The Parliamentary Personnel Puzzle: Disentangling the Drivers of Parliamentary Staff Size Across the World

Hofland, Daan

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Universiteit Leiden

Daan Hofland

Student number: 1874136

Word Count: 9973

Supervisor: Dr. Simon Otjes

Second assessment: Dr. Tim Mickler

Political Science (MSc): Parties, Parliaments, and Democracy

Abstract

Recent advisory reports on the Dutch parliamentary system, public scrutiny, and parliamentary upheaval following transgressive behaviour by the old speaker of parliament have drawn attention to the functioning of parliamentary administrations. The support staff of parliaments is a scarcely covered topic in political science. In a new body of literature, this article is only the second to examine parliamentary staff size quantitatively. It fundamentally extends the scope of previous research from western democracies to a much broader population of parliaments. Drawing on both a functionalist and an institutionalist framework, it hypothesises that population size, population non-linearity, clientelism, parliamentary competition, an interaction between clientelism and parliamentary competition, parliamentary culture, and institutional isomorphism influence the number of institutional and committee staff in parliaments. This research uses house-level data from 161 countries over ten years and employs multilevel analysis to test these hypotheses. It finds strong support that population size, population size non-linearity, and institutional isomorphism influence staff size, while it finds mixed support for parliamentary competition as a predictor of staff size. There was no support for parliamentary culture, clientelism, and the clientelism-competition interaction hypotheses. Additionally, previously thought insignificant predictors of staff size, such as assembly size and parliamentary powers, were, in fact, significant. This article is the first to look at parliamentary administrations, which are vital to the functioning of primary democratic institutions, from a global perspective. Due to the mixed results, it calls for more extensive research on different types of staff, further disentangling of the mechanisms posited, and further data collection to progress understanding of this veiled political and administrative institution.

Introduction

Recently, the supporting staff of parliaments has become increasingly salient in the literature and society: in the wake of public scrutiny on the functioning of parliament and political functioning in general, several calls were made in the Netherlands for reconsideration or reinforcement of the parliamentary support staff (Van Teutem, 2022; Otjes, 2021). There is a growing body of literature on the variety of features of parliamentary support staff. These include the many roles they can perform, such as advisor (Högenauer & Neuhold, 2015), scribe (Crosson et al., 2020), information broker (Egeberg et al., 2013), advertiser (Winzen, 2011), compromise facilitator, and planner (Becker & Bauer, 2021). The notion that parliamentary support staff provides parliament independence from the executive in their freedom of and access to information is considered critical too. In addition to this, their role as unelected civil servants and how this relates to democratic accountability has been researched as well (Moens, 2021). Clearly, they perform essential functions close to the heart of democratic systems.

The literature comparing parliamentary staff is limited, despite its societal and academic relevance. While there is a body of work that focuses on individual cases or some comparative cases – most prominently the US and European Parliament – only a single large-N study has been performed as of this time. Otjes (2022) researches the drivers of the size of the parliamentary support staff in parliament in 48 parliaments in Europe, as well as the US, Canada, Australia, New Zealand, Turkey, Israel, and Cyprus: these are all countries with similar levels of democratic and economic development. That study finds that among population size, parliamentary powers, and assembly size, population size is the dominant driver of parliamentary staff size. It is, however, limited by a few issues, such as a most similar systems case selection and a relatively low N, which results in having only a few independent variables being included in the analysis.

These limitations, as well as alternative explanations for the population of parliamentary administrations outside of the selected cases in Otjes (2022), provide the puzzle for this research. This thesis offers an innovative addition to the literature for multiple reasons. First, due to limited theoretical research on these relationships, this thesis will take an integrative interdisciplinary approach and draw on insights from political science, economics and public administration to explain the size of parliamentary support staff in democracies around the world. Second, this thesis uses cross-sectionally and longitudinally structured data from all parliaments to attempt to provide explanations for the staff size of parliamentary administrations. Third, it delves deep into the various mechanisms at play, clearing the previously opaque picture and providing avenues for future research. In doing so, it will specifically answer the research question: *What explains the staff size of parliamentary administrations across the world?* Answers to this question are vital, as they connect to the literature on parliaments, democratic performance, representation, and legitimacy.

Theory

Parliamentary staff is essential to the functioning of parliaments. Despite this, the research on parliamentary staffing in general – both in developed democracies and the global south – is quite limited. As a body of literature in its 'early', i.e., adolescent stages, it is focused on a qualitative and substantive assessment of their day-to-day activities. Peters (2021) recognises a typology of four different types of parliamentary staff: institutional staff – who work for the entire institution; committee staff; parliamentary group staff; and personal staff. These different staff types can act in different roles, discussed further on. It would make sense that different drivers have a differing effect on the occurrence of various types of parliamentary staff. The paragraphs below go into two theoretical perspectives to explain the size of parliamentary staff: functionalism and institutionalism.

Functionalism

Parliamentary staff act in different roles: advisor, scribe, information broker, advertiser, compromise facilitator, and planner. In these roles they perform tasks to keep parliaments up and running and facilitate the functioning of democracy (Otjes, 2022, p. 3-5). It is through these roles that they cater to the specific needs of all actors in the system: including, but not limited to, the populace, individual parliamentarians, and committees. Their existence and their quantity, in essence, is always a consequence of the needs of actors in the system. Additionally, they are a crucial part of this network themselves. Otjes (2022) conducted the first quantitative study into drivers of parliamentary staff size in 48 parliaments in developed countries. Through this functionalist lens, three hypotheses were formulated.

The first mechanism works as follows: parliamentary staff primarily serve as brokers or intermediaries between the population and members of parliament. They communicate between MPs and the population: as brokers, they gather information from the populace. In a larger society, more information is available, resulting in a greater need for staffers to process and communicate that amount of information. Through the advertiser role, parliamentary staffers inform citizens through a varying number of media channels, which is a higher number in a larger society. Logically, the number of staff should depend on the number of information channels they communicate with as well. Through these mechanisms, it is reasonable that the size of the population is related to the size of the parliamentary administration. Second, if their role is to be a scribe and compromise facilitator, working for MPs and acting as intermediaries between them, then their number should increase as the relations between MPs grow more complex. It would follow that the size of the parliamentary administration would then depend on the size of the assembly. Third, Otjes theorises that as parliaments have a need to be independent of the executive, they perform a variety of

functions. As the number of functions they perform, measured through parliamentary powers, rises, there is a need for more staff (Otjes, 2022, p. 7-9).

Of the three hypotheses, the one that held was that population size predicts the size of the parliamentary staff. There is no reason to suspect that this differs in the global south. The same mechanisms of brokering information being dependent on the population size are at play. This leads to the first hypothesis of this research:

> *Population Size Hypothesis: the larger the population, the larger the size of the parliamentary staff*

However, this relationship might be more complex. The well-known work of Taagepera (1972) posits that the size of national assemblies, and specifically lower houses, is centred around a cube-root relationship between the assembly and population size.

The reasoning behind this theorised link is that the size of an assembly is a balancing act between representation and efficiency. Representation improves the more there is contact between individual constituents and legislators, requiring a higher number of legislators. However, the more legislators there are, the more complex the system of communication channels grows; legislators communicate and discuss amongst themselves as well. According to Taagepera, having more legislators, i.e., an overabundance, means having a less efficient legislature. This efficiency value says that having fewer legislators is better. Taagepera (1972, p. 387-390), valuing these equally, mathematically poses that an optimum assembly size is found around the cube root of the population. Upper houses centre around a slightly different non-linear trend, which is in part based on population, the number of regional sub-units, and on the size of the lower house itself (Taagepera & Recchia, 2002; Colomer, 2017, p. 10).

Taagepera's research has been criticised in several ways, such as the exact form of the link (Auriol & Gary-Bobo, 2012; Margaritondo, 2021), which is claimed to be closer to a square root than to a cube root. The causal sequence of the 'law' has been challenged as well, as assembly sizes are much more static than population sizes. They rarely evolve as a direct result of each other (Jacobs & Otjes, 2015, p. 5-6). Despite this specific criticism of Taagepera, the notion that there is a non-linear relationship between assembly size and population size remains. The exact value of the exponent is not crucial for now, as we are primarily concerned with the presence of non-linearity and contrary to assemblies, the size of parliamentary administrations can differ from year to year, possibly because of population growth, due to a lesser extent of codification of its size.

When extrapolating the mechanism to the relationship between population size and parliamentary administration size, some assumptions hold. This is at least in part empirically supported by robustness checks by Otjes, which show statistical significance, but a worse model fit for a population cube root variable (2022, p. 14).

For instance, an assumption that might not hold is that the cube root law assumes that representation and efficiency are equally important (Kjaer & Elklit, 2014, p. 157). This is not necessarily true for different kinds of parliamentary staff. Some kinds of staff, such as personal and PPG, might have a more decisive focus on advertising and information brokering, as they cater to an MPs demand to communicate with the electorate and interest groups as they aim to fulfil a more representative and political function. Other kinds of staff, such as institutional and committee staff, may be more focused on day-to-day administrative tasks in parliament, such as being a scribe or planner, aiming to improve the efficiency of the assembly.

Thus, theoretically, parliamentary administrations are components of the mechanism behind the cube root law. Which part of the equation they reside in is dependent on what function they fulfil in the functionalist framework explaining staff size. No matter which, they aim to improve either representation or efficiency – reflecting the balancing task of assembly size and the cube root law. This leads to the following hypothesis:

> *Population Size Non-Linearity Hypothesis: population size influences the size of parliamentary staff in a non-linear fashion*

Apart from descriptive differences in the population, perhaps parliamentary practice also influences staff size. A well-known distinction in the analysis of legislatures is that between 'arena' and 'transformative' parliaments. An arena is predominantly focused on debate and issue-setting. Transformative parliaments play a more prominent role in the specifics of legislating and making policy (Polsby, 1975). Transformative parliaments are more deliberative than arena parliaments, which serve more as a function of publicity. Steffani (1979, p. 96) describes this phenomenon and their distinctiveness similarly, as ‘debating’ parliaments, where the executive and legislative meet, as well as the coalition and opposition, to showcase their positions. In contrast to this, there is the ‘working parliament,’ where substantive and expert debates are more important.

Both the transformative and the working parliament rely on their ability to deliberate and work independently from the executive (Siefken & Rommetvedt, 2021, p. 2). Functionalism suggests that the needs of these parliaments would differ: transformative parliaments have a higher need for (committee) staff to aid in the development of legislation than arena parliaments would, for example, thus leading to a higher number of parliamentary staffers. This leads to the following hypothesis:

Parliamentary Culture Hypothesis: The more deliberative a parliament is, the higher the size of the parliamentary support staff

Within countries in the global south, there are often far-reaching political inequalities which stem from economic inequalities, which are often reinforced by the political elite (Winters, 2013). Political inequalities could lead to a more extensive parliamentary exchange with the populace through clientelist bonds. Clientelism is the contingent and individual exchange of benefits between politicians and civilians (Weitz-Shapiro, 2012, p. 569).

One form this can take is patronage – a form of clientelism in which a politician hands (political) jobs to supporters of the political actor. The assumption is that patronage jobs are handed to the supporters of an incumbent in exchange for political services that help the incumbent maintain (electoral) support. This assumption is based on Oliveros (2021, p. 398), who finds that incumbent supporting beneficiaries of patronage jobs are more likely to be involved. This exchange for jobs can take many forms, such as mobilising voters or organising campaign events (Oliveros, 2021, p. 381; 389; Brinkerhoff & Goldsmith, 2002, p. 2). This effect can be decisively strong. In Brazil, being a political supporter of the party in power increases the probability of being employed in the public sector by 10.5 percentage points, a 47% increase overall (Colonelli et al., 2017, p. 36). A similar number comes up in research by Brollo et al. (2017, p. 39-41), who find a 40% increase in party members working in municipal bureaucracies in Brazil. Moreover, the effect is found to be pervasive through mayoral terms.

More examples pop up across the globe: research by Martinez-Bravo (2014) shows that appointed officials in Indonesia influence elections out of career concerns, showing that patronage has a marked influence on administrators' behaviour. In addition to this, research by Sidel (1999) shows that in the Philippines, political patrons have strong discretionary powers over administrative appointments. This is corroborated by Aspinall (2014), who

claims that legislators in Indonesia built personal political machines composed of those benefitting from clientelist bonds. Additionally, a striking element of patronage jobs is that they persist. Kopecký and Spirova (2011, p. 22) find that even after democratising, post-communist democracies with a patrimonial tradition have a higher occurrence of patronage jobs.

