STRENGTHENING STATE CAPABILITIES: THE ROLE OF FINANCIAL INCENTIVES IN THE CALL TO PUBLIC SERVICE*

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We study a recent recruitment drive for public sector positions in Mexico. Different salaries were announced randomly across recruitment sites, and job offers were subsequently randomized. Screening relied on exams designed to measure applicants' intellectual ability, personality, and motivation. This allows the first experimental estimates of (1) the role of financial incentives in attracting a larger and more qualified pool of applicants, (2) the elasticity of the labor supply facing the employer, and (3) the role of job attributes (distance, attractiveness of the municipal environment) in helping fill vacancies, as well as the role of wages in helping fill positions in less attractive municipalities. A theoretical model of job applications and acceptance guides the empirical inquiry. We find that higher wages attract more able applicants as measured by their IQ, personality, and proclivity toward public sector work—that is, we find no evidence of adverse selection effects on motivation; higher wage offers also increased acceptance rates, implying a labor supply elasticity of around 2 and some degree of monopsony power. Distance and worse municipal characteristics strongly decrease acceptance rates, but higher wages help bridge the recruitment gap in worse municipalities. *JEL* Code: H1.

I. Introduction

Despite continuing disagreements among economists over the size and scope of state intervention, two ideas seem beyond dispute. One, the ability of the state to implement policies, raise revenue, and protect property rights is a central aspect of

economic development; two, improving state capacity requires attracting the resources the state needs to function well.[1]

Human capital is a key resource of the state enterprise: producing public goods and raising the revenue to finance them is surely better done by an adequate number of capable agents. But able agents constitute only one aspect of the well-functioning, professionalized bureaucracy that is the mark of the modern state (Weber 1904–1911; Evans 1995).[2] The state apparatus may also require individuals of integrity or with strong public sector motivation. This of course begs the question of what are the various dimensions of candidate quality, and how do we attract these qualities to the public sector.

In this article we investigate the various dimensions of candidate quality and examine the role of incentives, both pecuniary and nonpecuniary, in attracting these qualities to the public sector. An essential ingredient needed to address this question is an estimate of the elasticity of the labor supply facing the firm (or in our case the government), and we provide the literature's first experimental estimate of this elasticity.[3]

Our analysis is based on an experiment conducted as part of an official program of Mexico's federal government called the Regional Development Program (RDP). The program seeks to enhance the presence of the state in 167 of Mexico's most marginalized municipalities. To this effect, the program has built a network of around 50 coordinators who supervise an even larger network of 350 community development agents. These public agents are to embed themselves in the local communities, identify areas where public good provision is deficient, and work with existing public programs and local authorities to remedy such

1. Abundant work in economics has emphasized the link between government and growth. More recently, Acemoglu (2005), Arias (2008), Besley and Persson (2009, 2010) have emphasized the importance of the operational capacity of the state in determining growth.

2. For empirical work on the effects of bureaucratic structure on economic performance, see also Rauch (1995) and Evans and Rauch (1999).

3. Manning (2011) in his excellent review of the literature on monopsony in the labor market states: "An ideal experiment that one would like to run to estimate the elasticity of the labor supply curve to a single firm would be to randomly vary the wage paid by the single firm and observe what happens to employment. As yet, the literature does not have a study of such an experiment." We are aware of only two papers that rely on randomization of wages: Fehr and Goette (2007) and Goldberg (2010). These papers are more safely interpreted as studying the important but different issue of the labor supply of individuals.

deficiencies. To hire these agents, the RDP conducted a recruitment drive in the months of June to August 2011, during which positions were advertised, candidates were screened, and jobs were offered to selected candidates. This process involved an exogenous assignment of wage offers across recruitment sites, as well as an exogenous assignment of job offers. With this dual experimental design, we investigate three key questions.

The first question is: do higher wages attract higher quality applicants? As we show through a simple model, if higher quality candidates as priced by the market demand higher compensation, higher wages in the public sector are a necessary condition for attracting those candidates. However, higher wages may improve quality at the cost of attracting candidates with weaker public service motivation—a concern motivating a literature in economics (Handy and Katz 1998; Francois 2000; Delfgaauw and Dur 2007; Prendergast 2007). Although these questions are of high practical relevance, empirical progress has met with at least two important hurdles. First, it is difficult to measure an individual's quality. Second, and perhaps more important, different wage offers for a given position are not typically assigned exogenously.

In this study, we overcome these limitations by exploiting two features of the RDP. First, two different wage offers were randomly assigned across 106 recruitment sites. In one set of recruitment sites an offer of 5,000 pesos a month was offered, and in the other sites a wage of 3,750 pesos was offered. Second, the RDP involved a screening session measuring a rich array of candidate characteristics. This allows us to classify candidate profiles along the dimensions of quality and motivation that have become standard in the human resources area, in both academic and industry circles. To our knowledge, the generation of a data set with this wealth of candidate information in the context of an experimental design involving compensation is novel.

Our characterization of candidate profiles involves two main categories. One is related to raw "quality," understood as aptitude or the ability to perform. This is measured directly through the candidate's intelligence and other personality traits widely considered to affect job performance and indirectly through the candidate's market value proxied by current or past earnings. The other category relates to motivational profile, or the desire to perform, particularly in the context of public service. To cover this second category, the RDP screening exam included measures of

integrity, prosocial inclinations, and the motivation for public service.

We find that higher wages help attract a better candidate pool in terms of both quality and motivation. In the places that announced a higher salary, the average applicant was smarter, had better personality traits, had higher earnings, and had a better occupational profile (e.g., more experience and white-collar background). These improvements go together with a stronger public service motivation profile. That is, we find no evidence that higher wages only improve candidate quality at the cost of attracting less motivated individuals.

The second question motivating our study is whether higher wages can help the state recruit more candidates. Although a substantial literature in labor economics has debated the properties of the labor supply facing the firm, clean evidence stemming from exogenous wage variation has been lacking.[4] To investigate this, we start with the simple observation that real-life recruitment is about more than posting wages. Positions must be advertised, applicants must express interest, and candidates must be screened and selected. Once selection is made, filling vacancies requires converting selections into accepted offers. This conversion process requires successfully recontacting candidates first and then having them accept the offer.

We incorporate the practical stages of recruitment into a simple theoretical model and decompose the labor supply elasticity into the elasticities of two subcomponents: the size of the applicant pool and the conversion rate of selected candidates into vacancies filled. Our point estimates indicate that the labor supply facing Mexico's government, though relatively elastic, is far from infinitely elastic and reflects monopsony conditions: a 33% increase in wages led to a 26% increase in applications and a 35% increase in the conversion rate, implying a labor supply (arc-)elasticity of around 2.15, which is similar in magnitude to the elasticity found in nonexperimental studies (e.g., Sullivan 1989; Falch 2011). Also noteworthy, a substantial role of higher wages is to increase conversion rates by raising the chance that candidates can be successfully recontacted.

The third question we address is: what are the effects on recruitment of job location disadvantages, such as commute

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4. Manning (2011) reviews the current state of the literature.

distance or weak rule of law, and can higher wages help the state fill positions in less attractive locations? This is of direct policy relevance to governments seeking to improve public good delivery in remote and challenging areas. Unfortunately, progress on this topic remains limited—in large part because workers are not exogenously offered jobs with different characteristics. Candidates to the RDP who met certain eligibility criteria were randomly selected to work in a municipality within a particular geographical area, producing exogenous variation in terms of commuting (or relocation) distance, and work environment. We find that it is much harder to attract workers to municipalities that are distant, have more drug-related violence, and score lower on the human development index.[5] Higher wages, however, do help bridge the recruitment gap in the worse municipalities.

Though this article has important implications for those concerned with the development and enhancement of state capabilities, it also contributes to an established yet active area in labor economics that examines the effects of financial incentives on job queues. For instance, using data from the Employment Opportunity Pilot Project, Holzer, Katz, and Krueger (1991) find that firms offering jobs that paid the minimum wage attracted significantly more applicants than jobs that pay either slightly more or slightly less than the minimum wage. Krueger (1988) examines the determinants of outside applicants for federal job openings in the United States during the 1950s–1980s. He finds that the ratio of federal to private sector earnings is associated with application rates for government jobs as well as the quality of the applicants. In a more recent paper, Marinescu and Wolthoff (2012) use data from an employment website and find that, conditional on occupation, higher wages attract more and better applicants.

The plan for the article is as follows. The next section offers some background on the RDP. Section III lays out a simple theoretical model to derive the central predictions that we take to the data. A fuller version of the theory with additional predictions is available in the Online Appendix. Section IV explains the experimental design. In Section V, we describe the data and also introduce and validate our measures of candidate quality and

5. These findings relate to a growing literature that examines the effects of firms' characteristics on employee recruitment and retention. See, for example, recent work by Brown and Matsa (2012), who show that employers' financial distress is associated with fewer and lower quality applicants.

motivation. Section VI presents the results on the effects of financial incentives on the size and quality of the candidate pool. Section VII presents our empirical results on how wages and job characteristics affect recruitment and our estimates of the elasticity of the labor supply facing the employer. Section VIII concludes.

II. Background

In 2011 the Mexican government began a program, the RDP, designed to increase the presence of the state in some of its most marginalized and conflict-ridden municipalities. To achieve this objective, the program created a large network of public agents—350 community development agents and the 50 coordinators who supervise them—whose primary responsibilities are to identify the needs of the community and report them directly to the federal government, which will then seek to channel resources to meet these demands.[6] By establishing a direct link to its citizens, the federal government hopes to establish a presence in several of the areas where the local government has proven to be ineffective.

The program has been implemented across 10 regions containing 167 municipalities and thousands of localities.[7] Each community development position was assigned to a particular municipality. These municipalities were selected based on an index of their socioeconomic characteristics. Consequently, the economic and social disparities between the RDP municipalities and the rest of Mexico are large. For instance, income per capita in the RDP municipalities is almost half of that in the other municipalities, and infant mortality is 50% higher. The

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6. These agents were hired on a full-time basis under a temporary contract, with the expectation that it would be renewed as long as the program still existed. While this is admittedly not the stereotypical bureaucratic job, these types of positions have become quite common in Mexico, as in other parts of the world. For instance, in Brazil 25% of public employees are hired on a temporary contract. These types of employees were also commonly used in the implementation of the PROGRESA program in Mexico.

