# Inside the Black Box: Uncovering Dynamics and Characteristics of the Chilean Central Government Bureaucracy with a Novel Dataset

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## ABSTRACT

This article examines bureaucracies using a novel dataset of Chilean central government employees from 2006 to 2020. Unlike perception-based sources, this dataset provides objective, disaggregated, and longitudinal insights into bureaucrats' characteristics and careers. The authors validate it against official employment statistics and conduct an exploratory and descriptive analysis, presenting six descriptive findings about the Chilean bureaucracy that cannot be discovered using available aggregate data. The analysis reveals significant degrees of personnel stability and professionalization in the civil service, but with considerable rigidity in careers and substantial interagency heterogeneity in turnover, wages, and exposure to political cycles. These findings suggest that the Chilean national bureaucracy is mostly well developed along Weberian lines, though not uniformly so. These measurements also serve as a benchmark for comparing other Latin American bureaucracies in the future.

*Keywords:* Bureaucracy, civil service, Chile, bureaucratic turnover, administrative data

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Public bureaucracies are a key actor in the policy process of modern democracies. Moreover, clean and competent bureaucracies are a core component of a state's capacity to deliver valuable social and economic goals. Despite their empirical and normative importance, their study in Latin America has received comparatively scant attention in political science, in no small part because the development of the subfield has been hampered by "the difficulty in collecting, maintaining, and sharing data on public agencies, the civil service, and the state in Latin America" (Polga-Hecimovich and Trelles 2016, 71).

In this article, we seek to advance their study by empirically quantifying and examining some key features of the Chilean central government's bureaucracies. We do so by assembling and using a novel dataset about these bureaucracies that—much along the lines of Bersch et al.'s 2017 data for the Brazilian federal government—is intranational, highly disaggregated, and based on objective administrative information. The data are based on individual, monthly observations of civil servants for most central government agencies (excluding those in the Ministry of Health) between 2006 and 2020. They include information on the employee's name, agency, employment regime (permanent, yearly, or temporary), geographical region of work, wage, qualifications, function, administrative rank (such as professional, technician, auxiliary, and managerial), and administrative degree (with lower degrees signaling a higher position). To this, we have added information on gender and an estimation of age. This allows us to advance our empirical knowledge of the Chilean bureaucracy on three counts.

First, the richness of the information on bureaucrats' characteristics allows for mapping the public workforce according to many variables of interest, such as those just mentioned. Second, the panel structure over 172 months allows us to study individual bureaucrats' careers over time, and thus measure the degree of stability of their employment and whether it is affected by exogenous events, such as election outcomes. The previous paucity of continuous data on national bureaucracies has particularly impeded this longitudinal analysis. Third, because individuals are nested within agencies and agencies are nested within ministries, the data can be analyzed cross-sectionally and longitudinally at these different levels of aggregation, allowing for empirical differentiation in our measures of the Chilean civil service. For example, stable, highly paid, and highly qualified civil servants might be a feature of some agencies but not of others.

We start by characterizing bureaucracies according to their dominant mode of recruiting personnel and discussing how meritocratic bureaucracies empirically differentiate themselves from patrimonial and politicized bureaucracies. We also discuss why disaggregated measures of bureaucratic characteristics may be valuable to advance our understanding of bureaucracies' functioning and situate Latin American bureaucracies comparatively. In the third section, we briefly explain how we assembled the dataset and validate it against aggregate personnel statistics from the Budget Office (which are constructed independently from our own). In the fourth section, we use this dataset to conduct an exploratory data analysis and present six descriptive findings that help characterize the Chilean civil service, along three dimensions of career

stability and progression, professionalization, and agency heterogeneity, which cannot be replicated with existing data. The final section discusses what these findings tell us about the structure and functioning of the Chilean civil service.

## MERITOCRATIC BUREAUCRACIES AND THEIR CHARACTERISTICS

A substantial body of literature has argued that Weberian civil services are a key component of greater state capacity and contribute to the achievement of a host of desirable economic and social outcomes (e.g., Evans and Rauch 1999; Henderson et al. 2007; Cingolani et al. 2015; Nistotskaya and Cingolani 2016). In terms of personnel selection, the key aspect of Weberian bureaucracies is that they are, above all, meritocratic: they recruit impartially, based on applicants' qualifications, experience, and expected performance on the job, rather than on political or other criteria. In systems where meritocracy is the rule, the careers of politicians and bureaucrats become separated, and so do the chains of accountability between them, allowing bureaucrats to monitor politicians without fear of reprisal (Dahlström et al. 2012). How this is achieved—whether through the granting of legal tenure to bureaucrats or through other means—is less crucial for performance than the consistent use of merit as a criterion for selection and promotion of bureaucratic personnel (Dahlström and Lapuente 2017).

Meritocratic bureaucracies stand in contrast to patrimonial and politicized bureaucracies. Patrimonial bureaucracies recruit personnel based on personal and social connections (e.g., nepotism), while politicized ones recruit based on party loyalty or ideological congruence (Andersen and Møller 2019, 288). Both types select bureaucrats for reasons other than competence for the job, implying appointing bureaucrats through patronage, which is "the power of political actors to appoint individuals by discretion to nonelective positions in the public sector, regardless of the legality of the decision and the merits of the appointee" (Panizza et al. 2022, 5). Merit and patronage are thus distinct and opposing ways of selecting bureaucrats, even if not all positions in a bureaucracy (and particularly those at the top) ought necessarily to be chosen on merit alone (Toral 2023; Grindle 2012; Andersen and Møller 2019).

In the polarity between meritocratic bureaucracies and patrimonial or politicized ones, Latin American countries have usually been closer to the latter pole (e.g., Munck and Luna 2022, 4; Andersen and Møller 2019). Scholars agree that patronage is prevalent in most of the region's bureaucracies (Panizza et al. 2022; Iacoviello and Strazza 2014, 54). These two opposing logics of merit and patronage coexist, with "large-scale patronage practices" operating alongside or even within formally "bureaucratic-Weberian models" (Ramos and Milanesi 2017, 10); indeed, the distance between *de jure* institutions and their de facto functioning has been noted as a feature of many Latin American institutions (Brinks et al. 2020). Existing empirical measures also bear out the view of Latin American bureaucracies as having a shortage of meritocracy. For instance, in Kopecký et al.'s 2016 survey of 22 countries, the Latin American countries studied occupy 4 of the 5 places with the most patronage in the

sample. Similarly, in the 2020 Quality of Government (QoG) Expert Survey (Nistotskaya et al. 2021, 42), Latin American countries tended to score low on meritocracy, with 7 of the 11 countries in the region ranked in the lower half of the 86 countries studied (including 2 of the last 3 places).

Within the region, Chile (and Brazil) have usually been considered nonetheless as partial exceptions. For instance, in the same 2020 QoG survey, Chile ranked number 20 (out of 88) in the merit indicator, above countries such as Germany and the United States. Likewise, in the Inter-American Development Bank's comprehensive study of the development of Latin American civil service systems, Brazil and Chile also come out consistently on top on most measures, although on the specific Merit subindex, related mainly to meritocratic hiring, Brazil comes out far ahead, while Chile ranks fourth (Iacoviello and Strazza 2014, 47). Panizza et al.'s recent work on patronage in seven Latin American countries, on the other hand, notes that in all countries patronage was widespread and that Chilean presidents used their appointment powers extensively (Panizza et al. 2022, 221).

Nevertheless, all these studies ultimately rely on perceptions, whether of experts, citizens, or bureaucrats. However, these measures have limitations. First, perceptions about bureaucratic meritocracy and performance may be contaminated by "halo" effects (Kaufmann et al. 2007; Kurtz and Schrank 2007), whereby ex-post policy results influence our perception of the ex-ante bureaucratic process. Second, evaluations may be based selectively on more visible or salient evidence—for instance, on what happens in some levels of government or agencies. Third, evaluators may disagree on complex concepts such as "meritocratic bureaucracy" or "patronage," and these evaluators may, moreover, change over time, making the validity and reliability of expert judgments questionable (Fukuyama 2013). Furthermore, these exercises typically result in a single, aggregate country score, hiding internal variability and leading to the "levels of analysis" problem (Gingerich 2013; Bersch et al. 2017; Fukuyama 2013).