Due to data collection difficulties, there is no empirical research on whether parliamentary staff differs from other public sector and political jobs in the occurrence of patronage contracts. Theoretically, De Vitis (2016, p. 40) posits a mechanism where institutional office holders and MPs act as patrons to officials within the parliamentary organisation called inner patronage, providing career advancements in change for support. One crucial consideration is that parliament could prove to be an unreliable patron; high legislative turnover renews the patrons, who – once renewed, have a dependency on the clients as a legislative and knowledge resource (De Vitis, 2016, p. 115). This would result in a challenging principal-agent problem. Nevertheless, if patronage is a crucial tool for staying in power, perhaps its occurrence influences the size of the parliamentary staff. From the perspective of functionalism, patronage jobs are essential to the broader political system of electoral success as they are a power mechanism. The political services that patronage beneficiaries play meet the needs of their patrons, i.e., by handing out more patronage jobs in parliament, it would be easier for an MP/party to stay in power as the staffers play the advertiser role, selling their policies to the broader population (Winzen, 2011, p. 18).

This leads to the following hypothesis:

> *Clientelism Hypothesis: the higher the occurrence of clientelist bonds and patronage jobs, the larger the size of parliamentary staff*

When looking at the demand side of parliamentary support staff, functionalism plays a role as well. In a parliament, different parliamentary groups compete over assistance from a limited number of parliamentary staffers. There is little research on this; however, functionalist view suggests that smaller parties will compete over institutional and committee staff more, as they have fewer funds to pay PPG and personal staff, which is thought to be in part substitutable by Otjes (2021, p. 180. Moreover, there is a difference between opposition and coalition usage of parliamentary staff. Research by Wilson (2020) on the Canadian parliamentary caucus research offices finds that opposition parties are more likely to call on central parliamentary offices than coalition parties. Moens (2021, p. 108-109) theorises that differences in how parties call upon central staff are due to the institutional setting of the government. Systems with a strong tradition of political advisors in the executive would have coalition parties lean less on central parliamentary staff than they otherwise would in systems without this 'Napoleontic' tradition. The mechanism proposed works as follows: as the number of opposition parties grows, the more reliant they are on centralised resources, putting increasing pressure on the parliamentary administration to hire more support. An example of this is the highly competitive Dutch parliament, which raised its financial support for parliamentary support staff after a successful proposal. Usually, smaller parties are opposition parties, which would increase their reliance on centrally provided parliamentary staff.

Another mechanism that might play a role in the demand side of parliamentary, and especially committee staff, can be viewed through the lens of the autonomy of committees. Mickler (2017, p. 97) contends that coalition parties use committees to 'keep tabs' on their coalition parties. Stronger committees allow for more ideologically distant coalitions due to this usage of tab-keeping. In systems where ideologically distant coalitions are often present, more committee staff could be desirable for coalition partners. Ideologically distant coalitions

are more often present in systems with a higher effective number of parties due to the number of parties necessary to form a majority being higher. In addition to this, countries that know a great variety of governing parties tend to have more autonomous committees. Put together, the factors mentioned in this section suggest that coalition-opposition competition and intra-coalition competition have a link with strong committees. Thus, I theorise that systems with a high number of parties have a higher need for committee staff.

In addition to this, the context within the parliamentary playing field plays a role as well. For example, research by Cochrane (1964, p. 365; 367) contends that Congressional minority members recruit staff through patronage and employ committee staff for personal ends. This could interplay with the number of parties in parliament and their relative power. Take the Brazilian parliament, which is highly competitive and clientelist. If the Clientelism Hypothesis holds, these factors could reinforce each other. As competition in a parliament grows, so does the need for staff. This leads to the following hypotheses:

> *Parliamentary Competition Hypothesis: as the number of parties increases, so will the size of parliamentary staff.*
>
> *Parliamentary Competition and Clientelism Interaction Hypothesis: the higher the number of parties, the stronger the effect of the clientelism hypothesis.*

Institutionalism

The research by Otjes merely looks at the determinants of parliamentary support staff size as a result of functionalism, overlooking other theoretical perspectives, such as those informed by institutionalism. An insight that is likely to be applicable to the case is that of institutional isomorphism, an insight from public administration science, which was first introduced by DiMaggio and Powell (1983). They contend that organisational development was no longer driven by efficiency or competition, but instead that by interacting in organisational networks organisations grew more similar as they had to compete for not only power but also

legitimacy towards each other (DiMaggio & Powell, 1983, p. 150). Besides competition, which can, there are three mechanisms through which institutions homogenise: power, attraction, and mimesis. Through the mechanism of power, institutions align through formal and informal pressures that are exerted by another institution the former is dependent on (DiMaggio & Powell, 183, p. 150). However, these mechanisms can produce both convergent and divergent outcomes (Beckert, 2010). Through attraction, institutions will homogenise if they perceive an external solution to be superior or if there are transnational communities that share norms or values. They will diverge if the norms, values or evaluations underpinning the institution do not correspond (p. 156-157). Mimesis, which is similar to attraction, occurs when actors imitate other institutions out of uncertainty, not by means of socialisation or pressures. Convergence will only happen, as with attraction, if the target institutions are regarded to be instrumentally successful and similar in values (p. 157; 159).

An example of institutional homogenisation for parliamentary administrations is documented by Högenauer et al. (2016), who describe transnational bureaucratic networks – a form of an organisational network as described by DiMaggio and Powell – but more importantly, also describe convergence and divergence in the 'Europeanisation' of national parliamentary administrations. Their research shows that there is slight cross-national variation in how parliamentary administrators handle EU scrutiny. The variation that is present, however, is not explained in their research (Högenaur et al., 2016, p. 107-108). Christiansen et al. (2021, p. 491) also suggest that parliamentary administrations working on EU affairs seem to converge. This is relevant to the research at hand. Despite being a different feature of an institution, i.e., the formal and informal practices of administrators (as opposed to its size), there is a case of similarity between EU parliamentary administrations. It seems likely that this is through a combination of the power mechanism (EU member states must adhere to formal rules) and attraction (EU member states share a normative frame). However, for non-

EU actors, mimesis could play a role (African Union/ASEAN/etc.) as member states copy each other due to uncertainty) or again attraction (shared normative frame). These mechanisms lead to the following hypothesis.

> *Institutional Isomorphism Hypothesis: having a shared institutional community or geographical closeness will result in similar staff sizes*

Case Selection

The principal aim of this study is to extend the scope of what we know about the drivers of the size of parliamentary staff from 'rich' and democratic parliaments to the entire world. Thus, as many data points on parliamentary staff size as possible will be used. In order to be as complete as possible, bicameral systems will have separate cases. Thus, the unit of analysis is an individual house. A dummy variable for bicameralism is included for all cases to consider whether an effect exists here.

Based on Otjes (2022), data will be pulled from the Interparliamentary Union (IPU). They have data available on parliamentary staff from many houses and parliaments in the world at different points in time. Different data points throughout time could give insight into what factors lead to sudden changes in staff size. For this reason, The IPU data is limited as they do not differentiate between the different types of parliamentary staff. Based on Otjes, who compares different datasets, it can be determined that the IPU data is on institutional and committee staff (2022, p. 10-11). The results of this research will, as such, have no implications for personal and PPG staff, which could have other theoretical drivers.

Methodology

Operationalisation & data collection

To test the hypotheses and formulate an answer to the research question, I will quantitatively analyse the effects of the various independent variables on parliamentary staff size worldwide. Multiple sources are consulted to gather the data of interest. The operationalisation of the concepts introduced in the theoretical section and the data source is described below. An overview of all variables is provided in Table 5 (Appendix A).

Dependent variable

The dependent variable for all hypotheses is the staff size in a chamber of parliament each year. Each year is a repeated measure of an individual chamber. Parline, the Interparliamentary Union's data tool, will be used for all parliamentary data. One issue here is that the IPU provides two different measures of staff size: in absolute number and fulltime-equivalent (FTE). Sometimes both are given; however, sometimes, only one or the other is provided. To complicate matters, sometimes this number is given per chamber and sometimes per parliament. At other times, the staff number for the other chamber could be calculated using the two metrics provided. To circumvent this problem, any potential differences or overlaps have been accounted for in the data collection process. Differences did not usually result in problems, and the case was removed entirely in cases of ambiguity. Tables containing the countries included and missing from the analyses can be found in Tables 9 and 10 (Appendix A). Like all variables, *Staff* will be transformed to a 0-1 scale for easier interpretation of the results and to prevent convergence problems due to variable scale differences in the model.

Independent variables

Population Size Hypothesis and Population Size Non-Linearity Hypothesis

The operationalisation of the population size hypothesis is the most straightforward. Population size data has been taken from the World Bank Open Data (World Bank, 2022). While Otjes (2022) mentions the notion of non-linear relationships being common between

population size and institution size, such as in Taagepera (1972), he does not investigate them. A population-squared variable will be included to investigate this. Both have been recomputed to a 0-1 scale to allow similar interpretation across the board. An investigation into outliers resulted in removing India as a case, as there were Z-values up to 10 and problematic Cook's distances upon further inspection. For this reason, India was removed from the main analyses. Several models that include India are also run for robustness (See Appendix C & Table 26, Appendix E).

Clientelism Hypothesis

To operationalise the Clientelism Hypothesis, I turn to the Varieties of Democracy (V-DEM) dataset. Here, a Clientelism Index variable is included (v2xnp_client), a factor derived from employing analysis of variables pertaining to clientelism, such as vote buying, particularistic vs public good provision, and programmatic vs clientelist party linkages. Lower scores in the clientelism index point to a more democratic situation, whereas higher scores point towards a less democratic situation (Coppedge et al., 2022). As Clientelism is notoriously hard to measure (Muno, 2010), extensive robustness tests have been performed. Three other variables from V-DEM have been included in separately run models, one specifically on whether the legislature engages in corrupt activities, one variable on clientelist party linkages, and another on whether the party partakes in particularistic or public goods provision. The last two are part of the Clientelism Index.

Parliamentary Competition, Hypothesis, Parliamentary Competition and Clientelism Interaction Hypothesis

Data on the ENP will be gathered using Fernando Casal Bértoa's *WhoGoverns* dataset and Michael Gallaghers *Election Indices* dataset, which are calculated according to the Golosov (2010) method. Specifically, ENPP (effective number of parliamentary parties, as opposed to

the effective number of electoral parties) will be employed, as logically, parliamentary actuality will influence staffing more than electoral outcomes. Data for the ENPP is relatively limited due to a lack of comparative data for 2013-2022. Data is available for earlier periods, but these datasets have, unfortunately, not been updated as of writing this. The choice was made to extend ENPP values from their election year to the year their legislative term ended to remedy this, almost quadrupling the cases and providing enough cases for multilevel analysis. For robustness, a pooled OLS model is included in the appendices as well (Appendix E) to investigate the interaction component further with lag introduced in preventing autocorrelation.

One important flaw in the data on ENPP is that it is predominantly European, which will likely result in a bias towards European cases, which have similar properties as long-time consolidated democracies.

Parliamentary Culture Hypothesis

Through a functionalist lens, staff are hired to cater to the institution's needs. Parliaments with a strong deliberative culture may have different needs than those with a work culture. The Deliberativeness Component Index variable will be pulled from the V-DEM dataset to test this. This aggregate measure contains respect for counterarguments, range of consultation, and engaged society (Coppedge et al., 2022, p. 54).

Institutional Isomorphism Hypothesis

The Institutional Isomorphism Hypothesis is operationalised through a series of dummy variables indicating membership of regional supranational institutions. In the case of Central and South America, it is a dummy variable indicating belonging to that region (*CSAMISO*). The variables included in the analysis are *EU*, *OECD*, *ASEAN*, *AU*, and *CSAMISO*. The first four refer to supranational organisations susceptible to isomorphism due to either stringent

institutional constraint (in the case of the EU), geographical closeness (ASEAN, AU, Central and South America), or being temporally close democratisers (ASEAN, AU, CSAMISO). Separate models are run to disentangle the effects of either stringent institutional constraints or geographical closeness. The OECD is included as an institutional factor, as these are all cases researched by Otjes (2022), accounting for similarities existing due to being most likely cases.

