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Do Wages Affect Politicians' Performance?

A regression discontinuity approach for Dutch municipalities

Daan van der Linde
Swantje Falcke
Ian Koetsier
Brigitte Unger

Universiteit Utrecht

Utrecht School of Economics

Tjalling C. Koopmans Research Institute
Utrecht School of Economics
Utrecht University

Kriekenpitplein 21-22
3584 EC Utrecht
The Netherlands
telephone +31 30 253 9800
fax +31 30 253 7373
website www.koopmansinstitute.uu.nl

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How to reach the authors

Please direct all correspondence to the first author.

Daan van der Linde
Swantje Falcke
Ian Koetsier
Brigitte Unger
Utrecht University
Utrecht School of Economics
Kriekenpitplein 21-22
3584 TC Utrecht
The Netherlands.
E-mail: D.E.vanderLinde@uu.nl

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Abstract

This paper examines the effects of local politician pay on performance for Dutch municipalities. Although literature has argued wages partly determine the value of holding political office and thereby higher wages may improve the quality of a candidate pool, no straightforward theoretical prediction exists relating politicians' remuneration to performance. Data on municipal finances is used in a regression discontinuity design that exploits population thresholds which exogenously determine the wages of local politicians. We find higher wages significantly increase municipal net debt and local budgets, at the same time finding some evidence for increased satisfaction with public space. We contrast our findings to previous research on Italy which found similar effects concerning significance, albeit differences regarding the direction. We argue that even though the direction of the effect may differ, both findings could entail better performance given institutional differences between the two countries.

Keywords: Politicians' wages, local finance, regression discontinuity design

JEL classification: J45, J31, M52, H11, H70

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1 Introduction

In order to make a vocation out of politics, Weber (1919) claimed one must either live for politics or be able to live from politics. Debates on the level of compensation of politicians however date back as far as ancient Greece, where Aristotle argued payment for attendance in the assembly could increase the poor's capacity for leisure, enabling them to engage in political activity. Markle (2004) finds three obols per meeting offered in 393BC would have been sufficient to allow political participation of the poor — one of the reasons why the oligarchs of 411BC were quick to end the remuneration (Farrar, 1988)[1].

Judging by the media coverage on for instance the recent increase in the remuneration of German Parliamentarians, still today the wages of politicians heavily resonate in the public debate. Stiglitz (1984) concludes however that serving the public good may itself be considered a public good: while all residents benefit from a better, more efficient and more responsive government, in many instances politicians seeking to realize any of these goals are unable to appropriate the full fruits of their labor.

To date though no straightforward theoretical predication relating politicians' wages to their performance exists. This study sets out to empirically address the question of the relationship between remuneration and performance, studying municipal politics in the Netherlands. Using a regression discontinuity (RD) design we find higher wages lead to an increase in both local tax and tariff revenues and local expenditure. Furthermore, municipalities that offer higher wages have higher levels of net debt, which we show to be accumulated for investments in buildings, infrastructure and other fixed assets. From data on the evaluation of public space we find some proof these investments increase municipal residents' satisfaction. We contrast our findings to earlier work by Gagliarducci and Nannicini (2013) in order to address in which way our results can be generalized and extended across countries. Gagliarducci and Nannicini's (2013) findings are similar regarding significance, but differ with respect to the direction. We argue, considering institutional differences between Italy and the Netherlands, both results may be interpreted as a sign of increased performance.

The remainder of the paper is organized as follows. The next section provides an overview of literature. Section 3 presents the institutional setting, showing how in the Netherlands wages increase discontinuously at the local level with the number of inhabitants. This enables the application of an RD design, which we lay out in section 4. Section 5 presents the results, followed by a discussion in section 6 and conclusions.

2 Literature

Central in the literature on the relationship between wages and job performance is efficiency wage theory (Akerlof and Yellen, 1986), which has argued higher wages increase the costs of losing one's job and may thus increase performance. Most theoretical applications of this argument related to the remuneration of politicians center around the value of holding office, yet many studies have gone beyond these mere material gains of holding office, including non-pecuniary elements such as ego rents (Rogoff, 1990), legacy concerns (Maskin and Tirole, 2004) or strong policy preferences or a civic virtue that drive politicians' public goods concerns (Besley, 2006). This has led some to claim a non-linear relationship to exist between both the pecuniary and non-pecuniary rewards and the quality of a candidate pool (e.g. Caselli and Morelli, 2004; Messner and Polborn, 2004). Besley's (2006) model captures both a disciplining (efficiency wage) aspect of wages, and a selection effect of wages, showing with a heterogeneous pool of candidates higher wages may not necessarily improve the political discipline of politicians.

A number of recent studies has empirically delved into the relationship between politicians' wages and performance. Besley (2004) empirically studies the congruence between governors' and

[1] On political pay in ancient democracies, see also De Ste Croix (1975).