Thus, there is room for complementing perception-based measures with administrative information. The data we use here has several advantages. They allow us to precisely quantify relevant phenomena, such as employment turnover, salaries, and qualifications, that are highly relevant to our judgments of bureaucratic professionalization and meritocracy. Our data cover more than 14 continuous years of central government employment, which allows for the study of individual bureaucratic careers over time, as well as for the evolution of some key characteristics of the state. Additionally, the panel structure data on individuals allow us to produce disaggregated measures of the relevant phenomena at the agency level.

For this purpose, we will conduct an exploratory data analysis to examine the degree to which Chile's bureaucracy conforms more to a merit-based model or to a patronage-based one (both understood as ideal types) along three interrelated dimensions.

First, a Weberian bureaucracy has substantial career stability, coupled with advancement opportunities, due to the existence of tenure protections and an established career track. Patrimonial or politicized bureaucracies are generally more unstable because they lack these characteristics, and a change of government can imply

large turnover effects. This instability is costly: such bureaucracies suffer from a loss of expertise and institutional memory, shortened time horizons, and recurrent discontinuation of projects, as Cornell (2014) found in Peru and Bolivia. Long-tenure bureaucrats can also have a greater influence on politicians and help stabilize policy across governments (Schnose 2015). More generally, there is evidence of the costs of staff rotation for organizational performance in both private and public sector organizations (e.g., Park and Shaw 2013; Fuenzalida and Riccucci 2019; Akhtari et al. 2022).[1] Additionally, if performance or "merit" is to matter once inside an organization, chances of promotion within it should exist and be awarded on that basis.

However, as Dahlström and Lapuente (2017) show, many highly meritocratic bureaucracies do not provide the strong employment protections that "closed Weberian" bureaucracies (as they call them) deem necessary. They contrast these to "managerial bureaucracies," such as Sweden or New Zealand, which have lower formal employment protections and a less established vertical promotion track but more flexible horizontal and diagonal professional mobility (Dahlström and Lapuente 2017, 198). In both these models, however, bureaucrats are shielded from political interference and face stable career prospects, even if performance incentives and advancement paths in each may differ to some degree.

The second dimension is that as patronage is based on trust, in nonmeritocratic bureaucracies politicians may choose less qualified but more loyal people to serve. This cost in qualifications is not guaranteed, since patronage can be used to bring highly qualified technocrats into government (Panizza et al. 2022). However, it may happen if patronage is used as a reward mechanism for supporters (e.g., Colonnelli et al. 2020, who indeed find that patronage lowers quality), or else for building political support in Congress, as Bersch et al. (2022) show for Brazil. In Chile, Ferraro (2008) has noted the influence of legislators on some bureaucratic nominations in Chile.

The third dimension is that extensive patronage can mean high heterogeneity between agencies in the same state. This can happen if presidents must choose which parts of the bureaucracy to use as a "spoils system" to reward partisans and build political support in Congress, and which must be meritocratically insulated to deliver key public goods (Geddes 1990). Typically, finance ministries and other economic institutions have been insulated from extensive patronage because they are perceived to be "strategic" (Ramos and Milanesi 2017; Salazar-Morales and Lauriano 2020). This segmentation can generate some "islands of excellence" or "pockets of effectiveness," even in countries with extensive patronage (McDonnell and Vilaça 2021). However, anticipating which government sectors or agencies will be more meritocratic in each country is not obvious (Gingerich 2013).

Using our novel dataset, we propose to examine the Chilean bureaucracy along these three dimensions of career stability and progression, qualifications, and agency heterogeneity. In a fully Weberian bureaucracy, we would expect to see long-term employment within the bureaucracy, as well as evidence of within-agency career advancement; well-qualified personnel, particularly in top positions; and significant degrees of agency homogeneity in terms of stability, wages, and exposure to political cycles.

In part, we follow along the lines of Bersch et al. (2017), who studied the Brazilian bureaucracy at the agency level using individual-level data on bureaucrats. However, rather than building abstract measures of autonomy and capacity for each agency, we choose to use descriptive data to shed light on measures regarding the professionalization of the Chilean bureaucracy. We believe that these descriptive findings contribute empirical knowledge to the scholarly and public policy communities, advance our comparative understanding of the region's bureaucracies, and serve as a benchmark for future studies in other countries in the region.

## The Chilean State

Chile is, along with Brazil, one of the Latin American states with the most developed civil service systems in the region (Iacoviello and Strazza 2014, 20). It is also—along with Uruguay—one of the countries in the region with the lowest levels of corruption (Kaufmann and Kraay 2023).

In 1989, the outgoing military dictatorship (1973–90) passed a civil service law, or administrative statute, that remains the core of the central government's employment laws (Alberts et al. 2021). The statute created a standard civil service career track with robust employment protections, akin to a "closed" Weberian system. Positions are defined by grades in a clear hierarchy tied to remuneration and rank according to the nature of the job—such as support staff, administrative staff, technicians, inspectors, professionals, and managers.[2] The civil service career ends at the mid-levels of the managerial rank, with the highest positions being defined as positions of trust to steer the bureaucracy in the direction desired by the government. Roughly half of managerial positions are civil service career positions, while the rest are trust-based (Centro de Estudios Públicos et al. 2018, 13). Remunerations are organized according to a governmentwide unified scale that specifies compensation according to grade. However, many agencies have different salary scales, such as superintendencies; indeed, a study identified 66 agencies (outside the judicial, education, and health sectors) that have at least partially special employment regimes (Pardo and Orellana 2009).

Along with the permanent (*planta*) career track, two other roads into government employment exist: the yearly contract (*contrata*) and the temporary contract (*honorarios*). The yearly contract can be indefinitely renewed and was meant to supplement permanent workers. These workers have a grade and a rank, can assume all responsibilities of permanent workers except managerial positions, and receive compensation according to their agency's salary scale. The temporary contract was meant for tasks not part of the regular operation of an agency (such as an IT project or a consultancy). They are not governed by the administrative statute and do not have a grade or rank. Both contracts were thought to be complements to the standard permanent track; by law, yearly employees cannot exceed 20 percent of permanent positions (Alberts et al. 2021; Rajevic 2018). However, over time, they became ways to hire long-term workers without creating new permanent positions. The yearly contract regime has grown and is now the dominant employment regime within the

state, as Congress has regularly overridden the 20 percent limit with yearly provisions in the budget law (Rajevic 2018).

The only major civil service reform since the dictatorship was the creation in 2003 of a specific career track for top management positions that used to be chosen solely on trust. Since this reform, an open, competitive process preselects the top candidates, and the president chooses only among these, thus now combining trust with merit (Olavarría-Gambi and Dockendorff 2016). However, the implementation of this reform has been fraught, and studies have highlighted the high rotation of these positions, particularly when a new government comes in, partly frustrating the aspiration to create a more professionalized upper management (González-Bustamante et al. 2016; González-Bustamante 2020; Fraile 2018; Grindle 2012). Of the rest of the civil service, however, we know little. An important recent exception is Moya Díaz and Garrido (2022), who studied patronage in Chile through surveys and interviews. They concluded that patronage is far more prevalent in upper positions of the civil service: 60 percent of their interviewees thought that "nearly all" those positions were political, as opposed to 30 percent in middle levels and 10 percent in lower levels (Moya Díaz and Garrido 2022, 96–97).

## The Dataset: Data Wrangling, Characteristics, and Validation

As part of a drive for greater public transparency, since 2006 Chilean central government ministries and agencies have been mandated to publish online individualized information on their employees and their positions.[3] This includes employees' full name, qualifications (as free text), position description, gross salary, geographical location, administrative grade and rank, type of employment relationship, and dates of entry and exit, among others.[4] We downloaded, processed, and cleaned all available data to create this novel dataset for all public services between January 2006 and April 2020, except for those pertaining to the Ministry of Health.