Control variables

GDP and GDP/capita

Separate models containing GDP and GDP/capita will also be run to account for in the models. Theoretically, any possible relationship between the raw size of economies and per capita economies is muddy. Otjes (2022, p. 20) notes that the strongest expansion of parliamentary staff occurred between the 1940s and 1970s. This reflects a period of dominant economic thought emphasising state and public sector employment growth. Afterwards, a neoliberal school of state retrenchment occurs (Brady & Lee, 2014). Assuming that parliamentary administrations mirror public administrations, which is not a given, this resembles economic literature on public sector employment. There is a lot of economic literature that links public institutions and the economy, e.g., public sector employment size and per capita income (Murrel, 1985), high public employment and GDP (Goldsmith, 1999), income and urbanisation on government employment size, with differing geographical effects for poorer regions (Rodrik, 2000; Gözgor et al., 2019). Boix (2001) shows that in democracies, the public sector grows parallel to the economy as structural changes happen. The expectation is, thus, that as the economy grows, so will the size of the parliamentary administration.

Operationalisation is quite straightforward– it will be measured using GDP data from the World Bank Open Data centre. An inspection of the standardised value revealed the United

States had GDP values removed from the mean up to 10 times the standard deviation. Problematic Cook's distances also led to the removal of these outliers in some of the models. GDP/capita also had some outliers (Monaco, Liechtenstein, Luxembourg), but neither their inclusion nor removal led to meaningful changes in the results, so they were left included.

Lower chamber & Bicameralism

Two variables pertaining to bicameralism will be included. First, a dummy variable will be included indicating whether the chamber is a lower house. The expectation is lower houses will have higher staff sizes, as they often have more far-reaching powers than upper houses. This control is necessary due to the structuring of the dependent variable treating lower and upper houses as the same. A bicameralism dummy will be included in robustness analyses as well to account for differences in budget allocation between chambers in bicameral systems. They are never run in the same models, as they cause problematic multicollinearity.

Authoritarianism

A metric for authoritarianism will be included in the analysis as well. There is no reason to expect that authoritarian systems will behave the same in staff size as democratic systems. The metric employed is the Regimes of World index from the V-DEM dataset, which combines metrics for electoral and liberal democracies. There is no explicit expectation of the directionality or size of the effect here. This metric categorises systems from 0-3 as closed autocracies, electoral autocracies, electoral democracies or liberal democracies. As with all other metrics, it has been transformed to a 0-1 scale for more straightforward interpretation of the results.

Assembly size & parliamentary powers

For robustness' sake and the expansion of the sample to the entire population, the two variables that were not proven to be significant in Otjes (2022) research will be included in the models as well in different models. These are Assembly Size, which will be taken from the IPU, and parliamentary powers, which will be taken from the V-DEM dataset. The main parliamentary powers metric that will be employed is the legislative constraints on the executive index, which captures the "extent to which the legislature and government agencies, e.g., comptroller general, general prosecutor, or ombudsman capable of questioning, investigating, and exercising oversight over the executive" (Coppedge et al., 2022, p. 50). The literature does not give any reason to believe these apply to the wider population more strongly. However, because we are dealing with a larger sample, they should be tested. The results could change because of either the new cases in the sample or the larger N itself. In robustness tests and disentangling of the effects, two separate components of this index, namely whether the legislature questions officials in practice and whether the legislature investigates in practice, will be tested as well, as these are the components most likely to require parliamentary support staff. The expectations for these control variables are the same as formulated by Otjes: larger assembly size should lead to a higher staff size, and more parliamentary power should lead to higher staff size.

Methods – data and model

Multilevel structure of the dataset

As will be discussed later, the longitudinal component of the nested data requires multilevel analysis. Three levels are included: level 1 (country *j*), level 2 (chamber *j*), and level 3 (time *i*). Level 2, house, is included to account for clustering in bicameral systems. The total N of the dependent variable Staff size is 906. The explicit expectation is that though the data is structured through time, it does not have an effect by itself, as the total period observed is relatively small in longitudinal terms (2013-2022, 10 years). This means that it is unlikely to

see any long-term trends unfold in this sample. Thus, no temporal expectations are formulated. As a result of the Institutional Isomorphism Hypothesis, there is an explicit expectation that this data structuration will be visible. All the variables are at the level of the individual parliament. Observations that are not independent of each other will be accounted for, as is explained in the section on the model.

Model

The model type for all hypotheses is a multilevel linear regression, otherwise known as a linear mixed model. This is based on a few things. First, this model is suitable to the data when considering how the data is structured and how the variables are aggregated at different levels (Toshkov, 2016, p. 236). Second, as a preliminary check, an unconditional means (or 'null') model, unconditional growth, and conditional growth model have been run to check if running this model with this specific multilevel structure improves model fit (Peugh, 2010, p. 101). Model fit improves slightly – which aligns with the expectation formulated in the previous section (Table 17, Appendix D). In addition to this, the intraclass correlation coefficients were calculated to verify whether values in the nested structure resemble each other (Peugh, 2010, p. 88). High and significant clustering is indeed present, warranting the need for multilevel modelling.

In further determining the model, the main issue here is whether to use a fixed slopes or random slopes. Almost always, the model used follows from theory, which does not imply that the temporal component of our cases requires a random slope. Clark and Linzer (2015, p. 399-400) describe that this choice should be a trade-off between preventing bias in the coefficient estimates or reducing the variance that is dependent on the sample used. Random slopes prevent bias; fixed slopes are sample dependent. The Institutional Isomorphism Hypothesis does not suggest a difference in effect between regions, merely a clustering. The

theoretical background does not imply meaningful random effects for the other predictor variables. Thus, the choice was made to employ a random intercept fixed-sloped model in the analysis. Including random effects in the models does not improve model fit, so the choice was made not to include them. In addition to this, though model fit did not improve, random slopes led to convergence issues because of imbalance in the data (Peugh, 2010, p. 94).

Assumption checks

All the necessary assumption checks have been performed to account for violations of the assumptions of linear regression. Especially important to account for in the pooled regression model testing the Parliamentary Competition Hypothesis is the possibility of serial or autocorrelation, considering the repeated measures in the data. A Durbin-Watson test has been performed on the 'full' model, i.e., the model that includes all control variables to account for this. This has not resulted in any significant problems of serial correlation in the model (See Table 19, Appendix D). In addition to this, VIF-tests have been performed for all ‘full’ models that do not contain an interaction variable to account for multicollinearity. Interaction variables correlate by definition, so including them would not make sense. For completeness' sake, the VIF-test for the model testing the population non-linearity hypothesis has been included as well, despite the same logic holding up for squared values. No problematic VIF scores have been found (Table 18, Appendix D). The deliberative component index and parliamentary powers index has a very high significant correlation, but this has not resulted in any problems of multicollinearity or changed results.

To detect outliers and influential cases, several measures were taken. First, important predictor variables were standardised on a Z-scale. Second, Cook's distances for all main predictor variables were inspected to ensure no influential case would go unnoticed or unaccounted for. Furthermore, an inspection of the residual plots saw little heteroskedasticity.

Finally, the possibility of non-linear associations has been accounted for in the models dealing with the Population Non-Linearity Hypothesis.

Results

Before going into the analysis, it is crucial to mention that this research runs a lot of models. Because of the number of models, the focus will be more on significant variables across models instead of by happenstance. Table 1 below shows the results of models 1 to 6.

These models progressively investigate the effect of population size, clientelism, deliberation, the square of population, and two interactions, which presented themselves during the analysis, on staff size. The models control for being a lower house, regime, assembly size, and parliamentary powers. Models 1-6 show that population size is, in all cases, a significant predictor of staff size at the p<0,001 level. This lends credibility to the Population Size Hypothesis, as seen continuously in further models. Models including outliers Brazil, India, and the United States greatly affect the strength of the effect, strongly diminishing it, though significance remains (See Appendix, B&C). The effect again grows stronger when population-squared is added to the analysis; this holds up across the samples enclosed in the appendices.

Models 5, 6, 11, and 12 (see table 2 for models 11 and 12) test the population non-linearity hypothesis. Population size is, again, significant at the p<0.001 level. More importantly, population-squared is significant across twelve out of sixteen models it is included in, supporting the population non-linearity hypothesis. Additional models that include India, but not other outliers, reconfirm the significance of population-squared (Table 26, Appendix E). The analyses suggested a possible interaction between population-squared and Assembly Size. Because of this, a variable investigating this interaction effect is run in models 6, 22,

and 38. This behaves conflictingly across samples, strengthening the effect of population in model 6, turning significant in model 22 whilst removing the significance of population (though this could be due to high multicollinearity), and not changing much in model 38. An interaction plot can be found in Figure 2 (Appendix F). These differing findings will be reflected upon further in the discussion section.

No models return a significant result for clientelism, even at the (P < 0,1) level. Robustness tests employing the V-DEM variables that the Clientelism Index is a composite of, as well as the perceived number of corrupt activities in the legislature, shed light on this (See Table 23, Appendix E). Here, across models, perceived corrupt legislatures consistently decrease the quantity of staff. In models 60 & 61, the more programmatic (as opposed to clientelist) party linkages are, the higher staff will be. This effect disappears when the isomorphism variables are added to the models. Across the main and robustness tests, clientelism (and perceivably corrupt legislatures) decrease the quantity of staff in a legislative house, which is opposite to the direction of the hypothesis. As such, only the thinnest support has been found for the Clientelism Hypothesis. Additionally, the analyses hinted at a possible interaction between clientelism and assembly size. In model 4, this is investigated. There is a significant non-hypothesised moderating effect between clientelism and assembly size in this sample, which is visualised in Figure 3 (Appendix F).

The deliberative component index is found to never be significant, not even at the (P<0,1) level, granting zero support for the parliamentary culture hypothesis.

Lower house, assembly size, and parliamentary power are significant control variables in almost all models, whereas regime is virtually never significant across all models (barring Table 15, Appendix C). Lower house, coded as a dummy variable, is significant in most models without outliers, significant in all models including Brazil (Appendix B), and only

rarely significant with all cases included. This is likely due to Brazil having an exceptionally large staff size and the US and India having very large upper house staff. Logically, it makes sense that lower houses have higher staff sizes, as they are often the more powerful chamber.

Assembly size and parliamentary power both insignificant in Otjes (2022), are significant in this analysis. Both are significant across all models in which they are included. The effect of assembly size, particularly, is quite large. For both go, the higher the predictor variable, the higher the predicted staff size.

No models grant any support for the economic expectations, as GDP is not significant in any. This is due to the removal of the United States in the analysis, which returns Z-scores up to 10 when standardising the value, indicating an extreme outlier, and is now proven to be an influential case. Results, including the United States can be found in Appendix C. All the models including the United States return GDP as a significant positive predictor for staff size. Upon further inspection, GDP has significant moderate-to-high correlations with all main explanatory variables (See Table 8, Appendix A). This would explain why GDP does not have a significant effect as a predictor. Robustness tests containing GDP per capita as a predictor variable do not return any significant result either (See Table 20, Appendix E).

