# UNDERSTANDING BUILT SPACE: A CONTRIBUTION ON THE STRUCTURE OF PARLIAMENTS

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**Abstract:** This paper explores the spatial variable in fifteen parliaments (upper chambers, lower chambers, and Brazilian state assemblies) intending to investigate aspects of structure and function, based on the premise that space affects legislative performance. The information for each institution was systematized according to five categories of interpretation: general data, profile, buildings, spatial characteristics synthesis of numerical synthesis. The obtained results allowed to identify similar features in the case studies, associated with the political-legislative nature, the symbolic appeal, and the spatial complexity of the built complexes, in addition to pointing out how much space should be understood as a "good" for the analysis of legislative houses.

**Keywords**: Parliaments; Structure and Organization; Spatial Variable; Spatial Complexity; Comparative Analysis.

## 1 Introduction

The article is a comparative study between spatial structures of legislative houses (state, in Brazil, and international) and seeks to discuss a spatial pattern in the institutions. Parliaments are the Legislative Branch's physical seat and comprise the building or set of buildings that house it. "One of the characteristics of modern democracies is the practice of the separation of powers and the existence of an assembly composed of representatives elected by the people to exercise the function of the Legislative Branch (…). Worldwide, the assemblies (…) are given different names: parliament, congress, diet, assembly, and chamber are some of them" (SATHLER and SATHER, 2020, p. 114, our translation).

In compendiums and dictionaries of architecture and cities' history, buildings that house national or local parliaments from the 18th century stand out. The central position in cities, the robust symbolic load, and the undeniable quality of the design are repeatedly mentioned as justifications for integrating the architectural pantheon (JORDAN, 1985; GLANCEY, 2001; RISEBERO, 2002; STRICKLAND, 2003; NUTTGENS and WESTON, 2006; STEVENSON, 2007; BORNGÄSSER, 2010; COHEN, 2013).

Lawrence Vale (1992), in the seminal work "Architecture, Power, and National Identity",

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explores power and identity issues in the seats and surroundings of national parliaments. This author states that political power assumes different forms and many regimes make symbolic use of the physical environment. From a perspective primarily based on a) symbolic characteristics (GOODSELL, 1988; BRUAND, 1999; HAKALA, 2000; BOTTON, 2007; PARKINSON, 2012; CALIB and PAZ, 2016; FLINDERS, COTTER, *et al.*, 2017) and b) the configuration of the primary plenary sessions (AMELLER, 1966; RIGGS, 1973; LARA and VEGT, 2017), the interpretations have expanded, which allows us to understand several spatial aspects that characterize the daily dynamics in legislative houses, based on evidence. This includes c) recognizing the role of physical space and structural and functional issues for these institutions (RIGGS, 1973; HEDLUND, 1984; FLINDERS, COTTER, *et al.*, 2017); d) the effect of the space built on the behavior of parliamentarians, political culture, and the legislative process (GRUMM, 1970; GOODSELL, 1988; STEVENS, 1997-1998); e) the relevance of location issues in the urban system (NORTON, 2017); f) the performance of informal spaces for parliamentary life (NORTON, 2019); and g) the issue of the lack of physical space in legislative houses (MARCONDES FILHO, 1958; MEDEIROS, 2010; MEDEIROS and REBELO, 2014). Studies that seek to identify variables for investigating structural aspects in these institutions are also highlighted, including concerning spaces (AMELLER, 1966; RIGGS, 1973; HEDLUND, 1984; LARA and VEGT, 2017).

Although distributed in time and space (regarding the location of the analyzed cases), the researchers are somewhat dispersed and do not yet consolidate a structured field of knowledge, lacking more solid findings. If a predominantly symbolic and aesthetic perspective predominates in architecture, in political science, spatial reading is still seen as tangent and somewhat irrelevant, although studies demonstrate the effects of the constructed form in different dimensions (HILLIER and HANSON, 1984) (KOHLSDORF, 1996; NETHERLANDS, 2002; NETHERLANDS, 2013; KOHLSDORF and KOHLSDORF, 2017; NETHERLANDS, 2019). Why would it be different in parliaments?

The article is based on the question above and understanding that the comparative reading of spatial relationships in buildings or complex sets requires the improvement of how much the architecture (broad sense), the built space, or the spatial configuration (relationships between the elements constituents of the built space) affect work relationships, interpersonal interaction, and exchange of experiences, focusing on the performance of institutions. At this stage of the research, we seek to answer two questions: a) how to read the spatial structure of parliaments?; and b) in spatial terms, how do the legislative houses approach each other?

To this end, the article is structured in two sections in addition to the introduction and conclusions. First, we present the methodological procedures. Subsequently, we disclose and discuss the results based on comparing spatial variables in fifteen case studies.