### Cleaning and Record Linkage

The data were dispersed in hundreds of web pages and thousands of tables, often in different formats, making downloading them a major undertaking. We cleaned and standardized the data, as mistakes and inconsistencies were abundant. The greatest challenge was using bureaucrats' inconsistently written names to assign a unique identifier to each, to track them accurately over time. A semi-automated process using fuzzy matching, logical rules, and human supervision to correct mistakes yielded a sizable reduction in names. This was supplemented by joining names to the electoral register to confirm identities, resolve ambiguities, and extract individual genders. Our final estimate is that the data cover 323,695 distinct individuals (in 15.8 million rows), a 16 percent reduction from the set of cleaned names in the data, and a 29 percent reduction from the 457,688 unique "as-downloaded" names in the dataset.[5]

Figure 1.  Difference in Total Employees Between DIPRES and Our Data, by Year (percent)
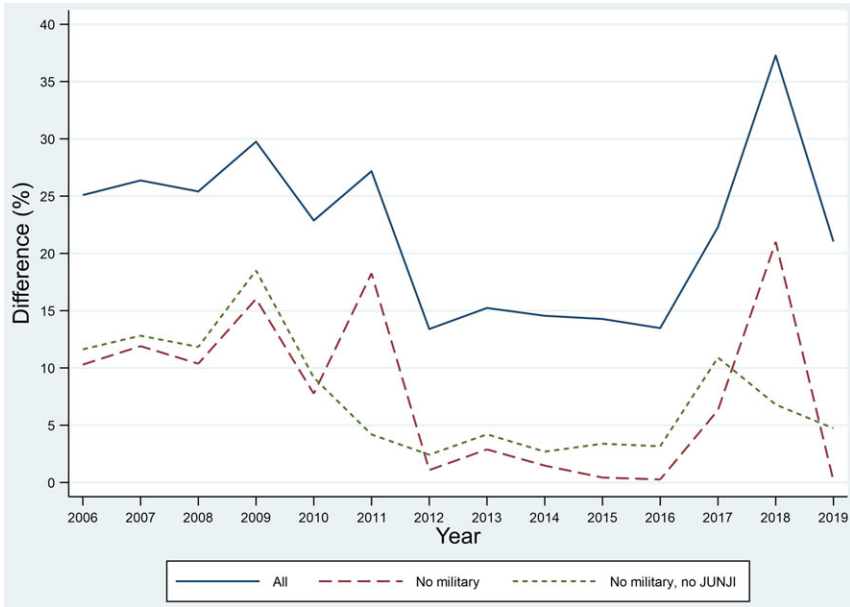


## Coverage and Quality of the Data

To assess how much we can trust this dataset, we validated it against official aggregate employment statistics published by the Budget Office (DIPRES). We used two separate DIPRES sources, one for the 2006–10 period (DIPRES 2011) and another for the 2011–19 period (DIPRES 2023). We found that the deficit in overall personnel varies between about 14 percent and 37 percent, depending on the year; however, the lion's share of this deficit is explained by just two large agencies, the prison guard service and (in 2011 and 2018 only) the nursery service (JUNJI), both of which are extremely large.[6] In figure 2, we report the percentage of personnel missing in total, once we eliminate the prison guard service and other smaller military institutions with incomplete data, and when, in addition to that, we eliminate JUNJI. Without military institutions, missing personnel drops to between 0 percent and 20 percent. If we also eliminate JUNJI, deficits range between 3 percent and 18 percent; after 2010, the highest deficit is 10 percent (see figure 1).

    These final results are largely explained by agency coverage: in the first three years (2006–8), about 16 to 18 percent of agencies did not report data, but by 2013, we have data for 94 percent of them, and in fact in every year from 2010 on, coverage is above 90 percent (see figure A5 in online annex 2).

    Perhaps the most important point is about the quality of the data we do have. To investigate this, we compared our estimates of (permanent and yearly) personnel to the

Figure 2.  Total of Employees by Agency/Year, DIPRES vs. Our Data
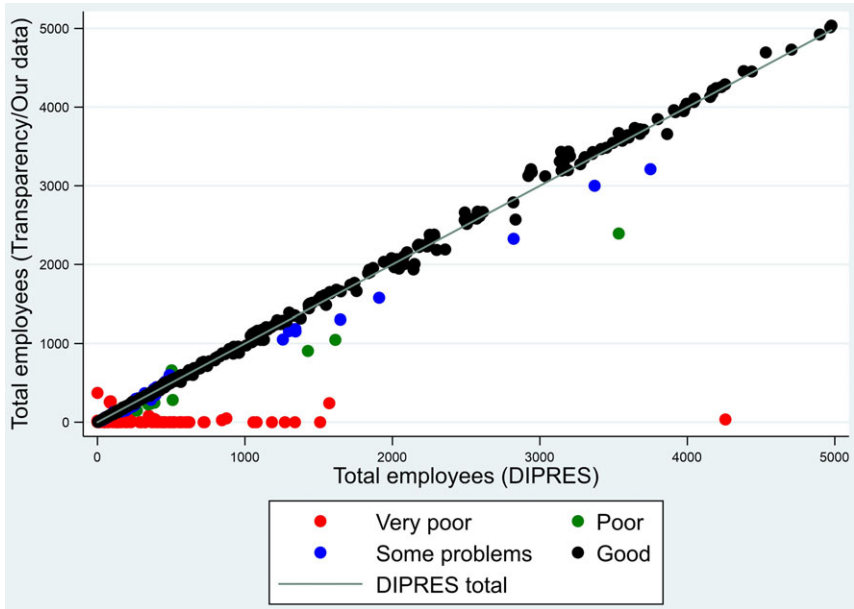


Note: Scatterplots of the Budget Office's estimates of employees in each agency/year against the same estimates derived from our data. Only agency/years with up to five thousand employees in the x axis (which are nearly all) are shown. For a plot covering all agencies, see figure A7 in online annex 2.

DIPRES figures.[7] We calculated the percentage of deviation of our data from DIPRES data for each agency/year for which both sources have at least some data. We then classified each agency/year as "Good" if the deviation was within +/–10 percent of the DIPRES number, as with "Some problems" if the deviation was between 10 and 30 percent, as "Poor" if it was between 30 percent and 50 percent, and as "Very poor" if the deviation was over 50 percent.

Our results show that 85 percent of data points are "Good" for 2006–10, and this rises to 89 percent for the 2011–19 period; the "Very poor" data are 4 percent or less in each period. In figure 2 we report scatterplots of DIPRES and our data for each agency/year in the 2011–19 period (including missing agencies), but leaving out the largest agencies for ease of visualization of deviations from the diagonal line. We color-coded the data according to the categories above. As can be seen, most points are very close to the diagonal. It also means that the name-matching procedure utilized was crucial for this, as without it, our data would have included 16 percent to 30 percent more (spurious) identities. Red points, representing large deviations, correspond mostly to cases in which Transparency has missing data, and are laid out along the x axis.