Table 1: Linear Mixed Model on Staff Size

	Dependent variable:					
	staff					
	(1)	(2)	(3)	(4)	(5)	(6)
Year	0.002*	0.002	0.002	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.336***	0.346***	0.348***	0.376***	0.725***	0.814***
	(0.069)	(0.070)	(0.069)	(0.071)	(0.185)	(0.215)
Population-squared					-0.490**	-0.726**
					(0.223)	(0.360)
GDP	0.005	0.003	0.002	-0.002	0.001	0.0003
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Clientelism		-0.027	-0.008	0.023	-0.010	-0.011
		(0.020)	(0.021)	(0.028)	(0.021)	(0.021)
Deliberativeness		-0.001	-0.018	-0.018	-0.019	-0.019
		(0.016)	(0.017)	(0.017)	(0.017)	(0.017)
Lower house	0.037	0.038	0.040*	0.047*	0.057**	0.058**
	(0.024)	(0.024)	(0.024)	(0.024)	(0.025)	(0.025)
Regime	0.010	0.007	0.004	0.002	0.005	0.004
	(0.012)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Assembly size	0.310***	0.304***	0.301***	0.364***	0.229***	0.193**
	(0.060)	(0.062)	(0.061)	(0.071)	(0.068)	(0.081)
Parliamentary powers			0.046**	0.048**	0.046**	0.047**
			(0.019)	(0.019)	(0.019)	(0.019)
Clientelism * Assembly				-0.218*		
				(0.126)		
Population-squared * Assembly						0.305
						(0.354)
Constant	-3.343*	-3.033	-3.069	-2.987	-3.009	-2.929
	(1.954)	(1.998)	(1.990)	(1.985)	(2.011)	(2.000)
Observations	804	800	800	800	800	800
Log Likelihood	1,432.324	1,426.302	1,429.330	1,430.818	1,431.614	1,431.984
Akaike Inf. Crit.	-2,836.648	-2,820.604	-2,824.660	-2,825.635	-2,827.227	-2,825.968
Bayesian Inf. Crit.	-2,770.994	-2,745.650	-2,745.021	-2,741.312	-2,742.904	-2,736.960

Note: *p<0.5; **p<0.01; ***p<0.001

Table 2: Linear Mixed Model on Staff Size

	Dependent variable:					
	staff					
	(7)	(8)	(9)	(10)	(11)	(12)
Year	0.002	0.001	0.002	0.001	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.337***	0.355***	0.325***	0.343***	0.826***	0.824***
	(0.069)	(0.068)	(0.067)	(0.066)	(0.176)	(0.175)
Population-squared					-0.649***	-0.630***
					(0.213)	(0.213)
Assembly size	0.307***	0.284***	0.331***	0.296***	0.231***	0.207***
	(0.060)	(0.062)	(0.059)	(0.060)	(0.065)	(0.065)
GDP	0.003	0.002	0.002	0.001	-0.0002	-0.001
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Clientelism	0.015	0.026	0.002	0.020	0.003	0.018
	(0.023)	(0.025)	(0.025)	(0.025)	(0.024)	(0.025)
Deliberativeness	-0.017	-0.015	-0.018	-0.015	-0.018	-0.017
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Lower house	0.035	0.041*	0.034	0.043*	0.057**	0.064***
	(0.023)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)
Regime	0.005	0.001	0.003	-0.004	0.003	-0.002
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Parliamentary powers	0.040**	0.038**	0.045**	0.040**	0.044**	0.040**
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
EU membership	-0.027		-0.020		-0.011	
	(0.024)		(0.026)		(0.025)	
OECD membership		0.017		0.045*		0.037
		(0.025)		(0.026)		(0.026)
AU membership	-0.054***	-0.046**	-0.052***	-0.034*	-0.054***	-0.041**
	(0.017)	(0.019)	(0.020)	(0.020)	(0.019)	(0.020)
ASEAN membership	-0.049	-0.039	-0.035	-0.013	-0.040	-0.023
	(0.040)	(0.041)	(0.040)	(0.040)	(0.038)	(0.039)
Central- and South America			0.078***	0.096***	0.086***	0.099***
			(0.029)	(0.028)	(0.028)	(0.027)
Constant	-3.105	-2.932	-3.087	-2.888	-3.076	-2.860

	(1.994)	(1.989)	(1.990)	(1.986)	(2.016)	(2.019)
Observations	800	800	800	800	800	800
Log Likelihood	1,434.647	1,434.235	1,437.784	1,438.955	1,442.122	1,443.071
Akaike Inf. Crit.	-2,829.294	-2,828.470	-2,833.568	-2,835.911	-2,840.244	-2,842.142
Bayesian Inf. Crit.	-2,735.602	-2,734.778	-2,735.191	-2,737.534	-2,737.182	-2,739.080

Note: *p<0.5; **p<0.01; ***p<0.001

Table 2 above displays the results of models 7-12, specifically testing the Institutional Isomorphism Hypothesis and two full models. When comparing these results to models 1-6, there are no surprises concerning the previously discussed variables; the results stay approximately the same. It is immediately noticeable that the AU and Central and South America return high significance across all analyses. This holds up for the analyses including Brazil (Appendix B), India, and the United States (Appendix C). The AU is significant less often in these models with outliers, which can be explained due to 'diluting' the sample with non-AU cases. Central and South America are significant across the board. The EU is only significant in model 39 (Appendix C), but this is likely due to the idiosyncrasies of that particular model and the natural result of running so many models, not a structural result. The same goes for models 23 & 24 (Appendix B), returning significant results for cases part of the ASEAN. While this suggests there might be a closeness in these cases, this is not evident. The same logic applies to the OECD, which is only significant in model 10.

Table 3 below shows models 13 and 14, mixed linear models for testing the Parliamentary Competition Hypothesis and Parliamentary Competition/Clientelism Interaction Hypothesis. ENPP is significant in model 15 but not in the hypothesised direction. Additionally, Durbin-Watson tested, pooled OLS models with lag introduced have been included in Table 24 (see Appendix E), where a thin significance for ENPP remains, and the effect is in the hypothesised direction. Due to the nature of the data and models, the results from models 15

and 16 are seen as superior. Pooled unlagged models (see Table 25, Appendix E) find significance for ENPP in all cases and ENPP*Clientelism in some. However, there is significant autocorrelation (Table 19, Appendix D), so these models have not been included in the primary analysis. Figure 1 displays the interaction included in model 16. It shows the mean +/- 1 standard deviation. At no point do the confidence intervals meaningfully diverge, disproving the interaction further. Figure 4 (Appendix F) does show a meaningful interaction, but the results of that model need to be taken with a grain of salt due to the significant autocorrelation.

All in all, thin support is found for the Parliamentary Competition Hypothesis and none for the Parliamentary Competition * Clientelism Interaction Hypothesis. Finally, the other results follow mostly the same trends. Population size and assembly size remain significant. Strikingly, parliamentary powers are not. This is possibly due to this sample comprising mostly western cases, introducing bias in the sample.

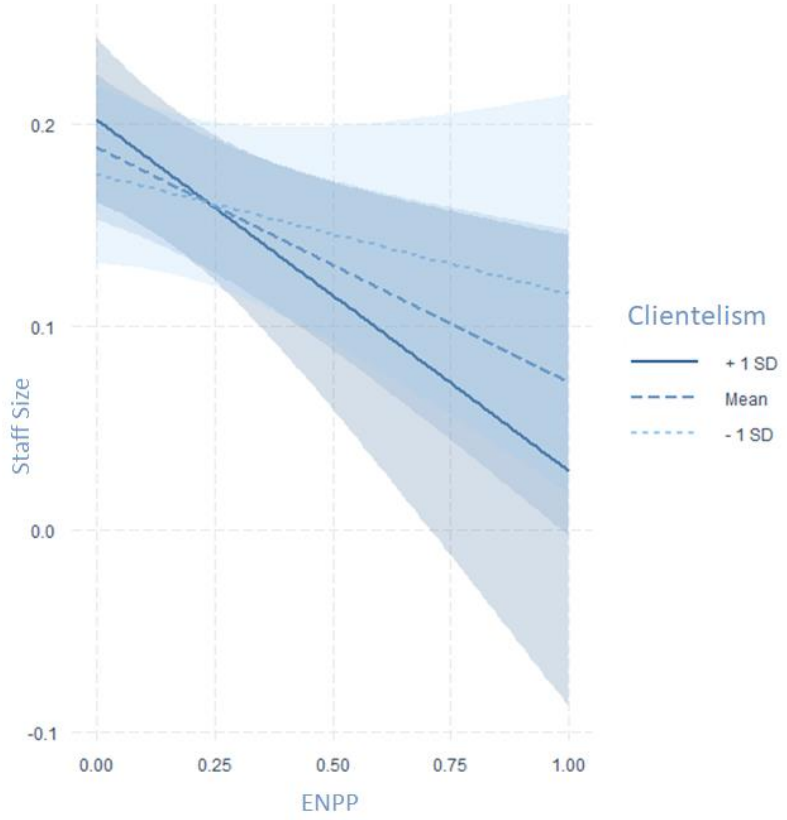
Table 3: Linear Mixed Model on Staff Size

	Dependent variable:	
	staff	
	(15)	(16)
Year	0.004***	0.003***
	(0.001)	(0.001)
Population size	0.604***	0.650***
	(0.143)	(0.147)
GDP	-0.038	-0.040
	(0.029)	(0.029)
Effective Number of Parliamentary Parties	-0.106**	-0.049
	(0.042)	(0.061)
Clientelism	0.017	0.050
	(0.033)	(0.042)

Lower house	0.105	0.103
	(0.083)	(0.083)
Regime	0.025	0.022
	(0.018)	(0.019)
Assembly size	0.314***	0.289***
	(0.105)	(0.106)
Parliamentary powers	0.024	0.041
	(0.023)	(0.027)
ENPP * Clientelism		-0.210
		(0.166)
Constant	-7.252***	-7.017***
	(1.325)	(1.335)
Observations	455	455
Log Likelihood	727.774	728.566
Akaike Inf. Crit.	-1,421.547	-1,421.133
Bayesian Inf. Crit.	-1,351.502	-1,346.967

Note: *p<0.1; **p<0.05; ***p<0.01

Figure 1: Interaction between ENPP and Clientelism and effect on Staff Size (Model 16)



Discussion

Considering the number of models and hypotheses in this research, it is fruitful to start by discussing what claims this research does not support. First, the expectation that economy influences staff size can be wholly rejected. It has significant correlations with all explanatory variables (though not multicollinear in any model) but is seldom significant in the analysis. It is only a significant predictor for staff size when the United States are included in the model. Perhaps there is a more sophisticated relationship between economic factors and parliamentary staff, but this rough measure does not capture it. It only slightly hints at the preconditional interplay it might have with factors such as population size and assembly size (which themselves are correlated).

Furthermore, the Parliamentary Culture Hypothesis garners no support. This is partly due to the high correlation with the control variable for parliamentary powers. Despite this, there is virtually no support for this hypothesis. One thing to consider is that the deliberativeness component metric might not adequately capture the theoretical concept of transformative vs arena parliaments. Consequently, further research should investigate a different operationalisation of this concept.

The hypothesis that gathers the most substantial support is the Population Size Hypothesis. Across all but one (logical) model, this is a significant predictor of parliamentary staff size. This strongly corroborates previous research by Otjes. In addition to this, extensive support can be found for the Population Size Non-Linearity Hypothesis, suggesting a decrease in the extra amount of parliamentary support staff needed the larger society gets. Interestingly enough, some evidence, albeit thin, was found for an interaction between Population^2 and Assembly Size (Table 11, Appendix B; Figure 2, Appendix F), suggesting that this determinant of parliamentary staff size might follow the mechanism explicated by

Taagepeera (1972) more closely than previously thought. Future research might want to investigate this interaction more closely.

Testing the Institutional Isomorphism Hypothesis offered mixed results and suggested the presence of a dormant precondition or interaction. Before going into this, little support was found for isomorphism within the ASEAN. The only models returning any significant results are those including Brazil, implying that this is more an idiosyncrasy of the model caused by Brazil biasing the non-South American results than a robust effect. There might be a semblance of closeness in these cases, but this is not something this research can safely conclude. The EU is only significant in model 39 (Appendix C) – a model with all outliers included. This is likely due to the idiosyncrasies of that particular model and the natural result of running so many models, not a structural result, as no EU country is an outlier. While this suggests that there might be a closeness in these cases, this is not something that this research can conclude. This significance can be attributed to happenstance accordingly. This result is mildly surprising, considering the aspects through which the mechanisms of power (formal pressures) and attraction (shared transnational community) should function are omnipresent in the EU.

The picture becomes less opaque when considering the last three groups. OECD is significant in three out of four models without outliers; the AU and Central and South America are significant in nearly all models. The first implication is that this lends credibility to at least part of the Institutional Isomorphism Hypothesis. The OECD and AU for the institutional component and the AU and Central and South America for the geographic closeness component. Upon further investigation of these cases, it is striking that they are connected in their moment of democratisation or expansion of parliamentary staff size. Otjes (2022, p. 20) notes that most western democracies expanded their staff in the period 1940-1970, coinciding with the founding of the OECD, providing a basis for both the mechanisms of attraction and

mimesis. AU and Central and South American countries, too, share a temporal space, as they often democratised in bursts, such as the Third Wave of Democratisation and the Arab Spring, providing a perfect basis for mimesis. This perspective also explains the non-significance of the EU, as these countries had already established institutional cultures, being less prone to mimesis as a mechanism. Future research should investigate temporal closeness and institutional outcomes further, as well as disentangling the various mechanisms of institutional isomorphism. For now, mixed support has been found for the Institutional Isomorphism Hypothesis.

There is no support for the Clientelism Hypothesis. A higher level of clientelism seems to diminish predicted staff size. Few models show significance; usually, they are limited models with fewer variables. There seems to be an interaction with assembly size, which is significant in one out of three analyses; see also Figure 3 (Appendix F). One way the possible mechanism of interaction between assembly size and clientelism influencing staff size could work is that larger assemblies would make it harder for clientelist leaders to ensure the loyalty of their staff. This is reflected in the direction of the interaction effect as well. Robustness tests with alternative measures reflect this mixed bag of results. Noticeably, of the three alternate metrics, legislative corruption and not party linkages or particularistic vs public goods, which should more directly measure patronage jobs, returns any significant results. This further confuses the mechanisms of clientelism, corruption, and parliamentary staff size.

