

Does the Strength of Incentives Matter for Elected Officials? A Look at Tax Collectors

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Abstract

In Pennsylvania property taxes are collected by municipal tax collectors who are elected officials. Wide variability exists in both the structure and level of compensation for these tax collectors. This paper analyses the existence of a pay-performance relationship for these officials. Using data on the percentage of real estate taxes that are actually collected at the municipal level, the paper finds that as the compensation tax collectors receive goes up, they collect more in taxes. This relationship is true only for those collectors who are compensated on a commission basis and not for collectors who are compensated on the basis of a flat salary. Furthermore, using novel data, the paper offers some evidence that local residents are more likely to seek the status of a “Qualified Tax Collector” when the compensation they receive for collecting taxes is higher. Lastly, the paper also finds that as the compensation of tax collectors increases, elections are more likely to be contested.

JEL codes: H70 (State and Local Government), J45 (Public Sector Labor Markets), J33 (Wage Level and Structure), D72 (Political Processes: Rent-Seeking, Lobbying, Elections, Legislatures, and Voting Behavior), and M52 (Compensation and Compensation Methods and Their Effects).

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1. Introduction

There is a growing theoretical and empirical literature that examines the effect of politician salary on a variety of measures such as performance of politicians while in office, the decision to run for election, and on the quality of politicians. This paper contributes to that literature by examining the institution of municipal tax collectors in the state of Pennsylvania. Municipal tax collectors are elected officials who are responsible for the collection of property taxes for their respective municipalities, school districts, and counties. This paper finds that an increase in the compensation of tax collectors is associated with greater collection of property taxes, but that relationship holds true only for collectors who are compensated on the basis of a commission and not for collectors compensated on the basis of a salary. It also finds that higher compensation induces more local residents to seek the status of a “Qualified Tax Collector”. Lastly, it finds that an increase in tax collector compensation is more likely to induce multiple candidates to run for office.

The theoretical literature that examines the effect of politician compensation on the quality and performance of politicians offers ambiguous predictions. Work in the area of efficiency wages suggests that paying workers more reduces shirking because of the higher cost of being fired (Shapiro and Stiglitz, 1984) and enhances the quality of the applicant pool (Weiss 1980). These ideas are also central to the model in Besley (2004) which predicts that a higher salary improves the average quality of politicians. Moreover, by increasing the incumbent’s payoff from being re-elected, higher compensation is also likely to spur better performance on the job.

On the other hand, models such as those in Caselli and Morelli (2004) and Messner and Polborn (2004) start off with the plausible assumption that bad candidates have lower opportunity costs than good candidates and predict that high compensation may induce lower quality candidates to run for election and in equilibrium, reduce the quality of candidates elected. More generally, a literature in personnel economics (Gneezy and Rustichini, 2000; Ariely et al., 2009) suggests that workers are often driven by intrinsic motivations and the impact of increasing external rewards might be to reduce the effect of intrinsic motivations via crowd-out. If that is true, increasing politician compensation may have the perverse effect of inducing candidates who are less intrinsically motivated to also run for office. Depending on the voting mechanism at hand, this can reduce the quality of candidates elected in equilibrium. Thus given these ambiguous predictions regarding the effect of politician compensation on quality, the analysis of compensation of elected officials on their quality and performance is an empirical matter.

Examining the relationship between politician compensation and quality empirically however runs into a number of challenges. For one, since politicians often play a role in deciding on their salaries, one cannot simply estimate the effect of compensation on politician salary without considering the possibility that causality runs in the opposite direction. For example, politicians who demonstrate better performance may be able to get the broader public to support

pay raises for them.¹ Recent papers attempt to overcome this problem either by exploiting large discontinuous changes in policy or by exploiting discontinuities of politicians' salaries with population size. Fisman et al. (2014) and Mocan and Altindag (2013) study politician performance in the European Union, exploiting a pay equalization policy that equalized salaries of Members of the European Parliament which had previously differed by as much as a factor of ten. These papers either find no effect of the increase in salaries on attendance and shirking (Fisman et al. (2014)) or that it has a negative effect on attendance and the number of questions asked by the parliamentarians (Mocan and Altindag (2013)).

Ferraz and Finan (2011) and Gagliarducci and Nannicini (2013) use a regression discontinuity research design that exploits the discontinuous change in salaries of municipal officials with a change in the population of their municipalities in Brazil and Italy respectively. Both papers find that higher salaries attract more educated individuals to run for public office and that more well-compensated politicians appear to have better performance in office. Gagliarducci and Nannicini (2013) find that in municipalities with better-paid mayors, the speed of revenue collection (that is, the ratio between collected and assessed revenue within the year) and the speed of payment (that is, the ratio between paid and committed outlays within the year) is higher. Ferraz and Finan (2011) find that higher wages increase legislative productivity, resulting in more legislative bills and the provision of more public goods.

