forces wide coalition governments that make accountability a hard job for voters (Manin 1997). The multiplication of parties is also an incentive for a decreased party identification: partisan alignment in Brazil is traditionally low (Kinzo 2005; Carreirão 2008; Paiva e Tarouco 2011; Baquero e Linhares 2011) and has been decreasing even further (Carreirão 2008; Paiva e Tarouco 2011). Political parties have been losing public support as an institution (Moises & Meneguello 2008) and have not been the central vehicle for voters' decision on electing Representatives (Paiva e Tarouco 2011).

The result of the incentives, as displayed in **Table 1**, is conducive to a personalistic scenario with low emphasis on policy. While many elements push Representatives to respond and hold themselves accountable to their constituencies, the way such response happens does not seem to be, from a purely institutional analysis, programmatic. In practice, empirical studies have been confirming it, although not entirely – as is the case of this work.

2.2. How Brazilian Representatives respond

A useful typology on how Representatives respond to their constituencies was proposed by Eulau & Karps (1977). There are, according to them, at least four "components of responsiveness": (i) service provision, (ii) pork-barrel, (iii) symbolic actions, and (iv) production of public policies. Representatives may be strongly oriented towards one of them, but usually present a little of each.

Service provision includes the use of a Representative's cabinet for individual purposes, such as accessing information or what is called "casework" (the use of the deputy's mandate to intervene directly with official bodies on behalf of specific voters). Pork-barrel direct resources to public and private entities in providing concrete local benefits, whether for large or small groups. Symbolic responsiveness encompasses public

actions made by Representatives to gain or maintain support from their base. And finally, legislative propositions and roll-call votes make the policy component.

Looking at the empirical studies' landscape, there is quite a lot of bare ground on assessing parliamentarian responsiveness to their voters in Brazil, through whichever component listed above. Based on empirical surveys conducted in two Brazilian municipalities, Ames et al. (2008) conclude that the clientelist vote (the one by which a particular benefit is expected) is low, in contrast to the vote for pork-barrel, which is high. The electorate expecting local or regional benefits is twice as large as those seeking national policies. However, the weight of issue voting is substantially higher than expected, even for parliamentary elections, making it clear that voters perceive programmatic responsiveness in federal deputy candidates (Ames et al. 2008).

Moreover, Ames et al. (2011) studied the pork-barrel response dynamics in Brazil, while Rennó & Pereira (2013) revealed that the use of pork was effective in terms of delivering social change. Barros et al. (2012) measured congruence through a more traditional way, focusing on voters' and Representatives' attitudes regarding electoral reform in Brazil. Besides that, the body of empirical studies has gone off the Representatives-voters connections.

Carreirão (2015) divided the existing representational studies in Brazil into four groups. The first ones gather those who study distortions in the number of seats vs. population per State and representational distortions caused by electoral coalitions. Nicolau (1997), for example, points to a 10% of sub representation of more populated States, particularly São Paulo, for the benefit of small Northern States. These are the exact results of Soares & Lourenço (2006), who also flagged the fiscal impacts of distortions in the proportional share of seats per State. The second group listed is formed by these studies on "descriptive representation." Here are a few studies that aim to map the access of minorities to institutional politics, like the study on the role and effectiveness of quotas for women in political parties developed by Araújo (2005) and investigations about the limitations on descriptive representation of non-white Brazilians in Congress conducted by Meneguello et al. (2012) and Campos & Machado (2015).

The third group study policy production and budget, and include studies carried out by Lemos (2001) and Ricci (2003) on the types of policy proposals and laws generated within a specific period, but with no apparent connection with the Representatives' constituencies. A last group, according to Carreirão (2015), is composed by studies on partisan contrast and behavior, as for example the study of Tarouco & Madeira (2013)

about the programmatic content of political parties to conclude that ideology plays an important role, or the mapping of Zucco (2011) revealing that the position of parties are less contrasted than before.

Although Carreirão (2015) gathers such papers under what exists in terms of congruence studies in Brazil, they all fall short when it comes to crossing preferences and legislative behavior. Lack of data and priority can explain why there is little production in terms of assessing responsiveness in Brazil, and it is clear that there is room to test new approaches, part of the proposal here presented.

In this work, I chose to test the policy component of responsiveness. Considering the incentives created by the Brazilian electoral and institutional framework as exposed above, policy is the most counter-intuitive vehicle for the responsiveness of Brazilian Representatives: it is the hardest to be used for credit claiming, the hardest to get finally approved, there is no pressure from political parties or voters' partisan identification. In light of the proposed hypothesis and research question, it is reasonable to believe that the institutional context for Representatives to respond through policy is not favorable to confirming evidence, making this a conservative choice of research.

In the next chapters, I present the empirical portion of this work, describing the methodological approach in each of the steps taken, their limitations, and the results they offer. I also try to interpret the results through the lenses of theory and previous applied research. In the end, I draw general conclusions from the theoretical and empirical approach of this thesis.

3. Analyzing congruence and proposed social policy in Brazil

A functioning democracy for inequality reduction requires, among other features, a responsive House of Representatives. That, in turn, requires meaningful policy deliver from Representatives to their constituencies and the population more broadly. Aiming to cover these functions, this study focused on two main legislative outputs: (i) the relation between voters' socio-economic environment and their Representatives' policy options; and (ii) the approved bills and their content and relevance.

Social policies on health and education are at the center of this analysis. The selection of these two issues is not deliberate or only intuitive but justified by a large body of research on the prominence of the positive impacts of expanding health and educational services on inequality reduction, as presented in the introductory remarks (Silveira et al. 2011; Lustig et al. 2013; Martinez-Vasquez 2015). It means that voter's socio-economic environment vis-a-vis their Representatives' policy options will be measured focusing on health and education, the same being true for the analysis of the new laws approved.

Congruence, as described before, is a broad concept. I do not intend to exhaust the multiple possible analyses on this issue under health and education's share of the public policies. It is my intention, on the other hand, to understand how responsive the House of Representatives is to the socio-economic reality of their constituents and whether the theoretical counter-incentives – as argued in **chapter 2** – for Representatives to present policies that address education and health gaps in their political bailiwick are observed in practice.

 I hypothesize that policy responsiveness from Representatives to voters' contexts exists. From that central hypothesis, I draw that priority has reduced as an effect of the recent social progress in Brazil – the same being true to the relevance of approved proposals. The results point to a partial confirmation of that on education and disconfirmation of that on health. The descriptive analysis of the variables also offers insights on how the House of Representatives as a whole has been responding – particularly disproving my subsidiary hypothesis of decreasing relevance – and the new laws' analyses suggest a yet different dynamic.

This chapter contains the constituencies and legislative behavior in terms of policy proposals, and the model that compares them. The analysis of the approved health and education bills that were transformed into law is developed further in **chapter 4**.

I will begin this chapter by outlining more broadly the methodological approach of this research, explaining my choices and the data used for the analysis, as well as the descriptive results of each of the variables. Next, I turn my attention to the model adopted for the congruence measure on health and education and the results I reached through it. At the end of the chapter, I summarize its main conclusions.

3.1. Methodology and data

Congruence was measured by assessing the correlation of *1. aggregated municipal socio-economic reality* to *2. legislative behavior*. I adopted a model that measures correlations of proportions on non-normal distributions – the beta inflated distribution (Ospina & Ferrari 2010). In a broader sense, I am comparing the total weight of the indicators on a Representative's electoral base – considering the aggregated weight of the municipal level of each of the health and education indicators on the municipal votes obtained by each Representative – to the level of priority the Representative gives to health and education policies – broadly measured by the proportion of health and education policies out of the total policies presented by the Representative.

It is essential to highlight that this is quite innovative and not mirrored in any other study. Unlike other legislative studies, I use two sets of variables that are understood under the same assumption: the existence of limited resources. Considering the electoral base – the explaining variable – Representatives are usually under heavy pressure for re-election, as the institutional frame increases the competition and hence uncertainty of the final results. Therefore, an electoral base must be very well cultivated, and it is expected that Representatives' legislative behavior addresses his or her constituencies' different demands and realities. In other words, the vote is a scarce resource.

The same is true for the policy-making side of the equation – the explained variable. Although it seems that a mandate has almost illimited time and resources for proactive policymaking – in a sense that Representatives could propose any kind of policy, as many as they would like – it does not happen in practice. Representatives have a short window to present policies when considered the odds of approval. Besides, policy design takes time and resources from his or her cabinet and from the House itself (through the Houses' legislative consultancy body) and competes for attention with other mandate's activities.

By comparing the proportion of health or education votes to the proportion of health and education policy proposals, I use parliamentary choices under limited resources as the critical measure for responsivity, expecting to infer if parliamentarians highly dependent on constituencies with low health and education attainment bases tend to prioritize health and educational policies in their agendas and vice-versa, hence responding to their constituencies' socio-economic reality.

There are two clear advantages to adopting such a methodology. The first one is the kind of information it offers, which have a value per se. From the side of the electoral base, it gives the dependence on municipalities with specific characteristics, expanding what we know in terms of electoral geography in Brazil. From the Representatives' side, it reveals the kinds of proposals they tend to present by thematic areas – in this case, health and education.

The other advantage is the availability of historical data, which allowed me to run the model throughout five Legislatures between 1998 and 2018. However, it also poses limits of interpretation, since Municipalities are heterogenic, and I do not know who voted for the Representative in turn. The ecological fallacy is an existent risk if the context is used as a perfect proxy to opinion, which is not[12].

The central database created for this research was composed of three primary sources – the socio-economic data on the municipal level, the electoral data on the municipal level, and the legislative proposals per proponent.

For the socio-economic data, I considered a set of indicators on health, education, and income. The available data on municipal level comes from IBGE/Census, carried out in 2000 and 2010 (and in decades before that, which were not included in the time-period analyzed in this research). The starting point was the Human Development Index (HDI), a synthetic indicator calculated over direct indicators on health, education, and income.

For health, HDI uses the measure of life expectancy at birth (ranging from 20 to 85 years). For education, HDI adopts the mean years of schooling for adults aged 25 or more and the expected years of schooling for children entering school age as measures. For income – or, more accurately putting according to the HDI, 'standard of living' – it considers the Gross National Income (GNI) per capita by purchasing power parity (PPP),

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[12]. It would be possible to do a more granular analysis considering the level of detail of the origin of votes offered by TSE. Crossing such an electoral map with socio-economic indicators in a municipality could be possible and would offer a fascinating set of information – for example, differentiating rural to urban areas. The limits of interpretation, however, would remain the same.

ranging from US$ 100 to US$ 75,000 or above. The aggregation of these indicators is made through geometric mean (UNDP 2018) and produces the HDI[13].

HDI is an index that is useful in many kinds of analyses, including those used to move the conversation on development beyond the GDP and GDP per capita. On the other hand, HDI has limitations as an indicator for the analysis of congruence brought to this study – mainly because people do not perceive "human development," but they do perceive lack of access to education or poverty. Moreover, HDI on the municipal level, despite being useful as "picture" for diagnosis of development within the country, is risky as a congruence measure for this study, considering I am already weighting the indicators on the total voting per municipality for the parliamentarians – as further explained – and hence already creating an artificial new measure. For such reasons, it was my choice to use the HDI sub-indicators as a measure of socio-economic context in the municipality level, adding a few extra ones to ensure robustness for the analysis. The full table of the indicators adopted in this analysis with their explanation is available on **Annex I**.

On health, I am using life expectancy at birth, as used in the HDI. Auxiliary indicators are also being considered – infant mortality at age 1[14] And the rate of the elderly in the municipal population. The reason for including these other health indicators is to widen our capacity to evaluate health conditions, given that life expectancy is greatly affected by other factors rather than health, as, homicide rate.

On education, I adopted HDI's mean years of schooling for adults aged 25 and expected years of schooling, adding some auxiliary indicators: school attendance rate for individuals aged between 6 and 17 and illiteracy rate. The additions are because only recently Brazil was able to virtually include all of its infant population aged 6 in school, and the inclusion of these other variables could increase the contrast of municipalities in terms of advances in educational indicators.

Although my primary focus on this research was health and education, I included the standard of living as well. It was not, however, calculated the same way it is done for

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[13] Considering HDI leaves many indicators aside, UNDP started to adjust their indexes. There is, for instance, an inequality-adjusted HDI, which controls the level of the Gini index.

[14]. Infant mortality has been criticized for being too narrow of a measure to be used as a proxy for the whole population. The criticism is very intuitive - the indicator refers to babies no older than one-year-old, a small minority of the population. Reidpath & Allotey (2003) tested infant mortality rate (IMR) in comparison to disability-adjusted life expectancy (DALE), another indicator that is well received in the scientific community but not available as frequently in many countries. The test was conducted with a 180 countries' sample. They found both measures to highly correlated, concluding that IMR remains a critical proxy indicator for population health.

the HDI. For that, I selected the poverty rate and inequality measured by the Gini index as indicators instead of municipal gross income per capita. Such methodological choice was made because of limitations offered by the available data on the gross product at the municipality level, an estimate that IBGE does base on other indicators. Given the fact I am already working with a synthetic indicator, I decided to mitigate risks by not adopting the HDI model.

It is important to flag that there is no clear category, as it will be explained further, for 'poverty reduction' legislative proposals, the reason why I have not considered the standard of living in both sides of the congruence models, but only on the voters' context analysis. Labor and employment policies could be a *proxy*, but it would take some sub-classification – something that, although it is possible, would make the analysis more subjective and hence more fragile. Another problem is the great impact of contextual economic dynamics – unemployment rates, investment rates, inflation – on income, and poverty. Adding it all to the model would make it lose its capacity to answer a quite straightforward question – whether a Representative responds to the reality of their voters. At the same time, there is an intrinsic value in assessing the weight of the "poverty vote" or "low-income vote" on the aggregated constituencies. Adding to such descriptive analysis, the model will measure congruence between dependence on poor voters and health and educational policies.

The second source of data for the central database was the electoral data on the municipal level, available on the TSE webpage. I used individual voting data for elected Representatives in each of the federal elections between 1998 and 2014. For each representative, I gathered their total votes as well as their sub-total per municipality, aiming to cross such data with the socio-economic indicators. The matching of the municipalities was facilitated by open matching codes available for R, given that TSE did not use IBGE codes for municipalities.

Considering that the IBGE/Census data refers to 2000 and 2010 only while electoral data refers to 1998, 2002, 2006, 2010, and 2014, I had to adopt a convention to solve this mismatch. My solution criterion was the use of the closest Census indicator before the election - except the 1998 election, for which I adopted the 2000 Census.

Finally, I used a set of data for legislative proposals. The House Rules of Procedure (*RICD - Regimento Interno da Câmara dos Deputados*) defines, in its Title V, the different kinds of proposals available for Representatives. There are five macro-categories of proposals, which are divided into Bills (*Projetos*), Indications (*Indicações*),

Requests (*Requerimentos*), Amendments (*Emendas*) and Opinion Reports (*Pareceres*). Under these categories, there are over 130 different types of proposals (see **Annex II**), depending on the specific role (i.e., whether to amend the Constitution or a bill) or on the proponent of the proposal (i.e., if originated from a Representative or in a House Committee).

For the current analysis, I selected seven kinds of proposals, as follows: Constitutional Amendment Proposals (*PEC*), Bill of Law (*PL*), Provisional Measure (*MPV*), Bill of Legislative Decree (*PDC*), Bill of Complementary Law (*PLP*), Indication (*INC*) and Information Request (*RIC*).

The main criterion for selecting these proposals is the control of the agenda the Representative has when issuing them. In other words, it matters if the proposal is something thought and executed within the Representative's cabinet, at the time of his or her choice, with the theme of his or her choice, not entering an existent process of approval or rejection of an already existing bill. That is what I am calling a 'proactive' proposal.

It is important to note that it is not possible to distill a purely proactive agenda out of the deep sea of agendas that exist in the House of Representatives. Parliamentarians respond to contextual events through proactive legislative proposals – as discussed in **chapter 1** – and not only through amending other pieces or giving speeches from the House floor. This has to be considered when analyzing the data and, ultimately, when interpreting the House capacity to be responsive to their political bases.