citizens' ideologies and using a fixed effects specification finds wage increases of United States governors increases congruence, either due to a selection or a disciplining effect. Other studies have managed to exploit institutional rules in quasi-experimental settings, either using population thresholds at the municipal level[2] or exogenous wage shocks. Mocan and Altindag (2013) exploit exogenous wage shocks for European Union parliamentarians and using a difference-in-difference framework show higher wages both decrease attendance and the number of questions asked at the European parliament's plenary sessions. Studies by Ferraz and Finan (2008) and Gagliarducci and Nannicini (2013) make use of discontinuous changes in politician remuneration in an RD design. In both their countries of study, Brazil and Italy, politician's wages at the municipal level are determined according to the number of inhabitants, where at certain population cut-offs wages increase discontinuously. For Brazil, Ferraz and Finan (2008) show wage increases lead to higher legislative productivity. Wage hikes increase both the number of bills submitted and approved as well as the provision of health clinics, schools and school infrastructure. In the case of Italy, Gagliarducci and Nannicini (2013) show higher wages paid to Italian mayors cause the size of municipal budgets to shrink, offering citizens lower tariffs combined with lower expenditures with no overall effect on deficits. In their account this is due to better organization of municipal bureaucracies, as the speed of collection and payment is higher in municipalities which pay higher mayoral wages. The finding of lower expenditure is mostly explained by lower investments and less goods and services purchased. Using an institutional rule that fixes mayoral terms to a maximum of two, the authors can furthermore discern a reelection motive from candidate quality, and by studying outcomes in the second term show a selection effect drives their results. Our study is in similar vein as the study by Gagliarducci and Nannicini (2013), and we will contrast our findings to those found for Italy, noting Italian municipalities differ in a number of respects, the implications of which we discuss in Section 6.

3 Institutional setting

Dutch municipal finances are dominated by transfers from central government, both through the *Gemeentefonds* (municipal fund, €18 billion in 2012) and earmarked spending (€17 billion in 2012). Next to these transfers, municipalities derive roughly €17 billion in local tax and tariff income from their citizens in 2012. The distribution of the *Gemeentefonds* is determined so as to guarantee each municipality can offer the same baseline level of goods and services to its citizens, taking into account local differences in tax collection capacity (e.g. because of differences in home value for property taxation). In recent years local government in the Netherlands has undergone significant changes, facing new tasks because of decentralization of policies, while the average size of jurisdictions has increased through municipal amalgamations. During the period of our study we note an increase in the size of municipalities in terms of size and inhabitants; their number declining from 467 to 403. This decline was most profound for municipalities with less than 20,000 inhabitants (declining in number from 223 to 137). The average municipality stands at around 41,000 inhabitants in 2012. Every four years national, but also increasingly local political parties compete for the electorate. After elections a coalition of parties forms the municipal executive and appoints its aldermen (*wethouders*). Dutch mayors remain unelected and while *de jure* appointed by the Crown *de facto* they are appointed upon recommendation of the city council. An appointment is for a six year term with possible reappointment for (an unlimited number of) successive terms. While usually being member of a political party, mayors are expected to be nonpartisan, chairing over the executive board (*college van burgemeester en wethouders*) and often responsible for public safety affairs.

In order to answer our research question on the relationship between politicians' pay and their performance we exploit a feature of the Dutch institutional setting in which the remuneration of

[2]For other studies exploiting population thresholds, see e.g. Correa and Madeira (2014); De Benedetto and De Paola (2014); Egger and Koethenbuerger (2010).

mayor, aldermen and council members is jointly determined by the registered number of inhabitants. Wage levels discontinuously increase at nine different population thresholds. Table 1 gives these thresholds as well as the respective wages and percentage-wise wage changes for mayors, aldermen and council members. Most Dutch municipalities fall between the classes of 14,001 to 24,000 inhabitants (110 in 2010) and 24,001 to 40,000 inhabitants (111 in 2010). For mayors as well as aldermen, percentage-wise wage increases between classes are similar and range between 5 to 13 percent. For mayors, wages in the first class amount to €5,750 and increases to €10,325 in municipalities with over 375,000 inhabitants. Aldermen's wages range from €4,380 to €9,100. Compared to the remuneration of mayors and aldermen, council members' wages change quite drastically moving from one class to another. Percentage-wise wage increases between the different classes vary a lot, with the smallest wage increase amounting to 14 percent while the largest amounts to 58 percent. Furthermore, council members get a far smaller remuneration than mayors and aldermen, ranging from €235 to €2,200 a month.

Two factors are of particular importance when using population thresholds in RD designs: there must be no simultaneous exogenous treatments within the institutional framework, nor must there be any simultaneous endogenous choices (Ade and Freier, 2011). In other words, in order to uniquely identify the effect of the wage change, nothing but the wage can change at the threshold. We verified with the Audit Office Utrecht (*Rekenkamer Utrecht*) and Association of Netherlands Municipalities (*Vereniging Nederlandse Gemeenten*) no simultaneous spending or borrowing rules apply at the thresholds, yet must drop the thresholds of 60,000 and 100,000 from our analysis as they coincide with simultaneous changes in the number of aldermen in a city council. Furthermore, sample size limitations entail we cannot make use of the observations around the thresholds of 8,000, 100,000, 150,000 and 375,000. Empirical analysis will thus be carried out at the combined population thresholds of 14,000, 24,000 and 40,000 inhabitants. As wages for mayors, aldermen and council members move jointly, in this framework we cannot discern whose wage increase causes the changes we report below.

Table 1: Population class and monthly wages as of 2010

Class	Number of inhabitants	Remuneration in €						Number of municipalities
		Mayor	Change in %	Aldermen	Change in %	Council member	Change in %	
1	< 8,000	5747.72		4380.72		235.58		17
2	8,001 – 14,000	6323.09	10	4964.76	13	372.25	58	83
3	14,001 – 24,000	6894.16	9	5553.35	12	580.23	56	110
4	24,001 – 40,000	7457.79	8	5943.06	7	900.64	56	111
5	40,001 – 60,000	8018.17	8	6529.63	10	1172.56	30	47
6	60,001 – 100,000	8626.59	8	7115.19	9	1372.07	17	31
7	100,001 – 150,000	9098.26	5	7703.79	8	1557.74	14	14
8	150,001 – 375,000	9691.95	7	8113.34	5	1814.73	16	9
9	375,001 <	10325.86	7	9098.26	12	2209.35	22	3

