Supplementary Material for

Reward or Punishment? The Distribution of Life-Cycle Returns to Political Office Political Science Research & Methods

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A Danish national elections and measurement of electoral closeness

The Danish national parliament has one chamber, Folketinget. It has 179 members, of which 175 are elected in the Danish principal country, while two are elected in Greenland and two on the Faroe Islands. We only have election data on candidates in Denmark and administrative data for people residing in Denmark, so we study only those who run for a seat in the Danish principal country.

The electoral system is a two-tier system, as seat allocation takes place at two levels. The initial allocation takes place in lower-tier of the 10 multi-member constituencies, *storkredse*, where 135 seats are allocated among the competing parties as consituency seats, *kreds-mandater*, based on the party votes using the D'Hondt method. The remaining 40 seats are allocated in the upper-tier as compensatory seats (*tillægsmandater*) based on the party votes in the three electoral provinces, *landsdele*, each of which consist of numerous electoral districts (Elklit, Pade and Nyholm Miller 2011).

As a voter you can vote either for a party or personally for a single political candidate, where the latter implies voting for the party that the candidate represent when seats are allocated in the process described above. A personal vote will then – in parties with an open party list – help the candidate in the intra-party competition in winning one of the seats allocated to the party. In closed-list structures, parties prioritize their candidates, which pre-empts internal competition and essentially makes the personal votes worthless in terms of what candidates end up serving. However, in Denmark the open-list structure has been prevalent in most of the parties for decades, and since the election in 2011 a closed-list structure has been used only by the Red-Green Alliance.

The Prime Minister in office decides when to call an election. However it must be held no later than four years after the previous election. As such, the timing of elections is not exogenously determined, and therefore the electoral periods vary in length. Our data cover the following national elections: 1990, 1994, 1998, 2001, 2005, 2007, 2011, 2015 and 2019.

Measuring electoral closeness

An example: Party A runs three candidates in constituency X in election year Y:

- Candidate 1 wins 1,000 votes
- Candidate 2 wins 550 votes
- Candidate 3 wins 450 votes

Assume that candidates 1 and 2 end up winning a seat. Then the party threshold is $\frac{550+450}{2} = 500$. In absolute votes the candidates distances to the threshold is 500 (candidate 1), 50 (candidate 2) and 50 (candidate 3). Their distances relative to the threshold is then 1, 0.1 and 0.1 respectively.

The distribution of relative scores in the candidate pool is a distribution of electoral closeness. The lower a candidate is placed in the distribution, the closer is the candidate to his/her party-constituency-year threshold. Thus, the lower the fractile in which a candidate is placed, in this distribution, the more narrowly did the candidate lose or win their seat.

Figure A.1 shows the distribution of electoral closeness for first time running candidates. The candidates to the left of the dashed line are first time running candidates who competed in the 20% most competitive elections and hence the candidates who comprise our sample. Note that the reason why the distribution contains so few "clear winners" is precisely because we look at first time runners who rarely win by a landslide.

Figure A.1: The distribution of fractiles of relative scores (closeness of race) for first-time running candidates from parties with open-lists.



Note: The relative score is partitioned into 25 fractiles, indicating what twenty-fifth of electoral closeness a candidates' race was. The smaller the value, the more competitive was a candidate's election. Candidates to the left of the dashed line are included in our sample.

B Sample characteristics

In Figure B.1, we show the distribution of our variable for electoral closeness for our sample across all elections. In the figure, we have flipped the value for the losing candidates around zero, which means that losing candidates are assigned the negative value of the electoral closeness measure. Evidently, the distribution is right skewed because most candidates are far from competitive while few first-time candidates do extremely well. For our main results, we include only candidates between the two dashed lines. Table B.1 shows the number of marginally winning and losing first-time runners in our sample for each election year.





Note: The relative score is partitioned into 25 fractiles, indicating what twenty-fifth of electoral closeness a candidate's race was. For visual purposes, in this plot we have assigned negative values to losing candidates, i.e., their fractile as a negative value. The solid line expresses the threshold of winning and losing (zero), and the closer the value is to zero, the more competitive was the candidate's race. Candidates between the two dashed lines are the candidates included in our sample.