Thus, we conclude that our data are highly accurate for the overwhelming majority of agency/years, but one should be cautious in drawing conclusions for the

Figure 3. Distribution of Employment Regime by Year (percent)
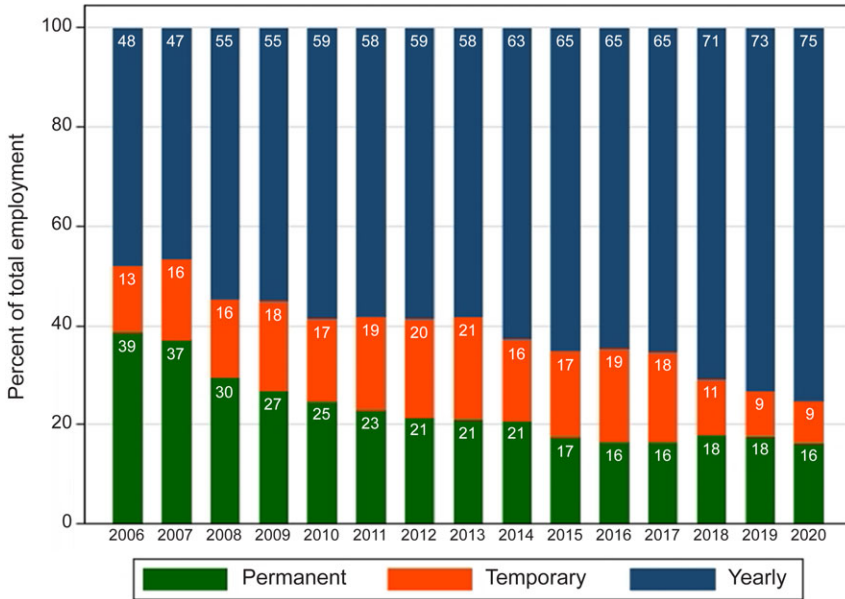
state as a whole if there is reason to believe they might be materially affected by the agency/years for which data are missing, such as military institutions.[8]

## RESULTS AND FINDINGS

In what follows, we present our main findings, organized along the three dimensions of career stability and progression, professionalization, and agency heterogeneity.

### Career stability and progression

*Descriptive finding #1. Though the permanent contract has severely declined, people hired on yearly contracts have only slightly lower job stability, and political cycles do not have great impact on either contract modality—even if they do have a small effect on overall turnover.*

Using aggregate data, previous studies have noted the increasing dominance of the yearly contract regime over the permanent contract (Alberts et al. 2021; Centro de Estudios Públicos et al. 2018). Recent rulings by the Chilean Supreme Court have given some degree of protection to yearly workers (Rajevic 2018, 410), but their *de jure* status is clearly inferior. This shrinking of the permanent contract employment

Figure 4.  Turnover Rates by Contract Type and Year (with 95 percent confidence intervals)
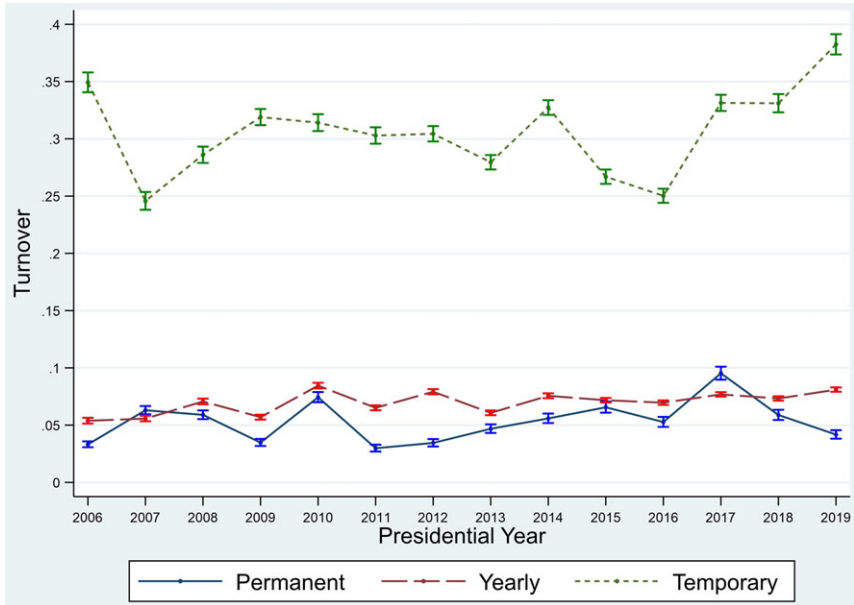


Note: Data include all agencies that have full data (see online annex 6), excluding the statistics agency (see figure A4 in annex 1 for an explanation of this exclusion). "Presidential year" is defined in the text. Managerial positions are excluded.

regime has amounted to the "destruction" of the civil service career model enshrined in the 1989 law, according to a leading authority (Rajevic 2018, 408). In figure 3, we plot the yearly evolution of all three employment regimes.[9] The growing dominance of the yearly contract is stark, as is the shrinking of permanent positions. Temporary jobs grew until the mid-2010s, then diminished quickly as many were converted to yearly contracts. We thus confirm that the standard civil service career path is now relatively marginal within the state.

Though this *de jure* aspect is undoubtedly important, we still want to know whether individuals on yearly contracts experience lower job stability, are more politically exposed, or have less projection in their careers. Previous studies have suggested that yearly workers' careers are just as stable as permanent staff (Alberts et al. 2021), though without providing evidence. Aggregate turnover data (for permanent and yearly staff taken together) do not suggest that turnover is affected by political turnover cycles in government (Centro de Estudios Públicos et al. 2018, 14).

To tackle these questions, in figure 4 we first show turnover data by year, separated by employment regime; we include all workers except managers (virtually none of whom have yearly contracts, thus potentially biasing the comparison).[10]

As expected, the temporary category exhibits a much higher turnover than the other two regimes, which are very similar. Yearly turnover averages 5.3 percent for permanent contracts and 7 percent for yearly ones, compared to almost 31 percent for temporary contracts. Therefore, the long-term replacement of the permanent modality by the yearly one does not seem to have implied significantly higher turnover, as the difference between them has been substantively small. Significantly, a combined yearly turnover rate of slightly over 6 percent is virtually identical to the average turnover of the federal civil service in the United States (Bolton et al. 2021). Though this does not mean that people under yearly contracts are in the same situation or face identical incentives to tenured employees on permanent contracts (they may, for instance, feel more pressured to comply with specific instructions, political or otherwise), it does at least suggest that differences are not so great as to translate into greater instability or politicization of yearly workers.

Indeed, figure 4 also allows us to see if there is any indication of political cycles in turnover. To measure more precisely, instead of the usual calendar years, we measure turnover by "presidential year," beginning in March of each year and ending in February of the next. Changes in government occurred in March 2006, 2010, 2014, and 2018. Only the first of these changes occurred between two governments of the same (center-left) coalition, with the other three being shifts from the center-left to the center-right (2010, 2018) or vice versa (2014). As per previous findings, however, we do not see systematic evidence of political cycles in turnover for any contract type.

This is perhaps puzzling, considering that 49 percent of bureaucrats surveyed by Schuster et al. (2017, 64) declare that government turnovers affect their job stability. To explore this in more depth, we look at permanent and yearly workers combined, this time including managers, in figure 5. However, we exclude JUNJI, which is by far the largest agency in our data and may hide tendencies present in the rest of the government.[11] We now find a clearer pattern in which, in the first year of a new government, there is a jump in employee turnover (whether voluntary or involuntary) of about 1.5 percentage points, or 20 to 25 percent more than in a "normal" year. We should note, in any case, that this analysis includes employment at all levels, and that therefore, larger political cycles could exist for particular positions, ranks, or agencies.

*Descriptive finding #2. Job stability varies very significantly according to rank.*
Overall careers seem to be largely stable, but is this true for all levels in the administrative hierarchy? One useful way to study these differences is through survival analysis. For our data, we define a job spell as a term of uninterrupted employment of person *A* in agency *Y*. If the individual switches to another agency, we count that as a separate job spell.[12] With this definition in place, we look in figure 6 at the Kaplan Meier survival graph for all job spells according to rank. What we find is that top positions are considerably more unstable than lower ones.