7. The 10 regions are Sierra Cora-Huichol, Costa Infiernillo, Huasteca Veracruzana, Montaña de Guerrero, Sierra Guerrero, Selva Lacandona, Sierra Tarahumara, Tierra Caliente-Oriente, Triqui-Mixteca, and Zapoteca Chontal.

presence of drug cartels and subversive organizations is also a serious concern for these areas compared to the rest of Mexico.[8]

III. Theory

The classic textbook model linking monopsony power to the elasticity of the labor supply facing the firm considers an employer posting wages and workers instantly filling vacancies. The reality of recruitment involves a process that unfolds over time, with workers applying for jobs, the employer making offers, and candidates deciding whether to accept the offer. Job applications have received attention in the literature (see, for instance, Holzer, Katz, and Krueger 1991; and more recently Brown and Matsa 2012; Marinescu and Wolthoff 2012), and so has the process of offers and acceptance (e.g., Weiss 1980; Lang 1991). In this section, we develop a model capturing both the application and job offer–acceptance stages to analyze how wages will affect the size and quality of the applicant pool and the acceptance rates.

Consider an employer who faces a residual labor supply made up of a potentially large number of workers. There are two periods and no discounting. In period 1, each worker must decide whether to incur a cost $c > 0$ to show up for a job interview with our employer, who has posted a wage w. Should the worker decide to show up, he will receive an offer with probability $\rho \in (0, 1]$ in period 2. Individuals differ along two dimensions, namely market quality $v \in [0, \infty)$ and inclination toward public service $\pi \in [0, \infty)$ (or public service motivation, PSM). PSM is a specific utility the individual receives from holding a public sector job. To keep things as simple as possible, we write the utility from getting the public sector job as $w + \pi$. Whether the individual will find this job attractive in period 2 will depend on his reservation utility as given by a market opportunity with a value of $v + \varepsilon$.

The term ε captures an idiosyncratic shock to reservation utility that is realized and observed in period 2 before the individual is made an offer; ε is unbounded and is distributed according to the function $G(\varepsilon)$, with mean zero and associated density $g(\varepsilon)$. The quality v, known by the individual from the beginning of

8. Table A1 of the Online Appendix compares the RDP municipalities to the rest of Mexico along various socioeconomic characteristics.

period 1, determines her expected reservation utility. Individuals are indexed by their personal v, which is distributed according to the function $F(v)$ and density $f(v)$.[9] At the end of period 2, job offers are made by our employer, they are accepted or rejected, and payoffs are collected.

We develop two cases. In the first case π and v are independently distributed among the population. In the second case π and v are positively correlated, and to simplify matters we focus on the extreme case in which all types (v, π) are contained in the graph of the function $v = m(\pi)$ (effectively, the type space becomes unidimensional), with $m'(\pi) > 0$, and $m(0) \geq 0$. This positive correlation case is not meant to generate general insights, but to provide a contrast with the independence case that helps us examine the data. To focus on the effects of interest, we make the important assumption that the probability ρ of getting the job is fixed, and to simplify notation we assume $\rho = 1$. The latter simplification is inconsequential, but the uniformity of ρ is not. If candidates believe that their chances of getting an offer depend on their type, different selection patterns are possible, including cases where nonmonotone selection occurs (both very low and very high types enter). In the Online Appendix we isolate conditions under which the results of our basic model are preserved under a formulation where ρ depends on the type of candidates.[10]

III.A. *The Effects of Financial Incentives on Candidate Quality*

We now study the different decisions facing a worker in each period and solve the model by backward induction. If offered a job in period 2, a candidate with realized outside opportunity $v + \varepsilon$ will accept the job whenever $v + \varepsilon \leq \omega + \pi$, which for a type (v, π)

9. The heterogeneity in quality relates our model to the classic framework by Weiss (1980). However, we modify that setup in several ways, including the addition of a temporal dimension and the emergence of alternative opportunities after the first match between the worker and employer. This latter aspect evokes the motivating considerations of Lang (1991), although we abstract from his symmetric (and formally instantaneous) competition among employers.

10. The dependence of ρ on candidate types raises issues similar to those studied by Morgan, Sisak, and Vardy (2012) in their model of job promotion policies in a general equilibrium context. In the Online Appendix we also examine cases where candidates infer job characteristics or eligibility criteria from the wage. We abstract from all of these complications in our main analysis to match the model to the recruitment process that actually took place and focus on what the data suggest are the first-order mechanisms.

will happen with probability $G(w + \pi - v)$. In period 1, entry decisions depend on the relationship between v and π.

A proposition in the Online Appendix characterizes the selection pattern into the applicant pool depending on the correlation between quality v and PSM π. The key takeaway is that the theory can rationalize a situation in which quality and PSM display a positive correlation in the applicant pool and the relatively low-quality and low-PSM types select in. What is required is that quality and PSM be positively related in the population in a specific way: an increase in PSM must increase the quality of a candidate at a rate faster than one for one ($m'(\pi) > 1$, a condition we assume henceforth). Against that backdrop, we can establish the following.

PROPOSITION 1.

(a) Given the assumptions of our model, an increase in wages increases the size and average quality of the applicant pool.
(b) In the case when PSM and quality are independent in the population, an increase in wages decreases the average PSM of the applicant pool.
(c) In the case when PSM and quality are positively correlated according to the function m(π), an increase in wages increases the average PSM of the applicant pool.

Proof. See Online Appendix.

Higher wages should always increase the quality of the applicant pool, but whether they will increase PSM depends on the underlying correlation between quality and PSM in the population. In the independent case, we should expect higher wages to worsen PSM.[11] However, in the positive correlation case, we can expect wages not to worsen PSM but increase it alongside quality. We let the data speak to this matter when we analyze the effects of wages on the applicant pool.

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11. This result parallels several others studies in the literature (e.g., Handy and Katz 1998; Francois 2000; Delfgaauw and Dur 2007; Prendergast 2007). Of these models, Delfgaauw and Dur (2007) is perhaps the closest to our setup for this section. Two important differences are that in their model the outside opportunity is unrelated to individual quality, and they model PSM as inducing a taste for effort in a setting where moral hazard is a concern.

III.B.   *The Effects of Financial Incentives on Recruitment*

To have the model speak to the recruitment effects of wages in the simplest possible way, in what follows let us abstract from the PSM aspect by setting $\pi = 0$. As shown in the Online Appendix, the selection pattern becomes very simple: there exists a finite type $\bar{v}$ who is indifferent between attending the interview or not. All $v \leq \bar{v}$ prefer to attend and enter the candidate pool, and all $v > \bar{v}$ stay out, and the separating type $\bar{v}$ is increasing in the value of the job w. As before, we have that higher wages increase the size and quality of the applicant pool. But recruitment requires filling vacancies with some of the applicants. Only those with modest reservation utility realizations (i.e., with $w > v + \varepsilon$) will accept an offer, so the overall recruitment, and effective labor supply facing the employer at wage w is

$$S = \int_0^{\bar{v}} G(w - v)f(v)dv = F(\bar{v}) \int_0^{\bar{v}} G(w - v)\frac{f(v)}{F(\bar{v})}dv,$$

where $F(\bar{v})$ defines the size of the applicant pool and $\int_0^{\bar{v}} G(w - v)\frac{f(v)}{F(\bar{v})}dv$ defines the *conversion* rate γ, namely, the rate at which offers are converted into filled vacancies. We can now state the following.

PROPOSITION 2.

(a) The measure of recruited candidates in our model, and the labor supplied to the firm in equilibrium, can be written as the product $F(\bar{v})\gamma(w, \bar{v})$ of the applicant pool size and the conversion rate. Thus, the elasticity of the labor supply facing the employer is $\eta = \frac{dS}{dw}\frac{w}{S} = \frac{dF}{dw}\frac{w}{F} + \frac{d\gamma}{dw}\frac{w}{\gamma} \equiv \xi_{F(\bar{v})} + \xi_{\gamma(w, \bar{v})}$.

(b) Under the assumptions of the model, the elasticity of the applicant pool size is positive ($\xi_{F(\bar{v})} > 0$) while the sign of the elasticity of the conversion rate $\xi_{\gamma(w, \bar{v})}$ is ambiguous.

Proof. See Online Appendix.

This proposition establishes that the elasticity of the labor supply facing the employer can be written as the sum of the elasticities of two components: the size of the applicant pool and the conversion rate. These are the elasticities we will measure in our empirical work. Furthermore, a wage increase should enlarge the applicant pool (from part (a) of Proposition 1) so we expect $\xi_{F(\bar{v})}$ to be positive. However, it is not necessarily true that the average conversion rate must go up with wages. This might be surprising

but is made transparent by the model: acceptance rates respond ambiguously to an increase in wages due to composition changes in the applicant pool. A higher wage will make all the inframarginal types $v < \bar{v}$ in the pool more likely to accept, but the marginal type that is added is less likely to accept. If the effect on the inframarginal types dominates, then higher wages will increase conversion rates. Again, we let the data speak to this.

IV. EXPERIMENTAL DESIGN

The process used to hire the public agents incorporated experimental variation in two consecutive stages. In the first stage, two separate wage offers were assigned across recruitment sites allowing us to study how wages affect the applicant pool.[12] In the second stage, eligible applicants for each vacancy were selected at random to be offered a job, creating a random match between municipalities and candidates; this permits an assessment of how characteristics of the municipalities affect acceptance decisions.

IV.A. *Job Postings*

Recruitment took place during June to August 2011. The recruitment sites were located mostly within the 10 target regions in localities with a small community college—in hopes of attracting a younger and more educated applicant pool.[13] Job postings were then sent out to 113 schools in 106 localities throughout the regions; we refer to these localities as "recruitment sites."

The job advertisements provided a general description of the job, along with a toll-free number and an email address for interested applicants (see Figure A1 in the Online Appendix). Telephone operators would then register the callers by recording, in addition to their contact information, answers to some questions

12. Since the inception of PROGRESA/Opportunidades, the Mexican government has sought to incorporate an evaluation component in the design of several of their programs (e.g., Seguro Popular, Programa de Apoyo Alimentario). The predisposition of the top officials in the RDP to implement a randomized evaluation reflected that trend as well as their desire to increase their understanding of the selection process, with the ultimate objective of improving recruitment for social programs.

