*Political Science Research and Methods (2025), page 1 of 9*
doi:10.1017/psrm.2024.67

RESEARCH NOTE

# Reward or punishment? The distribution of life-cycle returns to political office

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(Received 10 November 2022; revised 1 November 2023; accepted 21 February 2024)

**Abstract**
The remuneration of MPs affects who engages in politics. Even if average returns to office are positive, as found in all other studies, some officeholders' returns are likely negative. Further, the timing of returns to office is crucial as politicians often enjoy delayed compensation like lucrative pensions. Utilizing administrative data for parliamentary candidates in Denmark from 1994 to 2015, we estimate first-time runners' earnings and total income returns to office. Based on total income, practically all elected MPs experience economic gains during their first term. Computations of life-cycle returns reveal that the 25 percent highest earning candidates (pre-office) have no long-term economic gain from winning. Generally, considering the distribution and timing of returns to office improves studies of how office-holding is economically rewarded.

**Keywords:** causal inference

Are political careers economically attractive? In this research note, we make two empirical contributions to the existing literature on returns to office.

First, while returns to office may be positive on average, our first contribution is to consider how returns to office may be highly heterogeneous and perhaps even negative for some candidates. Heterogeneity may be rooted in observable characteristics such as previous occupation, gender, or political affiliation (Eggers and Hainmueller, 2009; Kotakorpi *et al.*, 2017; Berg, 2020). But, heterogeneity may also be manifested in unoberservable characteristics that will impact future income trajectories. Some candidates who run for office forego excellent career opportunities if they win a seat, while others have lower paid outside options. To capture this kind of effect heterogeneity, we apply a newly developed estimator to estimate the distribution of unconditional quantile treatment effects of the treated (Callaway and Li, 2019).

Second, we consider *the timing* of returns to office. On the one hand, politicians may have attractive career opportunities after they leave office (Egerod, 2021; Weschle, 2021). On the other hand, some politicians may experience an earnings penalty upon leaving, either because they have missed out on nonpolitical work experience or due to an unwillingness of employers to hire certain former politicians. Pension payments may also be higher among politicians, which increases the importance of timing.

More correct and nuanced analyses of MP's remuneration levels may be important for both politicians incentives and the general public's perception of politicians remuneration. The contract between politicians and the people is based on trust. For instance, Peters and Hood (1994) asserted that there is a relationship between rewards for politicians and citizens' trust

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https://doi.org/10.1017/psrm.2024.67 Published online by Cambridge University Press

toward those politicians. Pedersen *et al.* (2019) find that higher levels of remuneration to politicians is more acceptable to citizens if they are less visible and therefore harder to relate to. In our paper, we distinguish between less visible rewards such as tax-free allowances and pensions as opposed to higher base earnings.

We rely on rich administrative data including detailed income data and data on employer contributions to pension schemes for the entire Danish population going back to 1990. We link these registry data to information about all candidates that ran in parliamentary elections from 1990 to 2015. For causal identification, we compare first-time running candidates who narrowly won a seat with first-time running candidates who narrowly lost. For the full set of close winners and losers, we observe income both before and after the election year, which means that we can compare close winners and losers in a difference-in-differences (DiD) design.

In the first two years after winning, average returns to office of marginally elected candidates are found to be € 26,500 annually (≈ 46 percent increase) if we only consider the candidates' earnings, but € 70,300 annually (≈ 115 percent increase) when we also include allowances and pensions to form total income. These returns are comparatively high (Kotakorpi *et al.*, 2017; Berg, 2020; Cirone *et al.*, 2021). In addition to the large average short-term returns we estimate the unconditional quantile treatment effects. When only considering earnings, 40 percent of candidates' experience no returns to office. For total income (earnings, allowances, and pension), we reveal positive estimates of the returns to office in the first year for every decile, that is, across the entire distribution. When we compute the net present value of all future returns or losses and split the estimated returns by quartiles of the pre-income distribution, we find that electoral winners from the top quartile have no statistically significant gain from winning a seat in Parliament seven years after the election. This indicates that MPs in the high end of the pre-election income distribution are missing out in the longer run on outside opportunities that balance the immediate returns to office.