Other criteria considered were the capacity to relate them to a specific Representative (which implied in the exclusion of bills whose authors were House committees or the National Congress, for example) as well as their relevance in terms of frequency (which led me to exclude *PRO – Proposta,* for example).

For the legislative database, I used the House of Representatives' open data directory. Through it, I downloaded the 94,479 proposals under the above criteria, for all themes, registered between August 2000 to January 2019. For each proposal, the database offered 51 characteristics such as type (PL, PEC, PDC, etc.), year, theme, last status, proponent, the party of the proponent (if a Representative or a Senator), description of the proposal and so on.

One of the primary filtering criteria was thematic. For that, I used the House of Representatives' classification, which was useful for practical matters – it covers an ample time and the vast majority of presented projects. The process of classification begins with

the registration of the proposal in the House General Desk (*SGM – Secretaria Geral da Mesa*), where it is inserted into the House's system and manually indexed by the Index Department of the House. There is a thesaurus used as a base for such indexation (the *TECAD – Tesauro da Câmara dos Deputados*), and its main criteria are based on the Universal Decimal Classification – UDC.

The critical junction of socio-economic data, voting data, and legislative data are the Representative. The central database list all Representatives and their electoral base weighted by socio-economic indicator, as well as his or her legislative production under the interest themes and in total. The number of observations is 2.262, being 355 Representatives of the 51st Legislature, 463 of the 52nd, 477 of the 53rd, 473 of the 54th, and 494 of the 55th. The total number of observations is lower than the total number of parliamentarians elected in each year, both for methodological and operational reasons.

Methodologically, although in one single Legislature, there are 513 initial observations, this number is reduced as the database considered only the elected Representatives and excluded the alternate Representatives (*suplentes*), even if they joined the House early in the Legislature. This is a deliberate methodological choice that aimed at leveling the playing field by considering only the elected parliamentarians on the day of the initial results and avoiding adjustments due to lower political support of alternates and its legislative behavior implications.

Besides that, there were some losses due to the operation of the data. While compiling the database, there was a constraint to link TSE dada with the House of Representatives' data, given the lack of a connecting identification (i.e.: the CPF number) of these bases for the whole period considered[15]. The connection was made through the names of the Parliamentarians, a process that was quite successful but implied in the loss of observations due to structural differences in the names of the Representatives (differences in the declared or registered surname, for example). The final size of the database after the exclusion of alternates and the losses due to the TSE and Câmara dos Deputados databases' junction is robust, considering it reaches 88% of the elected Representatives in the five covered elections.

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[15] The open data offered by Câmara dos Deputados on the Representatives does not have CPF number for them, although they do present an identification number for each Representative since 1998. Such identification number, however, is only internal. The Superior Electoral Court – TSE data has only adopted the use of CPF since the 2014 elections.

The period analyzed is the 20 years between 1998 and 2018. It covers five Legislatures, from the 51st to the 55th, which are analyzed separately, given that electoral bases, as well as the set of Representatives, changed in each of them. For the 51st Legislature, it is essential to note that, despite the fact that the research used available data of the voting on municipal level for the 1998 elections, data on project proposals of Representatives were only available as for August 2000 - 18 months after the beginning of the Legislature. If on the one hand, it does not mean we are excluding projects on a specific issue or belonging to specific parliamentarians – therefore avoiding such biases – it could affect the analysis for missing the initial months of the Legislature, a period when Representatives tend to present their most important projects, very often all at once.

I have laid down the overall methodology and the data used for the congruence analysis conducted in this paper. I now move to the description of the models adopted and their variables, to subsequently expose the descriptive and correlational results of it.

3.2. Descriptive statistics: parliamentary composition vis-a-vis local indicators

Brazilian Representatives changed their electoral bases as Brazil changed its socio-economic situation through the time. The nature of such changes is an open field for research, and this work is not able to explore all contextual dynamics that brought along new constituencies and new Representatives to the House.

According to the UNDP (2017), between 2000 and 2010 – the two points in time used for mapping changes in Representatives' constituencies – the HDI increased from 0.612 to 0.727. The health indicator had a 12% increase, from 0.727 to 0.816, and the education one went from 0.456 to 0.637 – a nearly 40% increase in ten years. The standard of living indicator had a 7% increase, from 0.692 to 0.739. Brazil made undeniable social progress, and that had an impact on the composition of electoral constituencies.

The vote/socio-economic indicator relation, in this research, considers the weight of the total votes ("α") of a Representative ("r"), in a Legislature ("l"), from a municipality ("m") on the total number of votes that the Representative received ("T"). It then multiplies it for the selected health and education indicators on the same municipality, as follows: life expectancy ("EXP"), infant mortality at age 1 ("IMR"), elderly ratio ("ERA"), average years of schooling ("AYS"), school attendance for children aged 6 to 17 ("SAT") and illiteracy rate at age 18 ("ILR"). A standard of living indicator, the

poverty rate ("PRA"), as well as the local level of income inequality measured by the municipal Gini index ("INQ") are also weighted. I subsequently aggregate the municipal numbers by summing them all and dividing them by the total votes a Representative received, as described below for one of the indicators:

$$EXPvote_{rl} = \sum (\alpha_{rlm} * EXP_m)/T_{rl}$$

All indicators used were standardized because of the wide variation in scales of each of the indicators. The standardization adopted was through subtracting the group mean and dividing it by the standard deviation, the mean becoming 0, and the scale varies between positive and negative values. In the end, what I find is an artificial number – in the example above, the "EXPvote" – that does not make sense in itself, but only in comparison to other values and the dependent variable.

Considering the variables as described before, the House of Representative's general constituency became less rooted in low health cohorts of the population in the 54th and 55th Legislatures in comparison to the 51st, 52nd, and 53rd ones. This is what the three kinds of "health votes" – "EXPvote," "IMRvote," and "ERAvote" – reveal in a weighted analysis.

The series of boxplots seen in **Figures 2, 3, and 4** show a significant change in the profile of constituencies from one Legislature to another, particularly from the three first ones to the two latter ones. It is crucial to note that such kind of contrast is a result of the use of Census data – the 51st, 52nd, and 53rd Legislatures are related to the 2000 Census, while the 54th and the 55th are related to the 2010 Census. Therefore, there might be a missing graduality in the revealed constituency changes that this work was not able to identify for lack of data.

In **Figure 2**, it is possible to see that the EXPvote distribution increased, most likely as a result of the increase in the general life expectancy in Brazil during this period – from 70.6 to 73.8 average years (IBGE 2019). Moreover, there is a lower range in the latter Legislatures, revealing that the 54th and 55th constituencies became more homogenous than the previous three ones.

Figure 2. Distribution of life expectancy weighted vote – EXPvote in five Legislatures of the House of Representatives
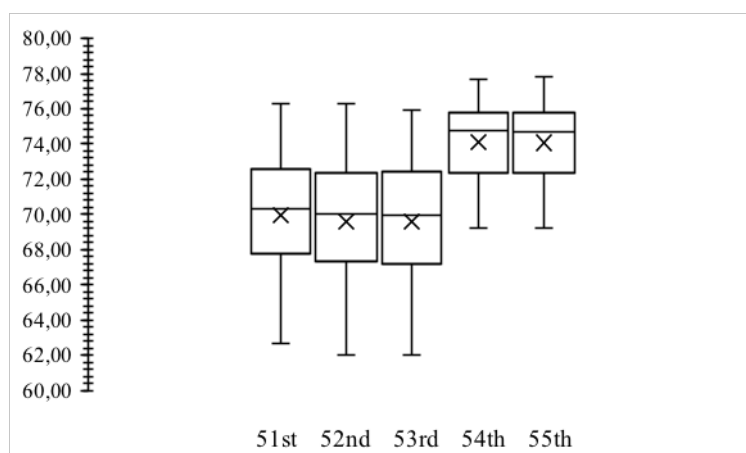
Source: Prepared by the author with data from IBGE/Censo 2000 and 2010, and from TSE 1998, 2002, 2006, 2010, and 2014.

Considering the 51st and the 54th Legislatures, the two of them that overlap the best with the Census data, it is quite clear that the Congress became more relying on people who improved their lives, judging by this particular indicator that is the one used in the calculation of the UNDP Human Development Index. There is a significant change in the weight of infant mortality through the period covered from the 51st Legislature to the 55th one.

Figure 3. Distribution of infant mortality at age one weighted vote – IMRvote in five Legislatures of the House of Representatives
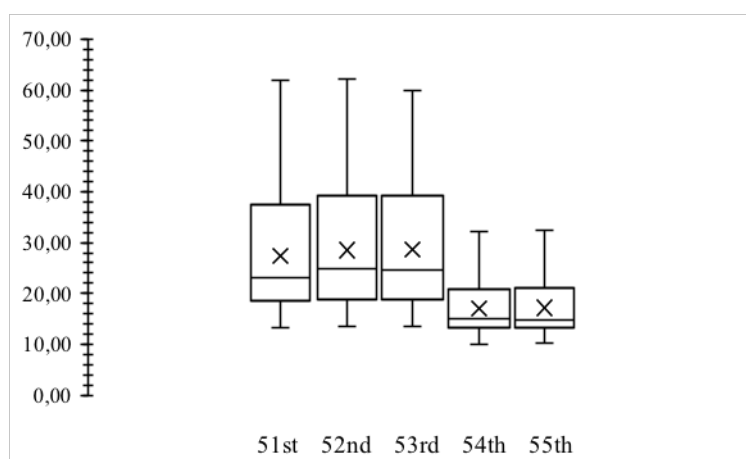
Source: Prepared by the author with data from IBGE/Censo 2000 and 2010, and from TSE 1998, 2002, 2006, 2010, and 2014.

Figure 3 shows a distribution of Representatives' dependence on votes vs. infant mortality at age one that changes from the initial three to the last two Legislatures, also with a narrower and more homogenous display. Again, in both **Figures 2 and 3**, the fundamental difference might be related to the context change captured by the two Census. That is a reasonable explanation for the leap between the 53rd and 54th Legislatures in both charts.

The last health indicator weighted on Representatives' votes is the elderly ratio per municipality ("ERA"). Alike **Figure 4**, the same leap is observed comparing the researched Legislatures, indicating that the constituencies have been counting on a more significant share of the elderly population. Looking at the 51st vis-à-vis the 54th Legislatures, there was an evident contrast between the location of the median value.

Differently from the life expectancy and infant mortality cases, however, there was an increased range in the distribution for the elderly ratio. The 54th and 55th Legislatures show a more spread level of influence of the elderly in the Representatives' constituencies when compared to the three previous ones.

Figure 4. Distribution of elderly ration weighted vote – ERAvote in five Legislatures of the House of Representatives

Source: Prepared by the author with data from IBGE/Censo 2000 and 2010, and from TSE 1998, 2002, 2006, 2010, and 2014.

While the more significant weight of the elderly in the 54th and 55th Legislatures could be explained by the fact that Brazilians are getting older in general, the broader range of dependence on "ERAvote" could indicate a less normal distribution of the elderly population among voters, pointing to the existence of more contrasted elderly "political neighbourhoods" (Johnston 1986).

Moving the descriptive analysis to the education indicators, there were three kinds of votes analyzed in Representatives' constituencies – "AYSvote," "SATvote," and "ILRvote." The results of the boxplot analyses for each of them present a similar general cleavage between the Legislatures, reinforcing the Census data contrast.

Advances in the Brazilian educational system and increased average schooling years between 2000 and 2010 were contextual changes that were identified in the composition of the voting bases of Representatives, as pointed in **Figure 5**.

Similar to two of the three health indicators – the "EXPvote" and the "IMRvote" – the two latter Legislatures had more homogenous constituencies than the previous three ones. It is interesting to note that the weight of average years of schooling did not significantly grow at the top of the distribution from the 51st to the 54th Legislatures, meaning that the decreasing width of the distribution reflected a more educated constituency comparatively over time, but not in absolute terms.

Figure 5. Distribution of average years of schooling weighted vote – AYSvote in five Legislatures of the House of Representatives
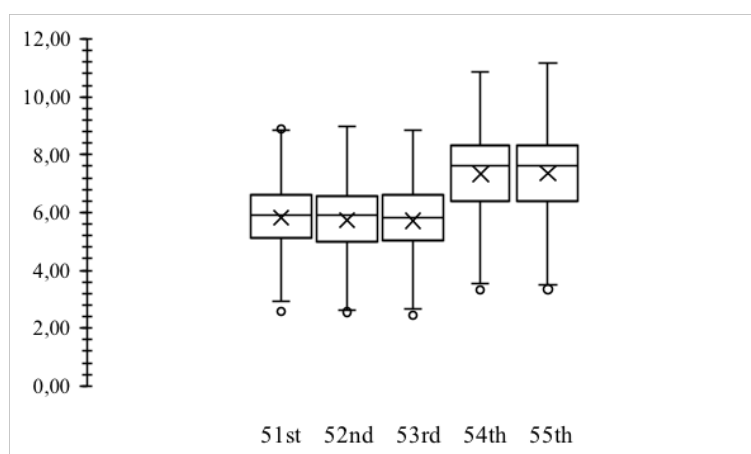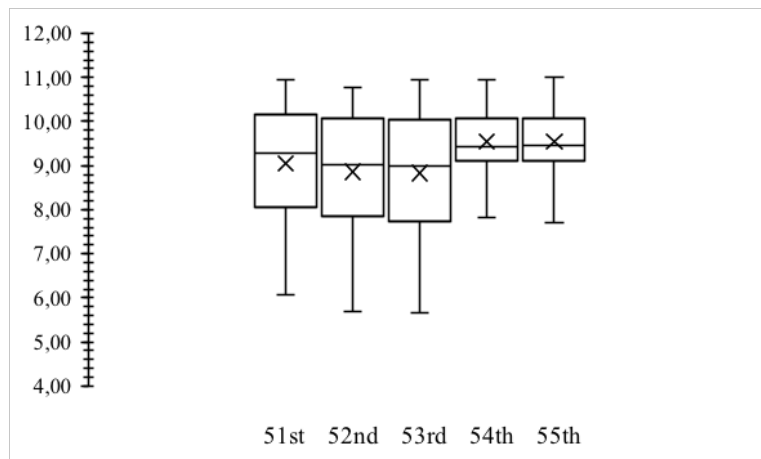

Source: Prepared by the author with data from IBGE/Censo 2000 and 2010, and from TSE 1998, 2002, 2006, 2010, and 2014.

The distribution of the Representatives by weight of school attendance rate in their constituencies showed a slightly different behavior from the average school attendance weight, as seen in **Figure 6**. While "SATvote" got narrower overtime alike the "AYSvote," it grew between 2000 and 2010. The comparison of the 51st to the 54th Legislatures makes it is clear that Representatives voters' children are attending school

more than before, following the increased school attendance observed in Brazil over the ten years covered by the two used Census.

Therefore, Representatives are gradually responding to a more educated electoral base, not only in average years of schooling now but also in the future, as children of their voters are increasingly attending school. This is a phenomenon that, although much studied by scholars through the lenses of support to democracy (Schlegel 2009), offers space for a more nuanced analysis of legislative behavior, beyond the congruence test now carried out.

There is an interesting contrast in **Figure 6** compared to the others, which is the number of outliers, particularly with low "SATvote." Between 8 and 19 observations across Legislatures were below the normal distribution of the Representatives according to the weight of school attendance in their constituencies. Taking a look at these cases is useful to realize there is no clear pattern in terms of legislative response through proactive policy in extreme cases.