## 2 Methodology

The research is exploratory and seeks to identify approximations between parliaments. The samples were selected from the availability of official data from the institutions: (a) on their websites; (b) in printed documents; and (c) provided by the technical units responsible for spatial management upon request for the study. There was no distinction between unicameral or bicameral legislatures. When bicameral, data from the upper and lower chambers were analyzed separately.

After evaluating the conditions, the sample resulted in the investigation of eleven legislative houses in six parliaments (Chart 1): Brazil (*Congresso Naciona do Brasil*: *Câmara dos Deputados* and *Senado Federal* - Figure 1); United States of America (*United States Congress*: *House of Representatives* and *Senate* - Figure 2); France (*Congrès du Parlement*: *Assemblée Nationale* and *Sénat* - Figures 3 and 4); Italy (*Parlamento Italiano*: *Camera dei Deputati* and *Senato della Repubblica* - Figure 5); Portugal (*Assembleia da República Portuguesa* - Figure 6); and United Kingdom (*United Kingdom Parliament*: *House of Commons* and *House of Lords* - Figure 7). Additionally, we included four state assemblies from Brazil (Chart 2): Câmara Legislativa do Distrito Federal (Figure 8), Assembleia Legislativa de Minas Gerais (Figure 9), Assembleia Legislativa do Estado do Rio de Janeiro (Figure 10), and Assembleia Legislativa do Estado de São Paulo (Figure 11).

**Chart 1** – National Parliaments (sample)

| Country | Official Designation of the Parliament | Official Designation of the Legislative Chamber | ID |
|---|---|---|---|
| Brazil | *Congresso Nacional do Brasil* | *Câmara dos Deputados* | 1 |
| | (bicameral) | *Senado Federal* | 2 |
| United States of America | *United States Congress* | *House of Representatives* | 3 |
| | (bicameral) | *Senate* | 4 |
| France | *Congrès du Parlement* | *Assemblée Nationale* | 5 |
| | (bicameral) | *Sénat* | 6 |
| Italy | *Parlamento Italiano* | *Camera dei Deputati* | 7 |
| | (bicameral) | *Senato della Repubblica* | 8 |
| Portugal | *Assembleia da República Portuguesa* | *Assembleia da República Portuguesa* | 9 |
| | (unicameral) | | |
| United Kingdom | *United Kingdom Parliament* | *House of Commons* | 10 |
| | (bicameral) | *House of Lords* | 11 |

**Chart 2** – Brazilian state assemblies (sample)

| State | Official Designation of the State Assembly | Official Achronym of the State Assembly | ID |
|---|---|---|---|
| Federal District | Câmara Legislativa do Distrito Federal | CLDF | 12 |
| Minas Gerais | Assembleia Legislativa de Minas Gerais | ALMG | 13 |
| Rio de Janeiro | Assembleia Legislativa do Estado do Rio de Janeiro | ALERJ | 14 |
| São Paulo | Assembleia Legislativa do Estado de São Paulo | ALESP | 15 |

The information from the fifteen institutions was compiled, organized, and described according to the following categories of investigation: *a) general information:* general context of the legislative house in its corresponding territory; *b) profile:* institutional data, including area built, number of parliamentarians, and number of employees; *c) building information:* registration of buildings that make up the spatial structure of the parliament; and *d) synthesis of spatial characteristics and numerical synthesis:* consolidation of the most emblematic spatial features of the built set, as well as: *(d.1)* total number of parliamentarians; *(d.2)* ratio between number of inhabitants per member of parliament; *(d.3)* total built area of the architectural complex; *(d.4)* area built per parliamentarian; *(d.5)* area of parliamentary offices; *(d.6)* maximum possible number of collaborators/assistants per parliamentarian; *(d.7)* average number of employees/assistants per parliamentarian; and *(d.8)* average number of employees per parliamentarian.

Data management resulted in a set of findings regarding the legislative houses, which helped us to answer the research questions.

**Figure 1 –** *Congresso Nacional do Brasil: Palácio do Congresso Nacional na Esplanada dos Ministérios* (Brasília/DF)

**Credit:** Ana Volpe/Agência Senado. **Source:** "Official page of hte Sanate at Flickr" (https://flickr.com/photos/agenciasenado/23427566005/in/album-72157665543137366/)

**Figure 2 –** *United States Congress: Capitol Building* (Washington/USA).

**Credit:** Architect of the Capitol. **Source:** Architect of the Capitol Website "USCapitol" at Flickr (https://www.flickr.com/photos/uscapitol/13060481275/in/album-72157627522484962/).


**Figure 3 –** *Congrès du Parlement: Palais Bourbon* (National Assembly) (Paris/France).

**Credit:** Assemblée Nationale. **Source:** Assemblée Nationale Website(http://www.assemblee-nationale.fr/presse/photos/format-natif/colonnade-3.zip).

**Figure 4 –** *Congrès du Parlement: Palais du Luxembourg* (Senate) (Paris/France).

**Credit:** Sénat. **Source:** La Photothèque du Sénat Website (https://www.senat.fr/uploads/tx_templavoila/facade_sud_01_ap.jpg).