The main takeaway from this paper is that the distribution and timing of returns to office may have a fundamental impact on our view and understanding of MPs' remuneration. This is in all likelihood relevant in most countries.

## 1. Data and context

We rely on administrative data from Statistics Denmark from 1990 to 2018, which include individual-level income measures. We have annual observations for all Danes born between December, 1912 and June, 1997. All Danes have a unique civil registration number, which allows us to link the administrative data to information on all candidates that ran in any parliamentary election from 1990 to 2015. In addition, we have information on the year, district, and political party that candidates ran for, whether they ran for a party with an open or semi-open list, whether they were elected, and a variable measuring their win or lose margin. We access the data on Statistics Denmark's servers but due to privacy concerns the data may not be sent out of the servers and hence cannot be shared.[1]

### *1.1 Danish politicians' earnings and pensions*

For our analyses, all measures of income are standardized to 2015 prices and converted from Danish Kroner to Euro. All Danish MPs receive at least two sorts of remuneration while in office:[2] (1) a base earning of around €85,000 per year and (2) a tax-exempt cost allowance of around € 8,000 per year, which is equivalent to a taxable income of around € 18,000 per year. Originally, the cost allowance was intended to cover extra work costs of being a politician, but with modern technology it is

[1]Read more about Statistics Denmark's guidelines here.

[2]During the time period we study there have been changes made to their compensations, mostly making them less attractive. We review only the current compensation scheme here. This means that we may slightly underestimate the value of a political seat in the earliest of our elections.

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essentially an additional source of income, and we therefore follow a recent official commission on politicians' salaries and define this as income (Vederlagskommissionen, 2016). MPs are also entitled to a pension paid out annually from retirement age and until their death—which differ from ordinary labor market pensions in Denmark, where employers additional to the salary, pay employees an amount of pension every month administered by a pension fund. The commission on politicians' salaries estimated the annual value of the Danish MP's pension scheme to be approximately € 28,000. While in office, the MPs are free to hold other remunerated jobs without a reduction in their remuneration, except for the MPs who are appointed as ministers.

We consider two outcomes. First, gross annual labor market earnings including regular wage earnings, remunerations, net profit from own businesses, and welfare benefits. Similar measures of wage earnings are widely used in the existing literature. Second, our main outcome includes the above mentioned gross annual labor market earnings as well as tax-free allowances and the value of the annual payments to employer administered retirement benefits. For politicians serving in parliament, we add the pre-tax value of the tax exempt allowance since this is the value that it would have for "ordinary" workers.[3]

### 1.2 Danish national elections

The Danish national parliament has one chamber with 175 members elected in Denmark and four in total elected in Greenland and on the Faroe Islands. We have election data on candidates in Denmark only, and accordingly we include only these candidates in our analyses. Election terms are not fixed and our data cover eight national elections from 1990 to 2015.

The Danish electoral system is a proportional system with a proportional allocation of seats within ten multi-member constituencies.[4] In each constituency, the seats are distributed to the parties and subsequently allocated to individual candidates. Voters can either vote for a party list or personally for a candidate. A vote for a candidate is also a vote for the party of the candidate. Each party can either run using an open list or a semi-open list. We include only politicians from parties that ran on open lists. For these parties, candidates win seats based on their personal votes alone, so if a party wins $m$ seats in a constituency, their $m$ candidates with most personal votes win the party's seats in parliament.[5]

## 2. Research design

We must consider two selection issues: *who runs* and *who wins*. In line with the established literature, we address our first selection issue by considering only candidates running for office (Eggers and Hainmueller, 2009; Querubin and Snyder Jr., 2013; Kotakorpi *et al.*, 2017; Berg, 2020). To overcome the second selection problem, the standard in the literature is to compare marginal winners and marginal losers around the threshold for winning a seat. We follow this standard and take it a step further by exploiting the panel structure of our data, which allows us to use a DiD model on our set of marginal winners and losers.