Figure 6. Distribution of school attendance rate weighted vote – SATvote in five Legislatures of the House of Representatives
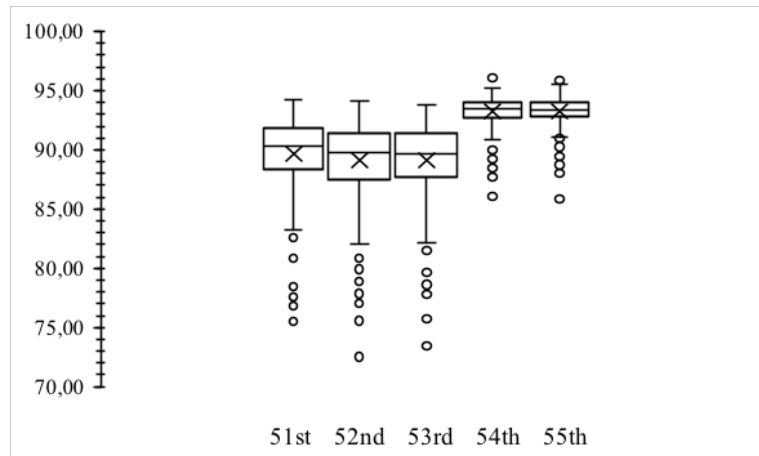
A few of these outliers produced a significant amount of policies. Congressmen Atila Lins (PSD-AM), for example, who was elected for all five studied Legislatures and is the Representative with the least educated constituency according to the "SATvote" criterium in all of them, produced no education policy in the 51st, presenting 2, 8, 10 and 5 in the four subsequent Legislatures, respectively. Another compelling case is Silas

Câmara (PRB-AM), who was also among the outliers throughout the five Legislatures and, differently from Lins, had a more erratic – although bold – legislative behaviour, producing no proposal on education on the first two Legislatures, then presenting 125 proposals in the 53rd and 60 in the 54th Legislatures, coming back to only 1 in the 55th. Many outliers did not produce a single education proactive policy.

Of course, while it does not prove that there is no response at all (given there are other ways to respond or other "components of responsiveness"), it is useful for the analysis to consider such lack of pattern on extreme cases. More on this will be discussed further, through the results of the model.

The third indicator of education was tested besides "AYSvote" and "SATvote" – the weight of the illiterate population on Representatives' constituencies – "ILRvote." Such an indicator followed the same pattern as observed through the previous ones, revealing reduction over time, especially contrasting the group of the two later Legislatures with the previous three ones.

The range of the "ILRvote" reduced less than the range observed in "AYSvote" and the "SATvote," as indicated in **Figure 7**. Illiteracy, as I further debate in the results of the model, has a relatively significant impact on the odds of a Representative to prioritize an educational-focused legislative agenda.

Figure 7. Distribution of illiteracy rate weighted vote – ILRvote in five Legislatures of the House of Representatives
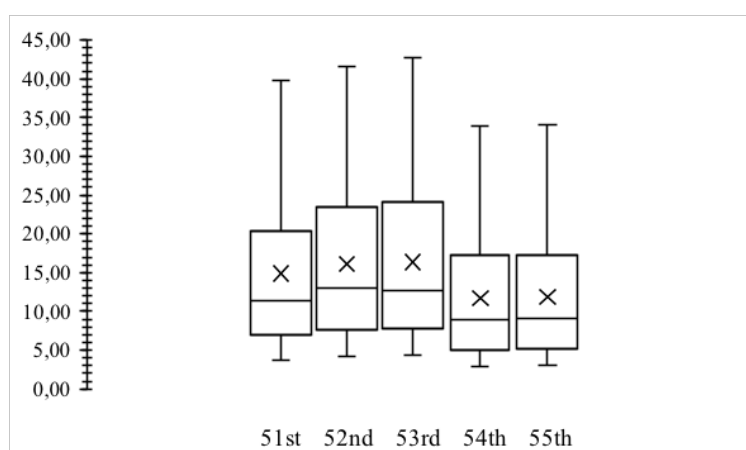
Source: Prepared by the author with data from IBGE/Censo 2000 and 2010, and from TSE 1998, 2002, 2006, 2010, and 2014.

Figure 8 shows the distribution of the Representatives by the participation of poor people in their constituencies. As expected, there are fewer poor people directly

represented by the elected Legislatures over time, most likely an effect of the outstanding poverty reduction observed in Brazil between 2000 and 2010. According to IBGE, the overall poverty rate[16] In Brazil, the poverty rate decreased from around 35% to nearly 20% in ten years.

There is a "flattening" effect of poverty reduction on the constituencies, also reducing the width of the distribution. The median is dislocated much lower in a comparison between the 51st and the 54th Legislatures. A similar effect was observed in the "ILRvote" and "IMRvote," showing that advances in some fundamental indicators such as infant mortality, illiteracy, and poverty had a substantial impact in House constituencies.

Figure 8. Distribution of poverty rate weighted vote – PRAvote in five Legislatures of the House of Representatives

Source: Prepared by the author with data from IBGE/Censo 2000 and 2010, and from TSE 1998, 2002, 2006, 2010, and 2014.

There were advances in inequality, as well. The Gini coefficient has substantially dropped in Brazil between 2000 and 2010. Targeted social transfers, which were in place since the '90s, were an important driver for such reduction (Soares et al. 2006). The increase in the minimum wage, together with the formalization of the labor market, also contributed to a better distribution of income inequality (Komatsu & Menezes-Filho 2015). Although the top of the income distribution has not substantially lost their income

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[16] here was calculated by Ipea. According to them, "[t]he poverty line considered is twice the extreme poverty line, an estimate based on FAO and WHO recommendations. Different values are estimated for 24 regions of the country. Series calculated from responses to National Household Sample Survey (Pnad / IBGE)".

share over the last three decades (Souza 2016; Morgan 2017), there was a redistributive dynamic that happened in Brazil that brought the poor closer to the middle class.

In terms of the implications of such change in the House of Representatives' constituencies over time, the overall inequality reduction – which happened in 4,432 out of the 5,570 Brazilian municipalities (IBGE 2019) – was reflected in the electoral bases of the different parliamentarians, as displayed in **Figure 9**. The comparison between the initial three to the following two Legislatures analyzed show an offset of the median at the 54th Legislature to a lower level, indicating the more significant share of municipalities in which inequality is lower in comparison to previous Legislatures. The width of the variation is also larger, indicating a more heterogenic distribution of inequality weighted constituencies.

Meanwhile, the width of the distribution of Representatives according to their electoral bases' intra-municipal inequality measured by the Gini coefficient substantially increased from the 51st to the 54th Legislatures. Over time, the House constituencies became more heterogenic when it comes to the source of the Representatives' votes and the different levels of inequality observed. The model did not find any significant relation between such change and the proclivity of Representatives to present health and education legislative proposals, but this increase in the heterogeneity of the constituencies, together with the lower poverty weight, offer insights to explain the proclivity of Representatives to support constraining fiscal measures.

Figure 9. Distribution of intra-municipal inequality weighted vote – INQvote in five Legislatures of the House of Representatives

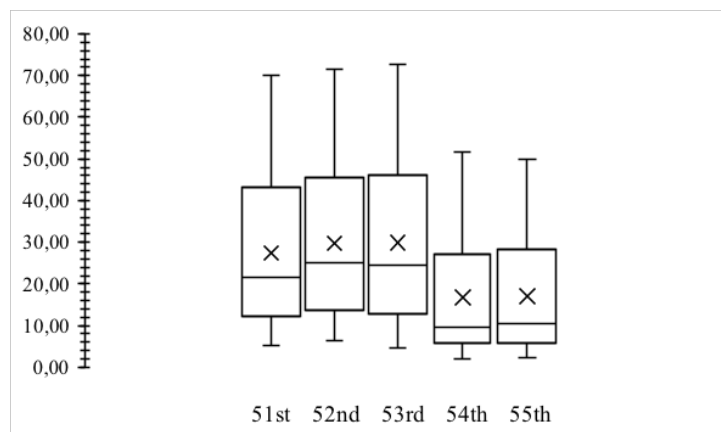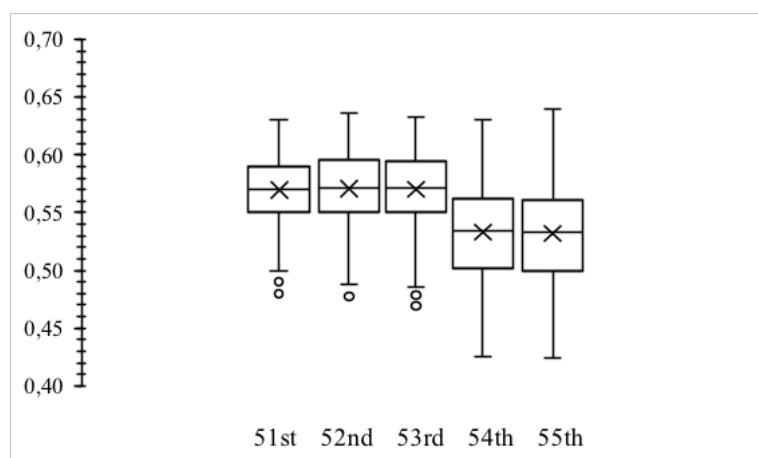
Source: Prepared by the author with data from IBGE/Censo 2000 and 2010, and from TSE 1998, 2002, 2006, 2010, and 2014.

In sum, Brazil went through bold socio-economic changes in the studied period. Such changes, captured on municipal level indicators, reflected an undeniable shift in the composition of Representatives' constituencies. The presented Boxplots show that Representatives' electoral bases live longer, are older, have better health, are more educated, less illiterate, less impoverished, and less unequal.

According to the central hypothesis of this work, such changes should have reflected the Representatives' legislative behavior. The rationale behind this idea is quite straight forward: if the voters of a Representative are no longer under the poverty line, have better health and education, he or she should expect them to demand other kinds of policies, and considering the competitive electoral environment, he or she should be delivering them.

Nevertheless, the aggregated data on the level of priority for health and education in the House of Representatives tells a different story. In the next session, this paper turns its attention to the health and education agenda dynamics in the House of Representatives.

3.3. Descriptive statistics: House of Representative's agenda

Considering the categories used in this study – PEC, PL, MPV, PDC, PLP, INC, and RIC – there were 113,528 legislative proposals presented between August 2000 and January 2019. It is the equivalent period of nearly five Legislatures, considering that the 51st Legislature (1999-2001) had already started.

The House of Representatives attributes a thematic classification to each of the proposals, as exposed before. The thematic classification of the proposals is not exclusive, meaning that one proposal can have more than one classification. For such reason, the number of observations based on themes is higher than the number of bills, reaching 119,177 in total[17], as seen in **Table 2**.

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[17] There are14,247 proposals with no theme attached. The vast majority of them – 10,117, corresponding to 71% of the unlabelled ones – is composed by Indications (INC), followed by Information Requests (RIC) – 2,667, or 18,7% of the unlabelled – and Bill of Legislative Decree (PDC) – 762, or 5,3% of the unlabelled. There is also a concentration of unlabelled proposals in the initial years of the analysis: 86.6% of the unlabelled proposals are from 2001 to 2005. These proposals were excluded from the analysis because they are very much concentrated in the initial years, which can bring some bias for the model. Since INCs and RICs are the majority of the proposals, I aimed to use more the other types for the congruence analysis.

The five most frequent themes of proposals are 'Communications' (with 11,742 proposals, corresponding to 9.9% of the total), 'Public Administration' (with 10,908 proposals, 9.2% of the total), 'Health' (with 10,648 proposals, 8.9% of the total), 'Education' (with 9,054 proposals, 7.6% of the total) and 'Human Rights' (with 7,237 proposals, 6.1% of the total). 'Communications' proposals are at the top mostly because concessions for some kinds of communication media must have approval by the Congress to be granted, resulting in thousands of bills with that objective. 'Public Administration' includes all changes made in the Executive structure, which explains the level of priority it has in the House agenda.

Following Communications and Public Administration, Health and Education are the third and fourth most frequent themes in the House agenda, respectively – confirming previous findings (Gomes 2012). That level of priority is per se very telling – the house debates health and education issues a lot, although a very little proportion of the bills is expected to be transformed into Law.

On a different note, it is useful to realize that almost 57% of the classifications fall under eight labels, and are related to either (i) communications, (ii) public administration issues (Public Administration; Public Finance and Budget); (iii) social rights (Health; Education; Human Rights and Minorities); or (vi) the economy (Economy; Labor and Employment).

Health and education constitute 18% of the Congressional agenda, mainly because of the Representatives themselves rather than the Executive branch. As displayed in Table 3[18], Representatives are the direct proponents of 7,891 education-related proposals, 89.9% of the 8,776 total of education-related legislative pieces. On health, they are the authors for 9,968 proposals – 96% of the total.

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[18], Table 3 does not consider the 14,247 unlabelled proposals. Hence, the total amount of legislative pieces is 99,321 – part of them linked to more than one theme. The majority – 81.3% of them – has only one thematic classification, while 17.5% of them have two themes.

Table 2. Frequency of themes for the selected legislative proposals – 2000-2018

Theme	Absolut frequency	Relative frequency (in %)
Communications	11,742	9.9
Public Administration	10,908	9.2
Health	10,648	8.9
Education	9,054	7.6
Human Rights and Minorities	7,237	6.1
Public Finance and Budget	6,497	5.5
Economy	5,949	5.0
Labor and Employment	5,689	4.8
Cities and Urban Development	5,312	4.5
Transportation and Mobility	5,149	4.3
Defense and Security	4,216	3.5
Criminal and Procedural Law	4,085	3.4
Energy, Water, and Mineral Resources	3,656	3.1
Industry, Commerce, and Services	3,562	3.0
Environment and Sustainable Development	3,249	2.7
Social Security and Welfare	3,023	2.5
Civil Law and Civil Procedure	2,294	1.9
Sports and Leisure	2,294	1.9
Land	2,161	1.8
Tribute and Commemorative Dates	1,851	1.6
International Relations and Foreign Trade	1,791	1.5
Consumer Law and Protection	1,717	1.4
Agriculture, Livestock, Fishing, and Extractive	1,572	1.3
Art, Culture, and Religion	1,490	1.3
Politics, Parties, and Elections	1,441	1.2
Science, Technology, and Innovation	1,122	0.9
Tourism	562	0.5
Law and Justice	428	0.4
Legislative Process and Parliamentary Performance	341	0.3
Constitutional Law	134	0.1
Social and Human Sciences	3	0.0
Total thematic classifications	119.177	100.0

Source: Prepared by the author with data of Câmara dos Deputados (2019).

Representatives have also presented many proposals indirectly, through Permanent House Commissions (notably the Social Security and Family Commission and the Education Commission) and, less so, through other House Commissions, which include Special Commissions, Bicameral Commissions, External Commissions, Parliamentary Inquiry Commission (from the House or Bicameral),

The Federal Senate[19] and the Executive Branch have a much lower share of the proposed policies debated in the House of Representatives. The Judiciary has residual participation, as do other actors (gathered in "Others" on **Table 3**), such as the Federal Public Attorneys' Office, the organized civil society, the Public Prosecution Office.

Table 3. Frequency of themes debated in the House of Representatives per type of author – 2000-2018

Author	Absolute frequency				Relative frequency (in %)				Total
	Education and Health	Education	Health	Others	Education and Health	Education	Health	Others	
Representative	246	7,891	9,968	65,347	0.3	9.5	11.9	78.3	83,452
Permanent House Commission	17	436	167	10,250	0.2	4.0	1.5	94.3	10,870
Other Commissions	1	20	31	515	0.0	3.5	4.6	90.1	567
Executive Branch	4	120	46	1.469	0.2	7.3	2.8	89.6	1,639
Judiciary Branch	-	-	-	234	0.0	0.0	0.0	100.0	234
Federal Senate	10	309	158	2.016	0.4	12.4	6.3	80.9	2,493
Others	-	-	-	62	0.0	0.0	0.0	100.0	62
Total	278	8.776	10.370	79.897	0.3	8.8	10.4	80.4	99,321

Source: Prepared by the author with data of Câmara dos Deputados (2019).

Considering only the Representatives' pieces, the dynamics of the proposals reveal some identifiable patterns, as seen in **Figure 10**. While electoral years are moments of a significant reduction in the number of proposals presented, the initial year of a Legislature – 2003, 2007, 2011 and 2015 – usually registers a peak in new proposals. As further discussed in **chapter 4**, there are incentives for a Representative to both not present any new policy in election year – as it will hardly get any approval and credit claiming is not easy – and present new policies at the beginning of its term – when chances of approval are the highest[20].

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[19] , The proposals from the Senate, include only those that were debated in the House, and not all Senators' proposals.
[20] According to the House of Representatives internal Rules of Procedure, every closing of Legislature entails the archiving of legislative proposals. Even if the Representative gets reelected, he or she has to

The numbers also suggest that the amount of health and education proposals have been increasing from Legislature to Legislature. Between 2003 and 2015, education proposals in initial Legislature years increased from 241 to 285, while the health ones grew from 159 to 282, a significant expansion of new health policies proposed by Representatives.