Losers Winners Total Election (treatment) (control) candidates year Total

Table B.1: Number of marginally winning and losing first-time running candidates from openlist parties in each year

C Copula stability assumption

To assess the copula stability assumption we use Kendall's τ to estimate the association between two variables of the candidates, 1) their lagged income, i.e., income in the previous year, $income_{i,t-1}$ and 2) their first difference income, i.e., income change from the previous year to the present year, $\Delta income_{i,t} = income_{i,t} - income_{i,t-1}$. This will express the association between candidates' placement in the income distribution and their income development. As Kendall's τ is used to compare ordinal variables, this measurement of association is not vulnerable to extreme observations. Because the two variables by definition require a past year to be created, we only perform estimates from year t-5 to t-1.

Figure C.1 plots the estimates of Kendall's τ for the change in income and initial placement in the income distribution five years preceding the election for the winning and losing candidates. The 95% pointwise confidence intervals are bootstrapped with 1000 iterations. Kendall's τ varies very little in the five years leading up to the election and is thus stable over the time period. This indicates evidence in favor of the QTT estimator's assumption of copula stability (Callaway and Li 2019).





Note: 95% pointwise confidence intervals are computed using the empirical bootstrap with 1000 iterations.

D Pre-election variables

We show that our sample is balanced on a number of pre-treatment covariates in Table D.1.

We find no significant pre-treatment imbalances.

Variable	Losers	Winners	Difference	$P(Diff \neq 0)$
Woman	0.392	0.403	0.011	0.832
Age	39.246	39.992	0.746	0.587
Age^2	1654.7	1771.4	116.7	0.299
$Married_{t-1}$	0.558	0.532	-0.026	0.638
Earnings $_{t-1}$	$58,\!894$	59,563	669	0.875
Total income $_{t-1}$	$63,\!028$	62,550	-478	0.917
Average total $income_{t-4:t-1}$	60,069	$57,\!383$	-2,686	0.576
Mother's family's income %-tile _{$t-1$}	58.05	67.09	9.04	0.097
Right wing dummy	0.608	0.573	-0.035	0.514
Majority coalition dummy	0.500	0.524	0.024	0.663
Education dummies:				
Primary $school_{t-1}$	$0,\!125$	$0,\!121$	-0.004	0.912
High $school_{t-1}$	0.213	0.161	-0.052	0.229
Vocational $education_{t-1}$	0.188	0.185	-0.003	0.963
Medium-long $education_{t-1}$	0.258	0.306	0.048	0.340
Long education $_{t-1}$	0,217	0,226	0,009	0.843

 Table D.1: Balance test of pre-treatment variables

Note: Difference between pre-treatment variables for our sample of marginally elected first-time runners from open-list parties from 1994-2015. Prices in \in in 2015-prices.

Figure D.1 shows the average yearly total income for the candidates comprising our sample, i.e., the first time running candidates who marginally win or lose. The plots shows that in the four years before entering politics marginal winners and losers have similar incomes, on average.



Figure D.1: Candidates distributions of annual earnings and annual total income averaged over the years preceding the marginal candidates' first run.

Note: Based on our sample of first-time runners from open-list parties who marginally won or lost. X-axis in $1000 \in$ in 2015-prices.

In Figure D.2, we test differences in income for future winners and losers between any two given years in the six years leading up to the election. This essentially mimics the situation if the election of winners had taken place in any pre-election year and compares it to any prior pre-election year. For both outcomes, the changes between winners and losers are inseparable for all years, which is strong evidence in favour of the parallel trends assumption, even without imposing restrictions on the functional form of the trends.





Note: Year-wise comparison of losers and winners annual earnings and annual total income in six years preceding first run. This test parallel trends in income of winners and losers in pre-election years with no assumptions of the trends' functional form. Income in \in in 2015-prices. 95% confidence intervals. Standard errors clustered at party-constituency-year level.

Figure D.3: Income distributions for winning and losing candidates before and after the first election for different subsets of candidates.

Note: Income distributions for our sample of marginally winning and losing first-time runners from open-list parties. Distributions made from candidates average annual earnings and average annual total income in six years preceding their first run (before election) and two years following their first run (after election). X-axis in $1000 \in$ in 2015-prices.