### 2.1 Defining marginal winners and losers

In an open list proportional system, it is not straight forward to define a threshold for winning office (Folke, 2014). Our strategy is to take the number of votes and seats for the party as given and consider how seats are assigned within the party.[6] For each party winning at least one seat in

[3]Our total income measure covers all formal office-related incomes of politicians, but it does *not* include income from assets or shareholding. Previous research has studied returns to portfolios of elected officials with mixed findings (Ziobrowski *et al.*, 2004, 2011; Eggers and Hainmueller, 2013).

[4]Before 2007 the number of constituencies was 16.

[5]See Appendix A for further description of the Danish electoral system.

[6]Note, that in a recent paper, Luechinger *et al.* (2023) develop a method for measuring closeness in PR systems that accounts for both the party margin and the candidate margin.

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any given combination of municipality and election year, we define a threshold as the midpoint between the elected candidate with the fewest votes and the non-elected candidate with the most votes. Then we compute for each candidate a score expressing how many votes a candidate received relative to their year, district, and party-specific threshold:

$$\text{Relativescore}_i = abs\left(\frac{\text{personalvotes}_i}{\text{threshold}_{\text{pdy}}} - 1\right)$$

where $i$ is a subset for the individual candidates and *pdy* are subsets for party, district, and year. The relative score takes the value "0," if a candidate receives exactly the number of votes needed for a marginal seat. As we take the absolute value, the relative score is nonnegative (see Appendix A for more detail). Upon creating the relative scores, Statistics Denmark required that we aggregated the relative score into 25 fractiles to ensure the candidates' anonymity. The smaller the fractile in which a candidate is placed, the more narrowly did the candidate win or lose. We restrict the sample of candidates to those in the first five fractiles of relative score, that is, with the 20 percent smallest values of the relative score metric.

We limit our sample to first-time running candidates to avoid pre-treatment effects on income. Since 1990 is the first year with election data, we can identify first-time runners from 1994 and take that year as our starting year which gives us a total of seven consecutive elections in our sample.[7] We have 125 narrow winners and 240 narrow losers granting us a total of 365 candidates with approximately two losers for each winner. In Appendix B, we provide additional details on the sample and its distribution on key variables.

### 2.2 Difference-in-differences model

As we only study first-time candidates, the years prior to their first election will always express the pre-office outcomes. As our data are temporarily granular, we can follow candidates' annual income as they approach office. We therefore set the pre-treatment period to be the six years preceding the election and the post-treatment period to be the two years following the election year to avoid overlap with the election year and future election years. We estimate the following model:

$$Y_{it} = \alpha + \beta_1 Elected_i + \beta_2 Post\ Election_t + \beta_3 Elected_i \times Post\ Election_t + \epsilon_{it}$$

where $Y_{it}$ expresses the income of a first-time runner, $i$, averaged over period $t$, $Elected_i$ is a dummy, which equals 1 if the first-time runner, $i$, won a seat, *PostElection* is a dummy, which equals 1 if the period, $t$, is after the election. The coefficient on the interaction between these two variables, $Elected_i \times Post\ Election_t$, expresses the DiD, and hence $\beta_3$ is our parameter of interest. The error term is clustered at party-constituency-year level. One might object that the multiple pre- and post-treatment periods inflate our number of observations, however, the DiD-estimates remain significant when annually estimated (see Figure 1).

### 2.3 Estimating quantile treatment effects

We estimate the QTT based on the candidates' annual income in the years $t_{-2}$, $t_{-1}$, and $t_{+1}$, respectively. The QTT looks at quantile treatment effects for dynamic income trajectories rather than just static pre-office income. To estimate the QTTs, Callaway and Li (2019) impose an assumption of distributional DiD. The assumption states that the distribution of changes in counterfactual potential outcomes does not depend on treatment status. An additional assumption is the Copula Stability Assumption stating that both the change in the untreated potential outcomes

[7]We found that 4.2 percent of the first-time candidates in 1998 had also run in 1990, but not in 1994 suggesting we only misclassify few as first-time runners in 1994.