**Figure 5 –** *Parlamento Italiano: Palazzo Montecitorio* (Chamber of Deputies) (Rome/Italy).

**Credit:** Valério de Medeiros.

**Figure 6 –** *Assembleia da República Portuguesa: Palácio de São Bento* (Lisbon/Portugal).

**Credit:** Valério de Medeiros.

**Figure 7 –** *United Kingdom Parliament: Palace of Westminster* (London/England).

**Credit:** UK Parliament. **Source:** UK Parliament at Flickr (https://www.flickr.com/photos/uk_parliament/3384058073/).

**Figure 8 –** CLDF: Headquarters of the *Câmara Legislativa do Distrito Federal* (Brasília/DF).

**Credit:** Sílvio Abdon. **Source:** CLDF Website (http://www.cl.df.gov.br/web/guest/ultimas-noticias/-/asset_publisher/IT0h/content/nota-de-esclarecimento-sobre-o-concurso-publico-da-cldf?redirect=http%3A%2F%2Fwww.cl.df.gov.br%2Fweb%2Fguest%2Fultimas-noticias).

**Figure 9 –** ALMG: *Palácio da Inconfidência* (Belo Horizonte/MG).

**Credit:** Guilherme Bergamini. **Source:** ALMG Website (Press Room) (https://www.almg.gov.br/sala_imprensa/fotos/index.html?idAlb=1139&albPos=20; https://mediaserver.almg.gov.br/acervo/960/645960.jpg).

**Figure 10 –** ALERJ: *Palácio Tiradentes* (Rio de Janeiro/RJ).

**Credit:** Rafael Wallace. **Source:** ALERJ/Palácio Tiradentes Website (http://www.palaciotiradentes.rj.gov.br/galeria-de-fotos/pordentrodopalacio/).

**Figure 11 –** ALESP: *Palácio 9 de Julho* (São Paulo/SP).

**Credit:** José Antônio Teixeira. **Source:** ALESP Website (https://www3.al.sp.gov.br/repositorio/noticia/N-08-2018/fg226430.jpg; https://www.al.sp.gov.br/noticia/album.jsp?id=393532).

## 3 Results and Discussion

The comparative analysis between the spaces built of legislative houses allowed us to identify similar features between the institutions. The political-legislative nature of the spaces, the symbolic load, and the buildings' dimension indicate an evident approximation - which disregards the current system, whether unicameral or bicameral. Shared characteristics are:

1) Presence of a building (usually the headquarters) - or several buildings forming part of the architectural complex - of heritage interest. Institutions have traditionally been located in built sets of expressive architectural appeal, bearing in mind the Legislative Branch's meaning as a representation of society. The sample includes specimens listed or located in areas classified as Cultural Heritage of Humanity (Palace of Westminster, London; *Assembée Nationale* of France, Paris; and the *Congresso Nacional do Brasil*, part of the Brasília Pilot Plan) or registered as a historic place (such as the *Palácio de São Bento*, in Lisbon; or the *Palácio Tiradentes*, in Rio de Janeiro).

2) The architectural sets have significant spatial complexity, resulting from the existence of two or more buildings composing the institutions' physical structure. The characteristic, linked to aspects of spatial discontinuity, given that the buildings are located far apart or separated by streets and blocks (when arranged in the immediate surroundings), requires a series of solutions for their physical connection - ramps, mats, corridors, internal

subway systems, underground or aerial walkways, etc. - and logistics, to ensure the vitality of the buildings.

3) The architectural complexes are usually located in urban centers: the historical and political process linked to these buildings has resulted in prominent locations. The seat of the Legislative Branch has traditionally been located in squares, visually dominated by the building, as is the case in Piazza Montecitorio and the homonymous palace in Rome, or in the case of practically all Brazilian state assemblies. When present in planned cities, such as Washington and Brasilia, the main parliament building makes up the most emblematic urban settlement perspective: if the National Mall directs to the US Capitol, the *Esplanada dos Ministérios* directs its gaze to the *Congresso Nacional do Brasil*.

4) There is a clear relationship between buildings and specific activities - which expresses the concept of a vocation. Usually, the building of historical and patrimonial interest houses a significant portion of the political-legislative and reception activities: the halls and social spaces and the main plenary. It is the context of the Chamber of Deputies of Brazil, in which the Main Building houses the Ulysses Guimarães Plenary and the Green, White, Black, and Noble Halls. The parliamentary offices are usually located in buildings created for that purpose, which, if they do not concentrate the totality of the individual workspaces of the parliamentarians, at least a significant part of them. This is the case of *Edifício Novo*, in the *Assembleia da República Portuguesa*, or of the *Edifício Anexo IV* of the Chamber of Deputies, in Brasília. Administrative buildings tend to be located away from the headquarters.