4 Data and Methodology

Data

Data on municipal financial statistics and an index capturing the quality of public space in municipalities along a number of dimensions is collected for the period 2005-2012, extracted from Statistics Netherlands (CBS, 2014) and Leefbaarometer (2014).[3]

We largely follow Gagliarducci and Nannicini (2013) in selecting dependent variables of interest, for now focusing on total and operational deficit, total revenue, total expenditure and net debt. Table 2 provides summary statistics for these variables for our selected cases, taken in constant 2005 prices and on a per capita basis. Net debt incorporates the municipal debt and corrects for loans granted and total current assets (e.g. liquid assets and accrued income). In other words, net debt is lower when the value of loans granted and current assets is higher. We subtract these categories from the debt figure as loans granted and current assets will be recouped in the future or are liquid. For our sample, we note an average net debt of €1,258 per capita over the period 2005-2012 below the threshold and €1,313 above of the threshold. The operational deficit is the operating result of a municipality, being the difference between total expenditure and total revenue. The definition of total deficit only differs from the operational deficit in one respect, as it includes the change in municipal reserves. The average municipality in our sample left of the threshold has a negative operational and total deficit of respectively €44 and €59 compared to negative means of €36 and €39 right of the threshold, implying on average our sample runs surpluses. Total municipal expenditures on average stand at €2,162 (below the threshold) and €2,263 (above the threshold) per head, while we find total revenue to be on an average €390 (below) and €405 (above). For this latter variable we only aggregate local taxes and tariff income and exclude central government transfers from the Gemeentefonds, which are largely exogenous to the internal politics of municipalities.

In order to validly apply an RD framework, politicians must not be able to manipulate the treatment variable, in this case the number of inhabitants. This is a particular concern when using population thresholds, as for instance Ade and Freier (2011) claim municipal administrations may easily manipulate the data when approaching a threshold. In order to test whether municipalities sort around the threshold we apply the McCrary test (McCrary, 2008). As can be seen from Figure 1, no indication for manipulation in our sample is found.

Figure 2 displays the geographical distribution of our different classes of municipalities (at a 25% bandwidth), and clearly illustrates any absence of clustering of classes (for instance around urban centers), while also showing our selected cases are geographically dispersed and cover most parts of the country.

Table 2: Summary statistics for performance indicators

	Below the threshold					Above the threshold				
	Obs	Mean	SD	Max	Min	Obs	Mean	SD	Max	Min
Net debt	1311	1,258	1,245	6,457	-1,845	1,028	1,313	1,315	6,150	-1,771
Operational deficit	1264	-44	256	1,380	-2,088	988	-36	305	1,676	-2,142
Total deficit	1,279	-59	149	876	-1,558	1,014	-39	157	1,728	-1,687
Total revenue	1,311	390	82	835	182	1,028	405	90	871	221
Total expenditure	1,251	2,162	559	6,049	108	979	2,263	628	6,076	111

Data: CBS (2014), the sample comprises all observations included at a bandwidth of 25 percent

[3]We exclude three municipalities (Berkel en Rodenrijs, Brielle and Giessenlanden) from our analysis which due to the fact that a nonrecurring and large transaction in our study's time frame took place form major outliers in our dataset. Furthermore, as wages are rigid downwards during a term in office, we omit municipalities that in our time span fall from above to below a threshold.

Figure 1: McCrary test

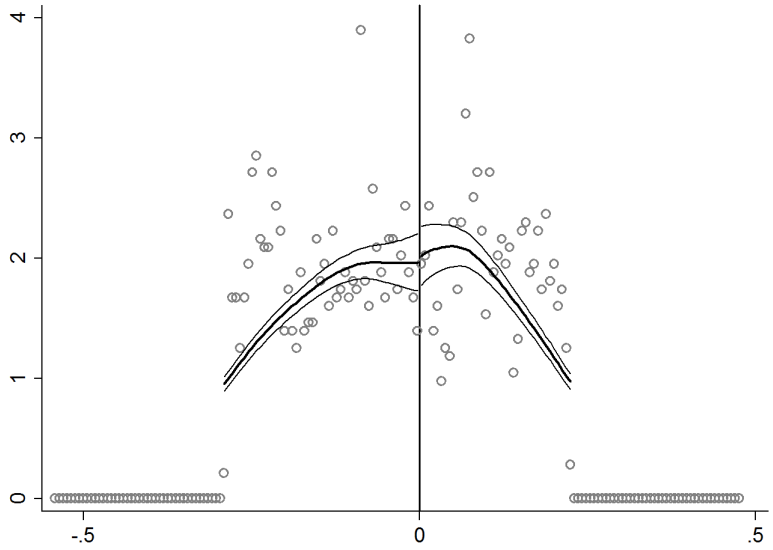
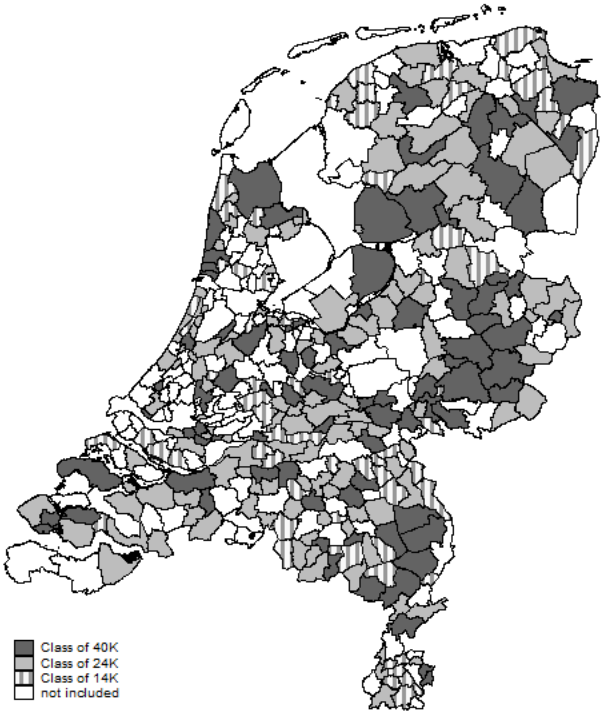


