Policies Make Politicians: Intermediaries, State Benefits, and Political Entrepreneurship in Brazil

Appendix

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1 Overissuing of DAPs

In the main text, we present maps that estimate the rate at which DAPs were overissued in the Northeast region. This analysis is based on data from the rural censuses conducted by the Brazilian Institute of Geography and Statistics (IBGE) in 2006 and 2017. We applied the criterion of maximum area of a property to identify the potential number of DAP-eligible properties in a municipality.[1] As a result, we could estimate for 2006 and 2017 the upper bound of potential DAP recipients in a municipality, assuming that the IBGE data provide a fair representation of existing rural properties in the country.[2]

Taking this estimated universe of potential DAP recipients in a municipality for 2006 and 2017 as denominators, we calculated the number of unique DAPs issued by EMATER agents (excluding renewals and DAPs issued by unions) between 2000–2006 and 2007–2020 to be used as numerators. This gives the ratio of DAPs issued to the maximum number of eligible properties.

2 Wages of City Councilors

In the main text, we discuss how EMATER agents being elected to the city council allows them to substantially increase their income because they are able to keep both jobs and combine salaries. To measure councilor salaries, we use Brazil's 2005 legislative census which has data for every municipality in the country—the most recent comprehensive source. For a comparable measure of EMATER salaries, we use the RAIS data for the year 2006. In Table 1 we show the average wage for each position in the 9 states of the Northeast region.

[1] According to eligibility criteria, DAP recipients cannot have properties larger than 4 "módulos fiscais." This unit was defined in by the National Institute for Colonization and Agrarian Reform (INCRA) in 1980 for each municipality in Brazil. The measure has not changed since then, so we can assume that the maximum area of eligible properties has been stable during the period analyzed.

[2] The IBGE adopts a fairly loose definition of rural property—any type of property whose production is to be commercialized or is an important source of food for its owners. As census enumerators do not have to apply strict income threshold criteria, this is a more encompassing definition than the one used by DAP issuers.

State	Mean Wage (City Councilor)	Mean Wage (EMATER agent)
Alagoas	R$1,713	R$617
Bahia	R$2,345	R$1,225
Ceará	R$2,299	R$547
Maranhão	R$1,737	R$876
Paraíba	R$1,1267	R$2,105
Pernambuco	R$2,390	R$923
Piauí	R$1,163	R$934
Rio Grande do Norte	R$1,335	R$638
Sergipe	R$2,026	R$2,333

Table 1: Mean Wage for City Councilors (2005) and EMATER Agents (2006)
Source: RAIS 2006 (for EMATER agents) and Bremaeker (2010). Mean wage is monthly wage.

3 Correlation Between DAP Issuance and Running for Office

In the main text, we show the correlation between changes in DAP issuance and in the probability of running for office. In Figure 1, we show the cross-sectional correlation between these two variables (i.e., levels rather than changes), which is similarly positive.

4 Alternative Specification

In the main text, we present results showing the effect of issuing DAPs on political entry using a conventional two-way fixed effects estimator. Given that running for office and winning election are binary variables, one might be concerned that the conditional expectation of number of DAPs and the fixed effects with respect to the outcome may be non-linear. A specification that allows for a

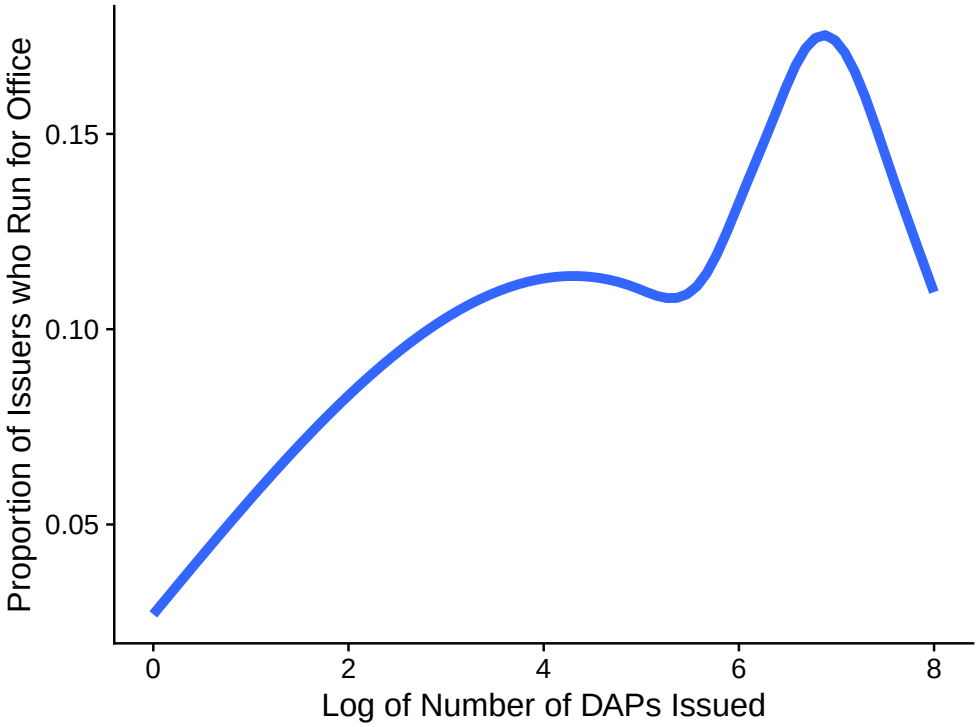

Figure 1: DAP Issuers and Running for Office. Blue line is estimated using a penalized cubic regression spline smoother and shows the correlation between number of DAPs issued and the probability of running for political office.