E The short-term returns to office

DiD estimates: Total income

In Table E.1, we show the estimated returns to office for total income in the two years following an election year with and without year-constituency-party fixed effects. Total income includes earnings, allowances and pension contributions.

	Total Income (2015€)		
	(1)	(2)	
Elected times Post Election (DiD)	70,273***	69,410***	
	(4,199)	(4,114)	
Post Election	10,470***	12,850***	
	(2,773)	(2,623)	
Elected	-2,536	1,615	
	(4,853)	(6,641)	
Constant	60,953***	25,334***	
	(3,240)	(6,315)	
Fixed effects for cluster?	NO	YES	
Candidate-years	$2,\!896$	2,896	
Candidates	365	365	

Table E.1: Short Run Average Returns to Office - Total income

Note: The DiD estimate expresses the immediate returns to office measured by the total income, meaning earnings including allowances and pension contributions over the first two years after the election year. Pre-election years covers the six years preceeding the election. Estimated without (1) and with (2) fixed effects for clusters of partyconstituency-year (k=231). Standard errors are clustered at the party-constituency-year level in both models.^{*}, ^{**}, and ^{***} indicate p < 0.1, < 0.05, and < 0.01, respectively.

It is worth pointing out that losing candidates also see their income increase, as evidenced by the both statistically and substantially significant coefficient on *Post Election* in Table E.1. We point to four potential mechanisms for this decrease: Firstly, as we can see from Figure 1, candidates are generally on an upwards income trajectory around the time they run for office for the first time. Secondly, Figure 1 also reveals that this upwards trajectory sees a drop in the year before the election, probably because candidates forego income to campaign. Such a drop should be temporary. Thirdly, the party might reward losing candidates who campaigned well with jobs in the party organization. Fourthly, losing candidates might be partially treated if they serve in Parliament for winning candidates who (temporarily) leave Parliament due to illness, leave, or pursuit of other career options.

The increase in losing candidates' income does not bias our estimate of the benefit from winning in a close election. The first three mechanisms would apply to the winning candidates too had they lost, while the last mechanism, the partial treatments of losers, has the reverse implication for the winners, meaning that some of them might not be fully treated. Consequently, the correct way to think of our estimate is to consider it as an intent-to-treat effect, where there is some non-compliance among both losing and winning candidates.

DiD estimates: Earnings

Some might argue that we should estimate returns to office without pensions because they are future windfall. They also come with some uncertainty since one is not guaranteed a long retirement to enjoy the returns from a beneficial pension scheme. Therefore, we also estimate the returns to office without employers' pension contributions in Table E.2. The DiD estimates in Table E.2 express the immediate returns to office measured by annual earnings excluding allowances and pension contributions over the first two years after the election year. Standard errors are clustered at party-constituency-year level.

When we estimate returns to office this way, they are $\in 26,461$ with a 95% CI of [18,692; 34,230], which corresponds to 46% of the winning candidates' pre-office income excluding their pension contributions. We also estimate these returns with and without fixed effects for party-constituency-year, and the results are very similar regardless of specification.

	Earnings (2015 euro)		
	(1)	(2)	
Elected times Post Election (DiD)	26,461***	25,732***	
	(3,962)	(3,920)	
Post Election	10,336***	12,408***	
	(2,592)	(2,522)	
Elected	-1,698	1,267	
	(4,524)	(6, 325)	
Constant	57,425***	25,284***	
	(2,936)	(6,040)	
Fixed effects for cluster?	NO	YES	
Candidate-years	2,896	$2,\!896$	
Candidates	365	365	

Table E.2: Short Run Average Returns to Office - Earnings

Note: The DiD estimate expresses the immediate returns to office measured as annual earnings, meaning that allowances and pension contributions are not included. This is done for the six years prior to and two years after the candidates' first run. Estimated without (1) and with (2) fixed effects for clusters of party-constituency-year (k=231). Standard errors are clustered at the party-constituency-year level in both models.*, **, and *** indicate p < 0.1, < 0.05, and < 0.01, respectively.