Figure 2: Dutch municipalities according to populations thresholds



Methodology

We employ a sharp RD design to test the effect of wage levels on the performance of politicians. An RD design makes use of arbitrary rules as a type of experiment (Angrist and Pischke, 2009), which in our case enables us to exploit population thresholds that exogenously determine wages of local politicians. A sharp RD design as we employ in our paper departs from the fact that some units (here: local politicians) are exposed to a treatment (here: higher wage), while others are not. The idea is that municipalities just below and above the population thresholds are comparable as they are approximately randomly assigned.

Following Egger and Koethenbuerger (2010), we standardize our data so observations are set around a single threshold (instead of respectively 14,000, 24,000 and 40,000) for all population thresholds in the analysis, defining the standardized number of inhabitants x_{it} as $ln(N_{it}/c_j)$, where N_{it} is the number of inhabitants and c_j is the relevant threshold. While smaller bandwidths around the threshold allow for better approximation of the causal effect, they do so at the cost of losing observations. As larger bandwidths include more observations, the assumption of randomization becomes weaker as the likelihood that units left and right of the threshold differ increases. Therefore throughout the paper we present five bandwidths away from the jth threshold, allowing us to take advantage of both a larger number of observations (at larger bandwidths) and information near the cut-off (at smaller bandwidths), offering additional robustness for our findings. Taking the three thresholds together allows us to estimate the average treatment effect jointly for all discontinuities and increases the number of observations. We assign treatment status in the following way:

$$D_{it} = \begin{cases} 1 & if\,(x_{it}) > 0 \\ 0 & if\,(x_{it}) \leq 0 \end{cases}$$

where D_{it} is a treatment dummy that takes the value one for every observation above the population threshold and zero for every observation below. The regression specification used in this paper can accordingly be written as:

$$y_{it} = \beta_0 + \beta_1 x_{it} + \beta_2 D_{it} + \beta_3 x_{it} D_{it} + \varepsilon_{it}$$

Where y_{it} is the selected performance indicator for municipality i in year t. In order to increase the flexibility of the model and as a robustness check we also add further polynomial terms of x_{it} and its interaction with D_{it}. To account for possible correlation between error terms ε_{it}, we cluster for both municipalities and time, as suggested by Cameron et al. (2011).

5 Results

Before discussing the main regression results the critical assumption of an RD design—randomization around the threshold—needs to be tested. In order to validate the assumption we compare observations left and right of the threshold regarding variables that may influence the performance of a municipality. We check for systematic differences in land surface, demographic pressure, disposable income (per household), and use of social assistance. Table 3 displays the results of the two-sided t-test on these variables, where different columns refer to the different bandwidths, respectively the bandwidth of 25 percent (column 1), 20 percent (column 2), 15 percent (column 3), 10 percent (column 4) and 5 percent (column 5) from the cutoff.

Table 3: Difference in mean below and above the threshold

	25%	20%	15%	10%	5%
Demographic pressure (age group 0-19 and 65+/age group 20-65)	0.03	-0.20	-0.79*	-0.79	0.40
Average household disposable income (in €1,000)	-0.39	-0.15	-0.27	-0.24	-0.02
Average number of social assistance recipients per 1,000 inhabitants	4.1*	4.8*	5.5*	3.4	4.8
Land surface per capita (in square meters)	524*	402*	236	36	241

*$p < 0.05$, two-sided t-test

As one can see in Table 3, no *systematic* differences left and right of the threshold exist for any of the variables. For average disposable household income at none of the bandwidths any significant differences can be noted. For land surface and social assistance, there exist differences at the largest bandwidths, which suggest we should be cautious in interpreting outcomes if only robust at these larger bandwidths, as findings may be explained by differences in the size of municipalities or the socio-economic characteristics of its inhabitants and not solely by differences in wages. Importantly, we note no significant differences at the two smallest bandwidths of 10% and 5%, which gives validation of the assumption of randomization around the threshold.

Table 4 presents the results of the different RD regressions of the threshold dummy on each performance indicator, i.e. net debt, operational deficit, total deficit, total revenue and total expenditure. The different performance indicators are listed in the different rows. The coefficients shown are those from local linear regressions, while the row for *degree* refers to the polynomial degree until which the coefficient of the dummy is significant. Significance at higher polynomial terms entails the effect is not an artifact of extreme observations near the threshold. The reported constant of the regression enables us to assess the magnitude of the effect of a wage increase. Due to the normalization of our data the constant can be interpreted as the expected values of the variable just below the threshold. Furthermore, a graphical representation of the results is shown in Figure 3 for local linear regressions without any polynomials added.

As one can see in Table 4, wages seem to have a clear effect on net debt as across all bandwidths a wage hike increases net debt. The effect ranges from €344 (at the largest bandwidth) to €668 per head (at the smallest bandwidth), with respective constants of €924 and €685. At the smallest bandwidth this would imply municipalities just below the threshold have accumulated net debts of €734 per capita, while those just above have net debt level of around €1336 per capita. We find statistically significant effects for both total revenue and total expenditure, albeit finding prove somewhat less robust towards the lowest threshold. As wages increase, total revenue from taxes and tariffs increase by €32 to €52 per capita (with respective constants of €358 and €345), while expenditure rises by between €132 to €252 per capita (with a respective constants of €1,944 and €1,891). The lower number of observations may partly explain the insignificant results at the bandwidth of 5%. Findings regarding operational and total deficit are not robust to different bandwidths, yet if significant prove economically rather insignificant. Judging from the constants, all municipalities just left of the threshold run a surplus (between €53 and €70 per capita), showing the surplus of those municipalities just right of the threshold is somewhat lower (by €27 to €19 per capita). These findings may be driven by the municipal balanced budget requirement, which holds for all municipalities.