13. Although most of the recruitment sites were assigned to localities inside each targeted region, for logistical reasons a few were assigned to neighboring localities just outside of the region.

regarding the person's education level and employment background. After registering the applicant and depending on the locality in which the person had seen the advertisement, the operator would communicate the salary attached to the job, as well as the date and place for the candidate to show up and participate in the screening session.[14] All responses to questions concerning the job were given according to a preestablished script. In the end, 1,920 individuals registered; 1,665 did so by phone, 208 by email, and 47 individuals opted to do both.

Salaries were randomly assigned across recruitment sites, with 65 out of 106 localities (61%) posting a wage of 5,000 Mexican pesos per month and the remaining 41 localities (39%) announcing a wage of 3,750 pesos per month. As a point of comparison, 5,000 Mexican pesos was roughly equivalent to 500 U.S. dollars at the time of the recruitment drive.[15] Table I presents summary statistics for the localities in our sample by wage offering. For each characteristic, we also present the difference between locations with high- versus low-wage offerings (column (3)), as well as the proportion of treatment assignments that

14. The experiment was designed to minimize the possibility of sorting. If people knew about competing recruitment sites offering different wages, the high-wage places might attract all of the applicants even if the wage differential is infinitesimal. This could be mistaken for an infinitely large wage elasticity, when the reality is that at the lower wage people would apply as well if the higher wage were not available. To deal with this, our design forced each locality to offer a single wage—this was automatically the case when localities had only one school and was forced by block randomization when a locality contained more than one. This reduced the chances that individuals got to know about different recruitment sites potentially carrying a different wage offer. In addition, the design minimized the potential sorting effects by having the registration operators ask the candidate where he or she had seen the ad, and then communicate the wage and force the candidate to formalize their candidacy by attending the screening session in the same school. Naturally, a question arises as to whether candidates who showed up without registering could be displaying sorting effects. This could be the case if they had word-of-mouth information revealing the existence of two recruitment sites offering different wages. Since no two schools within a locality were associated with different wages, this was deemed unlikely—and in fact only 76 unregistered applicants turned out to be aware of multiple sites (which may not have offered different wages). Among those who showed up for the exam, 37% had not registered; conversely 71% individuals who had registered did show up. The pattern of unregistered show-ups and registered no-shows did not vary significantly by treatment and control.

15. Based on data from the 2010 census, the wage offers of 3,750 and 5,000 pesos correspond approximately to the 65th and 80th percentile of the wage distribution for the population residing in the program regions.

TABLE I

VALIDATION OF THE EXPERIMENTAL DESIGN

	Low-wage offer (1)	High-wage offer (2)	Difference (3)	Randomization inference *p*-value (4)
Latitude	19.359	19.754	0.396 [0.548]	.52
Longitude	99.088	100.136	1.048 [0.796]	.20
Altitude (m)	732.450	898.242	165.792 [158.536]	.30
Population (logs)	9.219	9.373	0.154 [0.331]	.67
Number of households (logs)	7.825	7.971	0.145 [0.335]	.71
Share of population between 15–65 years old	0.620	0.624	0.004 [0.007]	.56
Share of male population	0.480	0.482	0.002 [0.003]	.49
Share of indigenous population	0.275	0.160	−0.115 [0.061]*	.05
Illiteracy rate (% of illiterate among 15-year-olds and older)	0.104	0.096	−0.008 [0.013]	.45
Average years of schooling	8.335	8.251	−0.084 [0.249]	.75
Number of live births per woman	2.517	2.518	0.001 [0.081]	.99
Employment rate	0.965	0.960	−0.004 [0.008]	.88
Share of female-headed households	0.275	0.265	−0.009 [0.008]	.28
Share of households with access to electricity, water, and sanitation	0.715	0.756	0.040 [0.049]	.41
Share of households with a dirt floor	0.106	0.111	0.005 [0.018]	.80
Number of observations	41	65		

Notes. This table compares the observable characteristics of the localities in which high-wage announcements were made to those where the low wage was announced. Column (1) reports the mean of the corresponding variable among localities where a wage offer of 3,750 pesos per month was announced. Column (2) reports the mean of the corresponding variable among localities where a wage offer of 5,000 pesos per month was announced. Column (3) reports the difference between the two means, along with the standard errors. Column (4) reports the *p*-values based on a two-sided test statistic that the placebo coefficients are larger than the actual. The *p*-values were computed based on 1,000 random draws. These data were computed at the locality level by the Instituto Nacional de Estadística y Geografía (INEGI) based on the 2010 population census. The latitude and longitude data are measured in degrees, decimal minutes. *Statistically significant at the 10% level, ** at the 5% level, and *** at the 1% level. Robust standard errors are reported in brackets.

yield a difference that was greater or equal to that under the actual treatment assignment, based on 1,000 random draws (column (4)). As expected from the random assignment, there is little difference between places where a high versus low wage was

offered. Out of 15 characteristics, only 1 (share of indigenous population) is statistically significant at the 10% level. We also fail to reject the hypothesis that all the variables are jointly significant (F-test = 1.17; p-value = .30). Overall the results from Table I suggest that the randomization was effective.[16]

Given the experimental design, estimation of the causal effects of wages on the applicant pool is straightforward. We estimate the following regression model:

$$(1) \qquad\qquad Y_{icr} = \beta_1 T_c + \zeta_r + \epsilon_{icr},$$

where Y_{icr} is a characteristic of individual i who applied for the job in locality c, situated in region r. The variable T_c is an indicator equal to 1 if the locality received the high-wage announcement, and ζ_r denotes region intercepts.[17] The error term ϵ_{icr}, is assumed to be independent across localities, but in our estimation we allow for arbitrary correlation across observations within the same locality. Given random assignment, the coefficient β_1 captures the causal effects of wages on a particular feature of the applicant pool. From Proposition 1, we expect $\beta_1 > 0$ when the dependent variable is a measure of the size or quality of the applicant pool.

IV.B.   *Job Offers and Assignment*

To assess their qualifications, in the screening session applicants were administered a three-hour exam designed to measure three broad categories of personal characteristics: aptitude, personality, and motivations (especially inclination toward public sector employment).[18] These data were then entered and analyzed, and the 379 individuals (out of 2,254 total applicants) who scored below a 7 on the Raven exam were considered not eligible for employment. The remaining applicants were stratified into one of four wage-IQ types: (1) high-wage announcement and high IQ; (2) high-wage announcement and normal IQ; (3) low-wage announcement and high IQ; (4) low-wage announcement

16. The employment figures may appear very high for a developing country but are in fact consistent with national averages. See http://www.inegi.org.mx.

17. Our results are unaffected if we also control for the share of that population that is indigenous or any of the other variables presented in Table I.

18. According to Roberts (2006), there are four domains of personal variability, namely, personality traits (e.g., the Big 5, introduced later), values and motives (e.g., goals, interests), abilities (verbal, quantitative, and spatial intelligence), and narratives (e.g., stories, memories). The questionnaire we used captured the first three of these four domains.

and normal IQ, where "high IQ" is defined as a score above a 9 on the Raven exam, and "normal IQ" corresponds to scores of 7, 8, or 9.

Each of the 350 vacancies was assigned to a municipality so that when the vacancy became filled, the hired person would work in that municipality. Then, each vacancy, now associated to a municipality, was randomly assigned to one of the four type categories (the proportion of vacancies in each wage bin followed the proportion of recruitment sites announcing each wage). Then job offers were made randomly to candidates from the region drawn from the wage-IQ bin corresponding to each vacancy. In some municipalities the program imposed an extra requirement that eligible candidates speak the local indigenous language.

Approximately three to four weeks elapsed between the time the average person took the exam and the moment the RDP attempted to contact the selected candidates to make a job offer. If the person was not reached, the operators would try again over the course of about a week. If after that time the person could not be reached or had rejected the offer, a new person was randomly selected from the pool (again conditional on type) to be contacted. We focus our analysis on the first wave of offers because offers that are rejected, and hence resampled, are no longer truly random.[19]

Given that job offers under the announced wage were exogenously assigned to applicants, we can estimate the causal effect of higher wages on the likelihood that the applicant accepts the job using a regression model similar to the one presented in equation (1), where the dependent variable, A_{ics}, is an indicator equal to 1 if the selected applicant ended up accepting the job. Specifically, we estimate the following model:

$$(2) \qquad A_{ics} = \gamma_1 T_c + X_i' \beta + \zeta_s + \epsilon_{ics},$$

where γ_1 is the conversion coefficient. Proposition 2 states that this coefficient has an ambiguous sign. If the effect of wages on inframarginal applicants dominates, then $\gamma_1 > 0$. The vector X_i is a set of individual characteristics, and ζ_s represents indicators for a region by indigenous requirement pair. The error term ϵ_{ics}

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19. Applicants who were offered a salary of 3,750 pesos per month and rejected it were recontacted several days later and offered a salary of 5,000 pesos per month, which elicited further acceptances. In the analysis that follows, we abstract from all offers in subsequent waves.

again also allows for arbitrary correlation of observations within a locality.

When offered a position, candidates were also told the municipality in which they were expected to work. Because the assignment of the municipality was random, we can then estimate how the characteristics of the municipality m to which an applicant was assigned affected his likelihood of acceptance, and whether the higher wage offer had a differential effect based on these characteristics. In particular, we augment equation (2) as follows:

$$(3) \quad A_{icms} = \gamma_1 T_c + \gamma_2(T_c \times W_m) + \gamma_3 W_m + X_i'\beta + \zeta_s + \epsilon_{icms},$$

where W_m is a characteristic of the municipality to which the applicant was assigned. In estimating equation (3), we consider the following municipal characteristics: distance to the assigned municipality (from the candidate's home municipality), the municipality's Human Development Index, and the number of drug-related deaths per 1,000 inhabitants in the municipality.

V. Data

V.A. *Measuring Candidate Characteristics*

We group candidate characteristics into two broad categories. One is related to raw quality, understood as aptitude or the ability to perform. The other relates to motivational profile, or the desire to perform, particularly in the context of public service. In this section, we discuss how we measure these characteristics and describe the applicant pool.

1. Quality. In this article we take the view that quality relates to personal characteristics that make workers more productive and valuable to employers. We rely on two sets of measures. Our first measure of quality uses a person's current and/or previous earnings in their last employment spell ("outside wages") as an indication of the person's outside opportunity. As is common on most job applications, candidates were asked during the screening exam to provide information about their last three places of employment. This information included length of employment, employer's contact information (which signaled that information was verifiable), as well as previous wages. Using the candidate's previous wage as a measure of quality has the advantage of

capturing other elements of skill or productivity that are valued by the market but not reflected in standard measures of ability and productivity (e.g., years of schooling). Also, the outside opportunity is more directly linked to a person's decision to self-select into a job. A disadvantage of this measure is that realized past or current earnings may contain random shocks.