A few studies have looked at these questions in the U.S. context. In one of the earliest analyses, Di Tella and Fisman (2004) examine the variation of gubernatorial salary and estimate that governors experience a pay cut for increases in per capita tax payments and a pay increase for an increase in income per capita in their states. They consider various competing theories but find their results most consistent with a "pay for performance" mechanism. More recently however, a comprehensive study of U.S. governors and state legislators by Hoffman and Lyons (2014) shows little correlation between salary changes and changes in politician performance or quality.

This paper analyzes the relationship between (1) pay and performance and (2) pay and politician quality in the context of municipal tax collectors within Pennsylvania. There are a number of advantages of this setting over some of the settings that have been studied previously. First, we observe considerable variation in both the structure and level of compensation of tax collectors across municipalities. For example, while some municipalities compensate their tax collectors on the basis of a flat salary, others use a commission-based structure. These variations are largely driven by variations in the enabling codes of local government in Pennsylvania. Additionally, for those municipalities which compensate their tax collectors on a commission basis as a percentage of the real estate taxes collected, there is considerable variation in the percentage and in the resulting overall compensation. This variation in the compensation of tax collectors results in wide variation in the strength of incentives experienced by tax collectors.

¹ Di Tella and Fisman (2004) present suggestive evidence from the U.S. that better economic performance of their states results in higher salaries for governors.

None of the other papers in the literature exhibit such heterogeneity in the compensation structure of the public officials analyzed.

Second, we are able to measure the performance of public officials in a manner that is arguably superior to that of prior work. For the tax collectors that we study, their key responsibility lies in collecting real estate taxes for their municipalities (and typically also the school district and county where the municipality is located). We can estimate the performance of these tax collectors on the basis of what percentage of their municipality's predicted real estate taxes they were actually able to collect. Unlike a state's governor or legislators whose actions may have little influence on aggregate economic output of their state (especially over the time horizons considered in those papers), a tax collector is likely to have a greater ability to influence the percentage of real estate taxes that are actually collected in their municipality.

Lastly, we have a novel measure of quality that is likely to have a direct bearing on how well these tax collectors exercise their responsibilities. Local citizens can enroll in a training course involving subjects such as auditing, accounting, ethics, computerization, and law. On the completion of the said training, they can take a qualifying exam, and on successfully clearing the exam, they receive the designation of "Qualified Tax Collector." Prior to the passage of Act 164 (2014) by the Pennsylvania legislature, tax collectors were not required to take the qualifying exam and be a "Qualified Tax Collector" in order to run for office. However, individuals could go through the training, obtain the certification, and make themselves more attractive candidates for the office in the eyes of their fellow citizens and voters. Given that this was not a mandatory requirement for holding the office of tax collector until 2015, we can examine whether higher compensation induces more individuals to seek this certification. With the assumption that individuals who seek certification and become "Qualified Tax Collectors" are of a higher quality, we can directly test for the presence of a relationship between compensation and quality of elected officials in a manner that has not been possible earlier.

Our findings are as follows:

1. Higher compensation is associated with a higher level of real estate taxes collected. These effects are driven by those tax collectors who are compensated on a commission basis in the form of a percentage of real estate taxes collected. There is no statistically significant relationship for tax collectors compensated on a flat salary basis.
2. Higher salary induces more citizens to seek certification as a "Qualified Tax Collector."
3. Lastly, a higher salary is also more likely to induce more people to seek the office of tax collector. The likelihood of having multiple candidates run for office goes up as salary increases.

The paper is laid out in the following sections. Section 2 lays out the institutional setting, Section 3 describes the data sources, and Section 4 presents the econometric specification.

Section 5 outlines the results while Section 6 concludes and lists out the next steps that are to be undertaken.

2. Institutional Setting

Pennsylvania has a complex system of local government with the second highest number of local governments in the country, next only to Illinois. General purpose local governments: cities, boroughs, and townships, total approximately 2,600 units. Like local governments around the country, they rely on a mix of revenue sources, including taxes, transfers from higher levels of government, and user-fees and charges. Among the sources of tax revenue, the property tax and the local earned income tax are the two most important sources with each contributing roughly 40–45 percent of all tax revenue.