non-linear functional form and the use of fixed effects is the Poisson regression model (Wooldridge, 2010, p. 724). As shown in Table 2, our results are robust to this alternative specification.

	Candidate	Elected
Log DAPs Issued	0.0345**	0.0409+
	(0.0116)	(0.0217)
N	35.915	35.915
Issuer FE	X	X
Term FE	X	X

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Political Returns to Issuing DAPs: Time Series Evidence Using a Poisson Specification. Standard errors are clustered on DAP issuer.

One also might be concerned that the number of DAPs issued may influence the outcome in a non-linear fashion, which would make our linear specification inappropriate. To check for this possibility, we used a semi-parametric regression spline to examine the functional form of the

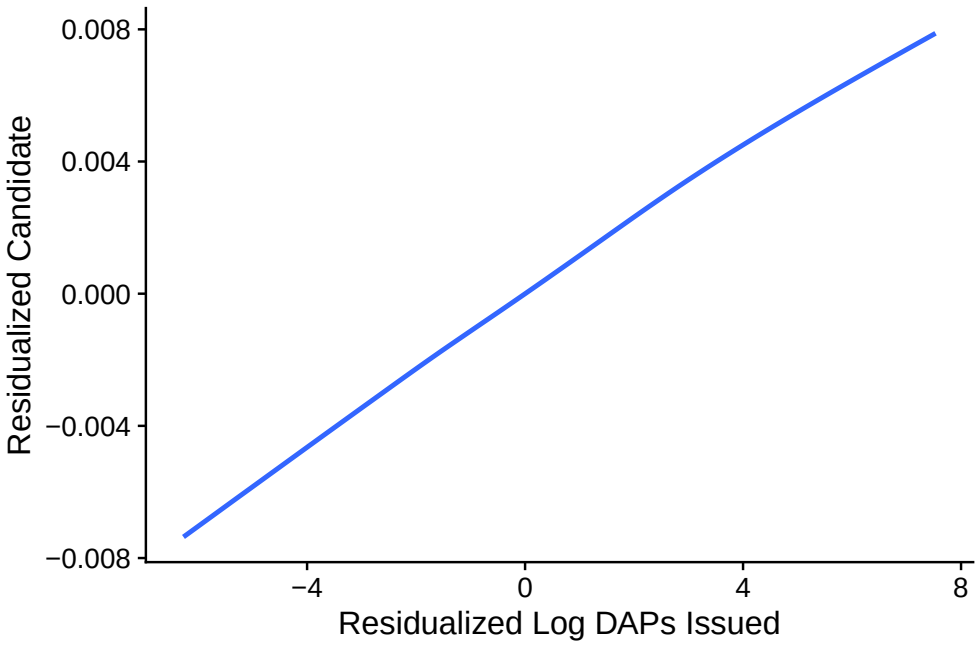

Figure 2: Relationship between Log DAPs and Candidacy after adjusting for Issuer and Term Fixed Effects. Blue line is estimate from a penalized regression spline.

relationship between the number of DAPs issued and the outcome, after accounting for the fixed effects. Specifically, we "residualized" the outcome and independent variables by regressing these variables on the two sets of fixed effects and then fit a penalized regression spline (using the `mgcv` package in `R`) on these residuals. The result of this procedure can be found in Figure 2. As shown by the plot, the relationship is linear.

5 Effect of Issuing DAPs Over Multiple Terms

We examine the effects of issuing DAPs on running for office over multiple terms. To do so, we estimate a dynamic fixed effect model that includes a coefficient for the contemporaneous effect of issuing DAPs and a coefficient for the effect of issuing DAPs in the previous term.

The issuer-level and issuer-municipal-level specifications are as follows:

$$y_{it} = \beta_1 \cdot \text{DAPs}_{it} + \beta_2 \cdot \text{DAPs}_{it-1} + \alpha_i + \delta_t + \epsilon_{it}$$

$$y_{mit} = \beta_1 \cdot \text{DAPs}_{mit} + \beta_2 \cdot \text{DAPs}_{mit-1} + \alpha_{mi} + \delta_{mt} + \epsilon_{mit}$$

In each of these models β_2 captures the effect of issuing DAPs in the previous term. The estimates of β_2 are shown in Table 3. In both specifications, both the contemporaneous and lagged effects are positive and significant. These results suggest that the effect of issuing DAPs on running for office is persistent over time.