Alternative outcome: Disposable earnings

We also estimate the short-term returns in disposable income, that is after taxes are subtracted and without pension. We present these results in Table E.3, where the DiD estimates express the immediate returns to office measured by disposable earnings, that is after total taxes are subtracted and *excluding* pension contributions over the first two years after the election year. Standard errors are clustered at party-constituency-year level.

Table E.3: Short-term Average Returns to Office: Disposable Earnings (earnings after taxes)

	Disposable Earnings (2015 euro)	
	(1)	(2)
Elected times Post Election (DiD)	21,492***	21,257***
	(2,819)	(2,950)
Post Election	6,736***	7,821***
	(1,555)	(1,594)
Elected	$-3,\!495$	-1,201
	(2,828)	(3,480)
Constant	32,746***	18,057***
	(1,519)	(3,288)
Fixed effects for cluster?	NO	YES
Candidate-years	$2,\!896$	2,896
Candidates	365	365

Note: The DiD estimate expresses the immediate returns to office measured as annual total income minus total taxes *excluding* pension contributions in the six years prior to and two years after the candidates' first run. Estimated without (1) and with (2) fixed effects for clusters of party-constituency-year (k=231). Standard errors are clustered at the party-constituency-year level in both models.^{*}, ^{**}, and ^{***} indicate p < 0.1, < 0.05, and < 0.01, respectively.

When measured this way, the returns to office are $\in 21,492$ with a 95% CI of [15,964; 27,019]. These results too are robust to using fixed effects. On the face of it, the effect on the disposable income seems small compared to the effects on gross income with and without

pension. However, the baseline is also considerably smaller, and the increase corresponds to a 69% increase in disposable income.

Perks and tax free income

In this section, we want to check whether politicians receive or lose others sources of perks and non-taxable incomes. If they do, we should include this in our estimation to get a full picture of the returns to office. In Table E.4, we estimate the taxation value of perks and tax exempt income. We have data on perks going back to 1993 only, which means that we have only one pre-election year for candidates running in the election of 1994 compared to four pre-election years for all later candidates. We use the same strategy to estimate the DiD with four pre-election years and two post-election years, excluding the year of election and clustering standard errors at party-constituency-year level. Again, outcomes are estimated with and without fixed effects for party, constituency, and year. The DiD estimates reveal no substantial effects of winning office on perks or tax-excempted income. This confirms that politicians are not rewarded with other perks or non-taxable incomes.

	Dependent variable:			
	Perks (2015 \in)		Tax-free In	ncome (2015 \in)
	(1)	(2)	(3)	(4)
Elected times Post Election (DiD)	-52	-151	138	89
	(246)	(239)	(97)	(101)
Post Election	-8	141	-216^{***}	-204^{***}
	(188)	(183)	(76)	(78)
Elected	-202	-194	-415^{**}	-339
	(339)	(796)	(171)	(271)
Constant	913***	442	883***	367
	(255)	(773)	(130)	(269)
Fixed effects for cluster?	NO	YES	NO	YES
Candidate-years	2,595	2,595	2,896	2,896
Candidates	365	365	365	365

Table E.4: Tax-exempt allowances not covered by administrative measurements of perks and tax-free income

Note: The DiD estimates show that winning office does not change the administrative measurements of candidates' perks or tax-free income, when comparing the winners and losers six years prior to and two years after their first run. This holds with and without fixed effects for clusters of party-constituency-year (k=231). For every model, standard errors are clustered at the party-constituency-year level.*, **, and *** indicate p < 0.1, < 0.05, and < 0.01, respectively.

F Effect heterogeneity by covariates

The following present heterogeneous returns to office by age, gender, education level, and political party. Figure F.1 presents DiD estimates for the two outcomes of various subsets of our data. It includes dashed lines at zero and at the average DiD estimate for the sample (earnings: $\in 26,461$ and total income: $\in 70,273$).

Figure F.1: DiD estimates across sample covariates

Note: Standard errors clustered at the electorate-party-election year level. One dashed line at 0 and one dashed line indicates the average DiD effect for the full sample (earnings: $\in 26,461$ and total income: $\in 70,273$).