The second class of quality measures is based on a vast body of research in psychology that documents the importance of both cognitive and noncognitive traits for predicting earnings, job status, and job performance (Schmidt and Hunter 1998). To evaluate an applicant's aptitude, the questionnaire included a series of questions intended to assess both raw cognitive ability ("general mental ability" or IQ), as well as standard market skills (e.g., computer use, years of schooling). We measured IQ through the *Raven's Progressive Matrices* Set I published by Pearson. The Raven's test, which is one of the most widely used tests for abstract mental aptitudes, measures a person's capacity to think logically and solve abstract problems, independent of context or acquired knowledge. The test comprises a series of matrices, and for each matrix the test taker observes a visual pattern of abstract figures and must identify the missing piece from a set of available options. Due to logistical constraints and the need to screen for various attributes, we administered Set I, which only contains 12 matrices. Consequently, this shorter version of the test cannot usually discriminate within the top 5% of the distribution.

To measure noncognitive attributes, we examined a set of personality traits that over time psychologists have grouped into five categories labeled "the Big 5." These traits are openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (see the Appendix for a definition of each trait). We measured the Big 5 personality traits using the Big Five Inventory (BFI) developed by John (1990). This is a 44-item questionnaire. An important advantage is it has been translated into Spanish for deployment in Mexico, and its use is validated there (Benet-Martínez and John 1988). These authors did not find important differences between the Mexican and U.S. populations. More generally, John, Naumann, and Soto (2008) report on extensive studies validating the BFI both for internal consistency in terms of test-retest reliability, as well as convergence with other personality inventories such as McCrae and Costa's (1992) NEO Five Factor scale.

In the analysis to follow, we report results on each personality trait separately, as well as an index of the Big 5. The index is constructed as an equally weighted average of the z-scores of each dimension, reverse-coding neuroticism, which is widely considered to be a negative characteristic (the negative of neuroticism is usually labeled "emotional stability"). The standardization was based on the mean and standard deviation of the applicants in the low-wage locations.

2. *Public Service Motivation.* We designed the questionnaire to measure an applicant's inclination toward public service. Research indicates that public sector employees have a different motivation profile in terms of values, inclination to public service activities, and volunteering (Bright 2005; Rotolo and Wilson 2006). Researchers in the area of public administration have explored the idea that public service motivation is central to the effective delivery of public goods and services (Perry and Wise 1990). Individuals with a strong desire to serve the public interest or who have higher levels of altruism are thought to not only be more attracted to public sector employment but also perform better on the job, perhaps due to better match quality. While estimating the extent to which public service motivation affects job performance remains an active area of research, recent meta-studies suggest that public service motivation is positively correlated with job performance in the public sector, broadly defined (Petrovsky 2009).

We measure an applicant's public service motivation using Perry's 1996 scale of Public Service Motivation (Perry 1996), which has become the gold standard in the literature on PSM. This index is constructed based on a questionnaire in which the subject must express agreement or disagreement with each of 40 statements. The questionnaire elicits opinions on the attractiveness of politics, public service, and prosocial activities. The questionnaire is subdivided into six modules labeled "Attraction to Policy Making," "Commitment to Policy Making," "Social Justice," "Civic Duty," "Compassion," and "Self-Sacrifice." Each dimension is an average of responses to several statements that are measured on a 5-point Likert scale, where a 5 represents strong agreement with the statement, and a 1 denotes strong disagreement. As with the BFI, we also construct a public service motivation index, which is an equally weighted average of the

z-scores of each dimension. Each dimension is standardized based on the mean and standard deviation of the applicants in the low-wage areas.

Given that PSM is in many respects closely related to prosocial behavior, we also collect information on various prosocial activities, such as volunteering, charity work, and political participation. We also observe the applicant's play in nonincentivized experimental games designed to capture social preferences.

3. Summary Statistics. Table II shows summary statistics for five different families of candidate characteristics: basic sociodemographics (Panel A), aptitudes and skills (Panel B), personality traits (Panel C), PSM (Panel D), and prosocial behavior (Panel E).[20] The total number of candidates that took the exam was 2,254, which is larger than the 1,929 who registered. This is due to the fact that some of those who registered alerted others about the exam. We perform our analysis with the full sample, but the results remain unchanged if we restrict attention to those who registered. The applicant pool is mostly males (60%), and the average age is 27 years. Many of these candidates had recently finished studying, and only a small fraction of them (14%) were employed at the time they applied. The average monthly wage reported for the last occupation of record is 4,276 pesos per month, which lies squarely between the two wages offered in the program (3,750 and 5,000 pesos per month).

The candidates reported an average of 14 years of schooling. Although some over-reporting is possible, this average most likely reflects how the recruitment was targeted toward localities with community colleges. The average IQ score in the Raven's test was 8.77. The median score is 9, which matches what studies have revealed for U.S. and U.K. populations (Pearson 1998). This goes together with a striking fraction of the candidates (39%) making a mistake when confronted with a simple hypothetical choice between a certain outcome of 2.5 million pesos and a lottery with equally probable prizes of 2.5 and 5 million pesos.[21]

Panel E displays summary statistics for various measures of prosocial behavior, like engaging in volunteer work (71%), charity

20. See the Appendix for a description of the variables used in the analysis.
21. Although this finding may seem puzzling, it has been documented in other settings and is an example of the "uncertainty effect" (e.g., Gneezy, List, and Wu 2006).

TABLE II

SUMMARY STATISTICS OF CANDIDATE POOL

	Observations (1)	Mean (2)	Standard deviation (3)	p10 (4)	p50 (5)	p90 (6)
Panel A: Sociodemographic characteristics						
Male	2,244	0.60	0.49	0.00	1.00	1.00
Age	2,231	27.34	6.89	20.00	26.00	37.00
Height	2,191	1.63	0.10	1.50	1.63	1.76
Indigenous	2,253	0.40	0.49	0.00	0.00	1.00
Wage in previous job	1,584	4,276.18	3,078.61	1,300.00	3,800.00	8,000.00
Previous job was white collar	1,784	0.30	0.46	0.00	0.00	1.00
Currently employed	2,250	0.14	0.34	0.00	0.00	1.00
Currently attending school	2,252	0.18	0.39	0.00	0.00	1.00
Years of experience in past 3 spells	2,237	1.36	2.45	0.00	0.25	4.00
Has work experience	2,237	0.56	0.50	0.00	1.00	1.00
Panel B: Aptitudes and skills						
Raven's score	2,254	8.77	2.69	5.00	9.00	12.00
Years of schooling	2,223	14.45	2.45	12.00	16.00	16.00
Chose dominated risk option	2,238	0.39	0.49	0.00	0.00	1.00

TABLE II
(CONTINUED)

	Observations (1)	Mean (2)	Standard deviation (3)	p10 (4)	p50 (5)	p90 (6)
Panel C: Personality traits						
Conscientiousness	2,188	4.28	0.47	3.67	4.33	4.89
Extraversion	2,206	3.67	0.55	3.00	3.63	4.38
Openness	2,193	3.93	0.49	3.30	4.00	4.60
Agreeableness	2,214	4.11	0.43	3.56	4.11	4.67
Neuroticism	2,216	2.19	0.53	1.50	2.13	2.88
Big 5 Index	2,120	0.05	0.73	−0.87	0.09	0.96
Integrity: indirect measure	2,206	45.01	22.62	13.33	46.67	75.00
Integrity: direct measure	2,248	0.06	0.24	0.00	0.00	0.00
Panel D: Public service motivation						
Commitment	2,195	3.35	0.59	2.57	3.29	4.14
Social justice	2,204	3.70	0.57	3.00	3.80	4.40
Civic duty	2,183	3.94	0.63	3.14	4.00	4.71
Compassion	2,192	3.05	0.55	2.38	3.00	3.88
Self-sacrifice	2,192	3.72	0.61	3.00	3.75	4.50
Attraction	2,242	2.86	0.59	2.00	2.80	3.60
PSM index	2,096	0.07	0.72	−0.79	0.05	1.01

TABLE II
(CONTINUED)

	Observations (1)	Mean (2)	Standard deviation (3)	p10 (4)	p50 (5)	p90 (6)
Panel E: Prosocial behavior						
Volunteered in the past year	2,249	0.71	0.46	0.00	1.00	1.00
Did charity work in the past year	2,248	0.54	0.50	0.00	1.00	1.00
Voted in last election	2,250	0.76	0.43	0.00	1.00	1.00
Belongs to a political party	2,250	0.10	0.30	0.00	0.00	0.00
Altruism	2,223	23.52	7.34	20.00	25.00	25.00
Negative reciprocity	2,231	0.55	0.50	0.00	1.00	1.00
Cooperation	2,182	26.40	10.71	10.00	25.00	40.00
Importance of wealth	2,048	3.22	1.38	1.40	3.20	5.20

Notes. This table reports summary statistics for the applicant pool. Column (1) reports the number of nonmissing observations. Column (2) reports the mean of the corresponding variable, and column (3) reports the corresponding standard deviation. Columns (4)–(6) report the 10th, 50th, and 90th percentiles. The statistics are computed based on the responses from the recruitment exam. See the Appendix for more information on the variables.

(54%), and having voted in the last election (76%).[22] The variable "Cooperation" tracks the contribution in a hypothetical voluntary contribution game where the person must decide how much out of 50 pesos to contribute to a joint account and how much to keep. Money in the joint account is multiplied by a factor of 1.4 and then divided between the two people participating. While the Pareto-efficient allocation is to contribute all 50 pesos, the Nash equilibrium is to contribute 0. "Altruism" tracks the amount the person gave out of the 50 pesos to an anonymous individual in a hypothetical dictator game. In both games, we find that individuals, on average, contribute approximately half of their hypothetical endowment. "Negative reciprocity" records whether the person would reject an offer of 1 peso in a hypothetical ultimatum game where the proposer keeps 49 pesos. We find that 55% of the applicants exhibit traits of negative reciprocity. Though the unincentivized nature of these games may be a limitation, there is some evidence that choices in incentivized experiments are often in line with choices in hypothetical games (Ben-Ner, Kramer, and Levy 2008). The choices made by the candidates do in fact correlate with the rest of their self-declared prosocial activities and with the patterns observed in incentivized experiments.