While the number alone does not tell us the content of such policies, thus limiting its analysis, it is relevant to observe the apparent disconnection between the improvements in socio-economic conditions [21] over time and the counter-intuitive increase in the Legislative policymaking in such areas. The dynamics of the presentation of legislative proposals do not seem to observe any parallel reality dynamic besides the electoral cycle.

Figure 10. Health and education proposals of Representatives only, in the House of Representatives – 2001-2018
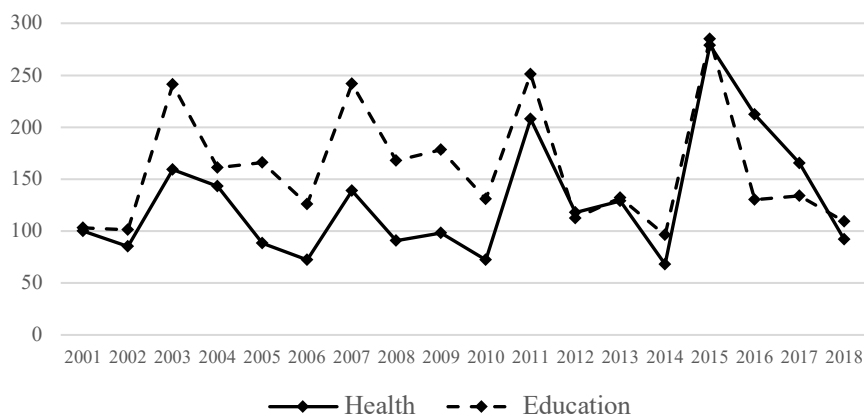
Source: Prepared by the author with data of Câmara dos Deputados (2019)

More Representatives are presenting health and education proposals. As pointed in **Figure 11**, the expansion over time observed in the House is an expansion of the number of parliamentarians making policy on these issues. Such numbers indicate that my subsidiary hypothesis of a losing relevance of such agendas is disproved. Other factors could be explaining the expansion of such an agenda, for example, the orientation of the

present a specific Request to unarchive the proposals. However, if he or she does not get reelected, and if no new Representative presents such Request, the proposal remains archived. Hence, the best chance for a Representative to have its policy finally approved is to present it at the beginning of the Legislature.

[21]. It is also true that the overall poverty rate has been growing in Brazil since 2014 (Ipea 2019).

policies – which are not measured in my database. Anyway, there is no apparent shift in the level of priority given to health and education as a result of socioeconomic changes.

Figure 11. Number of Representatives with one or more health and education policy proposals – 51st -55th Legislature
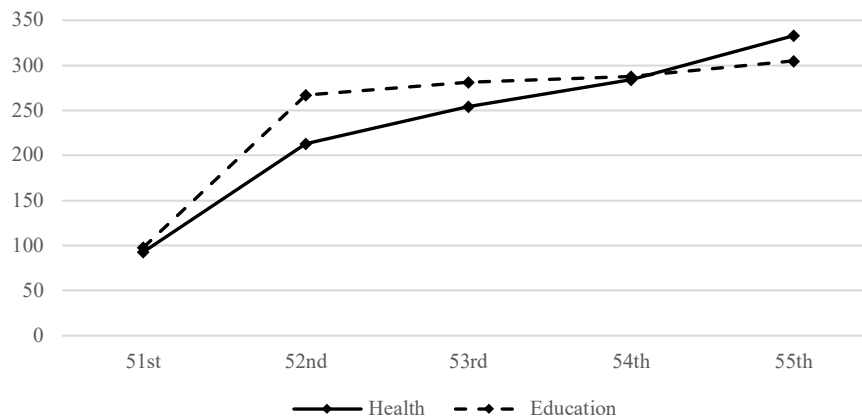
Source: Prepared by the author with data of Câmara dos Deputados (2019).

Although the increase in the number of health and education policies within Legislatures and among Representatives is quite telling of how the House has been steadily keeping such agendas high among its priorities, it is crucial for the congruence analysis to understand if such issues are dear to Representatives individually.

Representatives, as already argued, have more than one way to seek the representation of its constituents. While policymaking is one of them, he or she could use pork barrel or speeches (in a symbolic component, argued by Eulau & Karps) to be responsive to his or her constituencies. However, if a Representative chooses to use policymaking as a mean of representation, he or she has quite broad of choice on where to put his or her efforts in terms of policy issues.

In the limited time of his or her term, the Representative that uses policy as a means of representation will issue proposals on a myriad of themes. The shares of the themes in the total presented proposals will, according to the assumption of this research, tell where the Representative's priorities are, a measure that was adopted for the composition of the model. To be responsive, a Representative is assumed to prioritize according to the priorities of his or her constituencies, considering the different groups that compose them.

For example, a Representative with a large rural electoral base will use a relevant share of its mandate to propose policies that address rural issues. Likewise, a Representative whose electoral base is heavily supported by a specific union of workers has incentives to dedicate a substantial part of his or her mandate to deliver aligned policies. It does not mean that he or she would have to seek perfect equivalence – that would be impossible – but I assume that identifiable cohorts of voters are potent drivers for agenda-setting.

There are two measured variables: the health proposals' share ("HPS") and the education proposals' share ("EPS"). They are calculated as a reason of the total health proposals ("thp") and the total education proposals ("tep") on the total proposals presented by the Representative ("TPR"), for each Representative "r," under Legislature "l," as follows:

$$HPS_{rl} = thp_{rl} \,/\, TPR_{rl}$$

When lined up by the weight of the health proposals in the total legislative agenda for all five Legislatures measured in this research, Representatives are very much concentrated on the left side of the histogram, as shown in **Figure 12**.

Figure 12. Distribution of Representatives by weight of health proposals in their agendas
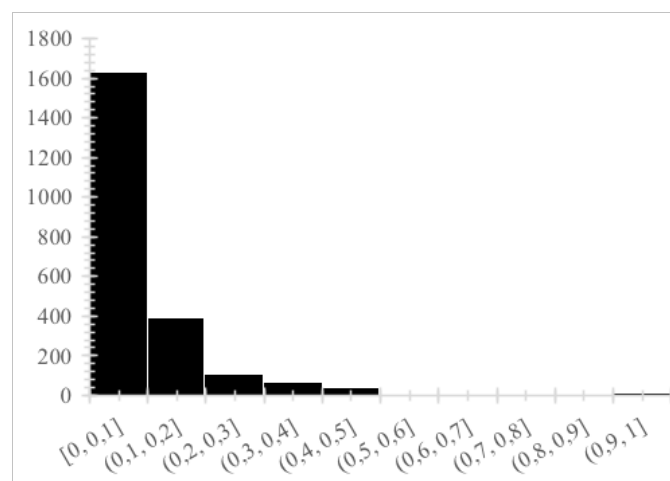
Source: Prepared by the author with data of Câmara dos Deputados (2019).

The vast majority of Representatives have health as a low share of their policy concerns, even though there is an increasing number of Representatives that launch at

least one health policy during their terms. The same conclusion can be drawn for the education policies, as pointed in **Figure 13**.

The histogram curve, in this case, is very similar to the health one, in which the vast majority of the observations are concentrated on the left side, between 0 and 20% of the total pro-active policies proposed by Representatives. Moreover, it is possible to find the "champions" of the issues in both cases – a tiny group of Representatives in all five Legislatures that make health and education more than a third of their proposed policies.

Figure 13. Distribution of Representatives by weight of education proposals in their agendas
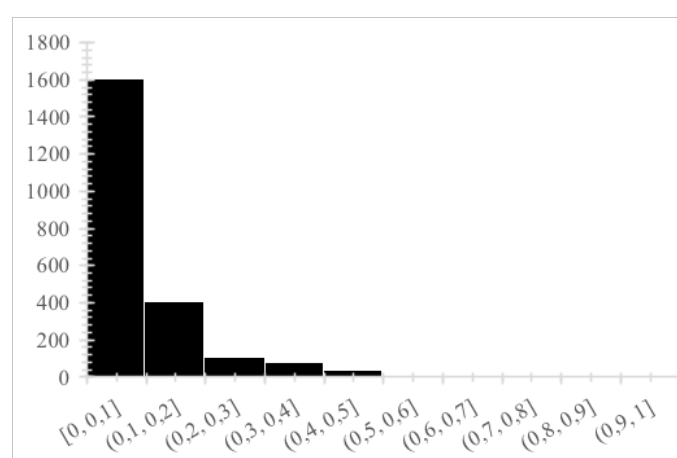
Source: Prepared by the author with data of Câmara dos Deputados (2019).

In sum, health and education are two of the central top-of-mind policies produced both in the House of Representatives and by the Representatives themselves, rather than the Executive branch, the Senate, or any other institution or actor. Proposals' dynamics are not connected to the socio-economic dynamics and its impacts on constituencies, and there is an increasing number of Representatives that present at least one health or education proposal. Such a phenomenon does not mean that health and education are increasingly dear to Representatives on an individual level, given there is a high concentration of Representatives with none or very low prioritization of such policy matters in their policymaking.

For the central hypothesis of this work, the comparison between constituencies' changes and Representatives' responses are not connected on an aggregated level. Such mismatch suggests that the House either does not respond to changes in their constituencies or that changes in their constituencies did not imply in an agenda shift.

Besides, as argued, the subsidiary hypothesis of a reduction in the level of priority given to health and education is quite disproven by the descriptive analysis.

I now turn my attention to the model through which I seek to explain variances in the proportion of legislative proposals on health and education as a function of the weight of socio-economic context on individual Representatives' constituencies.

3.4. Legislative production and congruence with Representatives' constituencies

Context influence policy (Pzeworsky 1974; Agnew 1996) and some of the results of the proposed model reiterate such a statement.

Electoral dependence on municipalities with high rates of illiteracy, high school attendance, high poverty rate, and low rates of infant mortality increases the odds of a Representative to prioritize education-related agendas. That happens even though responsiveness could happen in different ways besides policy. Brazilian institutions create counter-incentives for a policy as a response to Representatives' constituencies, and education is not part of most Representatives' main priorities.

On the other hand, health and education are some of the top priorities of the House agenda, the run-up for seats in the House is quite competitive and, overall, Brazil remains a country with a significant share of the population unattended by primary education, as well as a considerable contingent of poor people in a very unequal society.

In this session, I present the model adopted, its justifications, and limits. I then present the results of the database created and previously presented in the descriptive statistics sessions above. At the end of this chapter, I gather the conclusions of all results, both descriptive and from the model.

3.4.1. Beta Inflated Distribution model

The model used to test the database was the Beta Inflated Distribution[22]. It was chosen as a result of the non-normal characteristics of the explained variable – the share

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[22] The Beta Inflated Distribution was proposed by Ospina & Ferrari (2010). It has been used for correlations of proportions that need to include the extreme values of the distribution. The regression was run through GAMLSS, in R, for a Beta Inflated Distribution. The Beta Inflated Distribution parametrization is presented in **Annex III**. I tested the normal distribution, and the statistical model did not satisfy the assumptions to get valid inference – there were, for instance, negative values, which would not be interpretable. **Annex IV** presents the residues under the normal distribution model.

of health or education policies in a Representative's proactive policy agenda, represented by PEC, PL, MPV, PDC, PLP, INC, and RIC.

Such share, as already mentioned in the previous session, is a proportion variable that ranges from 0 to 1 (0-100%), including the extremes. It is spread in a one-tailed concentrated distribution, in which many Representatives presented no policy at all in these areas (having 0 for coherence purposes), while very few have presented only health or education policies (having 1). The distribution within the range is presented in **Figures 11** and **12**, confirming the type of curve.

For the model, I consider the variables as previously explained in the descriptive sessions, controlling for Legislature and the total number of projects, adding two new variables in the test – sex and profession of the Representative –, as follows:

$$log(HPS/(1-HPS)) = \beta_0 + \beta_1 EXPvote + \beta_2 IMRvote + \beta_3 ERAvote + \beta_4 AYSvote +$$
$$\beta_5 SATvote + \beta_6 ILRvote + \beta_7 PRAvote + \beta_8 INQvote +$$
$$\beta_9 Legis52 + \beta_{10} Legis53 + \beta_{11} Legis54 + \beta_{12} Legis55 +$$
$$\beta_{13} TOTP + \beta_{14} Sex + \beta_{14} Prof + \mu$$

For the above equation, "HPS" is the health policies' share (or "EPS" – education policy share, modeled separately); "EXPvote" is the standardized weight of life expectancy on a Representative's total votes, the same being true to the other vote indicators (infant mortality at age 1 – "IMRvote", elderly ratio – "ERAvote", average years of schooling – "AYSvote", school attendance for children aged 6 to 17 – "SATvote", illiteracy rate at age 18 – "ILRvote", poverty rate – "PRAvote", and income inequality measured by the municipal Gini index – "INQvote"); "Legis" is the Legislature, a dummy variable for the appropriate period; "TOTP" is the total number of projects presented by the Representative; "Sex" is a dummy variable, being 1 for male; and "Prof" is a dummy variable, being 1 when the Representative has a profession that is non-related with the field (health and education). In this last case, the table of professions and the classification adopted is presented in **Annex V**.

The pursuit of re-election makes a difference on a politician's behavior, as previous applied research indicates[23]. In Brazil, the majority of the Representatives try either to obtain another mandate in the House of Representatives or a higher political position and very few – especially the elderly Representatives – quit the political career by retiring (Leoni et al. 2003). In this study, given the fact that a majority of the Representatives try either to stay in the House or to move to another elected position, I am not controlling for re-election, instead assuming it is well distributed across Legislatures.

While the Beta Inflated Distribution is a useful model for correlation of proportions, it offers limits in terms of the quantifiable interpretation of such correlations. That is more so because of the way the explaining variables were built (as a weighted socio-economic indicator on a municipal vote), which allows us to have a scale of the contextual impact on a Representative's electoral base, but not a real-world number behind it (i.e.: I do not know the number or proportion of illiterate voters in a Representative electoral base). Nevertheless, for each way we measured the indicators' weight on a Representative's total votes, there is a correspondent probability of legislative behavior that can be related to that particular measure of the weighted vote, which can offer the significance of the variance effect.

The Legislature adjustment of the model was made with the basis of the 51st Legislature. While it is a natural parameter from a chronological point of view, this Legislature has the limitation of not having all proposals mapped. As an effect, the comparisons between Legislatures, as presented in the results, should be considered under such asymmetry.

3.4.2. Results

The variables statistically associated with health legislative proposals are displayed in **Table 4**, while the variables statistically associated with zero health proposals are in **Table 5**. The variations of chances for health are presented in **Table 6**.

Considering those with at least one legislative proposal on health, the results show a decreasing correlation from Legislature to Legislature, considering the 51st as the base

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[23] Klein & Sakurai (2015) find that first and second term mayors in Brazil take different fiscal decisions. A similar conclusion is to draw from Aidt & Shvets (2012) to legislative members in the U.S.

for comparison. In the following Legislatures, there was a drop in the chance of health propositions from 26.32% to 43.38%.

Such a phenomenon is also observed for education proposals and could be explained by the increasing number of Representatives that decided to present at least one policy in these areas, which implied in a more fragmented set of health and education bills, but less prioritized within each Representative's mandate.

The Total Projects – TOTP variable is also another control of the model. Thus, parliamentarians who tend to have a large number of projects tend to lower their chances of prioritizing health proposals. Each additional project implies a 0.06% reduction in the chance of health measures.

Table 4. Health – Variables associated with the presence of legislative proposals – 51st-55th Legislatures

Variable	Association	Estimate	Std Error	P-Value
52nd Legislature	Negative	-0,5688	0,0902	< 0,0001
53rd Legislature	Negative	-0,5235	0,0878	< 0,0001
54th Legislature	Negative	-0,4183	0,0857	< 0,0001
55th Legislature	Negative	-0,3055	0,0832	< 0,0001
Total Projects TOTP	Negative	-0,0006	0,0003	0,0216
Male	Negative	-0,2104	0,0701	0,0027
No Health-related Profession	Negative	-0,5231	0,0688	< 0,0001

Source: Prepared by the author with data of Câmara dos Deputados (2019), TSE (2019) and IBGE (2019).