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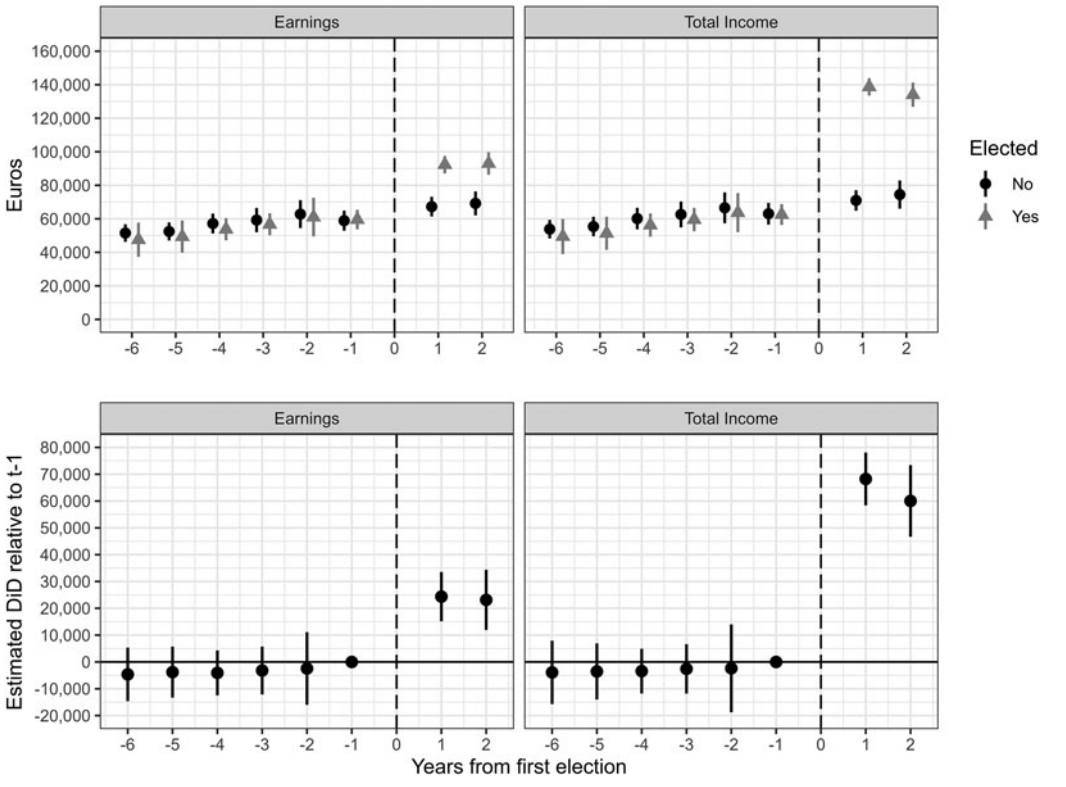



**Figure 1.** Average earnings and total income in the six years preceding and two years following a candidate's first run for office (top panels), and the estimated difference-in-differences in earnings and total income for winners and losers following the election (bottom panels).
*Note:* Total income in € in 2015 prices. Standard errors clustered at party-constituency-year level. 95 percent pointwise confidence intervals. The annual DiD estimated by the Callaway and Sant'Anna (2021)-estimator for DiD with multiple time periods.

of the treated group and the initial level of the untreated potential outcomes for the treated group are stable over time (Callaway and Li, 2019). See Appendix C for evidence in favor of the Copula Stability Assumption.

## 3. Results

In Figure 1 the top panel shows the average earnings and total income for winning and losing first-time runners in the six years preceding and two years following their first run for office. The figure provides visual proof for a clear jump in earnings and total income after winning office. The bottom panels show the corresponding DiD-estimate with reference to year $t_{-1}$. For both outcomes, (1) pre-election incomes have parallel trends, and (2) returns are significant for each post-election year. We estimate an average, annual return of € 70,273 over the first two years. The total income returns are precisely estimated with a 95 percent confidence interval of [62,040; 78,506]. It corresponds to 115 percent of the winning candidates' pre-office income.[8] For earnings (i.e., excl. allowances and pensions) the estimated returns are € 26,461 [18,692; 34,230] corresponding to 46 percent. This underscores the importance of including tax-free allowances and pensions.