V.B. Are These Measures Trustworthy?

We were able to collect a rich and comprehensive data set on individual characteristics through the screening session. However, the fact that the information is self-reported raises the concern that individuals may have misrepresented themselves.[23]

There are however, at least four reasons the amount of misreporting may in fact be minimal and—more relevant to the validity of the analysis—not correlated with treatment. First, all applicants were asked to sign an honor code verifying that the information provided in the questionnaire was accurate, which should raise the psychological cost of manipulating responses. Second, the contact information of the applicant's previous employers was collected, which provides an implicit threat of

22. According to the International Institute for Democracy and Electoral Assistance (IDEA), turnout for the 2006 presidential election in Mexico was just short of 59%.

23. Applicants were not told one way or the other whether the questionnaire would be used in the evaluation process.

verification. Third, the measures we use are standard not only in the academic side of personnel psychology but also in industry and consulting. Thus, these types of measures inform, at least partially, actual personnel decisions; this is suggestive of some validity.[24] Fourth and perhaps most important, as we discuss at length in the Online Appendix, the correlations in the data do not seem to suggest misreporting of previous salaries, response manipulation of prosocial attitudes, or differential effort-driven performance on the IQ tests.

VI. Effects of Financial Incentives on the Applicant Pool

Our article contains two sets of empirical results. The first, presented in this section, concerns the effects of financial incentives on the applicant pool. The second, presented later, investigates the effects of financial incentives on the ability of the recruiter to fill vacancies given a set of candidates. Table III presents evidence that speaks to Proposition 1. We estimate a series of models based on equation (1). The prediction of our theory is that higher wages should increase the number and quality of candidates. Each row corresponds to a separate regression. Column (1) presents the number of observations used in the estimation. Column (2) reports the mean of the dependent variable among the sites that were offered a low wage, whereas column (3) presents the estimates of the coefficient, β_1, which measures the difference in the dependent variable between high- versus low-wage offers after adjusting for region fixed effects. In column (4), we use randomization inference to compute p-values, which measure the proportion of random treatment reassignments that yield estimates greater than or equal to the actual treatment assignment, based on 1,000 random draws. In column (5), we report p-values that control for the false discovery rate (FDR), that is, the proportion of rejections that are Type I errors when we account for the fact that we are testing multiple outcomes (see, inter alia, Anderson 2008).

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24. Some specialists in personnel psychology have come to the view that "Results suggest that intentional distortion of self-descriptions may not be the problem it has often been assumed to be" (Hough and Ones 2002). These authors still advise to design tests with a clear request for truthful reporting and the potential for verification, as we have done.

TABLE III
EFFECTS ON FINANCIAL INCENTIVES ON APPLICANT POOL: PRODUCTIVE ATTRIBUTES

	Observations (1)	Control (2)	Treatment effect (3)	Randomization inference p-value (4)	FDR q-value (5)
Number of applicants	106	18.093	4.714 [4.430]	.36	n/a
Panel A: Market skills					
Wage in previous job	1,572	3479.667	819.154 [174.703]***	.00	0.00
Previous job was white collar	1,170	0.243	0.069 [0.029]***	.01	0.02
Currently employed	2,225	0.104	0.053 [0.019]***	.01	0.02
Has work experience	2,212	0.459	0.167 [0.048]***	.00	0.00
Years of experience in past 3 spells	2,212	1.185	0.284 [0.171]	.08	0.06
IQ (Raven test)	2,229	8.488	0.506 [0.223]**	.01	0.02
Raven score ≥ 9	2,229	0.572	0.091 [0.039]**	.01	0.02
Chose dominated risk option	2,213	0.431	−0.064 [0.025]**	.01	0.02
Years of schooling	2,198	14.552	0.091 [0.308]	.40	0.14

TABLE III
(CONTINUED)

	Observations (1)	Control (2)	Treatment effect (3)	Randomization inference *p*-value (4)	FDR *q*-value (5)
Panel B: Personality traits					
Extraversion	2,189	3.674	0.013 [0.036]	.37	0.14
Agreeableness	2,167	4.107	0.004 [0.022]	.44	0.15
Conscientiousness	2,191	4.235	0.063 [0.030]**	.03	0.04
Neuroticism	2,168	2.254	−0.099 [0.033]***	.01	0.02
Openness	2,168	3.910	0.042 [0.028]	.08	0.06
Big 5 index	2,099	0.000	0.087 [0.049]*	.07	0.06
Integrity: direct	2,223	0.067	−0.009 [0.013]	.73	0.26
Integrity: indirect	2,099	44.424	0.602 [1.232]	.33	0.14

Notes. This table estimates the effects of higher wages on characteristics of the applicant pool. Each row is a separate regression using the variable listed as the dependent variable. Column (1) reports the number of observations in the regression. Column (2) reports the mean of the variable in the control group (low-wage announcement), column (3) reports the coefficient on the treatment in a regression that includes region intercepts. Column (4) reports the *p*-values based on a one-sided test. statistic that the placebo coefficients are larger than the actual. The *p*-values were computed based on 1,000 random draws. Column (5) reports the *q*-value associated with the false discovery rate test, which accounts for the multiple testing. See the Appendix for more information on the variables. *Statistically significant at the 10% level, ** at the 5% level, and *** at the 1% level. Clustered standard errors at the level of the locality are reported in brackets.

Consistent with the theory, the recruitment sites that offered higher wages (*treatment areas*) attracted 4.8 more applicants on average than those that posted the low-wage announcement (*control areas*). Although this represents a 26.3% increase over the control areas, the difference is not statistically significant. Higher wages did, however, attract applicants with significantly higher reservation wages (proxied by previous earnings), as the theory predicts. The outside salaries of applicants in places with the high-wage announcement are on average 820 pesos higher than in the places with a low-wage announcement; a difference that represents a 22% increase from the average among the control. While these results suggest a significant mean effect, Figure I shows that the higher wage offering also affected the upper tail of the distribution. From Panel A of Figure I, we see that the density of outside wages in the treatment sites has been shifted to the right of the density in the control sites.[25] Moreover, whereas the maximum outside wage in the control areas was 14,000 pesos, it was above 20,000 pesos in the treatment areas.[26] Panel B of Figure I plots the treatment effect on the number of applicants per site by six evenly distributed wage categories.[27] The high-wage treatment had a significant effect on the number of applicants per site for each of the three wage categories above 3,000 pesos per month. For instance, the treatment led to a 105% increase (treatment effect of 3.03; baseline = 2.88) in the number of applicants per site who earned more than 5,500 pesos per month in their previous employment. Consistent with these findings on outside wages, applicants from the treatment sites are much more likely to be currently employed, to have had work experience, and to have been previously employed in a white-collar position.[28]

In addition to these findings on outside wages and employment, we also find significant effects when using various

25. We can reject the hypothesis that the two distributions are the same, based on a Kolmogorov-Smirnov test (*p*-value = 0.00).

26. Recall that most of these applicants are unemployed and hence report past, rather than current wages. Currently employed individuals may still apply to a job paying less than their current wage if they are pessimistic about their prospects in the current job.

27. These wage categories were defined based on the wage distribution of the control group.

28. We define white collar as any worker who performs professional, managerial, or administrative work.
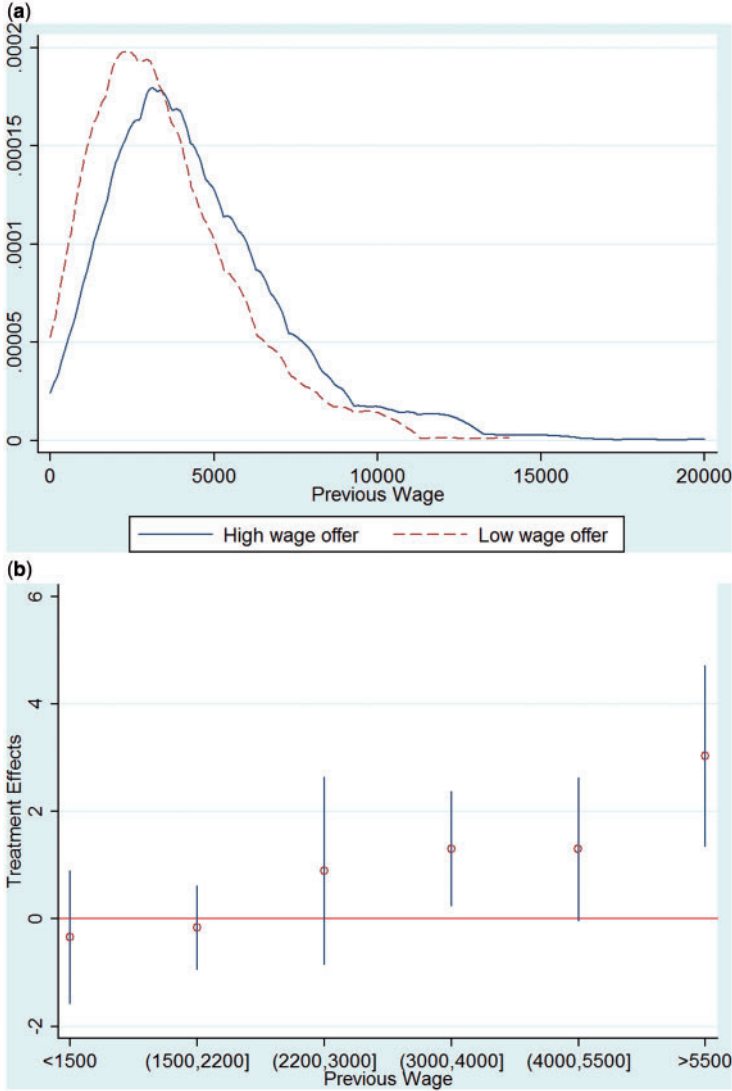
FIGURE I

The Effects of Financial Incentives on the Applicant Pool: Previous Wage

Panel A depicts the distributions of previous wages by treatment assignment. Each density was estimated using an Epanechnikov kernel and an optimal bandwidth. Panel B depicts the effects of financial incentives on the average number of applicants per site for different previous wage categories. The computation of the treatment effects accounts for region intercepts. The vertical bars denote 95% confidence intervals. The standard errors are clustered at the locality level.

measures of cognitive traits. Applicants in the treatment areas scored 0.51 point higher on the Raven test. This represents an increase of 0.19 standard deviations relative to the control. This mean effect reflects an increase in the number of above average IQ candidates, as well as a decrease in the number of below average IQ candidates (see Figure II).[29] In line with the favorable effect on IQ, we also find that applicants from the higher wage sites were much less likely to choose a dominated strategy in the risk game. Interestingly, we do not find that higher wages attracted individuals with more education or who are more likely to be able to use a computer (not reported). Although it is hard to know for sure, we suspect the lack of effects along these dimensions is most likely a manifestation of the recruitment targeting, which led to an applicant pool with extremely high schooling and where 92% know how to use a computer.