5) In several cases, the situation of the architectural complexes corresponds to areas of great capillarity in the urban network, which implies an abundant supply of public transport in the vicinity of the legislative houses. There are contexts of subway lines integrated into some of the parliament buildings (such as the Portcullis House - UK Parliament) and the layout of legislative houses off the corridors for public transport, such as in the *Esplanada dos Ministérios*, in Brasília – this characteristic tends to favor the daily flow in these buildings.

Regarding the numerical synthesis (Tables 1, 2, and 3), we performed no advanced statistical analyzes due to the exploratory nature and the number of case studies. However, the results allow to observe the question from a different perspective:

1) The first variable, the number of parliamentarians (in their various denominations: federal deputies, deputies, state deputies, district deputies, lords, members of parliament, or senators), shows significant variation. The lower chambers house a higher number of

parliamentarians, averaging in 506. The upper chambers have a more significant variation, with a minimum in the Brazilian Federal Senate (81) and maximum in the House of Lords, in the United Kingdom (779), with an average of 325.

2) When the number of inhabitants of the country or state per member of parliament is associated, except for the different processes of composition of the upper and lower chambers (according to the models of representativeness adopted), there is an approximation between the state assemblies (average of 281,700.09 inhabitants per state/district deputy) and the lower chambers (average of 252,899.47). The Brazilian chamber has a high ratio of 404,797.13 inhabitants per parliamentarian, while in contexts such as Portugal (unicameral), the figure reaches only 45,895.02 inhabitants per parliamentarian. Due to their composition process, the upper chambers reach an average of more than 1 million inhabitants, in addition to implying a scenario of strong heterogeneity (the Brazilian and North American cases stand out).

3) Concerning the total constructed area (Graph 1), the values reflect the corresponding scales of the legislative houses, varying when compared to the state assemblies, with an average of 42,280.73 $m^2$, and the national parliaments, reaching 206,533.20 $m^2$ for the chambers lower and 156,529.95 $m^2$ for the upper chambers. The largest group is that of the United States, with the House of Representatives reaching 567,479.45 $m^2$, while the Senate occupies 349,359.19 $m^2$, and the smallest, among parliaments, is the *Assembleia da República Portuguesa*, which occupies 83,500.00 $m^2$. The Chamber of Deputies of Brazil is in an intermediate position, with 176,719.77 $m^2$, which does not deviate from the values for the analyzed contexts, although it is 14.44% lower than the average. The total square footage is a clear indicator of the spatial complexity of such institutions, usually made up of several articulated buildings.

4) The area built per parliamentarian (Graph 2) provides a more accurate reading of the spatial component by expressing the relative proportion of space available per representative. Regarding the lower chambers, the Brazilian chamber, with 344.48 $m^2$ per federal deputy, is in an intermediate position, below the US House of Representatives (1,304.55 $m^2$) and the *Assembléia da República Portuguesa* (363.04 $m^2$), and above the equivalent institutions in Italy (179.37 $m^2$), France (214.91 $m^2$), and the United Kingdom (268.46 $m^2$). The Brazilian measure is 22.73% inferior to the average, which reaches 445.80 $m^2$. The North American scenario seems to comprise a separate spatial reality, distancing itself substantially from the sample.

5) Regarding the upper chambers, there is a strong polarization: three of them have lower values, even compared to the lower chambers (United Kingdom: 96.92 $m^2$, France:

316.09 $m^2$, and Italy: 346.03 $m^2$) while two distinguish themselves (in the USA, with 3,493.59 $m^2$, and in Brazil, with 1,713.46 $m^2$), at an average of 1,193.22 $m^2$. The average area available per senator (or equivalent) is 2.68 times superior to that related to federal deputies (or equivalent).

6) Excluding the exceptions in the three levels of legislative houses (House of Representatives and US Senate, *Senado Federal* and *Câmara Legislativa do Distrito Federal in* Brazil), a trend emerges: the areas per state deputy, in the state assemblies of Brazil (493.57 $m^2$ ), are superior to those of the upper (253.01 $m^2$) and lower (274.05 $m^2$) chambers. State deputies have 80% more relative area than federal deputies (or equivalent), and 95% more area than senators (or equivalent).