Table 5. Health – Variables associated with the absence of legislative proposals – 51st-55th Legislatures

Variable	Association	Estimate	Std Error	P-Value
Life Expectancy EXPvote	Negative	-0,6136	0,1131	< 0,0001
Poverty PRAvote	Negative	-0,2497	0,1115	0,0252
Total Projects TOTP	Negative	-0,0799	0,0046	< 0,0001
Male	Positive	0,3865	0,1851	0,0369
No Health-related Profession	Positive	0,9537	0,1898	< 0,0001

Source: Prepared by the author with data of Câmara dos Deputados (2019), TSE (2019) and IBGE (2019).

Table 6. Health – An Estimated variation of chances of prioritizing policy – 51st- 55th Legislatures

Variable	Lower Confidence Interval Limit (2.5%)	Upper limit of confidence interval (97.5%)	Variation of chance of prioritizing health policy (in%)
52nd Legislature	-52,56	-32,42	-43,38
53rd Legislature	-50,12	-29,64	-40,76
54th Legislature	-44,37	-22,14	-34,19
55th Legislature	-37,40	-13,28	-26,32
Total Projects TOTP	-0,11	-0,01	-0,06
Male	-29,38	-7,04	-18,97
No Health-related Profession	-48,21	-32,18	-40,73

Source: Prepared by the author with data of Câmara dos Deputados (2019), TSE (2019) and IBGE (2019). Note: Quantitative residues are approximately normal, which meets the assumptions of the model.

Among the candidate's background variables, it is worth highlighting gender and health-related profession (as declared to the TSE). Representatives whose declared professions were not related to health had an average 40.73% lower chance of prioritizing health-related legislative proposals. Male parliamentarians had an average 18.97% lower chance of prioritizing health policies than women.

Note that in the case of the health model, the parliamentary characteristic variables – profession and sex – were more critical than in the education model, in which the voting-weighted municipal indicators better explained the odds of propositions. The variables statistically associated with education-related legislative proposals are displayed in **Table 7**, while the variables statistically associated with zero proposals are in **Table 8**. The variations of chances are presented in **Table 9**.

A one-unit increase in the candidate's vote-weighted illiteracy rate indicator is associated with a 2.86% up to 33.08% increase in the chance of prioritizing measures in education (average point estimate of 16.99%, all else being equal). The school attendance indicator also had a positive association: an increase of one unit in the indicator points to an increase in the chance of having an educational proposal prioritized from 0.78% to 14.52% (with an average point estimate of 7.43%).

The 1-year infant mortality indicator, on the other hand, was negatively associated with the chance of proposing educational projects. The increase of one unit in such an indicator has an average chance of prioritizing educational proposals 17.57% smaller. In other words, that is, parliamentarians with more expressive votes in municipalities with higher child mortality rates tend to make fewer proposals on education as a proportion of their total.

On the other hand, the Poverty indicator has a positive association with the average chance of having proposals in education prioritized in a Representative's agenda. One more unit in the indicator points to 24.48% more chance of prioritizing measures in education.

The Legislature has entered the model for control purposes only. If in some period, the theme of education was more important in general, this parameter should capture this effect. And that is the case: the 51st Legislature, which is the reference had the highest proportion of propositions in education, as mentioned before. In the following Legislatures, there was a decrease in the chance of prioritization of propositions in education from 24.31% to 38%.

Table 7. Education – Variables associated with the presence of legislative proposals – 51st-55th Legislatures

Variable	Association	Estimate	Std Error	P-Value
Illiteracy – ILRvote	Positive	0,1570	0,0657	0,0170
School Attendance – SATvote	Positive	0,0717	0,0326	0,0317
Infant Mortality – IMRvote	Negative	-0,1932	0,0650	0,0030
Poverty – PRAvote	Positive	0,2190	0,0837	0,0086
52nd Legislature	Negative	-0,3249	0,0832	0,0001
53rd Legislature	Negative	-0,2785	0,0823	0,0008
54th Legislature	Negative	-0,3675	0,0970	0,0001
55th Legislature	Negative	-0,4780	0,0979	< 0,0001
Total Projects – TOTP	Negative	-0,0021	0,0004	< 0,0001
Male	Negative	-0,1830	0,0660	0,0056
No Education-related Profession	Negative	-0,2809	0,0901	0,0019

Source: Prepared by the author with data of Câmara dos Deputados (2019), TSE (2019) and IBGE (2019).

Table 8. Education – Variables associated with the absence of legislative proposals – 51st-55th Legislatures

Variable	Association	Estimate	Std Error	P-Value
Illiteracy – ILRvote	Negative	-0,1886	0,0618	0,0023
School Attendance – SATvote	Negative	-0,1542	0,0839	0,0662
Elderly – ERAvote	Positive	0,1747	0,0646	0,0069
52nd Legislature	Negative	-0,5365	0,1748	0,0018
53rd Legislature	Negative	-0,4335	0,1769	0,0130
54th Legislature	Negative	-0,4832	0,1943	0,0136
55th Legislature	Negative	-0,3476	0,1969	0,0861
Total Projects – TOTP	Negative	-0,0864	0,0056	< 0,0001
Male	Positive	0,5560	0,1945	0,0043
No Education-related Profession	Positive	0,5574	0,2625	0,0340

Source: Prepared by the author with data of Câmara dos Deputados (2019), TSE (2019) and IBGE (2019).

Table 9. Education - An Estimated variation of chances of prioritizing policy – 51st-55th Legislatures

Variable	Lower Confidence Interval Limit (2.5%)	Upper limit of confidence interval (97.5%)	Variation of chance of prioritizing Education policy (in%)
Illiteracy – ILRvote	2,86	33,08	16,99
School Attendance – SATvote	0,78	14,52	7,43
Infant Mortality – IMRvote	-27,43	-6,37	-17,57
Poverty – PRAvote	5,64	46,68	24,48
52nd Legislature	-38,61	-14,95	-27,74
53rd Legislature	-35,59	-11,06	-24,31
54th Legislature	-42,74	-16,25	-30,75
55th Legislature	-48,82	-24,89	-38,00
Total Projects – TOTP	-0,28	-0,14	-0,21
Male	-26,82	-5,23	-16,72
No Education-related Profession	-36,71	-9,90	-24,49

Source: Prepared by the author with data of Câmara dos Deputados (2019), TSE (2019) and IBGE (2019).
Note: The quantile residues are approximately normal, which meets the assumptions of the model.

The Total Projects variable is also another control variable. Representatives who tend to have a large number of projects tend to lower their chances of proposals in education as a share of the total. Each additional project implies a 0.21% reduction in the chance of measures in education as a proportion of the individual policy proposals.

Finally, the candidate's background variables included gender and involvement with the theme of education by profession declared to the TSE. Male parliamentarians had an average chance of prioritizing education-related policy 16.72% lower than women. Parliamentarians not involved in education in their professions had an average chance of prioritizing education proposals reduced by 24.49%.

3.5. Conclusions

In this Chapter, I analyzed how Representatives' electoral bases changed overtime, considering a specific set of socio-economic indicators. I also delved into the agenda of the House of Representatives in the last five Legislatures, with a specific focus on health and education – two of the main policy domains that affect inequality reduction in the long run. Finally, I developed a model to measure the correlation between the share of voters with low access to health and education (as well as high rates of poverty and inequality) and the priority given by Representatives to health and education agendas in their proactive policymaking.

Overall, it is safe to say that the socio-economic changes through which Brazil went between 2000 and 2010 had a significant impact on the context where the new voters are embedded. Representatives' electoral bases have better health and hence live longer. As Brazilians live longer, the constituencies got older. The impact of an increased life expectancy and lower infant mortality is a more homogenous general constituency, while there is an emergence of a stronger 'elderly' share of voters – making the overall constituency more heterogenic regarding the participation of 65-year-old or older voters.

Brazilians are less illiterate, more educated, and the country's children are going to school as never before, which also changed the electoral bases in the House of Representatives. In terms of school attendance, the constituency became more homogenous, and Representatives voters' children are attending school more than before. The increased average years of schooling caused the 54th and 55th Legislatures'

constituencies to have a "catch up" effect, with a more homogenous composition with the reduction of the voters' educational gap. Meanwhile, illiteracy weight on voters' bases had a similar effect – a "flattening" effect that also increased the homogeneity of voters in terms of capacity to write, read, and understand simple texts.

Poverty and inequality reduction also impacted constituencies. Representatives' voters are much less poor than before, and the same "flattening" effect is observed in the 54th and 55th Legislatures constituencies compared to the previous ones. Inequality reduction within municipalities affected constituencies differently, and although there was an overall inequality reduction in constituencies, the range became wider, pointing to a more heterogenic distribution of Representatives by weight of inequality measured by the Gini index.

Such positive changes, altogether, could be expected to make Representatives shift their priorities away from health and education issues. Nevertheless, this is not what happened in the Brazilian House of Representatives.

Health and education have been among the top 4 priority policies in the House of Representatives, primarily because of the Representatives themselves rather than the Executive branch or any other institution or actor. Over time, there has been an increasing number of Representatives pushing for at least one health or education-related policy, revealing not only an increase in the number of proposals but also in the number of concerned Representatives. At the same time, the priority given to health and education proposals is generally very low and has been lowering over time.

The dynamics of policy proposals also seem to be disconnected from social and economic progress on the ground, peaking in initial years of each Legislature and fading in electoral years. Institutional characteristics of the Brazilian House of Representatives and its elections could better explain such dynamics.

Finally, putting these variables together in a model revealed that both the context and the Representative's background influence policy. Representatives' odds to prioritize education-related policies increase if their constituencies are more dependent on municipalities where illiteracy, school attendance, and poverty rate are higher, or infant mortality is lower. On the other hand, there was not a clear relation to the tested socio-economic variables that could explain the prioritization of health policies in Representatives' agendas across the studied 5 Legislatures. Background, on the other hand, explained it better.

Male parliamentarians had an average lower chance of embracing health policies than women, and Representatives whose declared professions were not related to health had a much lower chance of prioritizing health-related legislative proposals. While the proportions were higher for health, the odds behavior was the same for education policies – males and non-education related professionals had a lower chance of making this a more substantial share of their legislative agenda.

Lastly, responsiveness, as measured in this study, decreased from Legislature to Legislature, a drop that could be explained by the fact that there are more representatives presenting such policies, which made contrast lighter.

Both the variables' descriptive statistics and the model sought to explain how Representatives attempt to respond to their constituencies through policies. Such a response has an almost symbolic role: a comparison between the proposed policies and the fraction that becomes an actual new law is underwhelming for any Representative that seeks to approve a policy of his or her own. Nevertheless, the analysis of the approved proposals is useful to understand what the relevance of Representatives' original proposals is, for those who manage to approve a bill of their own. This is what I do in **chapter 4**, as follows.

4. Analyzing the approved social policy between 2000 and 2018

4.1. Context and ground for the proposed analysis

Representatives have many ways to shape policy. As mentioned before, there are over 130 different proposals of bills, indications, requests, and amendments through which legislators propose or influence content and process in the policy-making of the House of Representatives. The legislative work also consists of directly influencing how policy is developed in the Executive branch, through Indications, through invitations or summons to ministers or decisive Executive branch's bureaucrats to participate in hearings and public meetings at the House, or through direct lobbying policymaking in the Executive branch. Many scholars argue that, in Brazil, the House of Representatives play an *ex-ante* influence in the Executive policy-making by indicating what is and what is not likely to pass.

While a full analysis of the role of the House of Representatives in shaping policies – and, in this case, health and educational policies – would have to account for such a wide variety of political influence it can exert, this study (and this chapter in particular) is much less ambitious and more focused. I delve into new laws sampled from the database of the proactive policies proposed by Representatives during the five analyzed Legislatures and approved within that period.

My initial hypothesis points to the existence of policy responsiveness from Representatives to their constituencies' contexts, which was partially confirmed by the empirical research so far. My two subsidiary hypotheses were related to a changing content of such responsiveness as a result of Brazil's advances in its socio-economic indicators – a reduction in the level of priority of health and educational agendas in the House of Representatives – which was disconfirmed – and the losing relevance of Representatives new laws, analysed in this chapter.

An initial question to be answered is 'how relevant are the policies originated in the House of Representatives?'. Relevance, as understood in this work, is a set of characteristic features of the new laws. Scholars have delved into this kind of analysis before, offering methodological trails and a basis for comparison.

Lemos (2001) conducted an assessment of health and educational proposals in the post-Constitutional period of 1988 to 1994. Her central objective was to find if legislative

proposals made by Representatives were concentrating or diffusing benefits. It was her hypothesis that Representatives had incentives to concentrate benefits, as a result of a personalistic vote received in their election:

> "O Legislativo é um corpo que se caracteriza por escolhas coletivas e que tem como tarefa principal alocar benefícios em forma de políticas. Uma vez que os legisladores estão sujeitos a eleições periódicas, e o espaço eleitoral é o geográfico, a "conexão eleitoral" significa que todo membro do Congresso tem fortes incentivos para atender aos interesses específicos dos eleitores de sua região." (Lemos 2001, p. 567)

That assumption was drawn from the debate initiated in the 1990s over the legislative behavior of Brazilian parliamentarians. It was pushed by an institutionalist approach of the effects of the electoral system on Representatives behavior (Carey & Shughart 1991; Ames 1995; Mainwaring 1999), as also discussed in **chapter 2**.

In response to that, Lemos (2001) tested her hypothesis through two main measures – the implication of budgetary transfers – what I later call "spending" – or not, and the changes in regulation – what I later call "rules and rights." Her findings point to the preponderance of diffusing-benefits proposals, disproving her hypothesis of a parochial Congress.

Ricci (2003) finds similar results. Through analyzing a narrower set of proposals in all themes – those approved, rejected, or vetoed – over a more extended time, and including the Senate, he concludes that the Congress acts towards diffusion, not concentration. He measures the laws through four primary lenses: distributive of broad impact, distributive of limited impact, concentrating of limited impact, and symbolic. The distributive of broad impact account for 66.2% of all approved legislation between 1991 and 2001.

Lemos (2001) and Ricci (2003) criteria for analyzing legislative proposals and approved policy, as well as their findings over the orientation of the House of Representatives and the Congress towards distribution are corroborated in this study. There is, however, no change in the nature of the preponderant kinds of proposals from Representatives overtime, disproving my second subsidiary hypothesis.

I now present the outline or the empirical analysis proposed and the results given by the lens of the selected criteria. Next, I interpret the results through the point of view of relevance and overall responsiveness.

4.2. Outline of the analysis

Representatives may or may not respond to their constituencies through policy (Eulau & Karps 1988), and many do, as observed in the previous sessions. Considering health and education, there is an increasing number of policies that are presented by an increasing number of Representatives, along the five Legislatures. On the other hand, only a nearly insignificant number of them gets finally approved. Those policies that do get approved are an interesting material of analysis since it tells a story of the profile of legislators' policies that allow credit claiming (understood that the original content may change along the way).

The analysis carried out in this session seeks to classify such approved proposals through a specific set of lenses, helping to understand what the role of the House of Representatives is in the policy-making process for health and education over the last two decades.

There are five main categories (and 16 sub-categories) of analysis gathered in the codebook applied for the produced database, as presented in **Table 10**. In sum, I tried to understand the approved health and education laws in the House of Representatives through the lenses of who proposed them (Representatives, Commissions, the Executive, and others), their description in terms of where it enters the existing frame (new, complimentary, detailing and others), their content (if it brings new investments or focus on changing rules and expanding rights), the exigence and allocation of spending and their distributional orientation.

The "proponent" is essential, especially for comparison purposes. For the research, the two relevant proponents are the Representatives and the Executive branch, since all legislative pieces of the Executive have to go through the House of Representatives to get approved. The Senate has a limitation, which is the circumscription of Senator proposals to those that made it to the House. They are included in any case, to allow analysis within themselves. Permanent and House Committees also produce policy, and hence were designated as possible options.

The "description" accounts for the role of the proposal within the existing set of rules and laws. If a law is "new," although it could be – and usually is – related to an existing policy, it brings an entirely new set of rules or investments. It takes resources to

create a proposal from scratch, as it does for "detailing" an existing rule or set of rules. A different level of resources is required for "complementary" rules, which could be more opportunistic as a proposal. Finally, based on what the database presented, I inserted "Revoking" and "Protocol/Agreement Approval" for the set of Legislative Decrees.