Governance of a municipality varies based on the class of municipality and is laid out in the respective codes enabling local government. Municipalities are either classified as cities, boroughs, or townships which can be either of the first class or the second class. Barring the three largest cities – Philadelphia, Pittsburgh, and Scranton, all cities are classified as cities of the third class and are governed by a mayor and four councilmen who constitute its governing body. Boroughs have a strong and dominant council and a weak executive (mayor). Townships of the first class are governed by a body of elected commissioners, either five elected at large or up to 15 elected by wards. Townships of the second class are governed by a body composed of three supervisors who are elected at large. Each municipality also has a number of other elected officers with powers that are independent of the city council or borough council or township board. The tax collector is one such elected officer.²

As described in the Tax Collector’s Manual, “The local tax collector is the municipal officer designated to collect municipal and school real estate and personal taxes levied under the municipal codes, and in most cases, county real estate and personal taxes. In boroughs and second class townships, the office is designated as tax collector; in third class cities³ and first class townships, the elected treasurer is designated tax collector.” This is an elected office; a person is elected for a 4-year term at the municipal election, which are held in odd-numbered years.

The Tax Collector’s Manual also describes the minimal qualifications required for candidates for local tax collector.⁴ In third class cities, the city treasurer must be a competent accountant, 21 years of age or more, and a resident of the city for a year before the election. An individual does not have to be a certified public accountant; s/he can be a qualified accountant

² There are exceptions to these general principles in the case of home rule municipalities which are allowed to abolish the office of tax collector if that was a part of the charter and approved by voters in a referendum. In such a case, the home rule charter specifies which office is responsible for the collection of municipal property taxes.

³ All cities in Pennsylvania excepting Philadelphia, Pittsburgh, and Scranton are cities of the third class. the home rule charter or administrative code designates which office is responsible for collecting local property taxes.

⁴ The requirement that tax collectors seek the “Qualified Tax Collector” designation offered by Pennsylvania’s entity in charge of local government matters, the Department of Community and Economic Development (DCED) does not come into effect until October 2015.

through training and experience. In townships of the first class, the only qualification is being a registered voter of the municipality. In boroughs and townships of the second class, the tax collector must have resided in the municipality for one year before the election and continue to reside there during the term of office.

Compensation of the tax collector is structured largely based on the codes enabling local government, such as the Third Class City Code, Borough Code, First Class Township Code, and Second Class Township Code. Within the broad parameters of these codes, the actual compensation of tax collectors is fixed by the local government they collect taxes on behalf of. City treasurers are compensated in the form of an annual salary for collecting taxes. The salary is determined jointly by the city council, school board, and, where applicable, county commissioners. Compensation for treasurers in first class townships is set independently by the taxing districts, typically the municipality, the school district, and the county. Compensation for township treasurer (and tax collector) is set by an ordinance of the township commissioners with the provision that total compensation for township duties alone cannot exceed \$10,000 a year. If the commissioners have not established a rate by ordinance, the treasurer receives the statutory rate of 5 percent of taxes collected and 1 percent of other township funds received, subject to the \$10,000 maximum. In boroughs and townships of the second class, the compensation for the tax collector is again set independently by the governing body of the municipality – either the borough council or board of township supervisors. Compensation can be in the form of a salary, wages, or a commission, with the total compensation not to exceed 5 percent of the amount of taxes collected for each unit except for second class townships with populations less than 3000, where it cannot exceed 10 percent.

Tax collectors in boroughs and townships are not eligible for fringe benefits such as health insurance which are limited to employees and elected members of the governing bodies and the mayor (when one exists). Also, as elected officers, tax collectors in boroughs and townships are generally not eligible for participating in municipal retirement plans. The status of city treasurers is distinctly different – they, like city employees, are eligible to participate in life, health, and accident insurance plans purchased by the city and in their retirement plans.

3. Data Sources

I utilize a variety of data sources for this study. There are two sources of data on compensation of tax collectors. The first comes from a 2004 survey conducted by the Pennsylvania Economy League (PEL) of municipalities in nine counties in central and eastern Pennsylvania regarding their tax collection practices. The second source of data on compensation is the Pennsylvania Manual. This provides information on the compensation of tax collectors from approximately 130 of the largest municipalities within Pennsylvania.

These data sources have their relative advantages and disadvantages: the data included in the 2004 study by the Pennsylvania Economy League (PEL) includes compensation data on a larger number of municipalities compared to the number of municipalities included in the Pennsylvania Manual. Second, because it includes data on a number of smaller municipalities

(generally boroughs and townships of the second class), we find more instances in the data where tax collectors are compensated on a commission basis rather than on a flat salary basis. Moreover, the percentage of real estate taxes paid to the tax collector as compensation exhibits considerable variation. With data from the Pennsylvania Manual, on the other hand, since these pertain to the largest municipalities (predominantly cities and townships of the first class), tax collectors in these municipalities are more likely to be compensated in the form of a flat salary and in a number of instances, townships of the first class bunch at the \$10,000 threshold imposed by the First Class Township Code. The primary advantage of the data from the Pennsylvania Manual is that these go back in time and it is possible to construct a panel dataset. For the purposes of this paper however, we use data on tax collector salary from the Pennsylvania Manual only for one year – 2012 and match it with measures of tax collector quality for 2013.