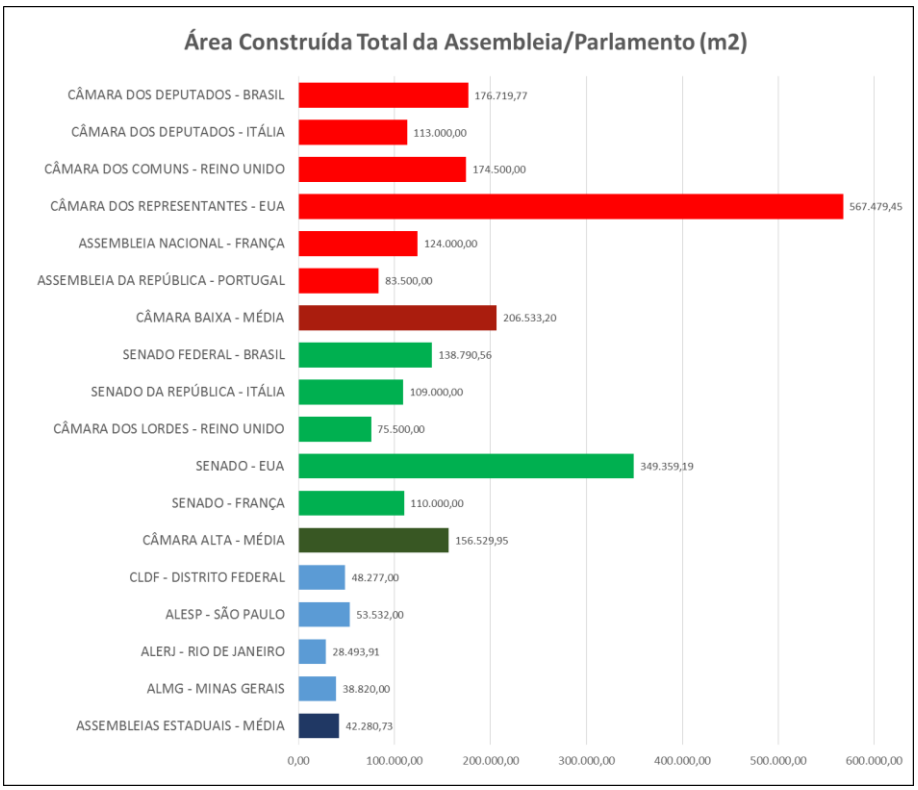
7) It was impossible to obtain the information regarding the areas of parliamentary offices for many of the institutions. For others, the measure translates the dimension into a specific building. The Portuguese context is noteworthy: in addition to being one of the smallest in the sample (19.50 $m^2$), each cabinet is shared by two parliamentarians, which results in a ratio of 9.75 $m^2$ per member. For the lower chambers, the Brazilian scenario is the one with the largest area offered (44.00 $m^2$, based on the reference of the Edifício Anexo IV of the Chamber of Deputies), compared to an average of 24.88 $m^2$. In general, the offices of legislative houses with data availability indicate measures between 22.00 $m^2$ (Italy) and 24.00 $m^2$ (France). There is not enough information to analyze the upper chambers. However, for state legislatures, the average value of 88.33 $m^2$ is 2.55 times higher than that of the lower chambers.

8) For the maximum number of employees per parliamentarian, the upper chambers' data is not enough for a detailed comparison. However, while a maximum of 55 is reach in the Brazilian Senate, the value in France is inferior to five. For lower chambers, the average ceiling is 15.50, with a peak in the Brazilian context. The Brazilian Chamber of Deputies allows up to 25 parliamentary secretaries. The American equivalent institution limits it to 22. The scenario in the United Kingdom records a maximum of 10, while France limits it to 5 in the National Assembly. However, state assemblies present a higher number of employees. The average here reaches 30.25, with a maximum of 38 in Rio de Janeiro, 32 in São Paulo, 28 in the Federal District, and 23 in Minas Gerais. The average value for the assemblies is 95.16% higher than that for the lower chambers.

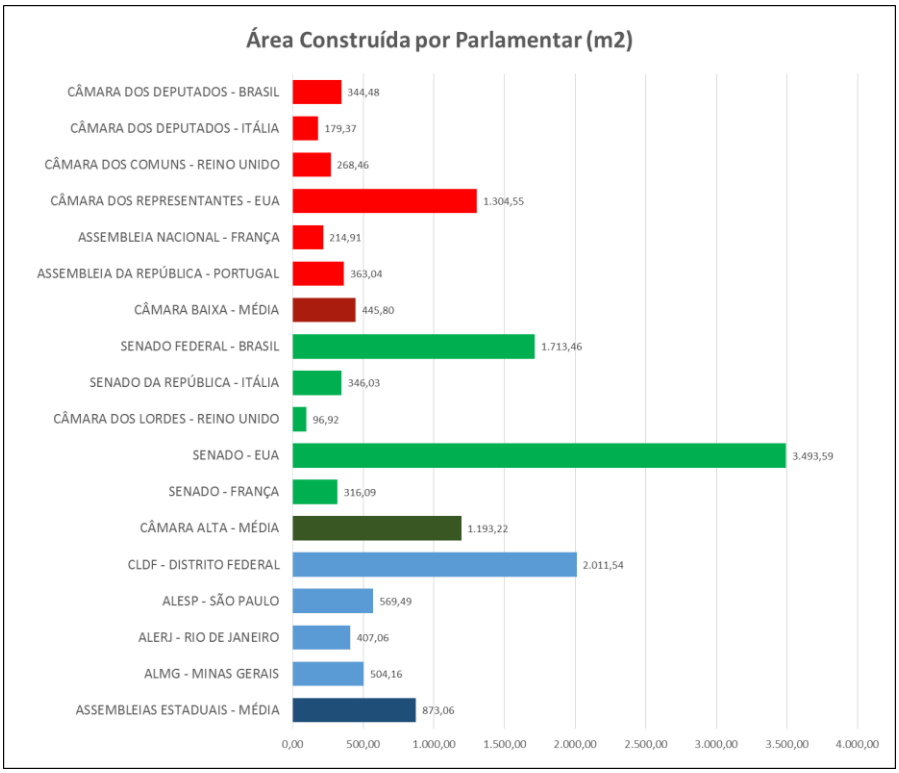
9) Regarding the average number of employees per parliamentarian (Graph 3), the previous scenario is maintained somehow, albeit with greater distances. The average of state assemblies remains high, at 30.16, just slightly below the maximum allowed. The result indicates that practically all positions are filled. In other words, state deputies use the