G Robustness to bandwidth selection

To test for the sensitivity of our results, we show two plots with different bandwidth value restrictions. As described in the research design, we subset to the candidates in the 20% closest elections. In Figure G.1, we assess the robustness of our choice of close election, by estimating the average returns in every bandwidth available to us. We start in a 4% bandwidth and progress in 4% increments. The standard errors are clustered at the level of treatment assignment in clusters of electorate-party-election year. The results show that our results are completely robust to other choices of bandwidth. This robustness also hold when adding fixed effects at the level of treatment assignment which is constituency-party-election year.

Note: The black estimates are the estimates from the main models. Standard errors clustered at the electorate-party-election year level.

H Long-term returns to office

To consider the returns to office over time – with no NPV calculation – we plot the average income difference between winners and losers for up to 20 years after their first run for office. We also plot the returns over time for each quartile of the income distribution.^{H.1} Figure H.1 shows how returns to office are strong on average in the first years after the election, but drop steadily until they become insignificantly different from zero after six years.

Figure H.1 also shows that for candidates from the first, second, and third quarters of the pre-income distribution, the returns to office seem to persist up to about six years after they first run for election. For candidates from the fourth quartile, the long-term effects are already indistinguishable from zero in the fourth year; probably due to good outside options.

^{H.1}Because we have elections from 1994 to 2015, but only income up until 2018, when we study returns to office in the future, we progressively drop observations from more recent elections.

Figure H.1: Long-term returns to office

Note: Difference in total income between winners and losers since their first race across quartiles of preelection income distribution. Standard errors clustered at party-constituency-year level. 95% pointwise confidence intervals.

I Mechanisms behind changes over time

What can explain the long-term patterns presented in appendix H? Why is the effect decreasing in the longer run?

At least four explanations may apply. Firstly, some of the losing candidates might rerun and become elected later. This will give them a future short-term income increase. Secondly, some of the winning candidates will not get reelected, which might bring their income back on level with the initially losing candidates.

In Figure I.1, we follow winning and losing candidates to see whether they are elected in future elections. We see a lasting effect of marginally winning a seat. In the next four elections, there is a higher share of initially winning MPs that win a seat again compared to initially losing candidates.

A third explanation may that first-time losers might excel in other careers with a steeper long-term income gradient than parliamentary careers allowing them to catch up. And, finally, a fourth explanation might be that MPs elected as early as 1998, which are the ones used for the longest-run estimates, were less able to benefit from office than MPs elected in later periods (who are only represented in the estimates of shorter-term effects).

The sample being used to estimate effects 20 years is restricted to MPs elected 1994. These MPs might be less able to benefit from office than MPs elected in later periods, who are only represented in the estimates of shorter-term effects. To consider this, we estimate the DiD for each decade of elections, i.e. 1994 and 1998 as 90s, 2001, 2005, and 2007 as 00s, and 2011 and 2015 as 10s. Figure I.2 show the raw incomes and Figure I.3 show the corresponding annual ATTs. The figures show that short run returns to office are consistently found for candidates in the 90s, 00s, and 10s, although the annual DiDs post-election for earnings (excluding allowance and pension) are insignificant, but positive for candidates in the 10s.

Figure I.2: Average earnings and total income in the six years preceding and two years following a candidate's first run for office

Note: Losers and winners earnings and total income in six years preceding and two years after their first run split by decade. In \in in 2015-prices. 95% confidence intervals. Standard errors clustered at party-constituency-year level.

Figure I.3: Estimated difference-in-differences in earnings and total income for winners and losers following the election (bottom panels).

Note: The annual DiD estimated by the Callaway and Sant'Anna (2021)-estimator for DiD with multiple time periods.

J Net Present Value

Figure J.1 shows the average NPV computed for each year since election. Generally, the estimated life-cycle returns, as we may call them, increase over years since the first election, meaning that, on average, winners tend to experience higher accumulated income each year after their first election as a direct causal outcome of being elected. The cumulative returns to office increase mostly in the first years following election; the years where candidates were shown to have clear returns to office according to Figure H.1. Holding office is cumulatively beneficial throughout all 20 post-election years, but the variation around the average estimate increases. The decreasing precision over time is to a large extent driven by the fact that we observe fewer observations, the longer the time span we consider. Given the chosen discount rate, the cumulative returns from holding office 20 years after running for the first time is around \in 372,000 (95% CI around [89,500; 655,000]) when pensions are included.