In Panel B of Table III, we examine the effects of wages on personality traits, which, as we discussed already, are considered to be important determinants of job performance and earning potential. Higher wages attract individuals who are more conscientious and less neurotic, and to a lesser extent individuals who are more open to new experiences. While these are only mean effects, we find (but do not report) that the high-wage postings attracted significantly more individuals per site who are from the upper quintile of the distribution in terms of conscientiousness and emotional stability (i.e., less neurotic). Though higher wages appear effective at attracting candidates with a better personality profile, as measured by the Big 5 personality traits, we do not find any evidence that wages affected the applicant pool with regard to integrity.

VI.A. PSM

Although higher wages may have attracted individuals with a higher reservation wage, higher IQ, and better personality traits, an important policy question is whether this comes at the expense of attracting applicants who are less motivated by

29. A potential explanation for this decrease is that candidates weigh the pros and cons of sinking the cost to attend a screening session. When the announced wage is higher, candidates may expect a higher threshold of eligibility, or tougher competition, causing those with lower IQs to desist. We do not find this pattern in other dimensions of quality, however, and therefore it is an aspect of behavior by applicants that our theory only takes up in the Online Appendix.
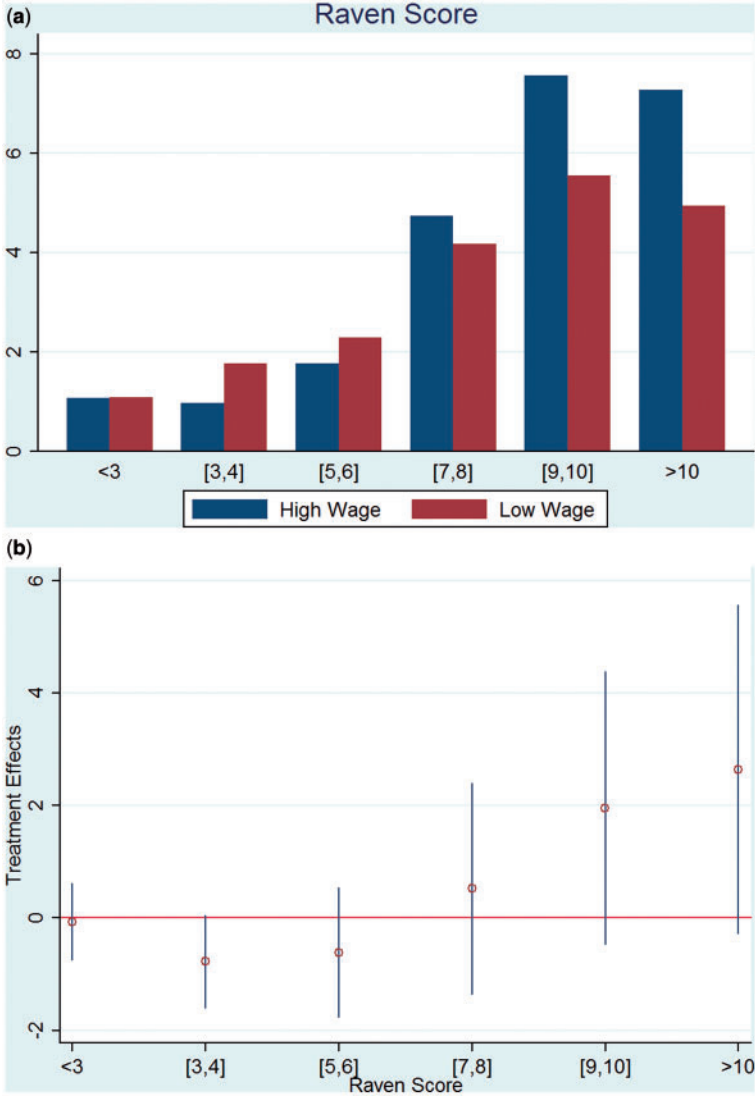
FIGURE II

The Effects of Financial Incentives on the Applicant Pool: Raven's Exam

Panel A depicts the distributions of the number of applicants per site by Raven score and treatment assignment. Panel B depicts the effects of financial incentives on the average number of applicants per site for different Raven categories. The computation of the treatment effects accounts for region intercepts. The vertical bars denote 95% confidence intervals. The standard errors are clustered at the locality level.

public service. If PSM correlates with public sector job performance as the literature suggests, providing higher salaries may not help build up the human capacity of the state. But as shown in Proposition 1, the theoretical prediction is ambiguous and ultimately depends on the correlation between a person's PSM and his or her outside option. If the traits that define PSM are valued by the market or correlate positively with traits valued by the market, then the effects of offering higher wages on PSM can in fact be positive. In Table IV, we test this hypothesis.

In Panel A of Table IV, we find that the applicants who were recruited under the high-wage offering scored a higher PSM index than applicants from the lower wage sites. Applicants in the treatment sites found policy making more attractive, were more compassionate, and had a stronger belief in social justice. Similar to the effects involving the Big 5 personality traits, the high wage attracted significantly more individuals per site who are from the upper quintiles of the distribution both in terms of the overall index (see Figure III), as well as in terms of the subcomponents of commitment, compassion, and social justice (not reported).

The empirical findings suggest that higher wages cause no harm to PSM. Our model predicted that in a world where quality and PSM are positively correlated in the population, one could observe both a positive correlation between those traits in the applicant pool, and a positive effect of wages on both dimensions. That is what we find. In the case of a deterministic, positive relationship between quality and PSM, increases in wages improve PSM through their effect of attracting individuals with higher earning potential. If the relationship is not deterministic, one may wish to empirically disentangle the effect of wages on PSM conditional on quality from the effects that operate by increasing quality. Such an exercise would require different instruments to separately affect the quality and the PSM of applicants. What we can say, however, is that if the effects of wages on PSM conditional on quality are negative, they are not strong enough to induce an overall crowding out of PSM.

In Panel B of Table IV, we explore the effects of the treatment on other measures of prosocial behavior. Overall the findings are mixed. For some measures, we do not find any effects (volunteer and altruism). For other measures, we find negative effects (charity work and political party membership). And yet for some others

TABLE IV

EFFECTS ON FINANCIAL INCENTIVES ON THE APPLICANT POOL: MOTIVATION PROFILE

	Observations (1)	Control (2)	Treatment effect (3)	Randomization inference *p*-value (4)	FDR *q*-value (5)
Panel A: PSM traits					
PSM index	2,074	0.000	0.092 [0.046]**	.05	0.09
Attractiveness	2,217	2.803	0.070 [0.041]*	.05	0.14
Commitment	2,170	3.316	0.045 [0.035]	.15	0.18
Social justice	2,180	3.646	0.075 [0.026]***	.01	0.04
Civic duty	2,158	3.924	0.027 [0.033]	.25	0.22
Compassion	2,168	3.001	0.066 [0.031]**	.04	0.14
Self-sacrifice	2,168	3.687	0.039 [0.034]	.15	0.18
Panel B: Prosocial behavior					
Altruism	2,199	23.491	0.039 [0.291]	.53	0.29
Negative reciprocity	2,206	0.508	0.075 [0.023]***	.00	0.00
Cooperation	2,157	26.174	0.675 [0.404]*	.08	0.16
Did charity work in the past year	2,223	0.605	−0.096 [0.041]**	.01	0.05
Volunteered in the past year	2,224	0.710	−0.006 [0.027]	.38	0.34
Importance of wealth	2,025	3.159	0.107 [0.087]	.14	0.18
Belongs to a political party	2,225	0.113	−0.026 [0.014]*	.07	0.16
Voted	2,225	0.758	0.019 [0.035]	.33	0.26

Notes. This table estimates the effects of higher wages on characteristics of the applicant pool. Each row is a separate regression using the variable listed as the dependent variable. Column (1) reports the number of observations in the regression. Column (2) reports the mean of the variable in the control group (low-wage announcement), column (3) reports the coefficient on the treatment in a regression that includes region intercepts. Column (4) reports the *p*-values based on a one-sided test statistic that the placebo coefficients are larger than the actual. The *p*-values were computed based on 1,000 random draws. Column (5) reports the *q*-value associated with the false discovery rate test, which accounts for the multiple testing. See the Appendix for more information on the variables. *Statistically significant at the 10% level, ** at the 5% level, and *** at the 1% level. Clustered standard errors at the level of the locality are reported in brackets.
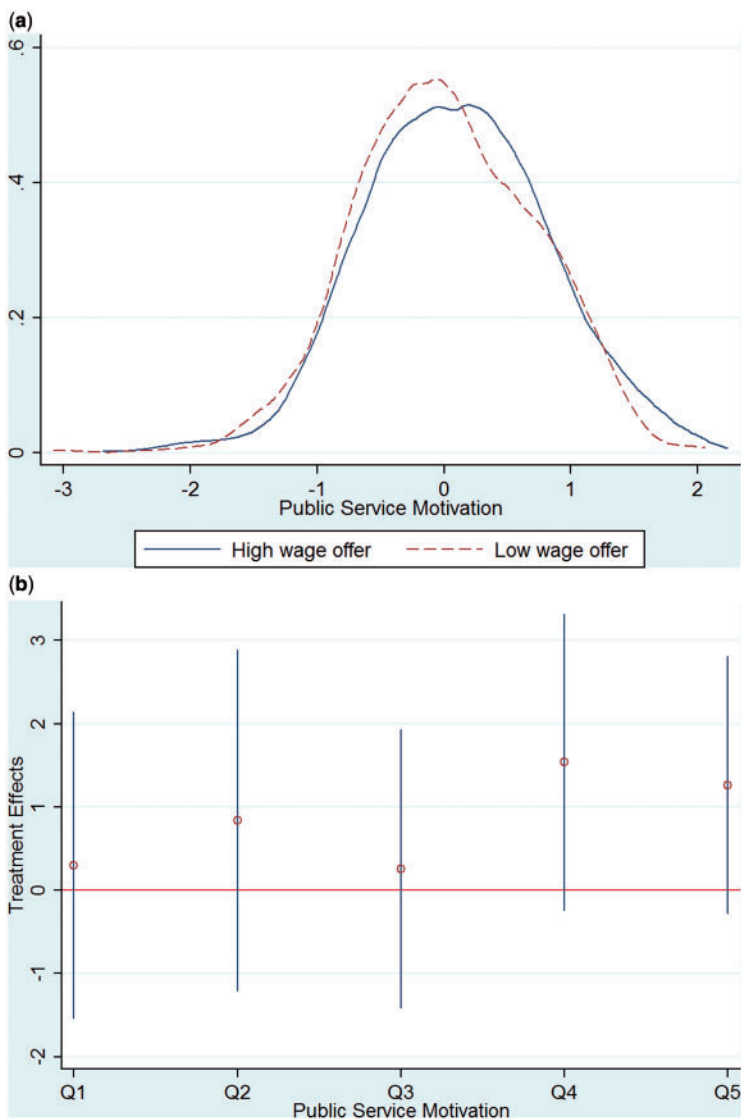
FIGURE III