	Issuer	Issuer-Municipal
Log DAPs Issued, t=0	0.0017**	0.0013***
	(0.0006)	(0.0003)
Log DAPs Issued, t-1	0.0023**	0.0008**
	(0.0008)	(0.0003)
N	28.732	121.732
Issuer FE	X	
Term FE	X	
Issuer x Municipality FE		X
Term x Municipality FE		X

+ p $<$ 0.1, * p $<$ 0.05, ** p $<$ 0.01, *** p $<$ 0.001

Table 3: Effect of Issuing DAPs on Candidate Entry Over Two Election Cycles. The dependent variable is whether or not the EMATER agent runs for office. "Issuer" refers to "Issuer-level" models and "Issuer-Municipal" refers to "Issuer-Municipality-level" models. Coefficients are for both the effect in the immediate next election ("t=0") and the effect in the subsequent election ("t-1").

6 Comparing Bureaucrats on Background Characteristics

In the main text, we show that EMATER agents are much more likely to run for office than other bureaucrats, a difference we attribute to their discretion over policy benefits. One possible concern, however, is that differences in background characteristics, such as education levels, wages, and age account for these differences in the propensity to run for office, since socioeconomic status is highly correlated with becoming a candidate in Brazil.

Occupation	N	Median Wage	Median Start Year	% Permanent Contract	Median Age	% College Graduate	% Female
EMATER Agent	1,335	R$3,002.96	2005	93%	53	18%	9%
Agricultural Extension Agent	40,495	R$1,876.25	2011	70%	30	18%	10%
Bolsa Familia Interviewers	807	R$1,081.20	2018	35%	31	16%	72%
Health Agents	291,816	R$1,302.66	2007	79%	39	10%	72%
School Director	59,565	R$1,675.00	2009	54%	40	48%	79%
Social Security Administrators	11,539	R$8,649.27	1988	100%	51	50%	52%

Source: RAIS 2006-2019. Median wage is monthly wage.

Table 5: Background Characteristics of 6 Types of Bureaucrats

Table 5 compares each category of bureaucrat with respect to wage, starting year in the position, percentage with permanent contracts, age, percentage with a college degree, and gender, as measured in the RAIS data. In each pairwise comparison between EMATER agents and the other categories, there are differences, but the differences vary in size and direction. Despite the variation in these differences, EMATER agents consistently run for office at a higher rate than other bureaucrats.

Group	% Running for Office	n
Matched Sample	5.7%	1271
EMATER Agents	9.9%	1271

Table 7: Emater Agents versus Matched Sample on Propensity to Run for Office.

To address the possibility that these baseline differences drive the differences in propensity to enter politics, we conduct a matching exercise that matches each EMATER agent to a similar bureaucrat. Specifically, we first match exactly on gender, whether or not they had a permanent contract, and whether or not they had a college degree. We then calculate the Mahalanobis distance between each EMATER agent and other eligible bureaucrats and match them to the bureaucrat with the smallest distance. When we compare the propensity to run for office between EMATER agents and matched bureaucrats, we find that the difference is still large at about 5 percentage points, which is about 70% of the baseline. The results of this exercise are shown in Table 7.

7 Effect of Winning on Issuing DAPs

To examine the effect of an EMATER agent winning office on the number of DAPs issued in the municipality they ran in, we estimate the following two-way fixed effect model:

$$y_{it} = \beta_1 \cdot \text{elected} + \alpha_i + \delta_t + \epsilon_{it}$$

where y_{it} is the number of DAPs issued in municipality i in term t, elected is a dummy variable that

	Own DAPs	All DAPs	EMATER DAPs
Elected	-0.0799	0.1451	0.0865
	(0.2416)	(0.2845)	(0.2804)
N	634	634	634
Term FE	X	X	X
Issuer x Municipality FE	X	X	X

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 8: Effect of Winning Office on DAPs Issued in the Municipality. The dependent variable is the number of DAPs issued by the winning EMATER agent ("Own DAPs"), all DAPs issued in the municipality ("All DAPs"), or all DAPs issued by EMATER agents ("EMATER DAPs"). Standard errors are clustered on the municipality.

equals one if the EMATER agent won the prior election and zero otherwise, α_i is a municipality fixed effect, and δ_t is a term fixed effect. We estimate this model with three versions of the outcome: the number of DAPs issued by the EMATER agent running for office, all DAPs issued in the municipality (including by unions), and all DAPs issued by EMATER agents (including those who did not run for office).

The results of this model are shown in Table 8. While the models provide some evidence that winning office leads to fewer DAPs issued by the winning agent, the effect is not statistically significant. When examining DAPs issued by any agent or by unions, we find positive coefficients that are statistically insignificant. The results suggest that winning office does not typically change the number of DAPs issued in the municipality.

References

Bremaeker, François E. J. de. 2010. "Remuneração dos Vereadores e Jornada de Trabalho." Salvador, BA, Brazil: Observatório de Informações Municipais.

Wooldridge, Jeffrey M. 2010. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.