For "content", I separated the laws into those what aimed at investing on health or education (through the development of new programs, or the expansion of existing ones, for example), and those that simply changed existing regulations or proposed new ones, with no explicit reference to the use of public proceeds. A third category was also created to gather those laws that have no impact either on regulation or investments but are symbolic. Here, the analysis starts to dig further into relevance.

For inequality reduction, the State is assumed to have the capacity to redistribute resources or invest in social policies with redistributive effects, as mentioned before. In Brazil, like in other countries, investments on health and education have an adjustment effect, not through reducing income inequality as directly as cash transfers, for example, but through avoiding private spending from families – especially lower-income families if the spending is progressive (Silveira et al. 2011; Lustig et al. 2013). Although a full policy analysis would require the classification of laws into a progressive/regressive category, the contrast between regulation and investments (through expanding transfers or services), conjugated with other categories in the codebook, offer a reasonable first classification in terms of relevance – in this case understanding investments as more relevant.

The following category is the presence of "spending" provision or not in the law. If it defines new expenses and points the source from where it will happen, it is then considered "new expenses," otherwise, it classifies as "no new expenses." Politically – and legally – news expenses need to be connected with the source from where it will come in the federal budget, or it does not have execution. Although there is some overlap with the previous category, it is still useful to keep them separated as new regulations do imply spending at times.

Finally, I point which health and educational laws proposed and approved between 2000 and 2018 are "diffusing" or "concentrating." In this last case, I use the criteria applied by Lemos (2001), mainly because of the alignment in the thematic choice. Such criteria are relatable to the one used by Ricci (2003), although I leave aside the "symbolic" regulation, as well as administrative measures, focusing only on these laws that fall under either of the two categories.

Table 10. Codebook for the analysis of the approved proposals – 2000-2018

Category	Options	Explanation of each option
Proponent: it classifies the laws according to the original proponent	Representatives	If the approved proposal was initially written by a Representative
	Permanent House Committees	If the approved proposal was initially written by a Representative but presented through one of the House's permanent Committees
	Special House Committee	If the approved proposal was initially written by a Representative but presented through one of the House's Special Committees
	Bicameral Committee	If the approved proposal was initially written by a Representative or Senator but presented through one of the House's Bicameral Committees
	Executive	If the approved proposal was initially written by the Executive branch
	Senate	If the approved proposal was initially written by a Senator
Description: it classifies the laws according to their unprecedentedness	"New"	If the approved proposal is a new law that does not seek to amend an existing one (even if it interacts with other pieces)
	"Complementary"	If the approved proposal is an amendment of previous laws, changing part of them
	"Detailing"	If the approved proposal is a nested law, which aims to better regulate an existing law through detailing its governance
	"Revoking"	If the approved proposal is a PDC with the objective to revoke an administrative measure taken by the Executive branch
	"Protocol/Agreement Approval"	If the approved proposal is a PDC that is set to ratify international treaties between Brazil and another country.
Content: it classifies the laws according to their content's objectives	"Investment"	If the approved proposal is an investment in health or education through new spending for new or existent policies
	"Rules and rights"	If the approved proposal sets a new rule or replaces an existing one, or if it declares new rights with no established way to deliver it or budgetary provision
	"Symbolic (Names and Days/Months)"	If the approved proposal establishes a day or a month to pay tribute to someone or to promote a specific cause, or it is giving official names to public buildings.
Spending: it classifies the laws according to the inclusion of new expenses or not to the federal budget	"New expenses"	If the approved proposal defines new expenses for existing or new policies, indicating the source of the resources in the federal budget
	"No new expenses"	If the approved proposal does not define new expenses, or if it implies in new expenses but does not indicate the source of the resources in the federal budget
Distributional orientation: it classifies the laws according to the concentrating of diffusing distribution of benefits	"Concentrating"	If the approved proposal grants financial benefits or rights to an individual, targeted group of people, a company, or a geographical location.
	"Diffusing"	If the approved proposal grants benefits to no particular individual, no targeted group, company, or geographical location.

Source: Prepared by the author, based on Câmara dos Deputados, Lemos (2001) and Ricci (2003)

Relevance, in the end, is understood under a scale that combines "content", "spending" and "distributional orientation", varying from the most relevant type – an investment that imply in new expenses and is diffusing – to the least relevant one – a rules and rights law, which imply in no spending and is concentrating. Symbolic laws are not considered, given their nature. Such graduality will be explored when I report the results of the application of the proposed taxonomy in the database.

The sample on which the above codebook is applied is the total amount of finally approved proactive proposals originated between August 2000 and December 2018, extracted from the main database that was used for the congruence analysis. Proactive proposals are the same as considered in **chapter 3**: Constitutional Amendment Proposals (*PEC*), Bill of Law (PL), Provisional Measure (*MPV*), Bill of Legislative Decree (*PDC*) and Bill of Complementary Law (*PLP*). The other two kinds of proposals – Indication (*INC*) and Information Request (*RIC*) – are issued by parliamentarians with no need for approval in Congressional Committees or the plenary and for that reason were left out of this analysis.

There is a myriad of other legislative proposals, such as Amendments to ongoing projects and various Requests (i.e., for public hearings or for inclusion in or exclusion of the House agenda) that were excluded in order to keep coherence with previous parts of the research. I am also not considering legislative proposals previous to August 2000[24].

Having described the criteria and the origin for the database, I now present the results of the classification of the policies, further indicating what they could mean in terms of the broader analysis of this work.

4.3. Approved social policy: 2000-2018

Between 2000 and 2018, 217 new pieces of Legislation on health and education were approved, out of the 19,424 proposed bills in the same period. The overall ratio of approval was, therefore, 1.1%. As seen in **Table 11**, Representatives and the Executive branch are the origin of the majority – 2/3 – of the approved rules. The Senate and Permanent House Committees follow the list, although in this last case, their approval

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[24] There were other approved pieces of legislation that were proposed before then, but they have no classification given by the House of Representatives and were hence left out of the analysis.

rate for health and education laws were restricted to PDC, practically all of them to ratify international cooperation deals in education.

There were significantly more education-related rules than health-related ones approved in the analyzed period – 148 and 69, respectively –, especially because the Executive branch did not rule on health – 14 new laws – as much as in education – 65 new laws. The Senate's higher focus on education and the cooperation deals also weighed on the education-related numbers.

Despite the intuitive impulse to credit new legislation to provisionary measures, bills of law predominated in the health and education policymaking. The primary type of proposals approved in the period was PL, which represented 150 (69%) of the 217, followed by the Committees' PDC and the Executive branch's MPV. It is particularly useful to realize that the Executive power has relied on MPV for 30 of their 79 health or education proposals. In the analyzed period, Provisionary Measures could not be issued indefinitely, which reduced the dominance of the Executive in the policy making after 2001 (Rodrigues & Zauli 2002; Gomes 2012).

A significant share of the approved proposals were completely new norms. In terms of their description, excluding the *sui generis* group of 33 approved proposals that served only to ratify international treaties, they are basically divided into completely new norms (84) and complementary norms (91). There is very little attention to the norms that aimed at detailing previous laws or Constitutional rules for health and education issues (7), and almost no revoking from the Congress to administrative rules issued inside the Executive branch (2)[25].

Defining new rules or expanding rights was the objective of 2 in every 3 new policies on health and education between 2000 and 2001. Considering the content of the laws, new investments were 25%, very much focused on education, which represented more than 22%. The creation of new Federal Universities and Institutes, as well as programs such as PROUNI, PNATE, PET, and PRONATEC, represented 30 of the 54 new investment policies during this period.

The number of symbolic laws, although not insignificant, is relatively small compared to the new substantive laws. There have been approved 16 new policies in this

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[25] The two PDC dedicated to revoke administrative measures that were approved became DC 273/14 – with the objective of revoking a prohibition from the Sanitary Agency of drugs used to reduce appetite, and DC 177/17 which revoked an internal ruling of the Ministry of Health which reduced the reach of exams for breast cancer prevention.

category, some of them with a broader role than paying tribute to an individual, as the example of the 'awareness campaigns' around common diseases' prevention (i.e., "Outubro Rosa" and "Novembro Azul"). Although the majority of these symbolic new laws are originated in Representatives' proposals, it is crucial to acknowledge their low emphasis on actual policy-making on such proposals for health and education.

Table 11. Proactive proposals turned into law by the proponent, type, description, and content – 2000-2018

	Total	%	Health	%	Education	%
Total	217	100%	69	31.8%	148	68.2%
Representatives	66	30.4%	35	16.1%	31	14.3%
Permanente House Committee	25	11.5%	3	1.4%	22	10.1%
Special House Committee	1	0.5%	1	0.5%	0	0.0%
Bicameral Committee	7	3.2%	1	0.5%	6	2.8%
Executive	79	36.4%	14	6.5%	65	30.0%
Senate	39	18.0%	15	6.9%	24	11.1%
MPV	30	13.8%	9	4.1%	21	9.7%
PL	150	69.1%	52	24.0%	98	45.2%
PEC	1	0.5%	0	0.0%	1	0.5%
PDC	35	16.1%	7	3.2%	28	12.9%
PLP	1	0.5%	1	0.5%	0	0.0%
New	84	38.7%	22	10.1%	62	28.6%
Complementary	91	41.9%	33	15.2%	58	26.7%
Detailing	7	3.2%	7	3.2%	0	0.0%
Revoking	2	0.9%	2	0.9%	0	0.0%
Protocol/Agreement Approval	33	15.2%	5	2.3%	28	12.9%
Investment	53	24.4%	5	2.3%	48	22.1%
Rules and Rights	148	68.2%	54	24.9%	94	43.3%
Symbolic (Names and Days/Months)	16	7.4%	10	4.6%	6	2.8%
Concentrating	16	7.4%	5	2.3%	11	5.1%
Diffusing	123	56.7%	34	15.7%	89	41.0%
None	78	35.9%	30	13.8%	48	22.1%

Source: Prepared by the author with data of Câmara dos Deputados (2019).

Finally, corroborating Lemos (2001) and Ricci (2003), the majority of the new health and education laws in the analyzed period were diffusing – 56.7%, while a very small portion was found to be concentrating. It is important to flag the methodological challenges to analyze inequality-reduction policies under the adopted taxonomy (which followed previous works). Indeed, not all concentrating laws seem to play against inequality reduction, for example, that which created a minimum income threshold for

school teachers (Law 11.738/2008). Likewise, not all diffusing laws are relevant, as the inclusion of music as a mandatory discipline in the primary education curriculum of every student (Law 11.769/2008). A more in-depth analysis of the content and impact of new laws would be more appropriate in order to increase assertiveness in the conclusions.

The classification adopted offers empirical confirmation of the diffusing feature of the policymaking, which will serve as the bases for the conclusion that the House of Representatives does seem to be working under a more distributive orientation, which in turn dialogue with other studies of political science.

The contrast between the role of the House of Representatives in setting the agenda for approved proposals in comparison to the Executive power reveals that Representatives individually have incredibly lower chances to be the author for health and education policies. Considering the amount of proposed policy (see **Table 3**) vs. the approved ones, the ratio of approval of health and education proposals for the Executive is 48%, while it is only 0.4% for Representatives[26]. On the other hand, considering only the approved policies, Representatives had a similar share to the Executive branch – 30.4% vs. 36.4%, respectively – corroborating to previous studies that pointed to the increasing importance of the Legislative branch

Table 12 shows numbers of description, content, the requirement of new expenses, distributional orientation, and the average years for approval for the new policies produced between 2000 and 2018, both for Representatives and the Executive branch separately. The data shows that the Executive branch is responsible for the most "relevant" health and educational policies produced over that period, considering relevance under such criteria of investment and spending oriented, as well as diffusing.

The Executive mostly sets what is new, while the House of Representatives more often complements existing policies. From the 84 new laws, the Executive power proposed 56, while Representatives were the origin of only 20. On the other hand, 42 of the complementary policies came from Representatives, while the Executive presented 18.

When it comes to investment policies, this is a definite territory for the President, and Representatives had a minimal role, at least considering health and education policies.

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[26] A more in-depth assessment of the projects would have to be made in order to calculate a more definitive ratio. Proposals are very often attached one to another to improve the flow of the policymaking, and perhaps there have been bills that were indirectly approved through the approval of a principal/precedent one. I have not conducted such analysis, but based on the number of proposed projects vis-à-vis the approved ones, it is reasonable to conclude that the final ratio number would not radically change.

49 of the 53 approved investment proposals were originated in the Executive branch, while there was only one Representative's investment policy approved[27]. In fact, 59 of the 65 new policies that implied in new expenses for health or education were proposed by the Presidents. Such unequal share reiterates Lemos's (2001) findings on the limited role of Representatives to actually proactively expand spending through regulatory policy. It also corroborates with findings around the vital role of pork-barrel for Representatives to deliver on spending (Pereira & Rennó 2013).

Table 12. New health and education laws, comparing Representatives' proposals vs. Executive's proposals, by description, content, the implication of expenses, distributional orientation and average years to be approved

	Total	%	Represent.	%	Executive	%	Others	%
Total	217	100%	66	30.4%	79	36.4%	72	33.2%
New	84	38.7%	20	9.2%	56	25.8%	8	3.7%
Complementary	91	41.9%	42	19.4%	18	8.3%	31	14.3%
Detailing	7	3.2%	2	0.9%	5	2.3%	0	0.0%
Revoking	2	0.9%	2	0.9%	0	0.0%	0	0.0%
Protocol/Agreement Approval	33	15.2%	0	0.0%	0	0.0%	33	15.2%
Investment	53	24.4%	1	0.5%	49	22.6%	3	1.4%
Rules and Rights	148	68.2%	56	25.8%	28	12.9%	64	29.5%
Symbolic	16	7.4%	9	4.1%	2	0.9%	5	2.3%
New expenses	65	30.0%	1	0.5%	59	27.2%	5	2.3%
No new expenses	152	70.0%	65	30.0%	20	9.2%	67	30.9%
Concentrating	16	7.4%	7	3.2%	7	3.2%	2	0.9%
Diffusing	123	56.7%	39	18.0%	55	25.3%	29	13.4%
None	78	35.9%	20	9.2%	17	7.8%	41	18.9%
Average years to get approved	2.6	-	4.8	-	1.0	-	2.4	-

Source: Prepared by the author with data of Câmara dos Deputados (2019).

On the other hand, Representatives do interfere in regulation and rights. Almost 26% of all approved proposals on health and education were new rules or rights proposed by Representatives – twice the share of the Executive branch. Inclusion of new disciplines in the public education system curriculum, expansion of rights for pregnant women to

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[27] Law 11.255/2005, which originated in the PL 432/2003, of Representative Mariângela Duarte, which defines a program for the public health system to attend and prevent Hepatitis. Article 6 of such Law defines that Article 6. "the expenses resulting from the application of this Law shall be borne by the proper budget allocation of the three (3) spheres of Government", which was not vetoed by the President, unlike other proposals.

define their doctor and hospital before-hand, and mandatory inclusion of brothers and sisters in the same school are examples of such policies. They are surely impactful and allow credit claiming by Representatives, even though they do not imply any direct spending or transfer.

With regards to distributional orientation, the level of priority given to diffusing policies is overwhelming, be it for Representatives or for the Executive branch. Both of the proponents dedicated their policy-making predominantly for diffusing proposals, again confirming previous studies on the issue (Lemos 2001; Ricci 2003). Although there are incentives for Representatives to push for universal or collective-focused policies instead of targeted policies (Ricci 2003), this is not the easiest way for Representatives to be responsive to their constituents – certainly not the fastest.

While a Presidential proposal on health or education takes an average of 1 year to get approved, a Representative's proposal takes nearly five. Considering they have a 4-year mandate, it is very risky to bet on policy approval as a strategy for responsiveness to constituencies. Except for very few Representatives that manage to get a bill approved, the vast majority will not be able to deliver new policies to their voters within the same Legislature.