In order to obtain a sense of the efficiency of the property tax collection system at the municipal level, I turn to data on municipal finances available from the Pennsylvania Department of Community and Economic Development (DCED). The data most relevant to us are data on the assessed value of real estate, the millage rate chosen by the municipality, and the real estate taxes that were actually collected. We can use these data to define the percentage of real estate taxes collected as:

Percentage of real estate taxes collected = Real estate taxes actually collected/ (Millage rate/1000 * Assessed value of real estate).

For example, consider Hazleton City in Luzerne County. For 2008, their tax rate on assessed value of real estate was 39.8 mills and the total assessed value of real estate was \$43,901,369. Thus the real estate taxes that should have been collected equal \$1,747,274. However, \$1,573,661 was actually collected for the year, suggesting that 90.1 percent of the taxes that should have been collected were actually collected.

As was noted earlier, tax collectors and citizens interested in running for that office can seek certification as a “Qualified Tax Collector” by undergoing a training and successfully completing an exam at the end of the training. Under current law (and until October 2015), this program is voluntary. From the DCED, we have a list of all individuals from the state who were “Qualified Tax Collectors” as of January 2013.

The last data source I use is data on elections for tax collectors. These are available from the websites of the Boards of Elections for the counties in which the municipalities are located.

Summary statistics are presented in Table 1. Table 1 clearly indicates the wide variation in the compensation of tax collectors across municipalities. Additionally, one can also discern wide differences in compensation based on the two sources – the 2004 PEL survey and the Pennsylvania Manual. These differences reflect the differences in size of the municipalities covered by the two sources. The largest municipalities which are included in the Pennsylvania Manual are more likely to pay their tax collectors (or treasurers) higher salaries than the smaller municipalities, which are more likely to appear in the PEL survey.

4. Empirical Specification

There are three analyses we are able to undertake on the basis of the data at hand and I lay out the empirical specification used for each.

First, to examine if there is a relationship between tax collector compensation and their performance, I look at the percentage of predicted real estate taxes that were actually collected by the municipality. As there may be considerable year-to-year variation (perhaps because a large owner of real estate was delinquent in a given year but paid off his taxes in the next), I consider the average over a multiple-year window. When using the 2004 data on compensation from the Pennsylvania Economy League, I consider an unweighted average of the percentage of real estate taxes collected for the subsequent four-year period from 2005 through 2008. The specification used is:

$$Y_{it} = \alpha + \beta * C_{i,t-1} + \gamma * W_{i,t} + \epsilon_{it} \quad (1)$$

In the equation above, Y is the percentage of real estate taxes actually collected, C refers to compensation as a percentage of real estate taxes collected, W includes municipal-level controls that are likely to have an independent influence on the efficiency of the property tax collection system, and ϵ is the error term. Standard errors are clustered throughout at the county level to account for arbitrary correlation in error terms for observations within the same county.

To examine whether a higher salary induces more individuals to seek certification as a “Qualified Tax Collector”, I use the following specification:

$$Y_{it} = \alpha + \beta * S_{i,t-1} + \gamma * W_{i,t} + \epsilon_{it} \quad (2)$$

In the equation above, Y is a binary (0/1) variable which tells us whether a given municipality has any “Qualified Tax Collector” or not who could run for the office of tax collector, S is the log of annual salary received, W includes municipal-level controls which might have an independent influence on the likelihood that a citizen will seek this “Qualified” status, and ϵ is the error term. This analysis is conducted using the list of “Qualified Tax Collectors” for 2013 and 2012 data on salaries from the Pennsylvania Manual.

Lastly, in order to examine whether a higher salary induces more individuals to seek the office of Tax Collector, I use a specification identical to (2), with the difference that here Y is the number of candidates who run for the office of tax collector in the general elections and W includes municipal-level controls which might have an independent influence on the likelihood that a citizen will run for office. Given that we have data on compensation for a larger number of municipalities in the 2004 Pennsylvania Economy League study, this analysis uses that data source and considers salaries in 2004 and the number of candidates who contested the round of municipal elections that were held in November 2005.

5. Results

A. Does higher compensation induce the collection of more taxes?

Tables 2 and 3 present the results of this analysis using specification (1). Table 2 uses observations from all municipalities, irrespective of whether tax collectors are compensated on the basis of a flat salary or on a commission basis while in Table 3, only those municipalities which compensate their tax collectors on a commission basis are included.