Support for the Parliamentary Competition Hypothesis is mixed as well. These models have a far lower N (455) than the others. There is significance in one of the two main models, which does not include the interaction effect, which will be discussed later. The robustness tests employing alternative measures for clientelism in the ENPP model (see Appendix E) are all non-significant. This is, however, either, and most likely, due to the lower N and high amount

of predictor variables or due to the specific sample of cases, so this should be interpreted with caution. Optimistically, there is slight support for this hypothesis, noting that including more cases might completely flip this. This holds up only for lower houses, as there was no data on ENPP in upper houses in either of the datasets consulted. Finally, there seems to be virtually no support for the Parliamentary Competition/Clientelism Interaction Hypothesis. While the inclusion of the interaction effect does lead to a higher level of significance for ENPP, the interaction itself is not, except in a fringe pooled model (Table 25, Appendix E). Recommendations for further research involve broadening the scope of cases, inspecting whether there is an interaction between coalition and opposition use of parliamentary staff and more qualitative focused research on how a fractionalised demand for parliamentary staff manifests in the organisational aspects of the parliamentary administration.

As a final note, before wrapping up this section, this article did not hypothesise that assembly size and parliamentary powers would significantly affect staff size due to earlier research. However, by enlarging the sample and extending the scope of the analysis to a broader population, both variables proved to be significant time and again. There is a suggestion that assembly size interacts with other variables in the model, as can be seen with clientelism and in the correlation matrix (Table 8, Appendix A). Parliamentary Powers, and especially its component 'legislature questions officials in practice' (see Table 21, Appendix E), were also significant across models. Controlling for being a lower house was predominantly significant, proving essential in predicting staff size. This is likely because lower houses have more far-reaching powers than upper houses. Regime and bicameralism (see Table 23, Appendix E) were insignificant control factors. The former could result from the data having a higher occurrence of more democratic systems. The latter suggests that bicameral systems do not fundamentally need to balance resources across parliaments, but this is a very thin conclusion from limited analysis.

Table 4: Support for Hypotheses

	Support	Mixed results	Rejected
Population Size Hypothesis	X		
Population Size Non-Linearity Hypothesis	X		
Parliamentary Culture Hypothesis			X
Clientelism Hypothesis			X
Parliamentary Competition Hypothesis		X	
Parliamentary Competition * Clientelism Hypothesis			X
Institutional Isomorphism Hypothesis	X		

Limitations

Lack of data is the most pressing limitation. As can be seen in Tables 9 & 10 (Appendix A), Europe makes up for a third of the total cases, OECD countries even more, up to 40%. This proportion is even higher for European cases when removing the outliers India, Brazil, and the United States. The operationalisation of the Institutional Isomorphism Hypothesis controls for this to a certain extent. However, non-Western democracies are underrepresented. This is reinforced by the lack of data on highly interesting cases such as Russia and China, which could have provided crucial insight into the effect of the regime type on parliamentary staff size. Other essential cases, such as Mexico (N=4) and Argentina (N=2), also have low frequencies. Though the model accounts for data clustering, misestimation of the effect size can be introduced due to the underrepresentation of specific cases. Concludingly, there are some, though not egregious, and certainly not prohibitive, considerations pertaining to external validity due to the underrepresentation of certain cases.

Data availability is a limitation especially when it comes to the Parliamentary Competition Hypothesis. WhoGoverns and ParlGov provide data for a few cases, and here the proportion of EU cases is also very high. This is especially influential for any statements about the Parliamentary Competition-Clientelism Interaction Hypothesis, as European countries are

less prone to clientelism than democracies in the global south. The results from the models testing this hypothesis should thus be considered carefully.

In addition to this, the data available only concerned the timeframe 2013-2022. In historical terms, this is an extremely short temporal space. Therefore, this research did not expect to find any long-term trends, but the relative lack of systemic shocks and short timeframe does not allow for any inferences about time trends. Consequently, this article is best viewed as a cross-sectional study, despite the repeated measures qualities of the data and model employed.

Furthermore, while a large part of this study builds on a self-constructed dataset, many important variables were taken from the V-DEM dataset as well, which, unfortunately, contains many missing variables for the cases involved. This often brought down the total N of the analyses. While an effort was made to find alternative measures and bridge gaps in the data, this was not always possible. This is unfortunate, considering missing values are often part of country cases that are underrepresented in the literature in general. Moreover, these missing values are often for notoriously hard-to-measure concepts, such as clientelism and parliamentary culture. This should be considered when interpreting the results for these hypotheses.

This study also only makes any claims about institutional and committee staff. The IPU only reports data on the parliamentary administration staff. Research by Otjes tentatively remarked that institutional and committee staff are, in part, interchangeable with each other due to their overlapping roles (2022, p. 20). It follows from this that this study is incredibly limited in making statements about systems where there is a culture of higher PPG and personal staff. These proportions and trade-offs could have great implications for the exact drivers and mechanisms influencing staff size, even in different parts of the world, especially considering

the suggestions that the time of democratising or consolidating institutions plays a role in determining staff size.

Penultimately, this is an extensive and broad study informed by perspectives from multiple disciplines. While it is very insightful from a zoomed-out point of view, it cannot and does not fully explicate how specific mechanisms and interactions work, especially in the global south. More zoomed-in regional quantitative or mixed-methods approaches would be better suited to this. Finally, as has been mentioned before, this study runs many models and robustness tests. This approach risks having certain variables be significant by happenstance in a few models. Thus, this research has attempted to only make inferences from variables that were significant across the board or when a mechanism was explored more thoroughly in the robustness tests.

Conclusion & Future research

This article set out to investigate the drivers of parliamentary staff size from a global comparative perspective. This is important, as understanding staff composition has implications for the functioning of democracy, representation, efficiency, and legitimacy. It found remarkably high support for the existing theory that population size is an important driver of staff size, introducing a significant and robust non-linear relationship as well. In addition to this, it found high support for the Institutional Isomorphism Hypothesis, a perspective from public administration sciences that institutions mimic each other, especially if they are contemporaries in developing these institutions. It would be fruitful for further research to examine this relationship further. It found thin support for the Parliamentary Competition Hypothesis, providing a promising basis for further research on how competition in parliament influences its institutions. The Clientelism Hypothesis has no support in its main operationalisation. Clientelism is a concept that is notoriously hard to measure. It cannot be ruled out to influence staff size, as an alternative measure was significant. No

further support was found for the Clientelism-Parliamentary Competition Interaction Hypothesis either. Lastly, the Parliamentary Culture Hypothesis found no support, which might be due to challenges in operationalisation. The use of both a functionalist and an institutionalist framework proved successful and should be considered as the basis for further research into parliamentary staff size.

The findings of this article call for more research and data collection into the drivers of parliamentary staff size across the world. Higher data availability for least-likely cases would improve the external validity of the inferences made in this research and broaden the scope of this scientific field, which is very much in its infancy. The same goes for extending the variable of interest by including PPG and personal staff in the data. This would be a very challenging process of data collection and more suited to case studies or small-N case comparisons. It would, however, shed light on party-level determinants of staff size that this study forgoes entirely. Additionally, this article and its robustness tests have provided a promising starting point for follow-up studies on the exact mechanisms through which parliamentary staff size is influenced. As many indicators that are used from the V-DEM dataset are factor analyses or component analyses, a deeper dive further disentangling the mechanisms which influence staff size to which this study only provided a basis could prove valuable. A deeper dive into the inner machinations of the interactions uncovered in this article seems to be a promising direction of research as well.

All in all, this article greatly extends the scope of the young literature on parliamentary administrations by being only the second large-N study into staff size and the first of its kind to include non-Western democracies in the analysis. Its importance cannot be understated, as research into the veiled institutions that keep our democracy running is vital. Undoubtedly, there are many more features of these systems and societies that influence the workings of their institutions, and further research is warranted here, too.

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Appendices

Appendix A: Variables and Descriptives

Table 5: Variables of interest and where to find them

Variable	Data source	Type	Level
Parliament	IPU	Nominal – descriptive	3 - Country
Chamber ID	Self	Nominal	2 – House
Country	IPU	Nominal – descriptive	3 – Country
Region	IPU	Nominal – descriptive	3 – Country
Year	IPU	Ratio – Grouping in multilevel structure	1 – Year
Parliamentary staff size	IPU	Ratio – Dependent	1 – Year
Assembly size	IPU	Ratio – Independent	2 – House
Bicameralism dummy	IPU	Ratio – Independent	3 – Country
State Budget	IPU	Ratio – Independent	3 – Country
Regime type	V-DEM	Ratio – Independent	3 – Country
Deliberative component index	V-DEM	Ratio – Independent	3 – Country
Clientelism Index	V-DEM	Ratio – Independent	3 – Country
Subcomponents Clientelism	V-DEM	Ratio – Independent	3 – Country
Parliamentary Powers	V-DEM	Ratio – Independent	3 – Country
Subcomponents Parl Powers	V-DEM	Ratio – Independent	3 – Country
Population size	World Bank	Ratio – Independent	3 – Country
GDP	World Bank	Ratio – Independent	3 – Country
GDP/capita	World Bank	Ratio – Independent	3 – Country
Effective Number of Parliamentary Parties	WhoGovernsEU, ElectionIndices	Ratio – Independent	2 – House
Legislative corruption	V-DEM	Ratio – Independent	3 – Country
OECD member states	OECD	Ratio – Independent	3 – Country

ASEAN members states	ASEAN	Ratio – Independent	3 – Country
EU member states	EU	Ratio – Independent	3 – Country
AU member states	AU	Ratio – Independent	3 – Country
Central and South American States	IPU	Ratio – Independent	3 – Country

Table 6: Descriptive statistics for all variables in models (no outliers) (0-1 scale except year)

Variable	N	Min	Max	Mean	SD
year	906	2013	2022	2016	2.629
Staff size	906	0	1	0.0424	0.89
Population Size	906	0	1	0.392	0.124
Population-squared	906	0	1	0.017	0.116
GDP	871	0	1	0.092	0.186
GDP/capita	871	0	1	0.173	0.179
Clientelism	800	0	1	0.367	0.286
Deliberative Component Index	800	0	1	0.729	0.232
Effective Number of Parliamentary Parties	455	0	1	0.183	0.124
EU	906	0	1	0.289	0.454
ASEAN	906	0	1	0.049	0.215
OECD	906	0	1	0.405	0.491
AU	906	0	1	0.176	0.382
CSAMISO	906	0	1	0.131	0.338
Lower house	906	0	1	0.716	0.490
Bicameralism	906	0	1	0.599	0.490
Regime type	800	0	1	0.682	0.319
Legcon	800	0	1	0.713	0.273
Legexp	800	0	1	0.715	0.236
Leginv	800	0	1	0.583	0.218
Links	800	0	1	0.552	0.216
Legcor	800	0	1	0.469	0.216
Patron	800	0	1	0.597	0.162

Table 7: N Staff size per Region/Subregion

Region	Subregion	N
Americas		149
	North America	30
	Central America	17
	Caribbean	19
	South America	83
Europe		365
	Western Europe	132
	Nordic countries	25
	Southern Europe	62
	Central and Eastern Europe	146
Asia		120
	Central Asia	4
	South Asia	50
	South-east Asia	45
	East Asia	21
Middle East and North Africa		82
	Middle East	59
	North Africa	30
Sub-Saharan Africa		139
	Central Africa	40
	West Africa	35
	East Africa	21
	Southern Africa	43
Pacific		51
	Australia and New Zealand	27
	Pacific Islands	24

Table 8: Pearson's Correlation Matrix

Correlations

		Staff size	PopSize	AssSize	GDP	Delib	Legcon	Client	Regimes
Staff size	PR	1	.525**	.627**	.496**	-.006	.123**	-.101**	.109**
PopSize	PR	.525**	1	.520**	.578**	.036	.036	.033	.038
AssSize	PR	.627**	.520**	1	.550**	.076*	.135**	-.183**	.141**
GDP	PR	.496**	.578**	.550**	1	.288**	.304**	-.357**	.369**
Delib	PR	-.006	.036	.076*	.288**	1	.814**	-.680**	.781**
Legcon	PR	.123**	.036	.135**	.304**	.814**	1	-.659**	.751**
Client	PR	-.101**	-.033	-.183**	-.357**	-.680**	-.659**	1	-.750**
Regimes	PR	.109**	.038	.141**	.369**	.781**	.751**	-.750**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 9: Frequency Table per Country