Here the Legislative process vis-à-vis responsiveness deserves a note. There are ways to be in the spotlight through policymaking, which are not related to the creation of original proposals (a sort of graduation of Eulau & Karps' "policy component"). Becoming a rapporteur of a proposal in a select committee is one of them, but there are also political strategies to become a recognized voice in bills debated in plenary and the strategic positions that have more speaking time than the average Representative – for example, the Government Leader or the Opposition Leader.

All these ways, nevertheless, depend on the political wind and the agenda set by the House, and would not be as much under control of a Representative to be used as a responsiveness strategy as their capacity to set the agenda. In fact, given the disparity between a growing number of Representatives with proposals on health and education and the little number of actually approved policies on these fields, policymaking is much more a symbolic strategy than a substantive one, an argument I will further explore. Representatives respond with a policy as a way to "communicate" what they aspire to deliver, not to pursue delivery itself

The dynamics of the approved policies tell a new story. As displayed in **Figure 14**, the dominance of the agenda changes from time to time between the Executive and

the Legislative proposals. The Executive's agenda is dominant at the beginning of new Presidents' administrations: between 2003 and 2006 (Lula's first term), during 2011 and 2012 (Dilma's first term), and 2016 (Temer's post-Impeachment new government). It is also notable that between 2010 and 2014, there was an overall reduction of the approval of Representatives' proposals on health and education, something that changed in 2015.

Differently from the dynamics of the presentation of new proposals – as discussed in **chapter 3** – there seems to be a reduction in the level of priority of health and educational proposals' approval over time. The average number of approved health and educational policies per year in FHC's second term (considering the second half of his mandate, for which the data of approved proposals labeled by the House according to their thesaurus is available) was 8,5, which increased to 17.5 in Lula's first term. After that, there was a drop in the number of health and education approved policies per year: 10 in Lula's second term, 7.25 in Dilma's first term, 5.5 during 2015 and 2016, and 1.5 during the 2017 and 2018. There is a myriad of drivers for such change – a shrinking political base of the Federal government and a fiscal crisis being two of them – but there is an apparent reduction in health and education agenda in the policy delivery over the last 16 years.

Figure 14. Approved proposals per year and original proponent – 2000-2018
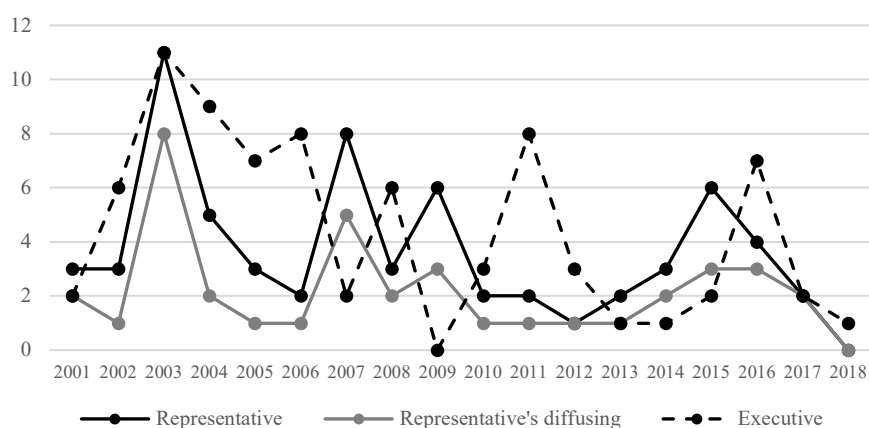
Source: Prepared by the author with data of Câmara dos Deputados (2019).

When it comes to the characteristics of the Representatives' proposals that reach an approval, there is no contrasting change overtime. The majority of their new laws are rules and regulation ones, with no investment involved and, as seen in **Figure 14**, diffusing orientation, well distributed over the years, with no change in nature. That is

disproving evidence that Representatives deliver "less relevant" policies as in correlation with an advancing socio-economic reality.

The existing limitations of such conclusions have to be considered. I had no illusion that responsiveness would happen as straightforwardly as the methodology suggested. Hence, it was not my choice to establish an electoral connection between approved policy and Representatives' constituencies. The number of observations would not allow for any consistent analysis, as there were no more than 66 Representatives that saw their proposals be transformed into law. Moreover, the legislative process may have changed the content of all of these proposals. It also may have offered a stage for other Representatives to take ownership of the proposal by becoming rapporteurs in Committees, for example. All to say, this is an analysis per se and could be made under an empirical responsiveness study.

Also, there is a vast body of evidence sustaining the dominance of the Executive branch in the policymaking, especially those policies that involve spending (Figueiredo & Limongi 1999; Ricci 2003), and nothing fundamentally changed in this research with these regards. There is an offset of the general proportion of dominance, given that Representatives are the origin of 30.4% of the approved health and educational policies while the Executive account for 36.4% of them. However, the aggregated analysis shows a certain homogeneity in the kinds of policies finally approved, with apparent differences between those designed in Representatives' cabinets or in the Executive branch, the last ones being more "relevant," as defined in this work.

Having said that, I now summarize the findings of this chapter. Following that, I wrap up my main arguments, revisiting my hypothesis, and drawing conclusions from the empirical results in **chapter 5**.

4.4. Conclusions

Representatives carry out symbolic proactive policymaking. Even if that was not the intention for many of them, it was the practical result of their option to represent through policy. The analysis reveals that a tiny portion of all proposed policies on health and education is finally turned into law, from which an even smaller part is originated in Representatives' policy proposals.

Considering the whole cohort of approved policies, there have been twice as many education policies as health ones, mainly because the Executive branch prioritized education over health in policy delivery. The primary vehicle for policy change was the Bill of Law (PL), even for the Executive branch, who used MPV in less than half of its approved health and education proposals. PL tends to be more debated than MPV in Congress, with more points of veto in the approval process, so this fact reveals greater Congressional involvement in shaping Executive-originates' health and educational policy.

In terms of the characteristics of the approved proposals, they are very much split into new or complementary policy, being the majority of them focused on rules and rights. The ¼ of the new laws that focused on investments were practically all originated in the Executive branch, showing that Representatives have not been able to set the agenda for budgeted policy-making on health and education.

This is aligned with the findings of Lemos (2001), which point that the majority of the Legislative proposals on health and education do not imply spending. It also points to both the importance of pork as a way of delivering resources and the limits of the traditional policy-making in terms of impact and relevance to their constituencies. A further analysis specifically focused on the Finance committee around the debate of the annual budget for the Federal government would be required before drawing more reliable conclusions on the role of the House in shaping the budget for health and education.

It is important to flag the significance of Representatives in designing new "rules and rights." New regulation over the access of pregnant women to better care and improved access to schooling – both very impactful on infant mortality or school attendance, for example – are initiatives that were originated in Representatives' cabinets and were finally delivered. It contrasts with the symbolic rules that are usually referred to as Representatives, which were only a small portion of the new health and education laws approved between 2000 and 2018.

Diffusing oriented policies are overwhelmingly dominant in health and education, both for proposals originated in the Executive branch and from Representatives. It corroborates Lemos (2001) and Ricci (2003) conclusions of their content analysis on presented bills and approved laws during the 1990s[28].

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[28] Lemos (2001) interprets it by stating that there is no damage to re-election in presenting proposals that seek collective benefits. She also recognizes a genuine will to distribute benefits more broadly from

Finally, there is no change in the nature of Representatives' policy approval over time. Despite the evident change in frequency – particularly between 2011 and 2015 – the profile of Representative-designed policies that were finally turned into law remained the same, disproving my second subsidiary hypothesis.

Having presented the results of the empirical tests conducted, I now try to reflect on what they mean in the broader debate proposed in this work.

Representatives as an explanation for such counter-intuitive fact. Ricci (2003) offers an explanation for the choice of diffusing policies – the size of the district. Given that electoral districts are relatively large in Brazil, Representatives would face high costs to establish a personal connection. Even in smaller districts, there would be a "competition cost" that would make it too hard to win votes on a personal basis, creating incentives for wide-reaching policies.

5. Final remarks and future research agenda

Brazil reduced inequality and advanced socio-economic indicators under a democratic regime. The 1988 Constitution increased the coverage of rights and created the basis for the Brazilian State to expand (Arretche 2018), even though it also created incentives for regressive public spending (Medeiros 2001). The reach of rights-expanding policies, as well as the assumed related role of the Brazilian democracy in ensuring socio-economic advances, still deserve more attention.

The work now presented sought to shed light on the role of one of the central democratic institutions – the House of Representatives – in responding to an assumed social call for State intervention towards inequality reduction. Public spending on health and education has a prominent role in correcting market inequality (Lustig 2013; Silveira 2011; Martinez-Vazquez et al. 2011; OECD 2012), and hence they offered context for the analysis here developed.

I chose to measure the responsiveness of individual Representatives as a way to measure the quality of Brazilian democracy. The overall objective of this work was to learn if the House of Representatives – the most prominent health and education policy producer among the country's democratic institutions – has been congruent to the context of their constituents.

The central hypothesis was that context influences behavior, and hence Representatives are responsive to their constituencies' environment. The competitiveness of the Brazilian elections (Nicolau 2002) and the importance given by Brazilians to State intervention on health and education policies (Reis 2001; Arretche & Araújo 2017; Oxfam Brasil/Datafolha 2017 and 2019) offered support to it. On the other hand, the personal vote fomented by Brazilian electoral institutions, added to the limited capacity for Representatives to approve their original proposals (and claim credit), create incentives for different methods of response instead of policy, setting the hypothesis to be disproved.

Two subsidiary hypotheses derived from the central one. The first expected that the relevance of the legislative agenda would decrease over time as a result of advances in health, education, poverty, and inequality in Brazil between 2000 and 2010. The second one considered that the relevance of the approved proposals would decrease as a result of a changing context.

In order to test that, I did two principal analysis: a correlational analysis that sought to explain the level of priority given by Representatives as a function of the weight of contextual indicators in their voting bases, and a descriptive analysis of the approved proposals between 2000 and 2018.

The databases generated in these analyses also offered additional insights into the broader research. They revealed changes in the aggregated constituencies of the House of Representatives, as well as the level of priority given to health and educational agenda in the House and by individual Representatives. They also pointed to a relevant set of approved policies initially designed within Representatives' cabinets, although incapable of increasing spending. The results of the empirical tests tended to confirm the central hypothesis, and disconfirm the two subsidiary ones.

The level of priority of education policies in Brazilian individual Representative policymaking has been reasonably correlated with the context of their voters, indicating a substantially congruent House. Illiteracy rates, school attendance rate, infant mortality, and poverty rate are significantly connected to the odds of a Representative elected on votes from such realities to present relatively more education-related proposals. Education is an agenda that is high in priorities of different social strata across Brazilians (Reis 2001) and is regarded as a solution to poverty and inequality, in the long run, possibly justifying it being so high in the Representatives' agenda in unattended regions.

Regarding health, on the other hand, no contextual factor – out of the modelled ones – could explain policy by context. It is true that an increasing number of Representatives are presenting health policies (even more than education policies), which reduces contrasts for correlation with constituencies. However, the fact that background mattered is a finding on its own. Doctors, nurses, and other health-related professionals who decide to run for office very often take their professional duty as a hook for policymaking. Constituencies, as discussed in **chapter 1**, could be using their Representatives' background to decide their votes, and here is a further research agenda to be explored.

On a broader level, the fact that the House of Representatives debates health and education with such high priority is already an interesting finding, which corroborated previous analyses (Lemos 2001; Gomes et al. 2009). Considering the odds of actual approval of bills, and assuming that Representatives are capable of calculating such odds, the tsunami of health and education-related proposals, with an increasing number of Representatives presenting them suggests a disconnection between context and the

policymaking process. It also disproves my first subsidiary hypothesis, under which the agenda priority of Representatives and the House as a whole would shift away from health and education.

There was a reduction in the number of approved social policies over the five analyzed Legislatures, something to be further investigated. Focusing on the proposals initiated by Representatives', there was no fundamental change over time, which also disproved my second subsidiary hypothesis. In fact, the profile of Representatives' new approved policies is quite homogeneous: complimentary and diffusing rules and rights with no budgetary provision. Even though such features do not show the irrelevance of Representatives' policy production, it is undoubtedly less relevant for inequality reduction as a proactive agenda.

The role of Representatives for inequality reduction, however, goes beyond tests conducted in this research, but their results should be interpreted more broadly. The dynamics of high intensity of policymaking on health and education, with a low level of policy approval, relevance, and – in the case of health – responsiveness to particular contexts suggest a "symbolic policy-making" – a merge of two of Eulau & Karps (1977) components of responsiveness.

In Brazil, the responsiveness of Representatives – at least for health and education – occurs by sending messages through policy, not by sending changes through policy. Considering the House of Representatives as a whole, symbolic policy-making has a practical effect – the maintenance of a pro-redistributive position in Congress as a general response to their constituencies.

If it is true that Representatives are less capable of individually approving relevant policies, it is also true that they keep the House as a high-pressure political space for debates on health and education, which have, so far, proved to be changed towards a diffusing direction. To present policy is to take a position. As a result, it is reasonable to consider policy proposals as indicatives of a Representative broader set of decisions – what sorts of interventions in ongoing agendas they make or how they vote for the redistributive policy under discussion in Congress, for example.

Looking at the broader debate on inequality and democracy, this study offers an argument for the critical role of the Brazilian House of Representatives. It reiterates the theories of redistribution as a function of the characteristics of the voters (Meltzer & Richards 1981; Acemoglu & Robinson 2000; Acemoglu et al. 2008). It also offers

empirical support for the argument of a functioning democracy that ensures Constitutional advances (Arretche 2018).

For the future, it will be useful to understand the effect of proposed and approved policies on redistribution – if regressive or progressive. It will also be paramount to expand studies of the impact of public policies, particularly linking them to an institutional and representational agenda.

I assume that the broader objective of democracy is to offer channels for the population to shape policies' outputs in order to achieve social progress as an outcome. For that to happen, many other studies on the institutions of democracy and the kinds of behavior they promote must be carried out for political scientists to boldly contribute to a less unequal world. It is my hope that this study is part of such a contribution.

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Annex I – Table of socio-economic indicators

Indicator	Description
Infant mortality at age 1	Number of children not expected to survive the first year of life per 1000 live births.
Elderly ratio (aging rate)	Ratio between the population aged 65 and over and the total population multiplied by 100.
Life Expectancy	Average number of years people should live from birth if the level and pattern of age mortality prevailing in the Census year remain constant throughout life.
Average years of schooling	Average number of years of schooling that a generation of children entering school must complete by the age of 18 if current standards are maintained throughout their school life.
Illiteracy rate	Ratio between the population aged 18 and over who cannot read or write a single ticket and the total number of people in this age group multiplied by 100.
School attendance rate	Razão entre população de 6 a 17 anos de idade que estava frequentando a escola, em qualquer nível ou série e a população total nesta faixa etária multiplicado por 100.
Poverty rate	Proportion of individuals with per capita household income equal to or less than R $ 140.00 monthly, in reais in August 2010. The universe of individuals is limited to those who live in permanent private housing.
Gini index	Measures the degree of inequality in the distribution of individuals according to per capita household income. Its value ranges from 0 when there is no inequality (the per capita household income of all individuals has the same value) to 1 when inequality is maximum (only one individual owns all income). The universe of individuals is limited those living in permanent private housing.