The variation among ranks is very large. Naturally, political authorities (such as ministers, undersecretaries, and regional delegates, among others) have the shortest lifespan, ending their job spells in 48 months at the latest, which is the length of a presidential cycle. But managerial positions are highly volatile, too: slightly over

Figure 5. Turnover Rates by Year, Without JUNJI (with 95 percent confidence intervals)



95% confidence intervals
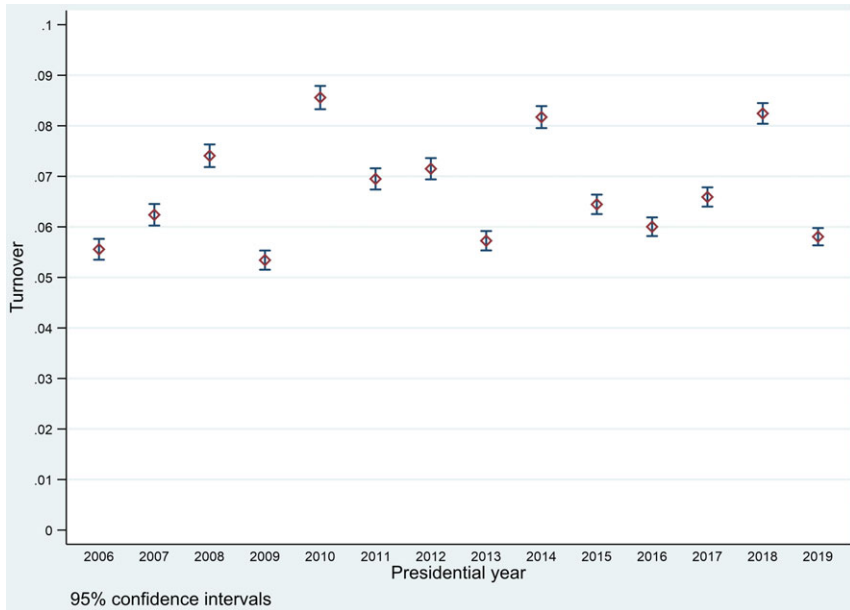
Note: Data include all ranks and all agencies with full data (see online annex 6), except JUNJI. Permanent and yearly contracts only.

50 percent leave their job within 48 months, and this suggests considerably more volatility in these positions than in the United States, where their turnover is only a few percentage points higher than the average (Bolton et al. 2021). This lower longevity is only partly explained by trust-based senior management positions (ADP), 50 percent of which have left in 3 years, according to González-Bustamante (2020). The next most short-lived rank is the professional rank (which is also the largest), where 50 percent of job spells last 90 months or less, or slightly less than 2 full governments. Administrative and technical jobs are more stable, with 50 percent of job spells ending after approximately three governments. Furthermore, the much smaller inspector rank —which only exists in 15 agencies in our data—is extremely stable. Since managers and professionals have the lowest survival rates, we can infer that stability is generally lower in the upper half of the hierarchy, and this may have consequences for the stability of public policies and organizational performance.

*Descriptive finding #3. Bureaucratic careers are stable to the point of immobility, with scant opportunities for advancement.*

Meritocratic bureaucracies offer opportunities for career advancement to those who perform well. These typically lie within the agency itself, as better positions become available, though they could also appear in other agencies. In this regard, a

Figure 6. Kaplan Meier Survival Estimates by Rank (2006–2020)
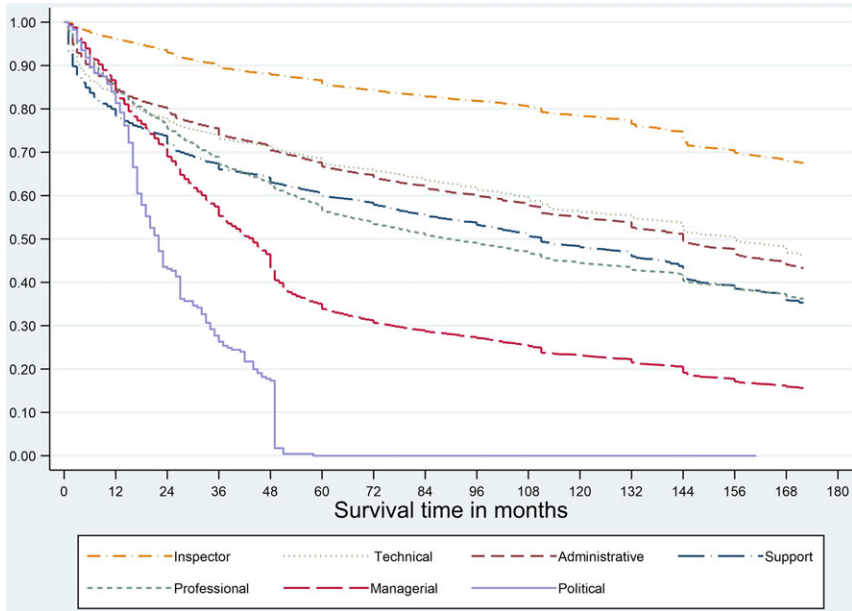


Note: Data include all agencies that have full data (see online annex 6).

large survey of Chilean central government bureaucrats (Schuster et al. 2017, 45–46) found that only 41 percent of employees agreed that they had "good opportunities" to advance their career within their agency, and 43 percent answered affirmatively regarding the state in general. What do our data suggest?

To answer this, we looked at how many job spells employees have had, how many agencies they have worked in, whether they changed employment regimes, and what typical grade advancement they achieved, whether within a single job spell or across job spells. We find substantial degrees of immobility on all counts.

First, there is substantial regime immobility. To see this, we classified job spells according to their initial and final employment regime (see table 1). We see that for all three regimes, over 80 percent of job spells began and ended under the same modality. When there was a change, it typically was toward the ever-growing yearly regime; thus, changes from permanent to yearly were more than three times more probable (conditional on the initial regime) than from yearly to permanent. Fourteen percent of temporary jobs moved on to a yearly contract, which suggests this is an avenue of improvement for some. However, stability in regimes dominates.

Second, over the 14-year period, 86 percent of employees registered just one job spell, and if we exclude job spells that were fully temporary from the calculation (meaning the job spell began and ended as temporary), this rises to 90 percent. This shows that people who come and go within the same agency (some of which might

Table 1. Initial and Final Contract Type, by Job Spell (totals and row percentages)

| Initial/Final | Permanent | Temporary | Yearly | Total |
|---|---|---|---|---|
| Permanent | 44,593 | 410 | 9,598 | 54,601 |
| (%) | 81.67 | 0.75 | 17.58 | 100 |
| Temporary | 1,113 | 158,392 | 25,876 | 185,381 |
| (%) | 0.6 | 85.44 | 13.96 | 100 |
| Yearly | 8,023 | 1,635 | 134,634 | 144,292 |
| (%) | 5.56 | 1.13 | 93.31 | 100 |
| Total | 53,729 | 160,437 | 170,108 | 384,274 |

Figure 7.  Percentage of Individuals with Only One Job Spell (Discounting All Fully Temporary Job Spells), by Rank
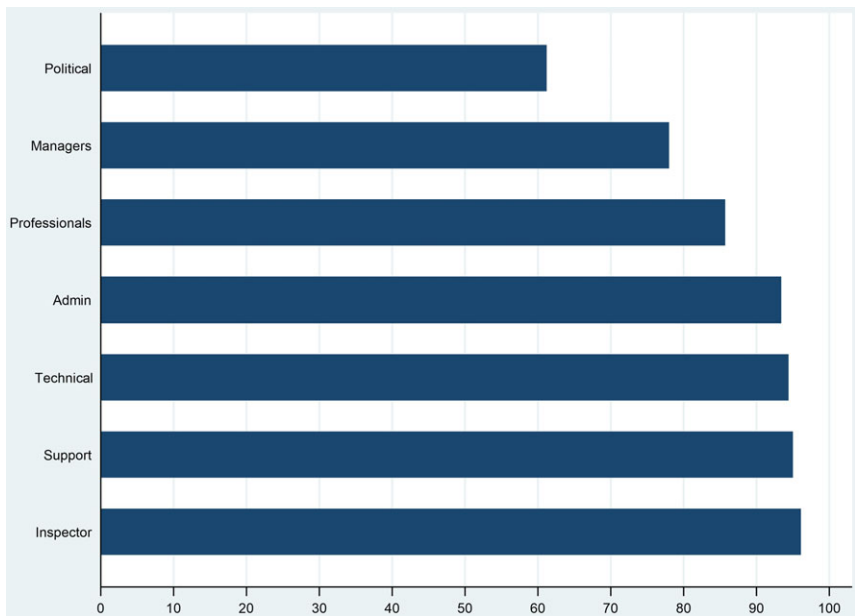


Note: Includes all agencies.

only work for a "friendly" government in two separate job spells; e.g., 2006–10 and 2014–18) are few. If we examine those rare cases that do have more than one (nontemporary) job spell, we find that it is the upper ranks that are likelier to be in that group (see figure 7).