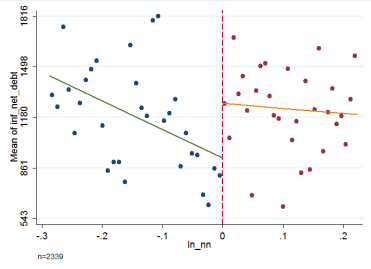
Our results suggest that net debt and municipal budgets (on the revenue and expenditure side) increase as politicians' wages increase. As the results for deficits prove economically insignificant, increases in net debt do not seem to be driven from running higher operational or total deficits. In order to allow insight into what these debts are accrued for, we analyze the asset side of the municipal balance sheets. Table 5 lists different components of the asset side, i.e. total material fixed assets, total financial fixed assets, total stock and total current financial assets, which again are taken as dependent variables in the RD analysis. We furthermore split these categories on the asset side into their respective subcategories, the results of which can be found in Table 7 in the appendix.

Table 4: RD results for key performance indicators

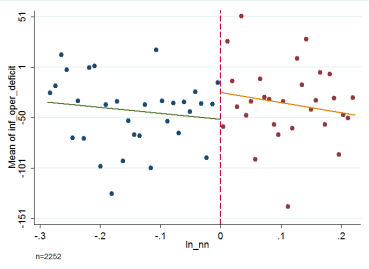
		(1)	(2)	(3)	(4)	(5)
		25%	20%	15%	10%	5%
Net debt	D	344*	408*	668***	650**	602*
		(209)	(232)	(259)	(295)	(346)
	Constant	924***	865***	685***	623***	734***
		(132)	(136)	(161)	(169)	(205)
	N	2339	1863	1412	964	409
	Degree	*third*	*third*	*second*	*first*	*first*
Operational deficit	D	27***	19***	18	45	23
		(4)	(4)	(18)	(35)	(15)
	Constant	-52	-47	-34	-50	-42
		(47)	(41)	(47)	(45)	(26)
	N	2252	1797	1367	931	392
	Degree	*first*	*first*	-	-	-
Total deficit	D	19**	19	30**	39**	26
		(9)	(12)	(13)	(18)	(21)
	Constant	-53***	-54***	-59***	-70***	-43
		(13)	(13)	(16)	(18)	(26)
	N	2311	1838	1399	955	405
	Degree	*third*	-	*second*	*first*	-
Total revenue	D	22	32*	49**	52**	31
		(16)	(18)	(19)	(23)	(25)
	Constant	363***	358***	355***	345***	356***
		(11)	(11)	(12)	(15)	(15)
	N	2339	1863	1412	964	409
	Degree	-	*second*	*first*	*first*	-
Total expenditure	D	132*	188***	252***	214**	201
		(71)	(71)	(82)	(92)	(125)
	Constant	1944***	1893***	1891***	1926***	1910***
		(73)	(71)	(78)	(85)	(82)
	N	2231	1789	1359	925	387
	Degree	*third*	*second*	*first*	*first*	-

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$; standard errors clustered by municipality and time. All results are in Euros per capita (constant 2005 Euros)

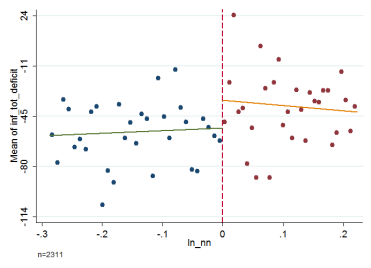
Figure 3: Graphical representation of RD



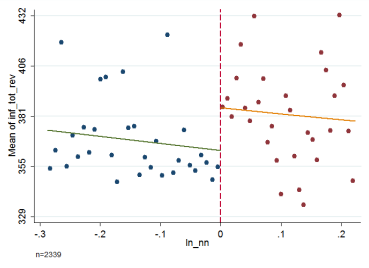
Net debt



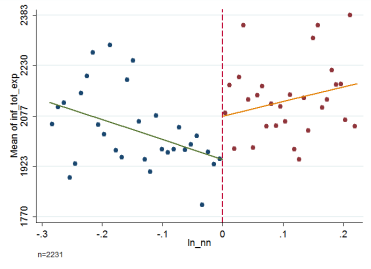
Operational deficit



Total deficit



Total revenue



Total expenditure

Table 5: RD results for asset side of the municipal budget sheet

		(1) 25%	(2) 20%	(3) 15%	(4) 10%	(5) 5%
Total material fixed assets	D	197*	237**	341**	610***	669***
		(106)	(121)	(141)	(169)	(244)
	Constant	1516***	1489***	1413***	1262***	1297***
		(73)	(85)	(97)	(91)	(109)
	N	2339	1863	1412	964	409
	Degree	*fourth*	*fourth*	*third*	*second*	*first*
Total financial fixed assets	D	56	49	103	90	-34
		(87)	(102)	(104)	(102)	(129)
	Constant	496***	487***	463***	455***	484***
		(60)	(70)	(73)	(90)	(104)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-
Total stock	D	158	244**	260**	256*	188
		(112)	(121)	(132)	(141)	(167)
	Constant	472***	402***	381***	291***	398***
		(77)	(82)	(92)	(85)	(119)
	N	2339	1863	1412	964	409
	Degree	-	*first*	*first*	*first*	-
Total current financial assets	D	-23	-24	-38	-59	-70
		(51)	(56)	(64)	(72)	(96)
	Constant	469***	455***	467***	475***	447***
		(39)	(44)	(54)	(66)	(88)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$; standard errors clustered by municipality and time. All results are in Euros per capita (constant 2005 Euros)