personnel resource close to the legal limit. In the lower chambers, for a maximum of 15.50, the average is 7.87, indicating that approximately half of the positions remain unused or the maximum possible division of positions is not conducted, indicating better remuneration for employees in a situation similar to parliamentary secretaries. For this assessment, the upper chambers reach a value 115.37% higher (16.95) than the lower chambers, while the state assemblies, in turn, reach an average 77.94% above institutions equivalent to the Federal Senate.

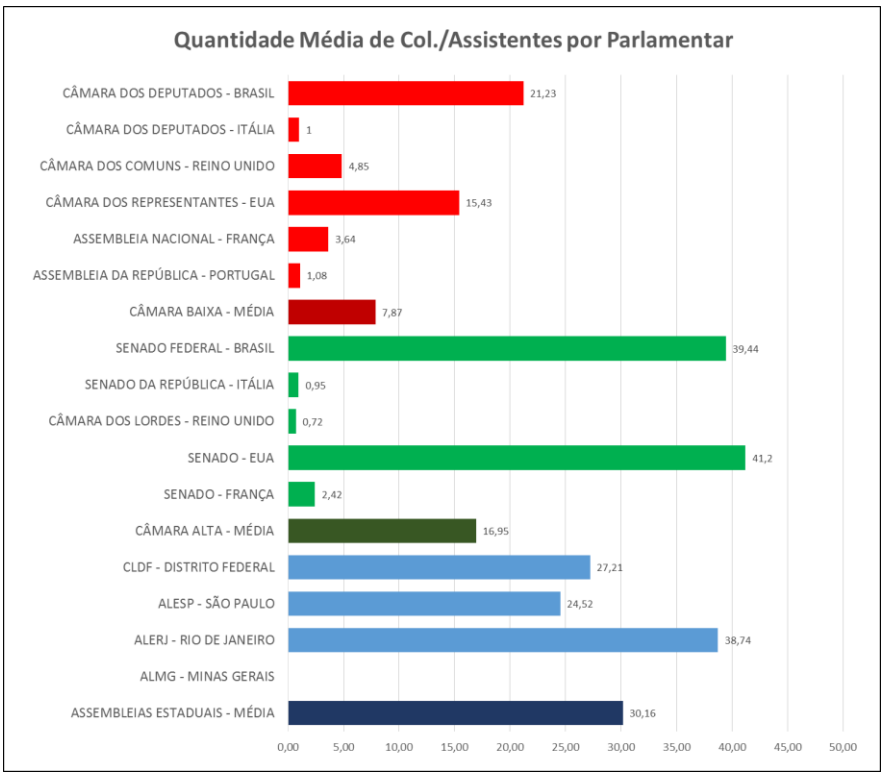
10) The previous trends are maintained when the average number of employees (excluding outsourced workers) per parliamentarian is observed. The highest quantitative cases are those of the state assemblies, with an average of 57.21, with 28.35 in the upper chambers and 12.21 in the lower chambers. It is worth noting the high values of the Brazilian Federal Senate (74.69), the *Assembléia Legislativa do Estado do Rio de Janeiro* (75.36), the *Câmera Legislativa do Distrito Federal* (63.92), and the US Senate (57.49). The Chamber of Deputies also stands out from similar institutions (32.87), with a value 168.21% higher than the average (12.21).




**Graph 1 –** Comparative analysis of legislative houses: Total built area ($m^2$).




**Graph 2 –** Comparative analysis of legislative houses: built area per parliamentarian ($m^2$).




**Graph 3 –** Comparative analysis of legislative houses: average number of employees/assistants per parliamentarian.

A few tendencies emerge when the variables are correlated.

*The higher the total number of parliemantarians of the legislative house:*

a) the smaller the area of parliamentary offices ($R^2$ = 50.38%): the growth in the area of parliaments does not seem proportional to the increase in the number of representatives, which progressively results in saturation or reduction in the workspaces of parliamentarians.

b) the lower the maximum ($R^2$ = 48.92%) and average ($R^2$ = 57.23%) number of employees/assistants per parliamentarian. Parliaments with a lower number of representatives are those that allow a higher number of employees, which may be related, among other factors, to greater availability of physical space. Furthermore, the social pressure on parsimony in human resources is greater in legislative houses with a high number of representatives, also presenting a spatial restriction that conditions the increase in the number of employees.