Figure 8. Grade Progression by Length of Job Spell (in years)
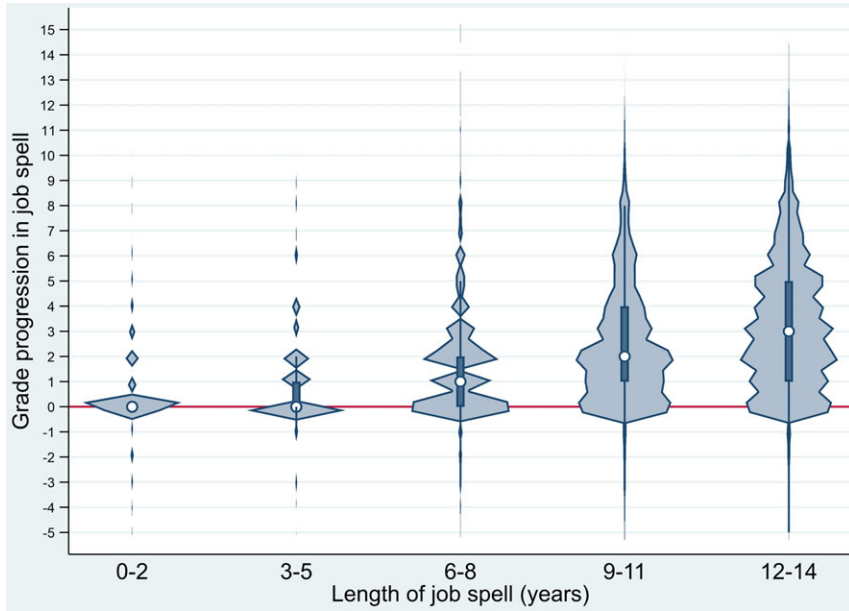


Note: Calculation includes all nontemporary job spells in agencies with full data (see online annex 6). For ease of visualization, 0.12 percent of observations were excluded.

Similarly, 89 percent worked for only one agency, and this rises to 93 percent if we exclude fully temporary job spells. These figures suggest very low sideways mobility: barely 7 percent of nontemporary workers have been employed, over the course of 14 years, in more than one agency—though, again, upper ranks are likelier to move sideways, with 12 percent of professionals and 19 percent of managers having worked in at least two agencies.

In addition, we looked at grade progression over job spells. Across all agencies for which we have full (2006–20) data, the median grade improvement was 0 for job spells and 0 for individuals (which may have more than one job spell).[13] The respective averages were 1.36 and 1.59. Considering that (for instance) professional grades range approximately from grade 18 to grade 4, a one-grade improvement is marginal indeed. Unsurprisingly, longer job spells had more grade progression, as can be seen in figure 8. Thus, for job spells that lasted 12 years or longer, the median grade progression was 3 grades. Within the 16 percent of individuals who climbed 4 or more grades within a single nontemporary job spell, the lower ranks—particularly the administrative—are heavily overrepresented; this makes sense, since they begin from a lower (numerically higher) grade, so have more room for advancement (see figure A10 in online annex 4). In contrast, 92 percent of professional job spells advanced 3 grades or fewer, and 64 percent did not advance at all.

Figure 9. Word Clouds of Most Frequent Professions, for Top Grades Only and for All Individuals



Note: Includes all agencies.

Overall, therefore, most people do not switch between employment regimes or agencies, and progress through the hierarchy within the same agency is mostly marginal. We conclude that meritocratic advancement opportunities, whether horizontal or vertical, are more the exception than the rule. However, significant grade progression is relatively likelier for lower ranks, while job switching is likelier for upper ones.

**Professionalization**

*Descriptive finding #4. The higher positions in the state are dominated by the same elite professions as the higher positions in the private sector—but they are combined with sector-specific expertise.*

Meritocratic bureaucracies select on "merit," usually meaning (at the very least) having the required educational credentials for a job. Since modern states perform a wide range of highly differentiated functions, they require significant technical and professional expertise to be performed successfully (Fukuyama 2013). They also need managerial skills to run large organizations. However, measuring the level and kinds of human capital a state possesses is hard, as this requires access to individual-level qualifications. Even then, we typically know only whether a person holds (for example) a university degree or not; however, not all degrees are equal. Our data in this sense are novel in that they include free text in which each bureaucrat's qualifications must be specified. We have codified keywords in the free text to extract professions -or job qualifications.[14] Though not perfect, these keywords provide a powerful first approximation to describing the state's human capital, allowing us to capture richer information about the kind of qualifications (e.g., lawyer, engineer) people hold.[15]

Table 2. Most Frequent Professions in Top Grades

| Profession | Frequency | % | % (Acc.) |
|---|---|---|---|
| Lawyer | 2,772 | 20.15 | 20.15 |
| Business Admin/Economist | 1,952 | 14.19 | 34.34 |
| Other Civil Engineers | 1,617 | 11.76 | 46.10 |
| Industrial Civil Engineers | 949 | 6.90 | 53.00 |
| Public Administration | 844 | 6.14 | 59.13 |
| Accountant | 576 | 4.19 | 63.32 |
| Teacher | 546 | 3.97 | 67.29 |
| Architect | 482 | 3.50 | 70.80 |
| Journalist | 479 | 3.48 | 74.28 |
| Agronomist | 290 | 2.11 | 76.39 |

We first show word clouds for the most frequent qualifications in the top four grades (figure 9a) and for all positions, including temporary personnel (figure 9a/b). Lawyers (*abogados*) are predominant in both, along with other professions, such as pedagogy (teachers), civil engineering, and so forth. However, in figure 9a/b, covering the full spectrum of positions, we see nonprofessional qualifications such as mere "experience" and high school diplomas (*educación media*).

In a meritocratic bureaucracy, we would expect the top positions in the state to be occupied by the most qualified people. In this context, this would mean that individuals possessing the most prestigious degrees would be particularly prevalent at the top. Interestingly, using university admission test scores, Zimmerman (2019) classifies law, civil engineering, and business administration/economics (in Chile the two are studied together as *ingeniería comercial*) as the three most prestigious professions and those that are most likely to lead, together with other conditions, to a position on the most important company boards. Law and business/economics are also considered the most prestigious professions in studies that examine ministerial careers in Chile (González-Bustamante and Olivares 2016).

What is the distribution in the top positions of government? We focus on the roughly 3 percent of top positions of the state that are grade 4 or higher (and not political authorities). Grades 1 to 3 are managerial only, while grade 4 is about one-third managerial positions and two-thirds very top professional ones. In table 2 we see a frequency table for the top ten professions in that bracket, as measured once yearly between 2016 and 2020. What we find is a very high concentration from just three professions, which together dominate the top echelons of the state: lawyers (20 percent), civil engineers—industrial or otherwise—(19 percent), and business managers/economists (14 percent). Together, these three professions occupy a remarkable 53 percent of all top positions. They are followed at some distance by

public administrators (6 percent), who are specifically trained for general-purpose jobs in the public sector; but that is not as socially prestigious a profession as the previous three. We can therefore confirm that those three professions' dominance extends also to the public sector. We also take this to be a sign of meritocracy, as lawyers are fundamental to government and are the most prestigious nonmathematical profession, while business and engineering provide valuable numerical and managerial skills that are essential for top positions.

Interestingly, however, other professions that have sector-relevant expertise occupy top positions in the related agencies and ministries. As can be seen in table 3, accountants are the most prevalent profession in the top positions of the Tax Agency, as are architects in the Housing Ministry, civil engineers in the Public Works Ministry, teachers in the Education Ministry, and agronomists in the Ministry of Agriculture. Economists, for their part, strongly dominate the Budget Office and lawyers are preponderant in the Ministry of Internal Affairs. Thus, what we see is a mixture in which the top positions in the state combine a strong presence of the three "prestigious" professions that also dominate the private sector, with the specific sector-relevant skills of other professions. Again, this suggests that professional expertise is highly valued for top positions in the bureaucracy, and that selection on merit is taking place. Notably, this is occurring in both specialized agencies, such as the Tax and Budget Offices, and in ministries.