		N		N		N
Valid	Albania	1	Greece	7	Norway	3
	Algeria	9	Grenada	2	Oman	7
	Andorra	6	Guinea	1	Pakistan	4
	Angola	1	Guinea-Bissau	1	Palau	3
	Antigua and Barbuda	2	Guyana	3	Papua New Guinea	1
	Argentina	2	Haiti	2	Paraguay	4
	Armenia	1	Hungary	9	Peru	4
	Australia	18	Iceland	9	Philippines	4
	Austria	16	India	14	Poland	14
	Azerbaijan	3	Indonesia	5	Portugal	9
	Bahrain	7	Iran	1	Qatar	4
	Bangladesh	4	Iraq	1	Republic of Korea	4
	Belgium	18	Ireland	18	Republic of Moldova	8
	Belize	2	Israel	9	Romania	17
	Benin	7	Italy	11	Russian Federation	6

Bhutan	6	Jamaica	10	Rwanda	7
Bolivia	6	Japan	16	Saint Vincent and the Grenadines	1
Bosnia and Herzegovina	8	Jordan	11	San Marino	3
Botswana	1	Kazakhstan	1	Sao Tome and Principe	4
Brazil	16	Kenya	14	Saudi Arabia	1
Brunei Darassalam	1	Kiribati	1	Senegal	2
Bulgaria	1	Kuwait	3	Serbia	9
Burkina Faso	1	Kyrgyzstan	1	Seychelles	2
Burundi	7	Latvia	8	Singapore	4
Cambodia	5	Lebanon	8	Slovakia	3
Cameroon	1	Lesotho	1	Slovenia	11
Canada	13	Liberia	1	Solomon Islands	6
Central African Republic	5	Libya	5	Somalia	3
Chad	1	Liechtenstein	4	South Africa	13
Chile	8	Lithuania	8	Spain	16
Colombia	5	Luxembourg	6	Sri Lanka	8
Congo	6	Madagascar	6	Suriname	9
Costa Rica	8	Malawi	1	Sweden	6
Côte d'Ivoire	7	Malaysia	15	Tajikistan	1
Croatia	8	Maldives	9	Thailand	8
Cuba	1	Mali	6	The Netherlands	8
Cyprus	5	Malta	6	Timor-Leste	1
Czech Republic	16	Marshall Islands	1	Togo	2
Democratic Republic of the Congo	5	Mauritius	6	Tonga	2
Denmark	8	Mexico	4	Tunisia	8
Dominican Republic	1	Micronesia	2	Türkiye	5
Ecuador	8	Monaco	6	Uganda	1
El Salvador	1	Mongolia	1	Ukraine	1
Estonia	2	Montenegro	8	United Arab Emirates	5
Eswatini	2	Morocco	1	United Kingdom	18
Ethiopia	3	Mozambique	1	United States of America	13
Fiji	6	Namibia	4	Uruguay	17
Finland	5	Nauru	1	Uzbekistan	1
France	13	Nepal	4	Vanuatu	1
Gabon	4	New Zealand	9	Venezuela	1
Gambia	2	Nicaragua	6	Vietnam	2
Georgia	2	Niger	1	Yemen	3
Germany	13	Nigeria	2	Zambia	5
Ghana	2	North	2		

	Macedonia
Total cases	906
Total countries	161

Table 10: Missing data from IPU member states

Country	Missing	Country	Missing
Bahamas	Both chambers	Mauritania	Both chambers, senate abolished in 2017
Barbados	Both chambers	Morocco	Upper house
Belarus	Both chambers, possible influential case	Myanmar	Both chambers, military coup
Bosnia	Upper chamber	Panama	Fully
Chili	Upper chamber	Saint Kitts and Nevis	Fully
China	Both chambers, possible influential case	Saint Lucia	Both chambers
Colombia	Lower house, possible influential case	Samoa	Fully
Comoros	Fully	Sierra Leone	Fully
Democratic People's Republic of Korea	Fully	South Sudan	Fully
Djibouti	Fully	Sudan	Parliament suspended from IPU following coup
Dominica	Fully	Switzerland	Staff shared across chambers
Egypt	Both chambers	Syrian Arab Republic	Fully
Equatorial Guinea	Fully	Tajikistan	Lower chamber
Eritrea	Fully	Trinidad	Staff shared across chambers
Guatemala	Fully	Turkmenistan	Fully
Honduras	Fully	Tuvalu	Fully
Kazakhstan	Upper house	United Republic of Tanzania	Fully
Laos	Fully	Uzbekistan	Upper house
Lesotho	Upper house	Zambia	Data error
Liberia	Upper house	Zimbabwe	Staff shared across chambers

Appendix B: Models including Brazil and Mexico

Table 11: Full LMM on Staff Size – including Brazil and Mexico

	Dependent variable:					
	staff					
	(17)	(18)	(19)	(20)	(21)	(22)
Year	0.0001	0.0001	0.00002	-0.00002	0.00002	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.154***	0.155***	0.157***	0.173***	0.152**	0.084
	(0.023)	(0.024)	(0.024)	(0.026)	(0.070)	(0.080)
Population-squared					0.005	0.173
					(0.080)	(0.124)
GDP	0.011	0.010	0.011	0.003	0.012	0.013
	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.018)
Clientelism		0.001	0.007	0.021	0.007	0.010
		(0.015)	(0.015)	(0.018)	(0.015)	(0.016)
Deliberativeness		0.013	-0.006	-0.008	-0.006	-0.001
		(0.014)	(0.016)	(0.016)	(0.016)	(0.016)
Lower house	0.016**	0.015*	0.016**	0.019**	0.016*	0.015*
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Regime	0.003	-0.004	-0.008	-0.010	-0.008	-0.009
	(0.009)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Assembly size	0.054***	0.054***	0.050**	0.075***	0.051**	0.078***
	(0.020)	(0.021)	(0.021)	(0.026)	(0.023)	(0.028)
Parliamentary powers			0.034**	0.037**	0.034**	0.032**
			(0.015)	(0.015)	(0.015)	(0.015)
Clientelism * Assembly				-0.096		
				(0.061)		
Population-squared * Assembly						-0.205*
						(0.116)
Constant	-0.267	-0.290	-0.062	0.013	-0.060	-0.133
	(1.205)	(1.235)	(1.249)	(1.249)	(1.250)	(1.257)
Observations	812	808	808	808	808	808
Log Likelihood	1,431.987	1,424.832	1,427.434	1,428.649	1,427.436	1,428.629
Akaike Inf. Crit.	-2,835.974	-2,817.664	-2,820.868	-2,821.297	-2,818.872	-2,819.257
Bayesian Inf. Crit.	-	-	-	-	-	-

	2,770.181	2,742.552	2,741.060	2,736.795	2,734.370	2,730.060

Note: *p<0.5; **p<0.01; ***p<0.001

Table 12: Full LMM on Staff Size including Brazil and Mexico

	Dependent variable:					
	staff					
	(23)	(24)	(25)	(26)	(27)	(28)
Year	-0.0001	-0.0001	0.00003	0.00002	0.00003	0.00002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.160***	0.163***	0.150***	0.150***	0.183***	0.176***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.069)	(0.068)
Population-squared					-0.041	-0.032
					(0.079)	(0.079)
Assembly size	0.057***	0.056***	0.067***	0.065***	0.061***	0.061***
	(0.020)	(0.021)	(0.020)	(0.020)	(0.023)	(0.023)
GDP	0.003	0.005	0.011	0.009	0.008	0.007
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)
Clientelism	0.010	0.012	0.009	0.012	0.009	0.012
	(0.017)	(0.017)	(0.016)	(0.017)	(0.016)	(0.017)
Deliberativeness	-0.0002	0.001	0.001	0.001	0.001	0.001
	(0.017)	(0.017)	(0.016)	(0.016)	(0.016)	(0.016)
Lower house	0.014*	0.014*	0.014*	0.014*	0.015*	0.015*
	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)
Regime	-0.015	-0.015	-0.019	-0.020	-0.018	-0.020
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Parliamentary powers	0.035**	0.034**	0.029**	0.029**	0.029**	0.029*
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
EU membership	-0.007		0.001		0.002	
	(0.008)		(0.008)		(0.009)	
OECD membership		-0.003		0.007		0.006
		(0.010)		(0.010)		(0.010)
AU membership	-0.022***	-0.021**	-0.013	-0.012	-0.014	-0.013
	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)
ASEAN membership	-0.027**	-0.026*	-0.020	-0.018	-0.020	-0.018
	(0.014)	(0.014)	(0.013)	(0.014)	(0.013)	(0.014)
Central- and South America			0.033***	0.034***	0.033***	0.035***

			(0.010)	(0.010)	(0.010)	(0.010)
Constant	0.127	0.110	-0.072	-0.062	-0.085	-0.071
	(1.248)	(1.249)	(1.247)	(1.246)	(1.245)	(1.245)
Observations	808	808	808	808	808	808
Log Likelihood	1,431.530	1,431.205	1,436.480	1,436.684	1,436.611	1,436.768
Akaike Inf. Crit.	-2,823.059	-2,822.411	-2,830.959	-2,831.369	-2,829.222	-2,829.536
Bayesian Inf. Crit.	-2,729.168	-2,728.519	-2,732.373	-2,732.783	-2,725.942	-2,726.255

Note: *p<0.5; **p<0.01; ***p<0.001

Table 13: OLS and LMM on Staff Size – Parliamentary Competition Hypothesis

	Dependent variable:			
	staff			
	OLS		*linear mixed-effects*	
	(29)	(30)	(31)	(32)
Year	-0.002	-0.002	-0.0001	-0.0002
	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.248***	0.270***	0.173***	0.194***
	(0.042)	(0.043)	(0.054)	(0.057)
GDP	0.021	0.015	-0.002	-0.005
	(0.030)	(0.030)	(0.030)	(0.030)
Clientelism	-0.030	0.012	0.014	0.042
	(0.023)	(0.032)	(0.025)	(0.035)
Effective number of Parliamentary Parties	0.202***	0.267***	-0.033	0.008
	(0.031)	(0.047)	(0.032)	(0.051)
Lower house	0.048	0.045	0.032	0.030
	(0.038)	(0.038)	(0.037)	(0.037)
Regime	-0.056**	-0.054**	-0.001	-0.004
	(0.025)	(0.025)	(0.021)	(0.021)
Assembly size	0.060**	0.059**	0.103**	0.098**
	(0.030)	(0.029)	(0.040)	(0.041)
Parliamentary powers	0.002	0.007	0.041	0.049*
	(0.024)	(0.024)	(0.025)	(0.026)
Clientelism * Effective number of Parliamentary Parties		-0.201*		

		(0.109)		
Clientelism * Effective number of Parliamentary Parties				-0.143
				(0.121)
Constant	4.332	4.389	0.229	0.307
	(2.855)	(2.848)	(2.201)	(2.169)
Observations	462	462	462	462
R^2	0.454	0.458		
Adjusted R^2	0.443	0.446		
Log Likelihood			715.036	715.689
Akaike Inf. Crit.			-1,396.073	-1,395.377
Bayesian Inf. Crit.			-1,325.768	-1,320.937
Residual Std. Error	0.076 (df = 452)	0.075 (df = 451)		
F Statistic	41.804^{***} (df = 9; 452)	38.156^{***} (df = 10; 451)		