The Effects of Financial Incentives on the Applicant Pool: Public Service Motivation

See Appendix for more information on the definition of the public service motivation index. The computation of the treatment effects accounts for region intercepts. The vertical bars denote 95% confidence intervals. The standard errors are clustered at the locality level.

the effects are positive (cooperation and willingness to pay a private cost to punish stingy behavior [negative reciprocity]).

In sum, we find strong evidence that higher wages attract individuals with higher quality, without any indication that this harms PSM. While enticing qualified applicants to apply with higher wage offers is a necessary first step for building up the human capacity of the state, it is by no means sufficient. In the next section we examine whether higher wages help fill vacancies.

VII. EFFECTS OF FINANCIAL INCENTIVES ON RECRUITMENT

In this section, we examine the extent to which higher wages help the recruiter fill vacancies and present our estimate of the elasticity of the labor supply facing the RDP.

Table V presents the estimation results for a series of models based on equation (2). The dependent variable is equal to 1 if the person selected to receive an offer accepted the position, and 0 if the person declined the initial offer or could not be reached after several attempts. Among individuals selected to receive a salary of 3,750 pesos, 42.9% accepted the position. An offer of 5,000 pesos increased conversion rates by 15.1 percentage points, or approximately 35.2% (see column (1)). This yields an (arc-)elasticity for the conversion rate of $\xi'_{\gamma(w,\bar{v})} = 35.2/33 = 1.07$ (the prime symbol denotes an arc-elasticity).

Note that this elasticity of the conversion rate reflects the effects of wages on acceptance decisions given candidate quality, as well as effects stemming from composition changes in the applicant pool, which is precisely an implication of the theory. Recall that Proposition 2 did not pin down the sign of the elasticity of the conversion rate. Higher wages raise the probability that any given quality type will accept a job if offered, but higher wages also attract higher quality types on the margin who are less likely to accept a job. Our empirical findings suggest that the inframarginal effects dominate, and therefore higher wages help recruitment, which is arguably the relevant policy issue. Alternatively however, one might be interested in the effects of wages on acceptance decisions holding quality constant, which we would have been able to estimate in our setting had we chosen two random groups of people who had not made a decision to enter the applicant pool, and offered them jobs carrying

TABLE V

THE EFFECTS OF FINANCIAL INCENTIVES ON RECRUITMENT

	Accepted (1)	Accepted (2)	Rejected (3)	Not reachable (4)
High-wage offer	0.151 [0.054]***	0.160 [0.054]**	−0.017 [0.034]	−0.135 [0.054]***
Characteristics				
Male		−0.080 [0.058]		
Years of schooling		−0.022 [0.008]**		
High IQ		−0.017 [0.053]		
Wage in previous job > 5,000 pesos		−0.007 [0.067]		
Big 5 index		0.042 [0.038]		
PSM index		−0.024 [0.044]		
Mean of dependent variable	0.55	0.55	0.13	0.32
Observations	350	343	350	350
R-squared	0.10	0.12	0.09	0.13

Notes. This table estimates the effects of higher wages on conversion, or vacancy filling. In columns (1) and (2), the dependent variable is an indicator equal to 1 if the person accepted the offer, 0 if the person rejected it or could not be reached. In column (3), the dependent variable is an indicator equal to 1 if the person rejected the offer, 0 if the person accepted it. In column (4), the dependent variable is an indicator equal to 1 if the person could not be contacted about the offer, 0 otherwise. In addition to the controls listed in the table, all regressions included intercepts for a region by indigenous requirement pair. See the Appendix for more information on the variables. *Statistically significant at the 10% level, ** at the 5% level, and *** at the 1% level. Clustered standard errors at the level of the locality are reported in brackets.

different wages. Short of running such an experiment, we can still say something about the effect of wages on acceptance decisions holding quality constant, by applying treatment bounds. Following Lee (2009), we can compute bounds for the treatment effect by making opposite assumptions on the composition changes in the pool induced by the wage change. In one case, we assume that the treatment induced an additional 26% from the lowest tail of the quality distribution to become eligible for an offer, and in the other we assume the added applicants belonged to the top of the quality distribution. We obtain an estimate for the upper bound on the treatment effect of 0.41 (bootstrapped standard errors = 0.12), implying an elasticity of 2.95 for the conversion rate, and the lower bound on the treatment effects is 0.05

(bootstrapped standard errors = 0.10) or a wage elasticity of conversion of 0.36.

In column (2), we reestimate the model including several of the characteristics of the applicant pool that differed across the two wage offers. The inclusion of these individual characteristics does not affect our point estimate of the effect of wages on conversion (point estimate = 0.160; std. err. = 0.054). Moreover, most of these characteristics do not predict conversion rates. Our theory predicts that the conversion rate should be lower for higher quality individuals. Although the sign of quality-related variables is, as expected, negative in four out of five cases, only years of schooling appears statistically significant.

An interesting fact arises when we unbundle the effect of wages on the conversion rate. Recall that the dependent variable is 0 for those individuals who declined the initial offer and those who could not be reached after several attempts. There may be various reasons these people were unreachable. For instance, they may have taken another job or decided against this job, and as a result may have chosen not to make themselves available.[30] Alternatively, they may have been busy during the call-back period, or their contact information was invalid.[31] In any case, as we see from columns (3) and (4), much of the effect of wages on conversion rates comes from individuals not being recontacted as opposed to rejecting the offer directly. This suggests an interesting nuance to the practical challenges of recruitment. Higher wages help attract more and better applicants, and they certainly do not hurt a recruiter's ability to convince a selected candidate to say "yes." But crucially, higher wages help increase the chance of a successful matching process with the selected candidates.[32]

Our theory does not pin down predictions on how the effects of wages on recruitment vary with individual characteristics. Nonetheless we explore this in Online Appendix Table A5. We

30. Thus, a failure to recontact a candidate may reflect an implicit rejection of the job offer to be made. Recall that three to four weeks had elapsed between the time the average individual took the exam and when the RDP attempted to recontact candidates.

31. In 23 of the cases, or 6%, the contact information was incorrect. For these cases, there is no difference between treatment and control.

32. Although one might be concerned that the operators may have put more effort into contacting high-wage applicants, this was certainly not the case. The call-back process was both completely centralized and scripted.

investigate whether wages help recruitment differently along various dimensions, such as IQ, previous earnings, personality, and gender, and we do not find important effects.

VII.A. *The Elasticity of the Labor Supply Facing the Employer*

In our theory section we established that the elasticity of the labor supply facing the employer $\eta = \frac{dS}{dw}\frac{w}{S}$ can be written as the sum $\xi_{F(\bar{v})} + \xi_{\gamma(w,\bar{v})}$ of the elasticities of the size of the applicant pool and of the conversion rate. We estimate η by adding our estimates of the elasticity of the applicant pool and the conversion rate, and it is worth remarking that this approach has some identification advantages. To see this, suppose that a firm advertises jobs at two different wage levels and attains two levels of recruitment, yielding two pairs of wage-employment data. The first inclination might be to compute the (arc-)elasticity defined by the two wage-employment pairs—after all, the firm's recruitment equals the labor effectively supplied to the firm. But this could be misleading because actions by the employer, such as advertising the high-wage positions more strongly, may violate the exclusion restriction even if wages were randomized. Thus, the use of employment-wage data to measure the labor supply elasticity may confound aspects of the labor supply with aspects of the labor demand. The safe approach is to use information on the elasticities of the applicant pool size and the conversion rate emphasized in our theory, which reflect only on the labor supply.[33]

The numeric computation of the labor supply elasticity must take into account that the wage variation in our setting is not infinitesimal, but large: 33%. So we should compute an arc-elasticity. Moreover, the arc-elasticity of a product is not equal to the sum of the arc-elasticities of its factors. Given the product $S(w) = F(\bar{v}(w)) \times \gamma(w, \bar{v}(w))$, where $F(\cdot)$ is the size of the applicant pool and $\gamma(\cdot)$ is the conversion rate, the arc-elasticity of the labor supplied to the firm S, denoted η', is given by $\xi_F' + \xi_\gamma' + \xi_F'\xi_\gamma' \times \frac{\Delta w}{w}$ (where $\frac{\Delta w}{w}$ is the rate of wage increase and primes denote arc-elasticities). If we incorporate the possibility that higher wages led, according to our point estimate in Table III, to a 26.31% increase in the number of applicants, the arc-elasticity of the

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33. This is the approach we follow here, although in our case, by design, the advertising intensity per recruitment site was held constant across wage conditions and the selection intensity varied only marginally.

applicant pool is $\xi'_F = 26.31/33 = 0.8$. Taking into consideration that the arc-elasticity of the conversion rate estimated in the previous subsection was $\xi'_\gamma = 1.07$, we conclude that the arc-elasticity of the labor supply facing the employer is $\eta' = 2.15$.