*c)* the lower the average number of employees (in all categories, excluding outsourced workers) ($R^2$ = 64.16%), per parliamentarian. A larger number of parliamentarians tends indicate a proportionally smaller number of employees acting in the legislative house per parliamentarian: for these situations, possible redundancies in tasks/processes may be eliminated.

*The higher the total built area per parliamentarian:*

a) the higher the maximum number of employees per parliamentarian ($R^2$ = 35.18%): the greater available space is associated with the greatest possible number of assistants. Resources - whether human or space - seem to grow proportionately, including in the legal sphere that establishes the ceiling for parliamentary secretaries or equivalent, so the space should also be read as an indication of the infrastructure network available to the representative.

b) the higher the average number of employees per parliamentarian ($R^2$ = 47.73%): when the number of assistants per perliamentarian is effectively considered, the correlation is even more robust than the previous one, reinforcing the reading that greater average space will indicate a larger direct representative support team, even though this area built per parliamentarians has no significant correlation with the size of parliamentary offices: $R^2$ = 10.05%. In other words, the larger available space per parliamentarian does not indicate that this area is available in the form of a parliamentary cabinet, but rather in the

institution as a whole. The cabinet itself may be smaller in size, although the legislature proportionally has a larger supply of area.

c) the higher the average number of employees ($R^2$ = 34.17%) in all categories (excluding outsourced employees) per parliamentarian: the result shows that the directly proportional association does not apply only to the support team linked to the parliamentarian, usually in commissioned positions, such as parliamentary secretaries, but rather to the set of civil servants acting in parliament. The question that remains from this reading is how space and human resources are associated, usually in commissioned positions, such as parliamentary secretaries.

*The higher the area of the office:*

a) the higher the average number of employees per parliamentarian ($R^2$ = 78%; however, there is no significant correlation with the maximum number: $R^2$ = 1.97%): the result indicates how space constrains the human resources that directly assist the parliamentarian. One possible interpretation is that the larger the size of the cabinet, the larger the team, and vice-versa. Therefore, a greater offer of space may indicate the expansion of human resources.

b) the higher the average number of employees ($R^2$ = 63.80%). The correlation in this case points to legislative houses distributed in a scenario delimited by extremes of parsimony and generosity (there is a clear polarization in the distribution of points), directly affecting both variables, which behave in a directly proportional manner. Larger offices are in the context of the highest average number of employees per parliamentarian. Smaller offices are in the situations of lowest average number of employees per parliamentarian.

*The higher the number of inhabitants per parliamentarian:*

a) the greater the area built by a parliamentarian ($R^2$ = 69.30%): when the parliamentarian responds to a larger number of citizens, the findings point to a larger institutional space.

b) the higher the average number ($R^2$ = 42.21%) and maximum number of employees per parliamentarian ($R^2$ = 51.74%): similarly, the interpretation associates the need for an average number and higher number of inhabitants also represented a higher maximum number of staff.

**Table 1 –** Numerical summary of variables for Brazilian state assemblies.

| State Assemblies[1] | | | | | |
|---|---|---|---|---|---|
| | **Average** | **MG** | **RJ** | **SP** | **DF** |
| a) Total number of parliamentarians [2] | *66.25* | 77 | 70 | 94 | 24 |
| b) Ratio between the number of inhabitants per parliamentarian | *281,700.09* | 273,255.35 | 245,142.29 | 484,456.77 | 123,945.96 |
| c) Total area built of the assembly/parliament ($m^2$) (approximate) | *42,280.73* | 38,820.00 | 28,493.91 | 53,532.00 | 48,277.00 |
| d) Area built per parliamentarian ($m^2$) (approximate) | *873.06* | 504.16 | 407.06 | 569.49 | 2,011.54 |
| e) Area of the offices of the parliamentarians ($m^2$) (approximate)[3] | *88.33* | 120 | 70 | - | 75 |
| f) Maximum number of employees/assistants per parliamentarian | *30.25* | 23 | 38 | 32 | 28 |
| g) Average number of employees/assistants per parliamentarian | *30.16* | - | 38.74 | 24.52 | 27.21 |
| h) Average number of employees (all categories) per parliamentarian [4] | *57.21* | 47.17 | 75.36 | 42.4 | 63.92 |

Observations:

1) *Assembleia Legislativa de Minas Gerais*, *Assembleia Legislativa do Estado do Rio de Janeiro*, *Assembleia Legislativa do Estado de São Paulo*, *Câmara Legislativa do Distrito Federal*.
2) State deputies, district deputies, senators, federal deputies, deputies, lords, Parliamentarians.
3) Or office area ($m^2$) per parliamentarian (if accounted).
4) Excluding "outsourced employees" or equivalent.