Note: *p<0.5; **p<0.01; ***p<0.001

Appendix C: Models including all outliers

Table 14: LMM on Staff Size – outliers included

	Dependent variable:					
	staff					
	(33)	(34)	(35)	(36)	(37)	(38)
Year	-0.0001	0.00003	-0.0001	-0.0001	-0.00003	-0.00003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.077**	0.075**	0.071**	0.074**	1.056***	1.059***
	(0.034)	(0.035)	(0.035)	(0.036)	(0.132)	(0.132)
Population-squared					-0.973***	-0.997***
					(0.127)	(0.149)
GDP	0.206***	0.211***	0.213***	0.211***	0.144***	0.144***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.031)
Clientelism		0.020	0.025	0.029	0.003	0.003
		(0.017)	(0.017)	(0.020)	(0.016)	(0.016)
Deliberativeness		0.025	0.010	0.010	-0.006	-0.006
		(0.015)	(0.017)	(0.017)	(0.016)	(0.016)
Lower house	0.007	0.006	0.006	0.006	0.024***	0.024***
	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)	(0.008)
Regime	-0.0002	-0.003	-0.006	-0.007	-0.010	-0.010
	(0.009)	(0.013)	(0.013)	(0.013)	(0.012)	(0.012)
Assembly size	0.106***	0.110***	0.108***	0.114***	0.026	0.025
	(0.019)	(0.020)	(0.020)	(0.028)	(0.020)	(0.020)
Parliamentary powers			0.027*	0.027*	0.034**	0.034**
			(0.016)	(0.016)	(0.015)	(0.015)
Clientelism * Assembly				-0.021		
				(0.065)		
Population-squared * Assembly						0.042
						(0.150)
Constant	0.318	-0.088	0.110	0.114	0.036	0.042
	(1.180)	(1.201)	(1.206)	(1.211)	(1.243)	(1.249)
Observations	832	827	827	827	827	827
Log Likelihood	1,437.129	1,428.814	1,430.619	1,430.244	1,454.981	1,454.695
Akaike Inf. Crit.	-2,846.258	-2,825.628	-2,827.239	-2,824.488	-2,873.961	-2,871.391
Bayesian Inf. Crit.	-	-	-	-	-	-

	2,780.124	2,750.143	2,747.036	2,739.567	2,789.041	2,781.752

Note: *p<0.5; **p<0.01; ***p<0.001

Table 15: LMM on Staff Size – outliers included

	Dependent variable:					
	staff					
	(39)	(40)	(41)	(42)	(43)	(44)
Year	-0.0001	-0.0001	-0.0001	-0.0001	-0.00004	-0.0001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.058*	0.063*	0.061*	0.068**	1.031***	1.029***
	(0.035)	(0.035)	(0.034)	(0.034)	(0.132)	(0.131)
Population-squared					-0.957***	-0.953***
					(0.127)	(0.126)
Assembly size	0.112***	0.112***	0.118***	0.115***	0.040**	0.038*
	(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)
GDP	0.207***	0.213***	0.221***	0.223***	0.152***	0.150***
	(0.030)	(0.030)	(0.030)	(0.029)	(0.031)	(0.031)
Clientelism	0.023	0.031	0.021	0.030	0.005	0.008
	(0.018)	(0.019)	(0.018)	(0.019)	(0.016)	(0.017)
Deliberativeness	0.013	0.017	0.014	0.016	0.0003	0.0005
	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)
Lower house	0.004	0.005	0.005	0.006	0.022***	0.023***
	(0.008)	(0.009)	(0.008)	(0.008)	(0.007)	(0.007)
Regime	-0.010	-0.010	-0.013	-0.015	-0.021*	-0.022*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Parliamentary powers	0.029*	0.026	0.024	0.021	0.029*	0.029*
	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)	(0.015)
EU membership	-0.018*		-0.007		0.002	
	(0.010)		(0.010)		(0.009)	
OECD membership		-0.004		0.008		0.006
		(0.012)		(0.012)		(0.010)
AU membership	-0.023**	-0.021**	-0.014	-0.009	-0.013	-0.012
	(0.009)	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)
ASEAN membership	-0.014	-0.011	-0.007	-0.002	-0.022	-0.020
	(0.016)	(0.016)	(0.015)	(0.016)	(0.014)	(0.014)
Central- and South America			0.038***	0.043***	0.031***	0.032***

			(0.012)	(0.012)	(0.010)	(0.010)
Constant	0.282	0.251	0.130	0.129	0.066	0.082
	(1.205)	(1.208)	(1.213)	(1.214)	(1.242)	(1.240)
Observations	827	827	827	827	827	827
Log Likelihood	1,434.128	1,432.480	1,439.046	1,438.997	1,462.986	1,463.148
Akaike Inf. Crit.	-2,828.257	-2,824.961	-2,836.093	-2,835.994	-2,881.971	-2,882.296
Bayesian Inf. Crit.	-2,733.901	-2,730.604	-2,737.019	-2,736.920	-2,778.180	-2,778.504

Note: *p<0.5; **p<0.01; ***p<0.001

Table 16: OLS and LMM on Staff Size – Parliamentary Competition Hypothesis – outliers included

	Dependent variable:			
	staff			
	OLS		*linear mixed-effects*	
	(45)	(46)	(47)	(48)
Year	-0.003**	-0.003*	-0.0003	-0.0003
	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.022	0.022	0.053	0.053
	(0.035)	(0.035)	(0.061)	(0.061)
GDP	0.508***	0.507***	0.208***	0.208***
	(0.049)	(0.049)	(0.038)	(0.038)
Clientelism	-0.002	-0.008	0.027	0.029
	(0.024)	(0.034)	(0.027)	(0.037)
Effective number of Parliamentary Parties	0.291***	0.282***	-0.045	-0.042
	(0.028)	(0.050)	(0.031)	(0.054)
Lower house	0.042	0.042	0.024	0.024
	(0.040)	(0.041)	(0.042)	(0.042)
Regime	-0.058**	-0.058**	0.006	0.005
	(0.026)	(0.026)	(0.022)	(0.022)
Assembly size	0.136***	0.136***	0.166***	0.167***
	(0.021)	(0.021)	(0.031)	(0.032)
Parliamentary powers	-0.007	-0.007	0.043*	0.044*
	(0.025)	(0.025)	(0.026)	(0.026)
Effective number of		0.026		

Parliamentary Parties * Clientelism				
		(0.112)		
Effective number of Parliamentary Parties * Clientelism				-0.011
				(0.122)
Constant	5.849*	5.830*	0.490	0.498
	(2.991)	(2.995)	(2.139)	(2.142)
Observations	474	474	474	474
R^2	0.478	0.478		
Adjusted R^2	0.468	0.467		
Log Likelihood			720.058	720.062
Akaike Inf. Crit.			-1,406.117	-1,404.124
Bayesian Inf. Crit.			-1,335.376	-1,329.222
Residual Std. Error	0.080 (df = 464)	0.080 (df = 463)		
F Statistic	47.289*** (df = 9; 464)	42.479*** (df = 10; 463)		
Note:				*p<0.5; **p<0.01; ***p<0.001

Appendix D: (Multilevel) assumptions

Table 17: Unconditional Means, Growth, and Conditional Growth models

	Dependent variable:		
		Staff	
	UM	UG	CG
	(49)	(50)	(51)
Year		-2.799	-2.799
		(9.203)	(9.203)
Constant	677.798***	6,320.578	6,320.582
	(91.388)	(18,552.980)	(18,552.970)
N	906	906	906
Log Likelihood	-7,431.292	-7,431.245	-7,431.245
AIC	14,868.580	14,870.490	14,874.490
BIC	14,883.010	14,889.730	14,903.340
Note:			*p<0.05; **p<0.01; ***p<0.001

Table 18: VIF-tests for relevant models

	VIF				
	Model 3	Model 5	Model 9	Model 10	Model 16
Year	1.011	1.011	1.019	1.021	1.197
Popsize	1.581	11.653	1.690	1.656	1.942
GDP	1.036	1.040	1.044	1.047	1.098
Client	1.679	1.667	1.471	1.551	1. 068
Delib	1.728	1.724	1.556	1.558	
Bic	1.238	1.400	1.264	1.298	1.025
Regime	1.265	1.273	1.241	1.271	1.187
AssSize	1.727	2.206	1.762	1.856	2.008
Legcon	1.870	1.858	1.512	1.517	1.326
EU			1.489		
AU			1.264	1.323	
ASEAN			1.144	1.190	
CSAMISO			1.197	1.157	
OECD				1.185	
PopSq		8.905			
ENPP					1.225

Table 19: Durbin Watson Test for Models 70 and 72, Appendix E

	Model 70	Model 72
Lag	1	1
Autocorrelation	-0.119	0.484
D-W Statistic	2.237	0.926
P-value	0.146	0

Appendix E: Robustness checks with alternative measures

Table 20: Full LMM with GDP/capita instead of GDP

	Dependent variable:			
	staff			
	(52)	(53)	(54)	(55)
Year	0.002	0.001	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.349***	0.726***	0.326***	0.342***
	(0.069)	(0.184)	(0.067)	(0.066)
Population-squared		-0.491**		
		(0.222)		
GDP	0.003	0.004	0.001	-0.017
	(0.032)	(0.032)	(0.032)	(0.033)
Clientelism	-0.008	-0.010	0.002	0.020
	(0.021)	(0.021)	(0.025)	(0.025)
Deliberativeness	-0.018	-0.019	-0.018	-0.016
	(0.017)	(0.017)	(0.017)	(0.017)
Lower house	0.039*	0.057**	0.034	0.044*
	(0.024)	(0.025)	(0.023)	(0.023)
Regime	0.004	0.004	0.003	-0.004
	(0.014)	(0.014)	(0.014)	(0.014)
Assembly size	0.301***	0.229***	0.330***	0.295***
	(0.061)	(0.068)	(0.059)	(0.060)
Parliamentary powers	0.046**	0.046**	0.045**	0.040**
	(0.019)	(0.019)	(0.019)	(0.019)
EU membership			-0.020	
			(0.026)	
OECD membership				0.049*
				(0.027)
AU membership			-0.051**	-0.035*
			(0.020)	(0.020)
ASEAN membership			-0.035	-0.013
			(0.040)	(0.040)

Central- and South America			0.078***	0.095***
			(0.029)	(0.028)
Constant	-3.075	-3.004	-3.054	-2.894
	(1.992)	(2.012)	(1.991)	(1.987)
Observations	800	800	800	800
Log Likelihood	1,429.323	1,431.619	1,437.888	1,439.083
Akaike Inf. Crit.	-2,824.646	-2,827.239	-2,833.776	-2,836.165
Bayesian Inf. Crit.	-2,745.008	-2,742.916	-2,735.399	-2,737.788

Note: *p<0.5; **p<0.01; ***p<0.001

Table 21: Full LMM on Staff Size with alternative measures for Parliamentary Powers

	Dependent variable:			
	staff			
	(56)	(57)	(58)	(59)
Year	0.002	0.002	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.353***	0.721***	0.328***	0.346***
	(0.069)	(0.185)	(0.067)	(0.066)
Population-squared		-0.478**		
		(0.223)		
GDP	0.002	0.0001	0.002	0.001
	(0.016)	(0.016)	(0.016)	(0.016)
Clientelism	-0.005	-0.008	0.008	0.025
	(0.021)	(0.021)	(0.025)	(0.025)
Deliberativeness	-0.014	-0.014	-0.014	-0.012
	(0.016)	(0.016)	(0.017)	(0.017)
Lower house	0.041*	0.058**	0.036	0.045**
	(0.024)	(0.025)	(0.023)	(0.023)
Regime	0.004	0.005	0.003	-0.003
	(0.014)	(0.014)	(0.014)	(0.014)
Assembly size	0.297***	0.225***	0.326***	0.293***
	(0.061)	(0.068)	(0.059)	(0.060)

Legislature questions officials in practice	0.043**	0.042**	0.047**	0.046**
	(0.018)	(0.018)	(0.018)	(0.018)
Legislature investigates in practice	0.021	0.020	0.017	0.012
	(0.022)	(0.022)	(0.024)	(0.024)
EU membership			-0.020	
			(0.026)	
OECD membership				0.043
				(0.026)
AU membership			-0.053***	-0.036*
			(0.020)	(0.020)
ASEAN membership			-0.033	-0.012
			(0.039)	(0.040)
Central- and South America			0.080***	0.097***
			(0.029)	(0.028)
Constant	-3.117	-3.076	-3.160	-2.974
	(1.991)	(2.016)	(1.991)	(1.988)
Observations	800	800	800	800
Log Likelihood	1,431.258	1,433.397	1,440.336	1,441.347
Akaike Inf. Crit.	-2,826.515	-2,828.793	-2,836.672	-2,838.695
Bayesian Inf. Crit.	-2,742.192	-2,739.785	-2,733.611	-2,735.633

Note: *p<0.5; **p<0.01; ***p<0.001

Table 22: Full LMM on Staff Size with alternative measures for Clientelism

	Dependent variable:			
	staff			
	(60)	(61)	(62)	(63)
Year	0.002*	0.002*	0.002*	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.317***	0.700***	0.296***	0.312***
	(0.069)	(0.182)	(0.067)	(0.065)