These results are very robust. In the appendices, we show that pre-treatment covariates are balanced and conduct placebo tests by estimating DiD between any two pre-election years,

[8]See Appendix E for estimates of the short-term returns to office.

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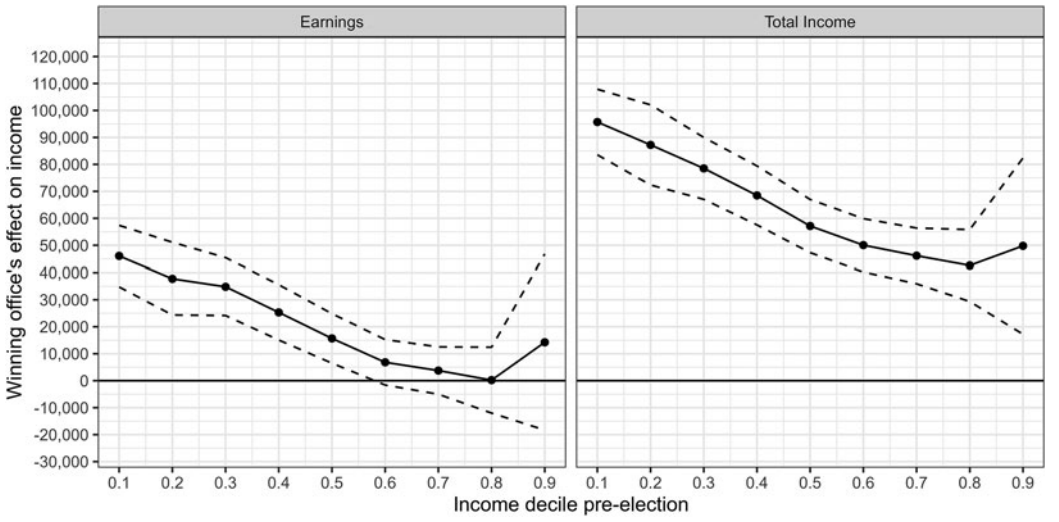



**Figure 2.** Short-term quantile treatment effects on the treated.
*Note:* Estimated returns to office for every decile in the pre-election distribution of earnings and total income trajectories based on periods t–2, t–1, and t+1 for the two income measures. 95 percent pointwise confidence intervals computed using the empirical bootstrap with 1000 iterations.

which is strong evidence in favor of parallel trends (Appendix D). Our results are robust to changing the 20 percent bandwidth around the election threshold (Appendix G). When estimating returns to office based on disposable income (Appendix E), we still find substantial effects, at 69 percent.

### 3.1 The distribution of short-term returns to office

Figure 2 shows the quantile treatment effects on the treated for every decile in the income distribution of the first-time running candidates in our sample—both for total income and for earnings.[9] For total income, the figure reveals that *all* deciles gain economically from being elected, and that heterogeneity is substantial. Candidates with low pre-election incomes experience returns to office that are close to € 92,000 in the first year after election. Yet, even those in the highest decile who are expected to have the highest counterfactual incomes on average receive economic returns to office of around € 40,000 in the short-term. Looking at earnings only, that is, excluding the tax-free allowance and pensions, reduces the short-term effects markedly. About 40 percent do not obtain a significant economic gain in earnings. This insight is new and substantially different from existing studies, largely based on an earnings measure, where the average returns to office for MPs always is found positive. On average, we also find returns to earnings to be statistically positive. This difference across the distribution underscores the importance of going beyond average effects in the analysis of returns to office—irrespective of whether one has access to data on allowances and pensions or not.

### 3.2 Toward life-cycle returns to office

Finally, we calculate the net present value (NPV), expressing cumulative returns to office since first election, for each first-time running candidate, $i$, from year $t \in [1; 20]$ up until the income most recently measured, $T$. Because future income is considered less valuable than immediate

[9]We apply the qte-package in R, Callaway (2016).