Source: IBGE/Census

Annex II – Types of legislative proposals

PEC - Proposta de Emenda à Constituição
PLP - Projeto de Lei Complementar
PL - Projeto de Lei
MPV - Medida Provisória
PLV - Projeto de Lei de Conversão
PDL - Projeto de Decreto Legislativo
PRC - Projeto de Resolução
REQ - Requerimento
RIC - Requerimento de Informação
RCP - Requerimento de Instituição de CPI
MSC - Mensagem
INC - Indicação
ADD - Adendo
ANEXO - Anexo
APJ - Anteprojeto
ATC - Ato Convocatório
AV - Aviso
AVN - Aviso (CN)
CAC - Comunicado de alteração do controle societário
CAE - Relatório de Atividades do Comitê de Admissibilidade de Emendas (CAE)
CCN - Consulta do Congresso Nacional
COI - Relatório do COI
CON - Consulta
CVO - Complementação de Voto
CVR - Contestação ao Voto do Relator
DCR - Denúncia por crime de responsabilidade
DEC - Decisão
DEN - Denúncia
DTQ - Destaque
DVT - Declaração de Voto
EAG - Emenda Substitutiva Aglutinativa Global
EMA - Emenda Aglutinativa de Plenário
EMC - Emenda na Comissão
EMC-A - Emenda Adotada pela Comissão
EMD - Emenda
EML - Emenda à LDO
EMO - Emenda ao Orçamento
EMP - Emenda de Plenário
EMR - Emenda de Relator
EMS - Emenda/Substitutivo do Senado
EPP - Emenda ao Plano Plurianual
ERD - Emenda de Redação
ERD-A - Emenda de Redação Adotada
ERR - Errata
ESB - Emenda ao Substitutivo
ESP - Emenda Substitutiva de Plenário
INA - Indicação de Autoridade
MAD - Manifestação do(a) Denunciado(a)
MCN - Mensagem (CN)
MMP - Mensagem do Ministério Público da União
MSF - Mensagem (SF)
MSG - Mensagem (CN)
MST - Mensagem do Supremo Tribunal Federal
MTC - Mensagem do Tribunal de Contas da União
OBJ - Objeto de Deliberação
OF - Ofício do Congresso Nacional
OF. - Ofício Externo

OFN - Ofício (CN)
OFS - Ofício do Senado Federal
PAR - Parecer de Comissão
PARF - Parecer de Comissão para Redação Final
PDN - Projeto de Decreto Legislativo (CN)
PDS - Projeto de Decreto Legislativo (SF)
PEA - Parecer à Emenda Aglutinativa
PEP - Parecer às Emendas de Plenario
PES - Parecer às emendas apresentadas ao Substitutivo do Relator
PET - Petição
PFC - Proposta de Fiscalização e Controle
PIN - Proposta de Instrução Normativa
PLC - Projeto de Lei da Câmara dos Deputados (SF)
PLN - Projeto de Lei (CN)
PLS - Projeto de Lei do Senado Federal
PPP - Notas Taquigráficas
PPR - Parecer Reformulado de Plenário
PRA - 1987/88
PRF - Projeto de Resolução do Senado Federal
PRL - Parecer do Relator
PRN - Projeto de Resolução do Congresso Nacional
PRO - Proposta
PRP - Parecer do Relator Parcial
PRR - Parecer Reformulado
PRV - Parecer Vencedor
PRVP - Proposta de Redação do Vencido em Primeiro Turno
PSS - Notas Taquigráficas
R.C - Recurso do Congresso Nacional
RAT - Relatório Setorial
RDF - Redação Final
RDV - Redação do Vencido
REC - Recurso
REL - Relatório
REM - Reclamação
REP - Representação
RIN - Requerimento de Resolução Interna
RLF - Relatório Final
RLP - Relatório Prévio
RLP(R) - Relatório Prévio Reformulado
RLP(V) - Relatório Prévio Vencedor
RPA - Relatório Parcial
RPL - Relatório Preliminar
RPLE - Relatório Preliminar Apresentado com Emendas
RPLO - Relatório Preliminar
RQA - 1987/88
RQC - RQC
RRC - Relatório de Receita
RRL - Relatório do Relator
RST - Redação para o segundo turno
RTV - Mensagem de Rádio e Televisão
SAP - Subemenda Aglutinativa Substitutiva de Plenário
SBE - Subemenda
SBE-A - Subemenda Adotada pela Comissão
SBR - Subemenda de Relator
SBT - Substitutivo
SBT-A - Substitutivo adotado pela Comissão
SDL - CLP
SIP - Solicitação para instauração de processo
SIT - Solicitação de Informação ao TCU
SLD - Comissões

SOA - CLP
SOR - Comissões
SPA - CLP
SPA-R - revisão (CLP)
SPP - Comissões
SPP-R - revisão (Comissões)
SRL - Sugestão de Emenda a Relatório
SSP - Subemenda Substitutiva de Plenário
SUC - Sugestão a Projeto de Consolidação de Leis
SUG - Sugestão
SUM - Súmula
TER - Termo de Implementação
TVR - Ato de Concessão e Renovação de Concessão de Emissora de Rádio e Televisão
VTS - Voto em Separado

Annex III – Beta Inflated Distribution and its parametrization

The Beta Inflated Distribution is given as

f(y)=p0, if (y=0),

f(y)=p1, if (y=1),

f(y|a,b)=(1/(Beta(a,b))) y(a-1)(1-y)(b-1), otherwise, for y=(0,1), α>0 and β>0. Beta(a,b) is the beta function.

The parametrization in the used distribution is:

mu=a/(a+b), for mu=(0,1);

sigma=1/(a+b+1), for sigma=(0,1);
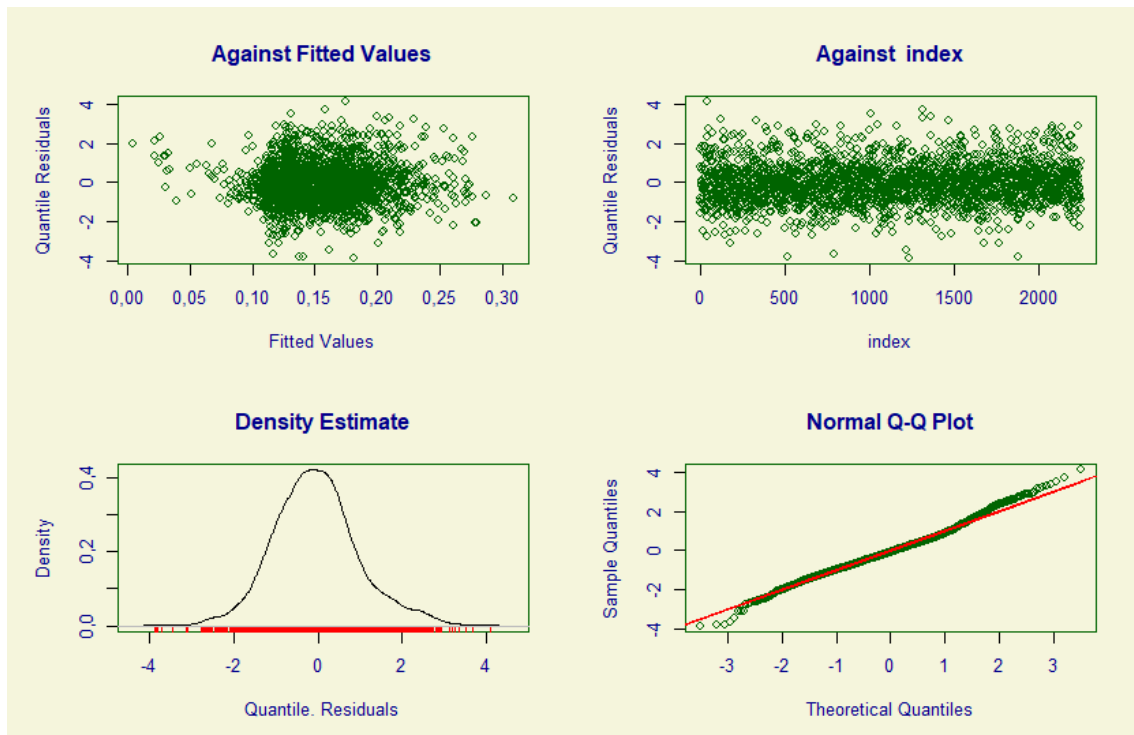
nu=p0/p2;

tau=p1/p2;

where p2=1-p0-p1.

Residues under Beta Inflated distribution

Annex IV – Residues under normal distribution

```
Residuals:
     Min       1Q    Median       3Q       Max
-0.19541  -0.07603  -0.04210   0.03468   0.95335
```

```
Coefficients:
                                              Estimate  Std. Error  t value          Pr(>|t|)
(Intercept)                                 0.09544872  0.01190554    8.017  0.00000000000000173  ***
T_ANALF18M                                  0.02475583  0.00880385    2.812             0.004967  **
T_FREQ6A17                                  0.00882328  0.00429948    2.052             0.040269  *
MORT1                                      -0.02012411  0.00829713   -2.425             0.015369  *
PMPOB                                       0.01059082  0.01060643    0.999             0.318131
as.factor(base_educ_data$Legislatura)52     0.02404732  0.00904790    2.658             0.007922  **
as.factor(base_educ_data$Legislatura)53     0.03018752  0.00903514    3.341             0.000848  ***
as.factor(base_educ_data$Legislatura)54     0.01676709  0.01120189    1.497             0.134584
as.factor(base_educ_data$Legislatura)55     0.00249592  0.01121629    0.223             0.823924
Tot                                         0.00003491  0.00003410    1.024             0.306038
siglaSexoM                                 -0.03365817  0.00977681   -3.443             0.000587  ***
PROFEducacao                                0.06019908  0.01360242    4.426  0.00001007830998960  ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1


Residual standard error: 0.1276 on 2238 degrees of freedom
Multiple R-squared:  0.03718,    Adjusted R-squared:  0.03245
F-statistic: 7.857 on 11 and 2238 DF,  p-value: 0.00000000000016
```
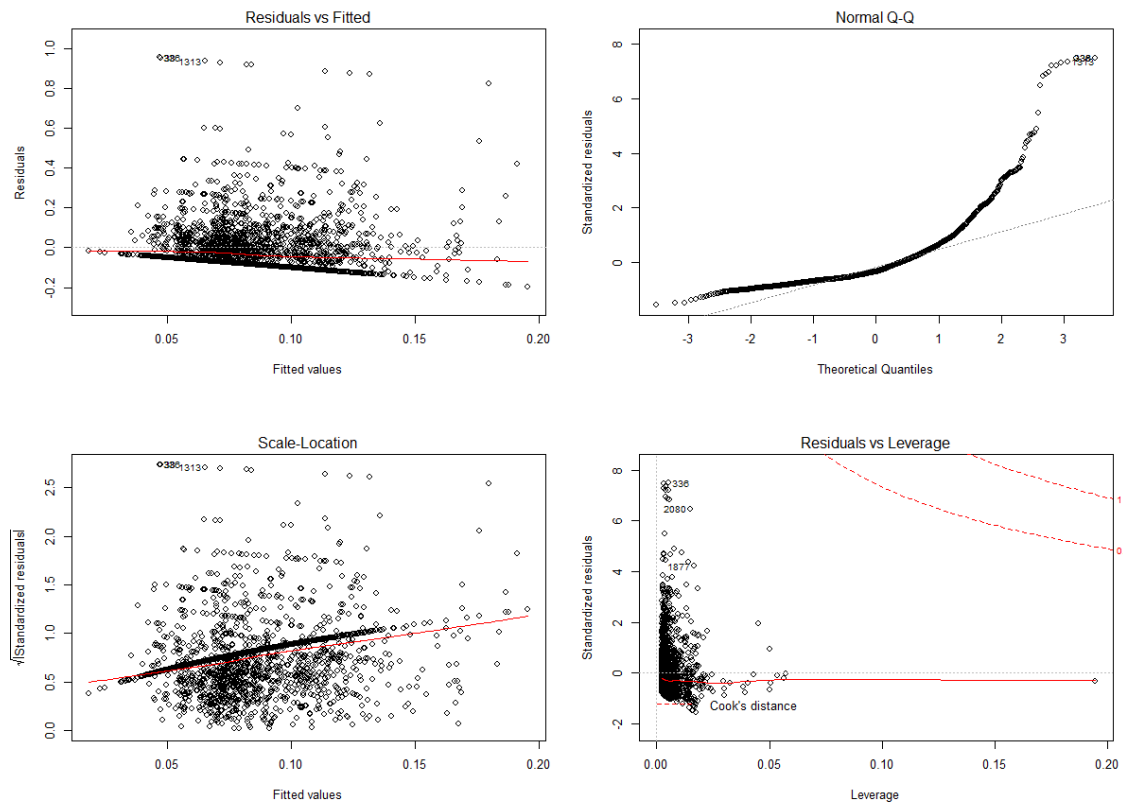
Annex V – Declared professions by the Representatives

PROFESSION	FREQUENCE	CATEGORY
ADMINISTRADOR	44	Outros
ADVOGADO	276	Outros
AGRONOMO	13	Outros
ANALISTA DE SISTEMAS	1	Outros
APOSENTADO (EXCETO SERVIDOR PUBLICO)	9	Outros
ARQUITETO	8	Outros
ASSISTENTE SOCIAL	6	Saúde
ATLETA PROFISSIONAL E TECNICO EM DESPORTOS	2	Outros
AUXILIAR DE ESCRITORIO E ASSEMELHADOS	1	Outros
BANCARIO E ECONOMIARIO	21	Outros
BIOLOGO E BIOMEDICO	2	Saúde
COMERCIANTE	37	Outros
COMERCIARIO	6	Outros
CONTADOR	8	Outros
CORRETOR DE IMOVEIS, SEGUROS, TITULOS E VALORES	8	Outros
DELEGADO, POLICIAL CIVIL, POLICIAL MILITAR	12	Outros
DIRETOR DE EMPRESAS	5	Outros
DONA DE CASA	2	Outros
ECONOMISTA	51	Outros
EMPRESARIO	134	Outros
EMPRESARIO E PRODUTOR DE ESPETACULOS PUBLICOS	14	Outros
ENFERMEIRO/NUTRICIONISTA	4	Saúde
ENGENHEIRO	119	Outros
ESTUDANTE, BOLSISTA, ESTAGIARIO E ASSEMELHADOS	16	Educação
FARMACEUTICO	3	Saúde
FERROVIARIO	2	Outros
FISCAL	2	Outros
FISIOTERAPEUTA E TERAPEUTA OCUPACIONAL	2	Saúde
FOTOGRAFO E ASSEMELHADOS	1	Outros
GEOGRAFO	1	Outros
GEOLOGO	2	Outros
GERENTE	3	Outros
HISTORIADOR	1	Outros
INDUSTRIAL	8	Outros
JORNALISTA/REDATOR/PUBLICITARIO/RADIALISTA	40	Outros
LEILOEIRO, AVALIADOR E ASSEMELHADOS	1	Outros
MEDICO	192	Saúde
MEMBROS DO PODER EXECUTIVO: PRESIDENTE, MINISTRO, GOVERNADOR, PREFEITO	3	Outros
MILITAR	7	Outros

MOTORISTA PARTICULAR	1	Outros
MUSICO/CANTOR/ATOR/ARTISTA	10	Outros
NAO INFORMADA	67	Outros
OCUPANTE DE CARGO EM COMISSAO	1	Outros
ODONTOLOGO	5	Saúde
OFICIAIS DAS FORCAS ARMADAS E FORCAS AUXILIARES	1	Outros
OPERADOR DE IMPLEMENTO DE AGRICULTURA, PECUARIA E EXPLORACAO FLORESTAL	1	Outros
OUTROS	134	Outros
PEDAGOGO	3	Educação
PRESIDENTE DA REPUBLICA, MINISTRO DE ESTADO, GOVERNADOR E PREFEITO	1	Outros
PRODUTOR AGROPECUARIO	21	Outros
PROFESSOR DE EDUCACAO BASICA	26	Educação
PROFESSOR DE ENSINO SUPERIOR	56	Educação
PROFESSOR E INSTRUTOR DE FORMACAO PROFISSIONAL	4	Educação
PROPRIETARIO DE ESTABELECIMENTO AGRICOLA, DA PECUARIA E FLORESTAL	11	Outros
PROPRIETARIO DE ESTABELECIMENTO INDUSTRIAL	7	Outros
PROPRIETARIO DE MICROEMPRESA	1	Outros
PSICOLOGO	5	Outros
REPRESENTANTE COMERCIAL	1	Outros
SACERDOTE OU MEMBRO DE ORDEM OU SEITA RELIGIOSA	22	Outros
SECURITARIO	1	Outros
SENADOR, DEPUTADO E VEREADOR	1046	Outros
SERVIDOR PUBLICO	55	Outros
SERVIDOR PUBLICO CIVIL APOSENTADO	7	Outros
SOCIOLOGO	7	Outros
TECNICO	28	Outros
TRABALHADOR AGRICOLA/PECUARIA	21	Outros
VETERINARIO E ZOOTECNISTA	4	Outros