## Agency Heterogeneity

*Descriptive finding #5. Job duration varies greatly between agencies, and (mostly) smaller agencies have noticeable spikes in turnover in the first year of a new government.*

In terms of longevity, we find substantive variation among agencies. In figure 10, we compute the Kaplan-Meier survival functions of employees of eight government agencies, chosen as illustrative of the full range of variation present in the data. Two institutions with very high job stability are the Tax Agency (SII) and the Aviation Authority (DGAC), where, after 172 months, almost 70 percent of staff were still at their jobs. The Ministry of Foreign Affairs (MINREL) also has moderately high stability. Then two institutions with middling survival rates are the National Service for Minors (SENAME) and the Civil Registry office (*Registro Civil*). These agencies have lost 50 percent of their staff after 108 to 132 months. Furthermore, three agencies with significantly lower survival rates are the Public Works Department (DGOP), which loses half its personnel in about 4 years, the regional and provincial presidential offices (GOBERNINTEND), and the Institute for Youth (INJUV), which lose half their personnel in just over 2 years.[16]

Moreover, we observe sharp jumps in turnover for many agencies during electoral years. To see this, in figure 11 we plot the average turnover for each agency in the first presidential year of an incoming administration (2006, 2010, 2014, and 2018) on the $y$ axis, and the average turnover in the remaining three years on the $x$ axis. We also plot two lines, one representing $y = x$ and another representing $y = 2x$. Thus, agencies that fall on or beneath the lower line ($y = x$) have an average turnover in the first year of a

Table 3. Most Frequent Professions in Top Grades, Selected Agencies

| Tax Agency | Budget Office | Housing Ministry | Internal Affairs Ministry | Public Works Ministry | Education Ministry | Ministry of Agriculture |
|---|---|---|---|---|---|---|
| Accountant (26%) | Business Admin/ Economist (63%) | Architect (27%) | Lawyer (46%) | Other Civil Engineer (17%) | Teacher (30%) | Agronomist (45%) |
| Lawyer (19%) | Public Administration (18%) | Lawyer (17%) | Public Administration (8%) | Lawyer (16%) | Lawyer (13%) | Veterinary (16%) |
| Industrial Civil Engineer (19%) | Industrial Civil Engineer (11%) | Business Admin/ Economist (12%) | Business Admin/ Economist (6%) | Business Admin/ Economist (11%) | Public Administration (8%) | Forestry (9%) |
| Business Admin/ Economist (11%) | Lawyer (4%) | Other Civil Engineer (10%) | Accountant (6%) | Architect (8%) | Business Admin/ Economist (6%) | Accountant (8%) |
| Public Administration (8%) | Other Civil Engineer (4%) | Industrial Civil Engineer (4%) | Journalist (5%) | Public Administration (7%) | Industrial Civil Engineer (5%) | Teacher (8%) |

Figure 10.  Kaplan-Meier Survival Estimates, Selected Agencies, 2006–2020
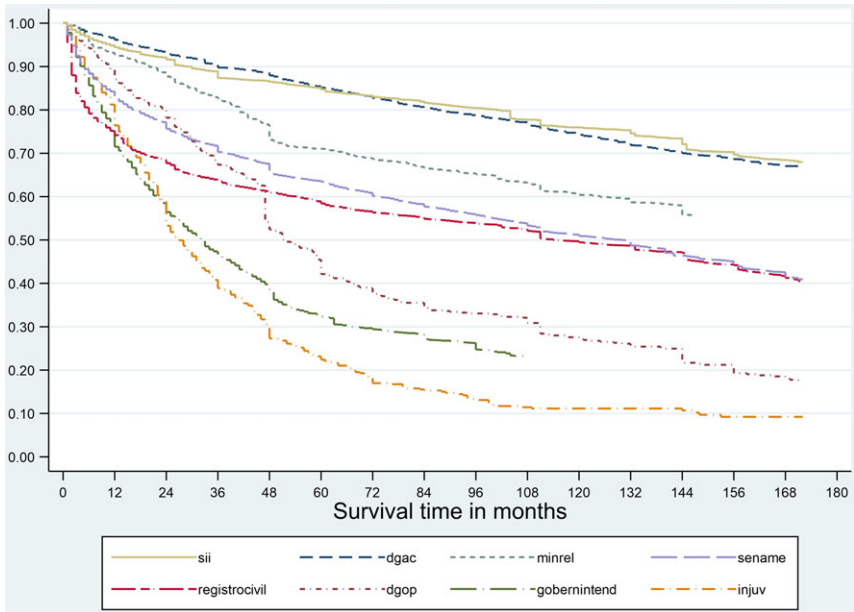


Note: Shorter lines correspond to agencies with fewer than 172 months of data.

new government that is lower or equal to their average turnover in years 2 to 4. On the other hand, agencies that fall above the upper line have an average first-year turnover that is more than twice their turnover in years 2 to 4. As can be seen, year 1 rotation is highly correlated to years 2–4 rotation, but we can also see that for most agencies the year 1 turnover is higher, and for a nontrivial number of agencies, much higher.

How do we reconcile this finding with the small electoral cycles found in figure 5? An important factor is that very large agencies are, on average, more stable than the rest. We can see this in figure 11, where agencies that between 2006 and 2019 had on average of more than one thousand workers (permanent and yearly only) are represented with a hollow circle. Almost all such agencies, including JUNJI—by far the largest and therefore the most influential—lie around or below the $y = x$ line, thus stabilizing turnover when calculated across individuals regardless of agency (as in figures 4 and 5). Therefore, we find that the overall numbers mask significant electoral cycles in many agencies, such as in the Youth Institute (INJUV), the Women's Service (SERNAMEG), the Indigenous Development Commission (CONADI), the Labor Ministry (SUBTRAB), agencies or ministries in the political core of government (PRESID, SEGPRES, SEGEGOB), and the Ministry of the Economy (SUBSECECONOMIA), among others, all of which lie above or near the $y = 2x$ line.

Figure 11.  Turnover by Agency, Year 1 of New Government vs Other Years



Note: Data include all agencies with full data (see online annex 6). Two agencies have two years of missing data. Presidential years (as defined in the text) are used.

*Descriptive finding #6. Some economics-related agencies are highly paid and have very low turnover, suggesting that they may be "islands of excellence."*

Following Fukuyama (2013), capable agencies are those that have well-qualified staff and adequate resources, while autonomous ones are those that do not suffer political interference. Autonomy is particularly important at managerial and upper professional levels, since (as we have seen) these are the most exposed jobs—and also the most influential for organizational direction and performance. In figure 12, we therefore plot the average 2010–19 wages for the top 8 grades only—a measure of an agency's relative ability to attract and retain highly qualified personnel—against turnover in this same group—a measure of autonomy. It is true that Bersch et al. (2017) use turnover as a measure of capacity, leaving autonomy for party membership only. However, high rotation may be due to political interference. It also allows those currently in power greater opportunities for staffing the agency with their own recruits. We therefore believe that turnover, particularly in these top positions where patronage is concentrated (Panizza et al. 2022), is a reasonable indicator of autonomy. Thus, if there are any "islands of excellence" in the Chilean state, we should expect them to be well paid and have low turnover—though these are probably necessary but not sufficient conditions for high performance.

Figure 12.  Average Wage and Average Turnover by Agency, Top 8 Grades Only



Note: Data include all agencies that have data beginning on or before January 2010 and ending on or after January 2020. Wages in nominal Chilean pesos. The *y* axis begins at 1,500,000 for better visualization. $N = 86$; four agencies have one or two years of missing data.