Table 6: RD results for Leefbaarometer

		(1) 25%	(2) 20%	(3) 15%	(4) 10%	(5) 5%
Leefbarometer: Public Space	D	50^{*a}	40^{a}	56^{b}	78^{c}	115^{**}
		(27)	(30)	(37)	(48)	(56)
	Constant	-34	-28	-49	-54	-82
		(25)	(28)	(36)	(43)	(51)
	N	1090	868	674	453	188
	Degree	*first*	-	-	-	*second*

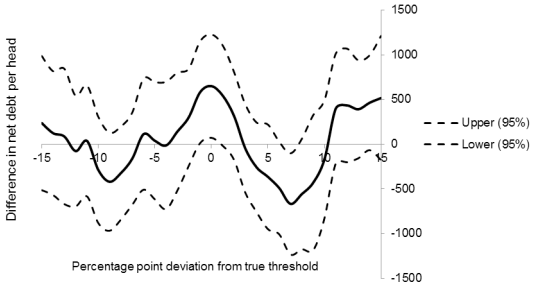
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$; standard errors clustered by municipality and time. All results are in Euros per capita (constant 2005 Euros)
[a]significant with third and fourth polynomial, [b]significant with third polynomial
[c]significant with second, third and fourth polynomial

For total material fixed assets we find a positive and significant effect at all thresholds, implying a move from one wage category to the next increases total material fixed assets by between €197 and €669 (with a respective constant of €1,516 and €1,297). This positive effect of wages on material fixed assets seem to be driven by increased investment in buildings (comprising of all buildings in municipal use, such as schools, municipal buildings or sport venues), infrastructure and other fixed assets (a broad category, including amongst others ICT, garbage collection and statues) (see Table 7 in the appendix for the asset side of the municipal balance sheet). In absolute terms, the higher valuations on the balance sheet are in the order of €150 to €300 per capita, which proves it economically significant. Looking at relative changes however, the effects of wage increases are more pronounced. Infrastructure and other fixed assets are valued respectively 35% to 85% and 160% to 290% higher above the threshold. Next to material fixed assets, total stock also increases on the municipal balance sheet as wages increase, and does so at all bandwidths but the 25% and 5%. If wages of municipal politicians increases, total stock increases by an amount ranging from €244 to €260 per head (with the respective constants of €402 and €381). Total stock predominantly includes undeveloped building grounds and work in progress (e.g. construction work). A high valuation of total stock gives an indication that a municipality is more likely to receive revenues from sales of building projects in the future. Politicians' wages do not have any effect on total current financial assets or total financial fixed assets (and its subcategory, total loans granted), as all threshold dummies are insignificant across all bandwidths. This means that changes in net debt do not orginate from the asset side of the municipal balance sheet but from an increase in municipal debt, more specifically from private loans (see Table 8 in the appendix for the liability side of the muncipal balance sheet). Just above the population thresholds studied, municipal politicians thus mainly use private loans to finance investments in buildings, infrastructure, other fixed assets and the total stock.

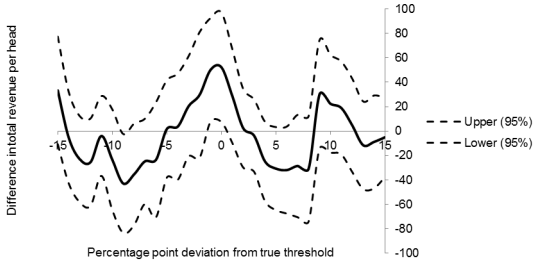
In order to evaluate how these incurred debts and accompanying investments are judged by citizens, we make use of the Leefbaarometer (2014) which offers a number of indices of objective and subjective factors to judge how citizens qualify their municipality. A value of zero on the index refers to the average of all municipalities, with higher numbers referring to above-average valuations. For our purposes the index on public space seems relevant, comprising of the value of sold homes, demolition of homes, noise pollution and green surroundings. We would expect higher investments to lead to higher evaluations on this index. Table 6 provides some evidence that higher wages for local politicians increase the quality of public space, yet the effect seems to be very local, as only the 5% threshold shows significant results. Larger bandwidths report insignificant dummies on linear functions, yet using this bandwidth in regressions with higher-order polynomials show significant results, similar to those reported for the 5% bandwidth (see Table 6). This leads us to infer higher investments from debt are positively evaluated, albeit very locally around the threshold.

We finally run a series of placebo regressions as a robustness check. In placebo regressions, other but the real threshold are used to define the threshold dummy. If the effects observed are due to the discontinuous increases at the threshold, the dummy should be insignificant in the placebo regressions. Figure 3 summarizes the results for our placebo regressions for the main performance indicators net debt, total revenue and total expenditure with a bandwidth of 10%. The horizontal axis shows how far away from the true threshold the placebo was run. Hence, at a value of zero on the horizontal axis, the true threshold was used, while at a value of five on the same axis a placebo threshold five percentage points to the right of the true threshold was used to run the RD regression. The vertical axis displays the estimates of the local linear regressions at the respective placebo thresholds. The dashed lines mark the 95% confidence intervals. As one can see, statistical significance disappears as one moves away from the true threshold, adding robustness to our findings. In other words, municipal politicians' wages seems to cause the effects reported above, as these effects only occur at the true population thresholds.