**Table 2 –** Numerical summary of variables for national parliaments (upper chambers)

| Upper Chambers [1] | | | | | | |
|---|---|---|---|---|---|---|
| | **Average** | **France** | **USA** | **U. Kingdom** | **Italy** | **Brazil** |
| a) Total number of parliamentarians [2] | *324.60* | 348 | 100 | 779 | 315 | 81 |
| b) Ratio between the number of inhabitants per parliamentarian | *1,264,005.22* | 193,074.71 | 3,276,655.40 | 84,272.27 | 192,012.61 | 2,574,011.11 |
| c) Total area built of the assembly/parliament ($m^2$) (approximate) | *156,529.95* | 110,000.00 | 349,359.19 | 75,500.00 | 109,000.00 | 138,790.56 |
| d) Area built per parliamentarian ($m^2$) (approximate) | *1,193.22* | 316.09 | 3,493.59 | 96.92 | 346.03 | 1,713.46 |

| | | | | | | |
|---|---|---|---|---|---|---|
| e) Area of the offices of the parliamentarians ($m^2$) (approximate)(3) | *264.00* | - | - | - | - | 264 |
| f) Maximum number of employees/assistants per parliamentarian | *30.00* | 5 | - | - | - | 55 |
| g) Average number of employees/assistants per parliamentarian | *16.95* | 2.42 | 41.2 | 0.72 | 0.95 | 39.44 |
| h) Average number of employees (all categories) per parliamentarian (4) | *28.35* | 5.29 | 57.49 | 1.25 | 3.02 | 74.69 |

Observations:

(1) French Senate, American Senate, House of Lords in the UK, Italian Senate, and Brazilian Senate.
(2) State deputies, district deputies, senators, federal deputies, deputies, lords, Parliamentarians.
(3) Or office area ($m^2$) per parliamentarian (if accounted).
(4) Excluding "outsourced employees" or equivalent.

**Table 3 –** Numerical summary of variables for national parliaments (lower chambers)

| | **Lower Chambers(1)** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Average** | **Portugal** | **France** | **USA** | **U. Kingdom** | **Italy** | **Brazil** |
| a) Total number of parliamentarians (2) | *505.83* | 230 | 577 | 435 | 650 | 630 | 513 |
| b) Ratio between the number of inhabitants per parliamentarian | *252,899.47* | 45,895.02 | 116,447.14 | 753,254.11 | 100,997.08 | 96,006.31 | 404,797.13 |
| c) Total area built of the assembly/parliament ($m^2$) (approximate) | *206,533.20* | 83,500.00 | 124,000.00 | 567,479.45 | 174,500.00 | 113,000.00 | 176,719.77 |
| d) Area built per parliamentarian ($m^2$) (approximate) | *445.80* | 363.04 | 214.91 | 1,304.55 | 268.46 | 179.37 | 344.48 |
| e) Area of the offices of the parliamentarians ($m^2$) (approximate)(3) | *24.88* | 9.5 | 24 | - | - | 22 | 44 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| f) Maximum number of employees/assistants per parliamentarian | *15.50* | - | 5 | 22 | 10 | - | 25 |
| g) Average number of employees/assistants per parliamentarian | *7.87* | 1.08 | 3.64 | 15.43 | 4.85 | 1 | 21.23 |
| h) Average number of employees (all categories) per parliamentarian (4) | *12.21* | 2.73 | 5.83 | 21.09 | 7.98 | 2.75 | 32.87 |

Observations:

(1) *Assembleia da República Portuguesa*, *Assemblée Nationale*, House of Representatives, House of Commons, *Camera dei Deputati*, and *Câmara dos Deputados*.
(2) State deputies, district deputies, senators, federal deputies, deputies, lords, Parliamentarians.
(3) Or office area ($m^2$) per parliamentarian (if accounted).
(4) Excluding "outsourced employees" or equivalent.

## 4 Conclusions

The results obtained from the sample and the investigated variables legitimize the strategy for the spatial understanding of parliaments, which answers the first research question: *a) how to read the spatial structure of parliaments?* On the other hand, the similarities identified answer the second question: *b) how do the legislative houses approach each other, in spatial terms?*

The findings achieved through the interdependence between variables clarify how much space should be understood as a "good" for analyzing parliaments, becoming a possible key to translating characteristics of the respective institutional dynamics. Greater space means greater power since larger or privileged domains are perceived as a political force.

Additionally, the study indicates future developments. It is important to analyze the growth process of the structure regarding the expansions and articulations of the parliamentary complex built. Interpreting the temporality of these additions may illustrate stages of consolidation of the current political system. It is also interesting to perceive the complexity of functions existing in legislative houses, those linked to the legislative process and the amenities that ensure the daily vitality in these institutions. Likewise, exploring the spatial issue of the lack of available space as parliaments become more complex is a form to understand present and future organizational challenges.

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