Population-squared		-0.498**		
		(0.220)		
GDP	0.003	0.002	0.003	0.001
	(0.016)	(0.016)	(0.016)	(0.016)
Party linkage type	0.041*	0.043*	0.036	0.022
	(0.024)	(0.024)	(0.024)	(0.025)
Legislative corruption	-0.087***	-0.087***	-0.102***	-0.118***
	(0.030)	(0.030)	(0.031)	(0.032)
Pork-barrel politics	0.020	0.020	0.017	0.016
	(0.024)	(0.024)	(0.025)	(0.025)
Deliberativeness	-0.021	-0.022	-0.021	-0.019
	(0.019)	(0.019)	(0.019)	(0.019)
Lower house	0.038	0.056**	0.034	0.044**
	(0.024)	(0.025)	(0.022)	(0.022)
Regime	0.008	0.009	0.007	0.0001
	(0.014)	(0.014)	(0.014)	(0.014)
Assembly size	0.311***	0.237***	0.332***	0.294***
	(0.060)	(0.067)	(0.058)	(0.059)
Parliamentary powers	0.055***	0.055***	0.049**	0.043**
	(0.019)	(0.019)	(0.019)	(0.019)
EU membership			-0.015	
			(0.025)	
OECD membership				0.055**
				(0.026)
AU membership			-0.051***	-0.032
			(0.020)	(0.020)
ASEAN membership			-0.037	-0.011
			(0.039)	(0.039)
Central- and South America			0.075***	0.095***
			(0.028)	(0.028)
Constant	-3.820*	-3.708*	-3.874*	-3.649*
	(1.989)	(2.011)	(1.991)	(1.981)
Observations	800	800	800	800

Log Likelihood	1,433.951	1,436.343	1,443.406	1,445.408
Akaike Inf. Crit.	-2,829.902	-2,832.685	-2,840.811	-2,844.816
Bayesian Inf. Crit.	-2,740.895	-2,738.993	-2,733.065	-2,737.070

Note: *p<0.5; **p<0.01; ***p<0.001

Table 23: Full LMM on Staff Size with Bicameralism dummy instead of Lower House

	Dependent variable:			
	staff			
	(64)	(65)	(66)	(67)
Year	0.002	0.001	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Population size	0.318***	0.605***	0.307***	0.320***
	(0.067)	(0.177)	(0.065)	(0.064)
Population-squared		-0.383*		
		(0.220)		
GDP	0.001	-0.001	0.002	0.001
	(0.016)	(0.016)	(0.016)	(0.016)
Clientelism	-0.009	-0.012	0.004	0.021
	(0.022)	(0.022)	(0.025)	(0.025)
Deliberativeness	-0.017	-0.018	-0.017	-0.015
	(0.017)	(0.017)	(0.017)	(0.017)
Bicameralism	-0.010	-0.017	-0.020	-0.024
	(0.017)	(0.017)	(0.019)	(0.019)
Regime	0.003	0.004	0.003	-0.003
	(0.014)	(0.014)	(0.014)	(0.014)
Assembly size	0.339***	0.295***	0.361***	0.338***
	(0.056)	(0.060)	(0.054)	(0.054)
Parliamentary powers	0.047**	0.047**	0.044**	0.039**
	(0.019)	(0.019)	(0.019)	(0.019)
EU membership			-0.021	

			(0.026)	
OECD membership				0.039
				(0.026)
AU membership			-0.050**	-0.034*
			(0.020)	(0.020)
ASEAN membership			-0.037	-0.018
			(0.040)	(0.040)
Central- and South America			0.078***	0.097***
			(0.029)	(0.028)
Constant	-3.031	-2.970	-3.053	-2.867
	(1.997)	(2.016)	(1.991)	(1.988)
Observations	800	800	800	800
Log Likelihood	1,428.176	1,429.593	1,437.192	1,437.982
Akaike Inf. Crit.	-2,822.352	-2,823.185	-2,832.384	-2,833.964
Bayesian Inf. Crit.	-2,742.714	-2,738.862	-2,734.007	-2,735.587
Note:				*p<0.5; **p<0.01; ***p<0.001

Table 24: Pooled OLS regression on Staff Size – Unfilled data – Parliamentary Competition Hypothesis

	Dependent variable:			
	staff			
	(68)	(69)	(70)	(71)
Year	-0.0005	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Population size	0.444***	0.396***	0.402***	0.459***
	(0.064)	(0.066)	(0.069)	(0.078)
GDP	0.007	0.030	0.023	0.014
	(0.053)	(0.050)	(0.054)	(0.054)
Clientelism	-0.019		-0.009	0.054
	(0.027)		(0.028)	(0.050)

Effective number of Parliamentary Parties		0.093*	0.089	0.212**
		(0.055)	(0.056)	(0.099)
Clientelism * Effective number of Parliamentary Parties				-0.383
				(0.254)
Constant	0.940	2.354	2.485	2.247
	(6.209)	(6.208)	(6.245)	(6.211)
Observations	115	115	115	115
R^2	0.445	0.456	0.432	0.444
Adjusted R^2	0.419	0.426	0.411	0.424
Residual Std. Error	0.081 (df = 109)	0.080 (df = 108)	0.081 (df = 110)	0.080 (df = 110)
F Statistic	17.458*** (df = 5; 109)	15.096*** (df = 6; 108)	20.917*** (df = 4; 110)	21.971*** (df = 4; 110)
Note:				*p<0.05; **p<0.01; ***p<0.001

Table 25: Pooled OLS Models – Parliamentary Competition Hypothesis

	Dependent variable:	
	staff	
	(72)	(73)
Year	0.003	0.003
	(0.002)	(0.002)
Population size	-0.179***	-0.127*
	(0.068)	(0.070)
GDP	0.120***	0.107**
	(0.046)	(0.046)
Clientelism	0.080**	0.173***
	(0.036)	(0.049)
Effective number of Parliamentary Parties	0.022	0.169**
	(0.050)	(0.074)
Lower house	0.055	0.049
	(0.058)	(0.058)
Regime	0.092**	0.096**

	(0.039)	(0.039)
Assembly size	0.706***	0.703***
	(0.046)	(0.046)
Parliamentary powers	-0.088**	-0.077**
	(0.037)	(0.037)
Clientelism * Effective number of Parliamentary Parties		-0.455***
		(0.168)
Constant	-7.132	-6.821
	(4.417)	(4.387)
Observations	455	455
R^2	0.609	0.615
Adjusted R^2	0.601	0.606
Residual Std. Error	0.116 (df = 445)	0.115 (df = 444)
F Statistic	76.892*** (df = 9; 445)	70.919*** (df = 10; 444)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 26: LMM on PopSq no outliers except India

	Dependent variable:			
	staff			
	(74)	(75)	(76)	(77)
Year	0.002*	0.002*	0.002*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Population size	1.757***	1.764***	1.665***	1.763***
	(0.366)	(0.366)	(0.358)	(0.352)
Population-squared	-1.466***	-1.567***	-1.404***	-1.466***
	(0.352)	(0.422)	(0.344)	(0.340)
GDP	0.005	0.005	0.005	0.004
	(0.014)	(0.014)	(0.014)	(0.014)

Clientelism	-0.008	-0.008	0.001	0.021
	(0.021)	(0.021)	(0.024)	(0.025)
Deliberativeness	-0.019	-0.019	-0.019	-0.017
	(0.017)	(0.017)	(0.017)	(0.017)
Lower house	0.039*	0.038	0.034	0.044*
	(0.024)	(0.024)	(0.022)	(0.023)
Regime	0.001	0.001	0.0004	-0.006
	(0.013)	(0.013)	(0.014)	(0.014)
Assembly size	0.313***	0.310***	0.340***	0.304***
	(0.060)	(0.061)	(0.058)	(0.059)
Parliamentary powers	0.046**	0.046**	0.045**	0.039**
	(0.019)	(0.019)	(0.019)	(0.019)
Population-squared * Assembly size		0.194		
		(0.448)		
EU membership			-0.020	
			(0.026)	
OECD membership				0.045*
				(0.026)
AU membership			-0.051***	-0.033*
			(0.020)	(0.020)
ASEAN membership			-0.031	-0.010
			(0.039)	(0.040)
Central- and South America			0.081***	0.098***
			(0.029)	(0.028)
Constant	-3.450*	-3.442*	-3.456*	-3.238
	(1.984)	(1.983)	(1.981)	(1.980)
Observations	814	814	814	814
Log Likelihood	1,462.147	1,462.240	1,471.023	1,472.328
Akaike Inf. Crit.	-2,888.294	-2,886.480	-2,898.046	-2,900.656
Bayesian Inf. Crit.	-2,803.659	-2,797.142	-2,794.602	-2,797.213
Note:				*p<0.1; **p<0.05; ***p<0.01

Appendix F: Additional & Non-hypothesised Interaction Plots

Figure 2: Interaction effect between Pop² and Assembly Size on Staff Size (Brazil and Mexico, Model 22, Appendix A)

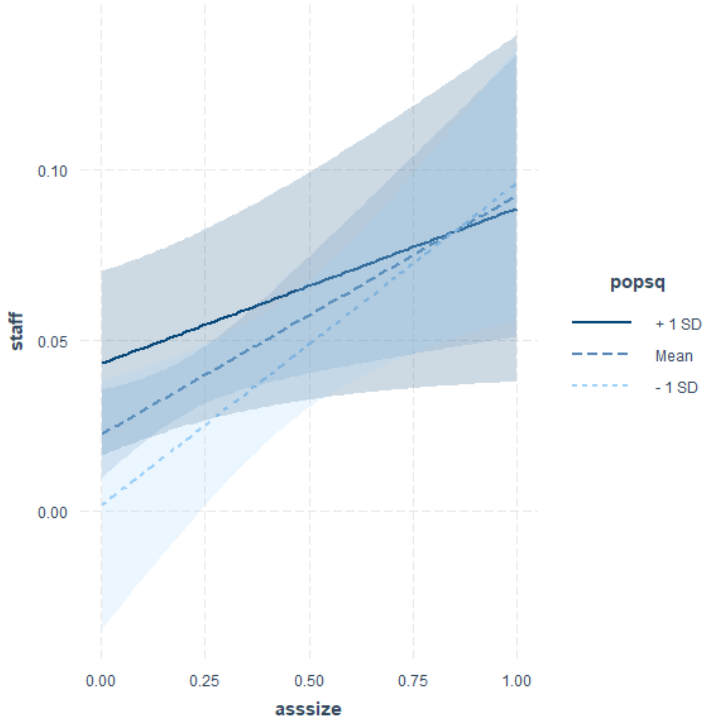

Figure 3: Interaction between Clientelism and Assembly Size on Staff Size (no outliers model 4)

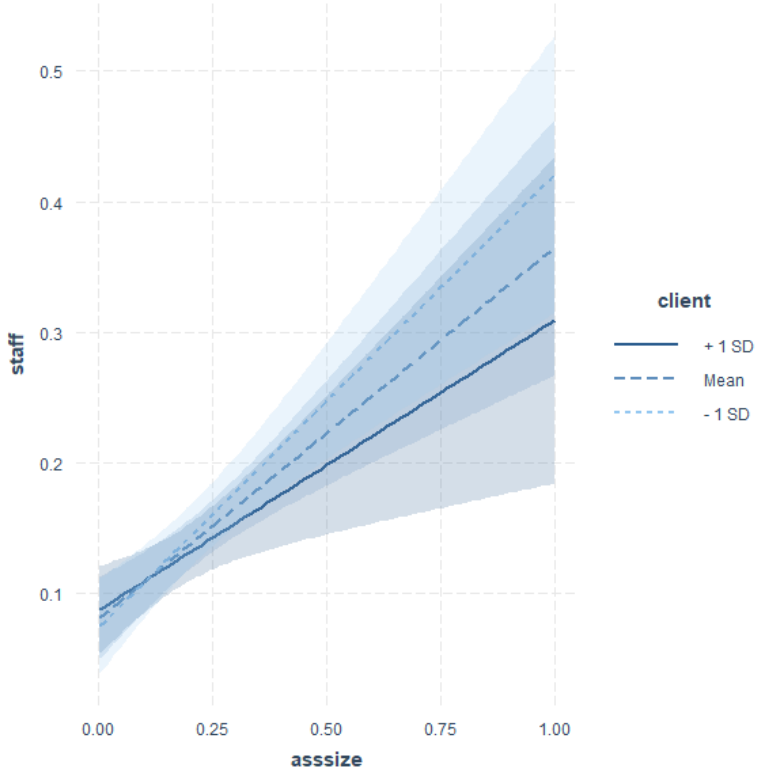

Figure 4: Pooled Interaction ENPP*Clientelism, Model 73