Column (1) of both tables estimates a parsimonious specification with no controls. Column (2) adds controls for the millage rate as well as the market value of real estate per capita, as these variables may have an independent influence on the percentage of real estate taxes that are actually collected. For example, a low market value of real estate per capita is likely in municipalities experiencing a challenging economic environment and it may be harder to collect real estate taxes in such a municipality. Columns (3) and (4) replicate columns (1) and (2) but add in county fixed effects as well.

[Table 2 about here.]

[Table 3 about here.]

When we consider the effect of a higher compensation on all municipalities in our estimation, including those which pay their tax collectors a fixed salary, we do not find a statistically significant effect of compensation on the percentage of real estate taxes that are actually collected. This is true across all four columns of Table 2. However, when in Table 3 our analysis is limited to those municipalities which pay their tax collectors on a commission basis, we find a positive and statistically significant relationship between the compensation received by tax collectors and the percentage of real estate taxes that are actually collected. This is true across the four columns of the table as progressively more controls are added.

The lack of a relationship between compensation and percentage of real estate taxes collected for tax collectors paid on a flat-salary basis is replicated when we use data from the Pennsylvania Manual. As was noted earlier, the data from this source pertain to the largest municipalities within the state and nearly all of these municipalities pay their tax collectors a fixed salary. Of the municipalities which have data on compensation of tax collectors, only 14 rely at least partly on a commission-based structure and we know the level of the commission for only six of those municipalities. The paucity of observations from this alternative data source prevents us from estimating a regression including only those municipalities which compensate their tax collectors on a commission basis. However, when we consider those municipalities that compensate their collectors on a fixed salary basis, the lack of a statistically significant relationship between salaries and percentage of real estate taxes collected that is observed in Table 2 is replicated. These results are available on request.

B. Does higher compensation induce more individuals to seek “Qualified Tax Collector” status?

To answer this question, we use the 2012 data on tax collector compensation from the Pennsylvania Manual. The reason for this choice is that the list of “Qualified Tax Collectors” is

only available for recent years – 2013 and 2014.⁵ The fact that most municipalities with data in the Pennsylvania Manual tend to compensate their tax collectors using a flat salary does not pose a problem for us as we would expect more individuals willing to seek certification as their total compensation increases, irrespective of whether that comes in the form of an increase in the salary or an increase in the commission paid.

Table 4 presents the results of estimating specification (2). In column (1), we consider the most parsimonious specification and only include the independent variable, log of annual salary. Column (2) adds in a control for municipal population as it seems likely that there may be more individuals interested in seeking this “Qualified” status in a larger municipality. Column (3) adds in a control for the predicted real estate taxes that are collected. To the extent that collecting more taxes involves expending more effort, a higher work load may dissuade individuals from seeking the qualification and eventually running for office. Columns (4) through (6) additionally also control for the class of the municipality; we add in dummy variables for the various classes of municipalities, viz. cities, boroughs, townships of the first class, and townships of the second class.

[Table 4 about here.]

In columns (1) through (3), we find that the coefficient on log annual salary is positive but not statistically significant at the 10 percent level. However, once we add in controls for the class of the municipality, the relationship is now statistically significant at the 10 percent level in columns (4) through (6). To obtain a sense of numerical magnitude of the estimates, consider the coefficient in column (4) of Table 4 of 0.0197. For a one standard deviation increase in annual salary of tax collectors relative to the mean (from \$17,641 to \$30,882), the corresponding increase in the dependent variable, “at least one tax collector” is 0.00479. Given that only about 150 municipalities have qualified tax collectors in 2013, the mean of the dependent variable is 0.0652. Hence, an increase in annual salary of tax collectors by one standard deviation translates to an increase of $0.00479/0.0652$ or 7.3 percent relative to the mean of the dependent variable.

As was noted earlier, the office of city treasurers appears to be qualitatively different from the office of treasurers in townships of the first class or tax collectors in boroughs and townships. City treasurers are eligible for health insurance, pension benefits, and other fringe benefits from their employers and therefore the salary they receive reflects only a portion of their total compensation. Hence, I repeat the entire analysis reported in Table 4 but excluding cities and limiting myself to boroughs and townships (both of the first class and the second class) and present those results in Table 5.

[Table 5 about here.]

The results are now stronger than what they were previously in Table 4. Although the sample size drops from 110 municipalities to 78, the coefficients are statistically significant at

⁵ A representative from the Pennsylvania DCED confirmed that lists of qualified tax collectors from years prior to 2013 had been lost because of a computer glitch.

the 10 percent level (or better) across all columns (1) through (6). The point estimates are also about 50 percent larger in absolute magnitude than those in Table 4.