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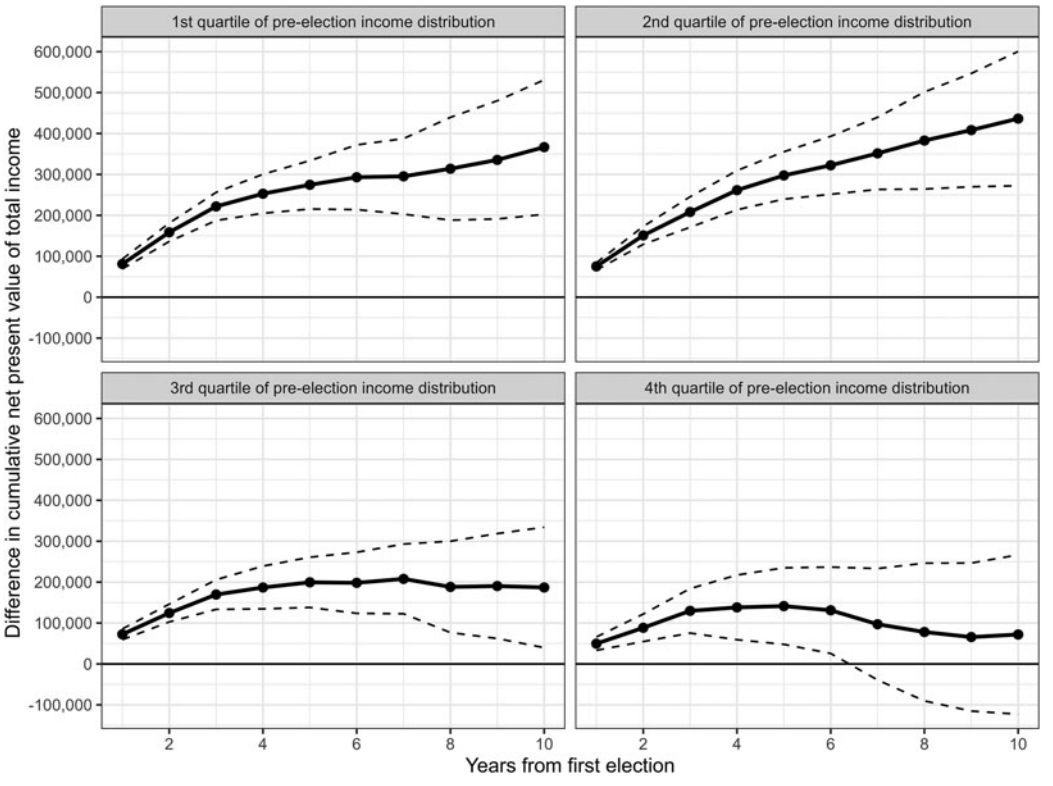



**Figure 3.** Life-cycle returns to office across quartiles of the pre-election total income distribution.
*Note:* The cumulative difference in total income between winners and losers since their first race across pre-election quarters of the total income distribution. Future income is discounted by 2.58 percent to account for future income being less valuable than current earnings. 95 percent pointwise confidence intervals. Standard errors are clustered at party-constituency-year level.

returns we discount future income:

$$NPV_{it} = \sum_{t=1}^{T} \frac{Y_{it}}{(1+r)^t}$$

Since we can track some candidates' income for 20 years and others for only four years after they become elected, $T$ varies individually. We calculate the NPV for the total income, $Y$, that is, including pensions and allowances, and we discount the value of future income by an interest rate, $r$, of 2.58 percent as this rate was used by the aforementioned commission on politicians' salaries in Denmark (Vederlagskommissionen, 2016).[10]

For all candidates, 20 years after their initial run for office the average NPV of returns is around €372,000 (95 percent CI around [89,500; 655,000]) when pensions are included (see Appendix J). In Figure 3, we show the NPV for each quarter of the pre-election income distribution. The confidence intervals become wider with years after the election, both manifesting some divergence between MPs' post-election total income streams and showing that the number of observations are smaller after 10 years than when considering the NPV after fewer years. For candidates placed in the first and second quartile of the pre-office total income distribution, the

[10]To check the sensitivity of the estimates, we also used a lower interest rate of 1.24 percent in Appendix J, which yields higher net present value of winning office.