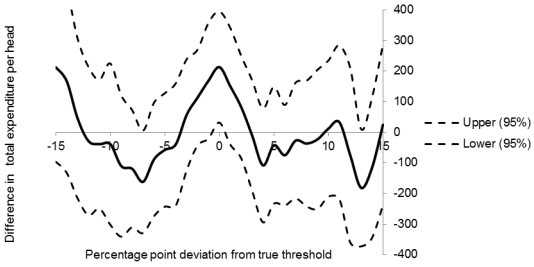
Figure 4: Placebo regressions



Net debt



Total revenue



Total expenditure

6 Discussion

In order to establish whether and to what extent our results can be generalized and hold across countries, we can compare our findings to those of Gagliarducci and Nannicini (2013). Both our studies report similar results regarding significance: wages matter and do so to a large degree. However, puzzlingly the effects are very different concerning their direction. While Gagliarducci and Nannicini (2013) find higher wages in Italy result in smaller municipal budgets, we find higher wages in the Netherlands increase both municipal budgets and net debts through investments. Gagliarducci and Nannicini (2013) offer two possible explanations for their findings: Firstly, the reduced municipality budget might be the result of increased efficiency. In this case, higher wages would indeed entail better performance. Secondly, the decrease in the municipality budget might be caused by differences in personal preferences of the Italian mayors themselves, as mayors elected in higher paying municipalities are found to have different skill levels, and thus may simply have different preferences. In order to find out whether lower budgets are driven by politicians' preferences or efficiency outcomes, Gagliarducci and Nannicini (2013) additionally study the speed of revenue collection and speed of payment as dependent variables in the same framework. Their findings show municipalities that pay higher wages are faster and therefore plausibly more efficient.

Following this line of reasoning, our results of increased municipal budget would mean higher wages in the Netherlands *increase* slack or *reduce* efficiency, or attract politicians that prefer *higher* spending. We argue however that this question of what is perceived as good performance of politicians cannot solely be answered along the lines of efficiency or preferences of politicians. Good municipal performance may as well be defined as better meeting the preferences and demands of the (median) voter, to which our results from the *Leefbaarometer* give some credence. Defined like this, decreasing municipal budgets in Italy as well as increasing municipal budgets and investment in the Netherlands may both be interpreted as a sign of improved performance or responsiveness to preferences by politicians. Focusing on institutional differences across the two countries, we offer two potential explanations of why both outcomes may entail improved performance, aimed to provide guidance for further research.

Firstly, voter preferences may be shaped by trust. According to the DICE Database (2014), public trust in politicians in Italy is amongst the lowest of the countries studied, while public trust is very high in the Netherlands. In reply to the question how they would rate the ethical standards of politicians with one being extremely low and seven extremely high, Italian respondents in 2012/2013 ranked their politicians a 1.8. Only Greece (1.5) and the Czech Republic (1.8) trust their politicians less. On the contrary, Dutch respondents rank the ethical standards of their politicians at 5.4. The only countries where respondents trust their politicians even more are Sweden (5.5), New Zealand (5.5) and Norway (5.7). It is likely that the different levels of trust into politicians affect the preferences for (local) public spending and taxation. When citizens trade off publicly provided goods against private consumption, higher trust in politicians may translate into higher demand for municipal provision of goods and services. In this case, increased local spending and investment (given accompanying tax increases) may be favorably judged as better performance compared to the case in which lower trust translates into lower demand for public provision.

Secondly, institutional differences between Italy and the Netherlands may form part of the explanation: Italian municipal councils are largely bipolar (Baldini, 2011) and more presidential-type institutions with powerful, elected mayors, especially compared to their Dutch counterparts that chair meetings of the city council and fulfill a largely nonpartisan role. The Italian system is said to be majoritarian for government while proportional for the opposition (Fabbrini, 2001), compared to Dutch system which in contrast is a multi-party system with a coalition executive and proportional representation. As Persson and Tabellini (2000) show, the two systems tend to supply different levels of public goods: Majoritarian systems will generally target narrower constituencies and are associated with lower levels of public goods provision compared to their proportional counterparts. Regarding the executive and legislative powers, the authors find parliamentary regimes overall will be associated with larger governments compared to presidential regimes. Improved performance

in both systems may entail politicians are better able to target their key constituencies, where presidential-majoritarian systems such as that of Italy better performance means better targeting of narrower constituences, decreasing the overall size of government, while in systems with proportional voting and parliamentarian regimes such as in the Netherlands better performance means targeting broader constituencies, increasing municipal budgets and supplying more public goods.

7 Conclusion

This paper empirically addresses the relationship between politicians' pay and performance. Exploiting an institutional feature for local government in the Netherlands in which wages are exogenously determined by population thresholds, we employ an RD design to study how wage increases shape municipal budgets and balance sheets. We find higher spending is associated with higher levels of net debt, higher levels of local spending and associated higher local tax and tariff revenues. Increased net debt figures are shown to be incurred because of higher investment in material fixed assets, comprised of infrastructure, buildings in municipal use and a range of other fixed assets.

Our findings are consistent with an earlier study regarding the significance of findings: Politicians' wages matter, and do so to a large degree. We however do find a reversal of the sign: While for Italy Gagliarducci and Nannicini (2013) find wage increases reduce municipal budgets, Dutch municipal budgets increase with wage increases. We argue if performance may be defined as politicians better meeting the preferences and demands of the (median) voter groups, (to which results from the *Leefbaarometer* give some credence) given institutional differences between Italy and the Netherlands, both results may be interpreted as signs of improved performance. We propose two possible institutional explanations for differences in the sign, arguing political trust and the political system (majoritarian or proportional, presidential or parliamentary) may shape outcomes when studying the relationship between pay and performance, and call for further theoretical and empirical research into factors mediating in this relationship.