C. Does higher compensation induce more individuals to seek the office of Tax Collector?

The final question we turn to is whether higher compensation induces more individuals to seek the office of tax collector. For this we revert to using data on compensation available from the 2004 survey by the Pennsylvania Economy League primarily because we have data on compensation for a larger number of municipalities relative to that in the Pennsylvania Manual. We are able to obtain data on the 2005 municipal elections for five counties that overlap with the counties included in the 2004 PEL survey – Berks, Lehigh, Luzerne, Northampton, and York. Our priors are that more individuals may be interested in running for office if they were to receive a higher compensation when in office. Again this is likely to be true irrespective of whether they receive compensation in the form of a salary or on a commission basis.

Columns (1) through (4) of Table 6 present the results of a regression analysis in which the dependent variable is the number of candidates who run for the office of tax collector in the general elections in their respective municipalities. In column (1), the amount paid to the tax collector in 2004 is the sole variable. Column (2) adds controls for population and the predicted real estate tax, because while a more populous municipality is more likely to see a contest, a higher predicted real estate tax is likely to correlate with the work load of the tax collector and may dissuade individuals from running for office. Columns (3) and (4) parallel columns (1) and (2) but they include county fixed effects.

Columns (5) through (8) present the results of a probit estimation where the dependent variable is a dummy variable that takes the value of 1 when there is more than one candidate seeking this office. In other words, it takes the value of 1 whenever there is an electoral contest for the office of tax collector. The inclusion of controls in columns (5) through (8) replicate the pattern of inclusion in columns (1) through (4).

[Table 6 about here.]

Looking at the coefficients in columns (1) through (4), there appears to be a relationship between the amount paid to tax collectors and the number of candidates seeking this office, even though the coefficient is not always statistically significant at the 10% level. The average value of the coefficient in columns (1) through (4) is 0.08 and for a one standard deviation increase in the amount paid to tax collectors (relative to the mean compensation), this corresponds to an increase of 0.025. As the position of tax collector is infrequently contested, the mean value of the dependent variable is 1.07 and hence a one standard deviation increase in compensation translates to an increase of about 2.5 percent in the level of the dependent variable.

When we consider the results of the probit estimation in columns (5) through (8), we find that higher compensation has an effect on the likelihood that there is an electoral contest with estimates being statistically significant at the 1 percent level across all specifications. If we were to consider the average value of the coefficient in columns (5) through (8) of 0.3128, then a one

standard deviation increase in the amount paid to tax collectors (relative to the mean) results in an increase of 9.7 percent in the probability that the election is contested. This is a large change when considered in light of the fact that only about 9 percent of elections for this office are contested and that the average number of candidates in the general election is 1.07.⁶

6. Conclusion

This paper presents one of the first analyses of whether a pay-performance relationship exists for elected municipal officials in the United States. Using data on percentage of real estate taxes that are actually collected, the paper suggests that municipal tax collectors collect more in property taxes as the commission they receive goes up. In contrast, there appears to be no statistically significant relationship for tax collectors who are compensated on the basis of a flat salary.

The paper also uses novel data on the qualifications of these tax collectors and offers some evidence that individuals are more likely to seek the status of a “Qualified Tax Collector” when the compensation they receive for collecting taxes is higher. Consistent with these findings, the paper finds that as the compensation of tax collectors increases, more candidates are likely to run for office and elections are more likely to be contested.

In ongoing research, I am working with a state agency (the Legislative Budget & Finance Committee) to obtain additional data on compensation of tax collectors. I also plan on constructing a panel dataset using successive issues of the Pennsylvania Manual and using that data to examine whether a relationship between compensation and performance exists once we control for time-invariant municipal characteristics, something that was not possible using the datasets constructed for the analysis presented here. I can also obtain additional data on elections in order to examine whether incumbents are more likely to seek re-election as salaries go up and whether primaries are more likely to be contested or not.

The work described in the paper as it currently stands along with the work that is proposed can help shed light on the question of whether and how incentives matter in the public sector. It can also be informative to ongoing public policy discussions of whether the compensation for municipal tax collectors is set appropriately or not.

⁶ Occasionally, there are no candidates who seek the office of tax collector in which case write-in candidates may be elected to the office. If there are no write-in candidates as well, then the governing body of the municipality appoints an individual to fill the vacancy. In our sample, we observe only write-in candidates for 5 municipalities, 1 candidate (i.e. uncontested) for 169 municipalities, and 2 candidates in (only) 18 municipalities. Therefore the average number of candidates = $(5 * 0 + 169 * 1 + 18 * 2)/192 = 1.07$. Thus, while 18/ 192 or 9.4% of all municipalities experience an electoral contest, the average number of candidates = 1.07.