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NPV of returns steadily increases, although by a falling rate. For candidates placed in the third quartile of the pre-office total income distribution, the NPV flattens and even decreases a little after approximately four years. For the 25 percent highest earners pre-office, the NPV of returns becomes insignificant after seven years. In Appendix J, we show the NPV of long-term returns conditional on how old MPs were when they first run for office.

## 4. Discussion and conclusion

Are political careers economically attractive? This was the question we set out to answer. In this paper, we take important steps beyond estimating short-term average returns to office. We compute unconditional quantile returns over the entire distribution as well as the net present value of returns since first election. These extensions bring about a more sophisticated understanding of MPs' total returns to office and they contribute fundamentally to a more refined and precise answer to the opening question.

We find positive and high average returns during the first term in office. The unconditional quantile DiD estimates reveal that across *the entire distribution* of pre-office income trajectories the returns to office are positive *in the short term*. Candidates' expected returns to office are arguably more accurate for the years immediately following the first election, and very few appear to run for office if it comes with the cost of an immediate reduction in earnings. Compared to previous studies from countries that are in many respects similar to Denmark, we find substantially larger short-term average returns to office (Kotakorpi *et al.*, 2017; Berg, 2020; Cirone *et al.*, 2021). These differences are partly due to variations in how we measure income, including that we here calculate total income as earnings plus pensions and tax exempted allowances, which highlights the importance of including all income streams. When only including earnings, the short-term returns to office are significantly reduced and for about 40 percent of the candidates, we find no significantly positive returns to office.

The annual returns manifest themselves in accumulated form in the "life-cycle" returns to office. For each year after the candidates' first run and until 20 years into the future, we compute their cumulative returns based on the net present value of all total income from the year following their first election till the last year with observed data. On average, the NPV returns accumulate to € 372,000 over 20 years. However, the cumulative NPV for the first 10 years over the prior income distribution reveals considerable heterogeneity. The NPV is largest for the lowest pre-office quartiles of the income distribution, and for the top quartile of the pre-office income distribution it becomes insignificant after seven years.

Generally, a large majority of the voters think that politicians are paid too much and are against increasing their salaries further (Pedersen and Pedersen, 2020; Pedersen *et al.*, 2022). However, the combination of high short-term returns to office across the income distribution and the fact that, over time, the cumulative returns to office are not universally positive underscores the importance of taking a detailed and comprehensive view on the returns to office. The answer to our opening question, whether or not political careers are economically attractive, depends on whether one looks at the long or short run and whether one considers the average or the full income distribution. The NPV remains positive and significantly different from zero for most elected MPs, but for the top quarter of elected MPs there is actually no economic reward when measured in terms of life-cycle returns to office.

In conclusion, estimates of returns to office are responsive to the time frame and place in the income distribution, which is important to understand when assessing returns to office. The link between politicians' remuneration and candidates running for office may have an important impact on who runs for office, of great importance in any democratic society, and simple short-term average effects may mask important information.

**Supplementary material.** The supplementary material for this article can be found at https://doi.org/10.1017/psrm.2024.67. To obtain replication material for this article, https://doi.org/10.7910/DVN/XNGCFM

https://doi.org/10.1017/psrm.2024.67 Published online by Cambridge University Press

**Acknowledgements.** We are grateful to Olle Folke, Johanna Rickne, and James Snyder for valuable feedback and comments on previous versions of this paper. This research is supported by the Danish Council for Independent Research — Social Sciences, grant no. DFF—6109-00052.

**Competing interest.** The authors declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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**Cite this article:** Dahlgaard JO, Kjøller FK and Kristensen N (2025) Reward or punishment? The distribution of life-cycle returns to political office. *Political Science Research and Methods* 1–9. https://doi.org/10.1017/psrm.2024.67

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