We do see such a cluster in the upper left-hand corner of figure 12. Consistent with the literature, these are mainly superintendencies or agencies related to economic functions, such as the Budget Authority (DIPRES), the electricity regulator (SEC), the Pension Regulator (SP), the Tax Agency (SII), the financial regulator (CMF), and the Customs Agency (*aduana*), among others. These agencies, for the most part, correspond to those that are on the supervisory wage scale, as they are in charge of oversight functions (Pardo and Orellana 2009, 508). The only noneconomic agency in this cluster is the Public Defender's Office (DPP). Below this group, we see a dense cloud where most agencies lie, at fairly low levels of turnover (on or below 15 percent) and lower salaries. A third cluster has slightly higher wages than the second cluster, but higher turnover. This group has a high prevalence of ministries, together with the Youth and the Women's Agencies. Save for the Ministry of Finance (*hacienda*) and the public procurement agency (CHILECOMPRA), we do not see high-wage, high-rotation cases.

Overall, we see that these differences between agencies have structure, with different kinds of agencies situated at distinct places on the graph. These differences make political sense: ministries and undersecretary positions tend to have less autonomy because they are part of the political command structure of a government, led by political authorities (undersecretaries and ministers). Nevertheless, high turnover in

them seems to go considerably beyond the trust-based managerial positions, including significant rotation in the top professional positions (grades 4 to 8).

For their part, regulatory agencies are meant to be highly qualified, neutral, and politically independent. However, it is remarkable that agencies such as the Pension Regulator (SP), the Financial Regulator (CMF), and the Insolvency Regulator (SUPERIR) have low turnover, because *all* their positions are based on trust alone (Pardo and Orellana 2009, 496). Yet they behave nonetheless on par with similar institutions under standard public sector employment laws. It is also notable that the Tax and Budget Agencies exhibit significant autonomy and seem to be staffed as neutrally as supervisory agencies, despite being crucial to any government's political projects. On the other hand, places such as the Youth Institute (INJUV) seem to be where patronage can be dispensed more freely.

## DISCUSSION AND CONCLUSIONS

The preceding analysis suggests that the Chilean bureaucracy seems to lie closer to the Weberian meritocratic ideal type than to patrimonial or politicized models of the bureaucracy. Its career paths show significant stability, regardless of whether workers are on a permanent or yearly contract; in fact, they are similar to the US federal civil service. Political cycles have, at most, a small effect on aggregate turnover, suggesting that most personnel are not subject to one of the most obvious consequences of politicization. The state's top positions are staffed mostly by highly qualified professionals with the most prestigious degrees, paralleling the private sector. At the agency level, these prestigious professions coexist with sector-specific ones, suggesting that top personnel are selected (at least to a significant degree) for their expertise.

On the other hand, the Chilean state seems to be less than fully developed in the Weberian sense. Career paths are largely static, suggesting a lack of a strong career civil service track and low incentives for high performance. However, there is some horizontal mobility in the professional and managerial ranks, resembling (to a modest degree) more open managerial bureaucracies. Job stability is considerable for lower ranks, but managerial positions are short-lived, creating instability at the top and thereby undermining bureaucratic autonomy. Individual agencies are highly heterogeneous, with some being more unstable or impacted by the political cycle. These differences, along with wage differences, suggest a highly diversified map of agencies in which stability, professionalization, and lack of patronage are not evenly distributed across organizations.

Furthermore, despite the de facto stability of yearly positions, their *de jure* position is weaker (though not entirely unprotected), and an administration determined to restaff the civil service might make things difficult for yearly workers. A survey shows that only 29 percent of bureaucrats believe that it would be difficult to remove them from the public sector (Schuster et al. 2017, 63). However, this lack of full civil service protections is not necessarily inimical to meritocracy and performance, and has arguably moved Chile from a closed Weberian model to a more open, managerial one (Dahlström and Lapuente 2017). The balance between protecting the

civil service from politicization and incentivizing flexibility and performance is difficult, but at the very least we can say that the long-term growth of the yearly regime does not seem—thus far—to have resulted in instability or large-scale patronage.

These results highlight the importance and limits of *de jure* institutions in shaping behavior, as well as the relevance of politics. Public bureaucracies would be thought to be tightly shaped by formal law, but this is only partially true. The law does determine some behaviors, such as higher wages for agencies on the supervisory scale. However, other laws seem irrelevant, such as the 20 percent cap on yearly contracts, which Congress regularly overrides through budget amendments, in a move of dubious constitutionality (Rajevic 2018, 413) that could perhaps be considered a legalistic form of "noncompliance" (Brinks et al. 2020). Perhaps more surprisingly, agencies with special employment laws designating all positions as trust-based (such as the Pension Regulator) are not more unstable or exposed to political cycles. Moreover, the large variability in turnover between agencies, most based on the same standard employment rules (e. g., the Budget Office and the Youth Institute), suggests that turnover is the product of political equilibria, with some institutions regarded by different governments as outside interference and others considered "fair game" for personnel rotation.

All in all, our study confirms some facts we knew from the literature, such as the increasing dominance of the yearly regime, the perception that the civil service offers few possibilities for advancement, and that agencies vary widely in their personnel management practices (Schuster et al. 2017). However, we have provided novel quantification of these phenomena. Our study has also revealed some original findings, such as the existence of a small political cycle in employment, the structure of professions within the state, and the difference in stability of employment among different ranks. We have also produced mappings of agencies along crucial dimensions, such as wages and turnover, none of which have, to our knowledge, been known or assessed in the literature.

We believe that these descriptive findings advance our empirical knowledge of Latin American bureaucracies (and beyond) by quantifying important bureaucratic indicators related to personnel characteristics and career dynamics. These results also can set a comparative benchmark to study other bureaucracies in the region. Given that Chile is thought to be a relatively Weberian case in Latin America, we would expect higher turnover rates and lower professionalization in most other cases, though with "pockets of effectiveness" coexisting with more politicized agencies almost everywhere. Future research and more widespread data availability will be needed to determine if this is the case.

## ACKNOWLEDGMENTS

## Supplementary material

To view supplementary material for this article, please visit https://doi.org/10.1017/lap.2023.41

## Notes

1. We use "rotation" and "turnover" as synonyms in what follows.

2. See figure A8 in annex 3 to see how grades are distributed according to rank.

3. By presidential directive in 2006, and by law since 2009.

4. It is important to note that not all these fields were required from the start. For instance, information on wages is available for most services only from 2010–11 on.

5. For a more detailed explanation of the process of data downloading, cleaning, and record linkage, see annex 1 online.

6. In fact, we have full data for this agency for November 2018 and January 2019, so the absence of December 2018—which is the month used by DIPRES to report its data—is not actually problematic.

7. We excluded temporary personnel because DIPRES (2011) does not report them for the 2006–10 period. For the 2011–19 period, our data are highly accurate for most agencies, though we register slightly more temporary employees than does DIPRES.

8. For a detailed analysis of the coverage and quality of the data, see annex 2 online.

9. In what follows, we use the expressions "contract regime," "employment regime," "contract type," and "contract modality" interchangeably.

10. Turnover (here and throughout) is measured as the percentage of job spells that ended in a given year as a proportion of all job spells active during that year.

11. This agency represents between 11 percent and 18 percent of all data in a given year. See annex 3 for the same graph but with JUNJI included.

12. See annex 1 for a detailed explanation of how job spells were created.

13. Progression in job spells was calculated as "Grade in first month of job spell" minus "Grade in last month of job spell" (excluding all job spells that began or ended as temporary). Progression for individuals was calculated as "Grade in first month of first job spell" minus "Grade in last month of last job spell." Substantively similar results are obtained if we use minimum and maximum grades across job spells and individuals, but these are slightly misleading, as they eliminate negative values and are more sensitive to errors in the data.

14. See annex 1 for a brief explanation of this procedure.

15. The quality of this data improves over time, and from 2012 on we have a nonmissing qualification for 98 percent of individuals each year.

16. These agencies disappeared after a reform that came into effect in 2021.

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## SUPPORTING INFORMATION

Additional supporting materials may be found with the online version of this article on the publisher's website: Appendix.