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Appendix

Table 7: RD results for the asset side of the municipal budget sheet, detailed

		(1)	(2)	(3)	(4)	(5)
		25%	20%	15%	10%	5%
1 Total material fixed assets	D	197*	237**	341**	610***	669***
		(106)	(121)	(141)	(169)	(244)
	Constant	1516***	1489***	1413***	1262***	1297***
		(73)	(85)	(97)	(91)	(109)
	N	2339	1863	1412	964	409
	Degree	*fourth*	*fourth*	*third*	*second*	*first*
1.1 Land	D	-5	-2	10	62***	-34
		(23)	(25)	(27)	(31)	(22)
	Constant	119***	112***	93***	57***	89***
		(15)	(15)	(13)	(17)	(13)
	N	2339	1863	1412	964	409
	Degree	-	-	-	*first*	-
1.2 Buildings	D	82	77	145**	198***	101
		(60)	(65)	(71)	(75)	(92)
	Constant	743***	738***	661***	649***	760***
		(46)	(49)	(57)	(55)	(74)
	N	2339	1863	1412	964	409
	Degree	-	-	*second*	*first*	-
1.3 Infrastracture	D	51	61	74	147*	291***
		(57)	(65)	(68)	(81)	(107)
	Constant	496***	491***	487***	431***	342***
		(35)	(38)	(43)	(46)	(42)
	N	2339	1863	1412	964	409
	Degree	-	-	-	*third*	*first*
1.4 Other	D	70	102	113	203*	310*
		(60)	(75)	(87)	(112)	(173)
	Constant	160***	148***	171***	125***	107**
		(31)	(42)	(36)	(39)	(48)
	N	2339	1863	1412	964	409
	Degree	-	-	-	*second*	*first*
2 Total financial fixed assets	D	56	49	103	90	-34
		(87)	(102)	(104)	(102)	(129)
	Constant	496***	487***	463***	455***	484***
		(60)	(70)	(73)	(90)	(104)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-
2.1 Total loans granted	D	-0.4	11	9	-7	-14
		(12)	(14)	(10)	(14)	(17)
	Constant	35***	30***	31***	32***	44***
		(6)	(7)	(8)	(10)	(14)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-
3 Total stock	D	158	244**	260**	256*	188
		(112)	(121)	(132)	(141)	(167)

	Constant	472^{***}	402^{***}	381^{***}	291^{***}	398^{***}
		(77)	(82)	(92)	(85)	(119)
	N	2339	1863	1412	964	409
	Degree	-	*first*	*first*	*first*	-
3.1 Undeveloped building grounds	D	62	165^{**}	134^{*}	139	143
		(57)	(66)	(69)	(75_	(95)
	Constant	154^{***}	93^{**}	115^{***}	119^{***}	133^{*}
		(27)	(41)	(42)	(48)	(69)
	N	2339	1863	1412	964	409
	Degree	-	*first*	*first*	*first*	-
3.2 Being developed	D	88	71	109	107	39
		(93)	(98)	(107)	(107)	(132)
	Constant	310^{***}	298^{***}	256^{***}	153^{**}	234^{**}
		(67)	(71)	(78)	(67)	(110)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-
3.3 Other stock	D	7	9	16	10	6
		(9)	(9)	(13)	(15)	(23)
	Constant	9	11	9	19	31
		(7)	(8)	(12)	(15)	(24)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-
4 Total current financial fixed assets	D	-23	-24	-38	-59	-70
		(51)	(56)	(64)	(72)	(96)
	Constant	469^{***}	455^{***}	467^{***}	475^{***}	447^{***}
		(39)	(44)	(54)	(66)	(88)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$; standard errors clustered by municipality and time. All results are in Euros per capita (constant 2005 Euros)

Table 8: RD results for the liability side of the municipal budget sheet

		(1) 25%	(2) 20%	(3) 15%	(4) 10%	(5) 5%
1 Total debt	D	352*	411**	635***	655**	518*
		(188)	(209)	(238)	(267)	(293)
	Constant	1475***	1395***	1239***	1146***	1244***
		(124)	(127)	(157)	(160)	(171)
	N	2339	1863	1412	964	409
	Degree	*third*	*third*	*second*	*first*	*first*
1.1 Total long-term debt	D	340*	432**	650***	668***	449
		(175)	(191)	(219)	(252)	(275)
	Constant	1115***	1042***	877***	803***	974***
		(109)	(112)	(137)	(143)	(155)
	N	2339	1863	1412	964	409
	Degree	*third*	*third*	*second*	*first*	-
1.1.1 Private loans	D	315*	409**	626***	652***	445
		(172)	(189)	(217)	(252)	(284)
	Constant	1105***	1039***	872***	797***	964***
		(109)	(113)	(137)	(143)	(155)
	N	2339	1863	1412	964	409
	Degree	*third*	*third*	*second*	*first*	-
1.1.2 Other long-term debt	D	24	23	24	16	4
		(16)	(19)	(17)	(17)	(18)
	Constant	10	3	5	6	10
		(6)	(10)	(6)	(8)	(7)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-
1.2 Total current debt	D	13	-21	-15	-13	69
		(41)	(50)	(56)	(62)	(49)
	Constant	360***	354***	362***	343***	270***
		(36)	(41)	(49)	(56)	(44)
	N	2339	1863	1412	964	409
	Degree	-	-	-	-	-

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$; standard errors clustered by municipality and time. All results are in Euros per capita (constant 2005 Euros)