We can also show what the NPV of future earnings are under different assumptions. First, Figure J.2 plots the estimated differences in NPV for winners' and losers' income, excluding pension and accounted by an interest rate of 2.58% and standard errors clustered at constituency-party-year level.

We picked the 2.58% discount rate because it was proposed by the expert commission, *Vederlagskommissionen*. In their report, they also proposed a less conservative discount rate of 1.24%. Figure J.3 plots the estimated differences in NPV for winners' and losers' income with and without including pension accounted by an interest rate of 1.24%. Once again, standard errors are clustered at party-constituency-year level. When discounted by an interest rate of 1.24%, the cumulative returns from holding office 20 years after running for the first time is around \in 410,000 (95% CI around [82,000; 737,000]) when pensions are included, and \in 323,000 (95% CI around [7,000; 639,000]) when pensions are not included. These estimates are in line with the estimates of the interest rate of 2.58, but this alternative (and more liberal) interest rate of 1.24 provides estimated NPVs that are larger and slightly

Figure J.1: The estimated average NPV of returns to office.

Note: This is the cumulative difference in income over time between winners (=1) and losers since their first race. Future earnings are discounted by 2.58% to account for future earnings being less valuable than current earnings. 95% pointwise confidence intervals. Standard errors are clustered at party-constituency-year level.

more volatile. Altogether, estimates of both interest rates suggest substantial life-cycle returns to office.

Finally, we look at the NPV across different age cohorts, concretely which third (tertile) of the age distribution of the candidate pool the candidate was part of when running for office. The first tertile consists of candidates aged 18-33, the second tertile consists of 33-46 year-olds, and the third consists of candidates aged 46 or older when they ran for office for the first time. We might see different long-term returns to office conditional on where candidates are in their career. Take the youngest candidates. On the one hand, they may be most likely to use a parliamentary career as a stepping stone to become a cabinet minister or obtain a lucrative outside occupation. On the other hand, they are at a point in their

Figure J.2: The estimated life-cycle returns to office when excluding pension from income. NPV discounted by 2.58%.

Note: The estimated life-cycle returns to office. This is the cumulative difference in income over time between winners and losers since their first race. Future earnings are explicitly discounted by 2.58% to account for future earnings being less valueable than current earnings. Income measured as total income excluding pension. Standard errors are clustered at party-constituency-year level.

career where progression is steep so they might forego outside opportunities by serving in office.

Figure J.4 shows the estimated cumulative effect for each age tertile discounted by our interest rate of 2.58 among winners and losers up to 10 years after they competed for office for the first time. Over ten years, winning office is on average about equally attractive for the first and second age tertile, with point estimates around $\leq 260,000$. For the oldest candidates, the point estimate is around $\leq 165,000$ and the 95% confidence interval includes zero. The returns to office, however, are not statistically significantly smaller than for the two other age groups^{J.1}. Across all age groups, winning office is never economically unattractive for the

^{J.1}The estimates for the three age tertiles in year 10 are: Tertile 1: 257,015 (95%-CI [154,183; 359,847]), Tertile 2: 270,953 (95%-CI [638,74; 478,031]), and Tertile 3: 165,840 (95%-CI [-33,847; 365,526])

Figure J.3: The estimated life-cycle returns to office when NPV is discounted by 1.24%.

Note: The estimated life-cycle returns to office. This is the cumulative difference in income over time between winners and losers since their first race. Future earnings are explicitly discounted by 1.24% to account for future earnings being less valueable than current earnings. Income measured as total income including or excluding pension. Standard errors are clustered at party-constituency-year level.

candidates. And for the two younger age groups, for whom winning office must be weighted against their alternative careers to a higher extent than the oldest candidates, the returns seem most secure.

Note: The cumulative difference in net present value of total income over time between winners and losers in each third of the age distribution since their first race. Future earnings are discounted by 2.58% to account for future earnings being less valuable than current earnings. Standard errors are clustered at party-constituency-year level.