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Table 1: Summary Statistics

	N	Mean	p25	Median	p75
Compensation data from the 2004 Pennsylvania Economy League (PEL) survey					
Amount Paid					
■ In absolute terms	299	\$4,986	\$1,572	\$3,549	\$6,957
■ As a percentage of real estate taxes collected	299	3.57	1.79	4.00	5.00
Average percentage real estate taxes collected (2005 – 2008)	2,518	466.5**	97.9	99.6	101.7
Compensation data from the 2012 Pennsylvania Manual					
Annual Salary	110	\$17,641	\$10,000	\$12,400	\$26,000
Data from 2005 Municipal Elections					
Number of candidates in the election for office of tax collector	192	1.07	1	1	1

** This is unduly affected by outliers. In the regressions therefore, we use values that lie within the 5th and 95th percentile of the distribution.

Table 2: Effect of higher compensation on percent real estate taxes collected

	(1)	(2)	(3)	(4)
	Dependent variable: Percentage municipal real estate taxes collected (average for years between 2005 and 2008)			
Compensation (as percent of taxes collected)	0.121 (0.99)	0.155 (1.16)	0.176 (1.41)	0.122 (1.07)
Millage rate		0.0255 (0.32)		-0.135 (-1.12)
Square of Millage rate		-0.000535 (-0.36)		0.00191 (0.95)
Market value of real estate per capita		0.00000936 (1.05)		0.0000112 (1.23)
Constant	100.4*** (196.91)	99.51*** (108.58)	100.2*** (233.58)	100.3*** (113.22)
County Fixed Effects	No	No	Yes	Yes
<i>N</i>	255	255	255	255
<i>R</i> ²	0.0032	0.010	0.044	0.069

Notes: Data on commission paid to municipal tax collectors is based on data provided by the Pennsylvania Economy League and pertains to nine counties in Central and Eastern Pennsylvania (Berks, Blair, Dauphin, Lackawanna, Lehigh, Luzerne, Lycoming, Northampton, and York). Data on percentage of predicted real estate taxes actually collected are based on author's calculations using the municipal financial statistics compiled by the Department of Community and Economic Development of Pennsylvania. The predicted real estate taxes for each municipality are calculated as the product of their assessed value of real estate and the municipal millage rate. The dependent variable is the ratio of real estate taxes actually collected to the level of real estate taxes predicted based on assessed value and millage rates. Data on commissions of municipal tax collectors are for the year 2004 and data on percentage of predicted real estate taxes that were actually collected are the averages for years 2005 – 2008. To reduce the influence of outliers, only those values of the dependent and independent variable that lie within the 5th and 95th percentiles of their respective distributions have been used.

t statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Effect of higher compensation on percent real estate taxes collected, limited to municipalities which pay their tax collectors on a commission basis

	(1)	(2)	(3)	(4)
	Dependent variable: Percentage municipal real estate taxes collected (average for years between 2005 and 2008)			
Compensation (as percent of taxes collected)	0.273** (2.40)	0.297* (2.26)	0.305** (2.38)	0.235** (2.51)
Millage rate		0.0368 (0.44)		-0.140 (-1.03)
Square of Millage rate		-0.00110 (-0.67)		0.00250 (1.05)
Market value of real estate per capita		0.00000606 (0.78)		0.00000683 (0.87)
Constant	99.59*** (180.81)	98.97*** (114.13)	99.46*** (189.29)	99.85*** (115.46)
County Fixed Effects	No	No	Yes	Yes
<i>N</i>	179	179	179	179
<i>R</i> ²	0.010	0.014	0.064	0.077

Notes: Data on commission paid to municipal tax collectors is based on data provided by the Pennsylvania Economy League and pertains to nine counties in Central and Eastern Pennsylvania (Berks, Blair, Dauphin, Lackawanna, Lehigh, Luzerne, Lycoming, Northampton, and York). Data on percentage of predicted real estate taxes actually collected are based on author's calculations using the municipal financial statistics compiled by the Department of Community and Economic Development of Pennsylvania. The predicted real estate taxes for each municipality are calculated as the product of their assessed value of real estate and the municipal millage rate. The dependent variable is the ratio of real estate taxes actually collected to the level of real estate taxes predicted based on assessed value and millage rates. Data on commissions of municipal tax collectors are for the year 2004 and data on percentage of predicted real estate taxes that were actually collected are the averages for years 2005 – 2008. To reduce the influence of outliers, only those values of the dependent and independent variable that lie within the 5th and 95th percentiles of their respective distributions have been used. Only municipalities which pay their collectors on a commission basis have been included in the estimations used for this table.

t statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Effect of a higher salary on the presence of at least one “Qualified Tax Collector” in the municipality

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: At least one “Qualified Tax Collector” in the municipality					
Salary	0.0189 (1.37)	0.0244 ⁺ (1.59)	0.0240 ⁺ (1.55)	0.0197* (1.81)	0.0245* (2.01)	0.0244* (1.93)
Population		-0.00000306*** (-3.02)	-0.00000213 (-1.00)		-0.00000312** (-2.53)	-0.00000269 (-1.11)
Predicted Real Estate Tax			-4.22e-09 (-0.51)			-1.95e-09 (-0.21)
Constant	-0.0423 (-0.31)	-0.0311 (-0.23)	-0.0345 (-0.26)	-0.180* (-1.85)	-0.175* (-1.71)	-0.175* (-1.73)
Dummy variables for class of municipality	No	No	No	Yes	Yes	Yes
<i>N</i>	110	110	110	110	110	110
<i>R</i> ²	0.0043	0.026	0.027	0.037	0.059	0.059

Notes: Data on salary paid to municipal tax collectors are for 2012 and are from the Pennsylvania Manual. The list of “Qualified Tax Collectors” is provided by the Pennsylvania Department of Community and Economic Development and reflects all individuals from the state who had this status as of January 2013. These regressions are estimated only on the sample of tax collectors who are elected, excluding individuals who hold appointed offices.

t statistics in parentheses ⁺ $p < 0.15$, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Effect of a higher salary on the presence of at least one “Qualified Tax Collector” in the municipality, estimated excluding cities

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: At least one “Qualified Tax Collector” in the municipality					
Salary	0.0323* (1.82)	0.0392* (1.88)	0.0388* (1.81)	0.0299* (2.04)	0.0377** (2.18)	0.0382** (2.12)
Population		-0.00000403* (-1.86)	-0.00000364 (-0.70)		-0.00000469* (-1.98)	-0.00000525 (-0.96)
Predicted Real Estate Tax			-1.42e-09 (-0.10)			2.04e-09 (0.13)
Constant	-0.148 (-0.86)	-0.136 (-0.71)	-0.137 (-0.71)	-0.274* (-2.03)	-0.270* (-1.73)	-0.271+ (-1.70)
Dummy variables for class of municipality	No	No	No	Yes	Yes	Yes
<i>N</i>	78	78	78	78	78	78
<i>R</i> ²	0.012	0.029	0.030	0.044	0.066	0.067

Notes: Data on salary paid to municipal tax collectors are for 2012 and are from the Pennsylvania Manual. The list of “Qualified Tax Collectors” is provided by the Pennsylvania Department of Community and Economic Development and reflects all individuals from the state who had this status as of January 2013. These regressions are estimated only on the sample of tax collectors who are elected, excluding individuals who hold appointed offices. Cities are excluded from these regression runs as the salary paid to city treasurers only reflects a portion of their compensation.

t statistics in parentheses + $p < 0.15$, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Effect of a higher salary on the number of candidates for office (columns (1) – (4)) and on the probability that there is more than one candidate (columns (5) – (8))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Number of candidates				Dependent variable: Probability that there is more than one candidate			
Salary	0.0923** (2.98)	0.0640 (1.70)	0.0971** (3.78)	0.0696+ (2.08)	0.358*** (5.31)	0.190*** (3.47)	0.432*** (13.60)	0.271*** (5.36)
Population		0.0000103 (0.69)		0.0000124 (0.85)		0.0000474 (0.79)		0.0000552 (0.88)
Predicted Real Estate Tax		8.75e-09 (0.12)		-1.30e-09 (-0.02)		3.27e-08 (0.11)		-5.84e-09 (-0.02)
Constant	0.310 (1.11)	0.492 (1.56)	0.271 (1.28)	0.439+ (1.78)	-4.329*** (-8.19)	-3.200*** (-8.44)	-5.405*** (-19.42)	-4.387*** (-14.77)
<i>N</i>	192	192	192	192	192	192	192	192
<i>R</i> ² / <i>Pseudo-R</i> ²	0.065	0.082	0.11	0.13	0.047	0.076	0.090	0.118

Notes: Data on salary paid to municipal tax collectors are for 2004 and are from the survey conducted by the Pennsylvania Economy League. The election data are for municipal elections held in 2005 and pertain to five counties – Berks, Lehigh, Luzerne, Northampton, and York. The data were gathered from the county boards of elections.

t statistics in parentheses + $p < 0.15$, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$