How does our estimate of the elasticity of the labor supply compare with those in the literature? To our knowledge, no other study has estimated the elasticity of the labor supply facing the employer using randomized wages. But there are a number of quasi-experimental estimates, and these typically range anywhere from 0.1 to 3.9. For instance, Staiger, Spetz, and Phibbs (2010) examine the effects of a legislated increase in the wages at the Veteran Affairs hospitals, and find that a 10% increase in wages increased labor supply by between 0% and 2%. Falch (2011) analyzes an exogenous wage change paid to teachers in Norway and estimates a labor supply elasticity of 1.4. Sullivan (1989) estimates the wage elasticity of the supply of nurses to individual hospitals by exploiting a shock to the demand curve. Using measures of hospital caseload as instruments, he estimates a long-run elasticity of 3.86. But whether our estimates are directly comparable to those in this literature bears examination. Ours is an estimate of a short-run, partial equilibrium—elasticity of the labor supply facing an employer who offers a temporary job—and it involves an unexpected wage raise. Some of the previous work studies long-run effects involving more stable jobs. We conjecture that our short-run estimate is a lower bound for longer run effects: when competitors adjust by raising their own wages, the effects we estimate of the higher wage are likely to become smaller, bringing our estimates even further away from the infinite elasticity that characterizes competitive markets.

VII.B. The Role of Financial Incentives in Overcoming Challenging Job Characteristics

Our research design provides a unique opportunity to investigate how the characteristics of the municipality to which the applicant was assigned affect the acceptance decision. Because individuals were randomly assigned to a municipality, the characteristics of the municipality constitute an exogenous shock to their choice sets. The Online Appendix details an extension of our basic model that allows us to derive predictions on the effect of municipal characteristics on acceptance rates. The key theoretical predictions are that worse characteristics lower

acceptance rates by candidates, but that under some conditions offering a higher wage should mitigate this effect. More precisely, the theory predicts that if high outside options and high-quality types are less likely than low ones, then the coefficient γ_2 of the interaction between negative (positive) municipal attributes and wages in equation (3) is positive (negative).

In Figure IV we examine whether acceptance decisions are affected by the distance to the municipality (Panel A), drug violence in the municipality (Panel B), and the municipality's degree of human development as measured by the Human Development Index (Panel C). For each characteristic, we use a locally linear regression to plot the probability that, conditional on being contacted, the applicant accepted the position, distinguishing between applicants who received the low-wage offers versus the high-wage offers.

Among the applicants who were offered a lower wage, we find a strong negative relationship between acceptance rates and the distance of the assigned municipality from the applicant's home municipality. For instance, 80% of the applicants who were offered a job in a municipality located less than 100 km away accepted the position across both wage conditions. Among those who were offered a job located more than 200 km away, the acceptance rate fell to 25% in the low-wage condition. This stands in striking contrast to the case of those in the high-wage condition, whose acceptance rates remain around 80% even when offered a job located more than 200 km away. This suggests a negative interaction between wages and job attributes (wages matter more for worse municipalities), which according to our theory can be rationalized in a world with decreasing densities for reservation wage shocks and quality types.

We find similar patterns when considering either drug-related violence, as measured by the number of drug-related deaths per 1,000 inhabitants, or the municipality's human development score. In both cases worse conditions cause lower acceptance rates, and this difference is strongly mitigated by high-wage offers.[34]

In Table VI, we present the regression counterparts to the results displayed in Figure IV. Each column presents regression coefficients from estimating variants of the model presented in

34. The results for the number of drug-related deaths per 1,000 inhabitants are measured with less precision.
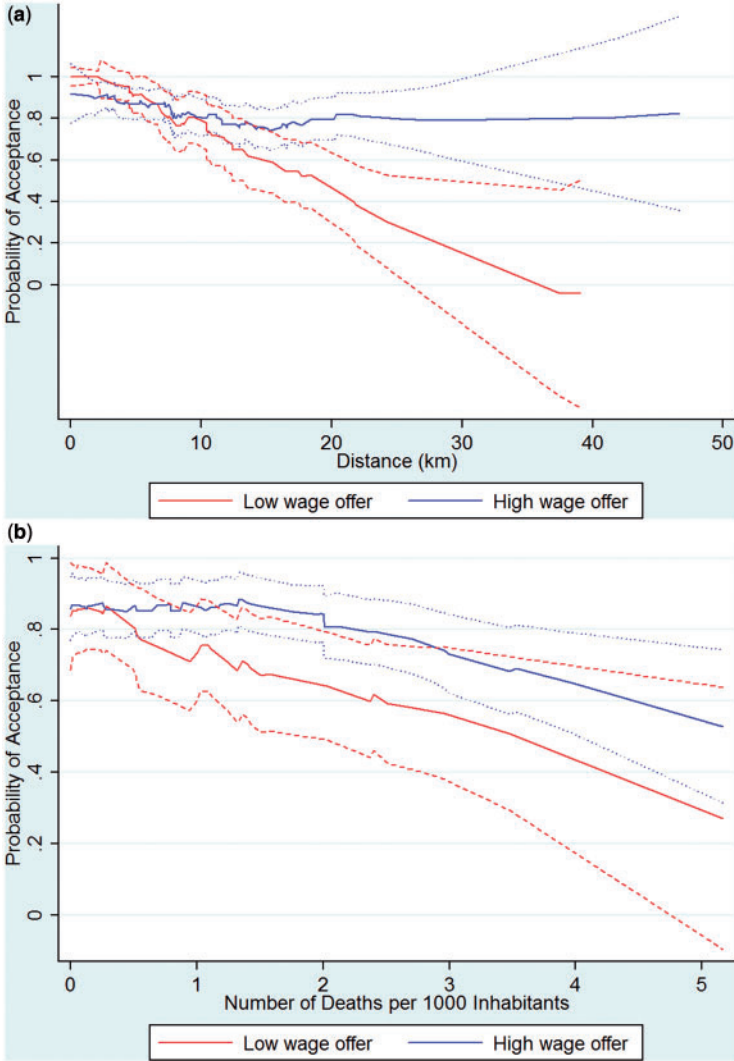
FIGURE IV

The Effects of Financial Incentives on Acceptance Rates by Municipal Characteristics

Each plot depicts the effects of financial incentives on acceptance rates, by characteristic of the municipality to which the applicant was assigned. Each line was estimated using a locally linear regression for the sample of applicants who were recontacted.
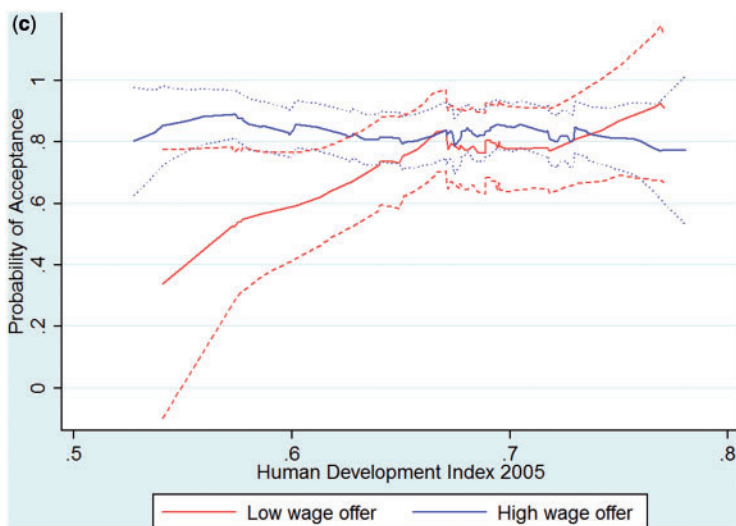
(continued)

FIGURE IV

Continued

equation (3), where the dependent variable equals 1 if the applicant accepted the offer, conditional on being recontacted. In columns (1)–(3) we estimate separately the effects for each of the three municipality characteristics and its interaction with the treatment indicator; in column (4) we jointly estimate the effects of all three municipal characteristics. The specifications estimated in columns (1)–(4) are conditional on individuals who were successfully recontacted because otherwise the individual would not know to which municipality he or she had been assigned. These estimates must be interpreted with care because those who are recontacted do not constitute a random sample. However, this potential selection will most likely dampen the estimated effects: if those who made an effort to re-establish a match are the ones with a stronger interest in the job, they should display less elastic responses to wage and job conditions. Moreover, it might be argued that the estimates in columns (1)–(4) are exactly the estimates of interest from the standpoint of the recruiter, as they are uncontaminated by the response of individuals who are unreachable and therefore unrecruitable.

TABLE VI

Effects of Municipal Characteristics on Acceptance Decisions

| Dependent variable | Acceptance | | | | |
	(1)	(2)	(3)	(4)	(5)
High-wage offer	0.047	0.066	0.075	0.056	0.147
	[0.037]	[0.047]	[0.053]	[0.041]	[0.047]***
High wage offer × Distance	0.026			0.028	0.010
	[0.005]***			[0.007]***	[0.007]
Distance	−0.027			−0.028	−0.017
	[0.004]***			[0.007]***	[0.005]***
High wage offer × Drug-related		0.078		−0.033	−0.025
deaths per 1,000 inhabitants		[0.039]*		[0.037]	[0.040]
Drug-related deaths		−0.107		0.000	−0.022
per 1,000 inhabitants		[0.044]**		[0.045]	[0.040]
High wage offer × Human			−1.482	−0.913	−1.368
Development Index			[0.738]**	[0.645]	[0.589]**
Human Development Index			1.526	1.044	1.002
			[0.673]**	[0.598]*	[0.521]*
Observations	238	238	238	238	348
R-squared	0.25	0.21	0.2	0.26	0.18

Notes. This table estimates the effects of municipal characteristics on acceptance decisions. In all columns, the dependent variable is an indicator equal to 1 if the person accepted the offer, 0 otherwise. In columns (1)–(4) the sample has been restricted to the applicants who were successfully contacted. In addition to the controls listed in the table, all regressions included intercepts for a region by indigenous requirement pair. See the Appendix for more information on the variables including their sources. Distance is measured in tens of kilometers. *Statistically significant at the 10% level, ** at the 5% level, and *** at the 1% level. Clustered standard errors at the level of the locality are reported in brackets.

The findings presented in Table VI are consistent with the patterns depicted in Figure IV. The direct effects presented in Table VI provide causal estimates of the effects of the work environment on the ability to recruit. In addition, the interaction effects show that the wage increase in the RDP largely compensated for the less desirable job conditions. For instance, the point estimates in column (1) suggest that while 10 extra km of commuting distance reduced acceptance rates by 2.7 percentage points for those offered the low wage, distance had virtually no effect on the acceptance decisions of those offered a high wage. A similar calculation can be made with respect to drug-related deaths and the Human Development Index. An extra death per 1,000 inhabitants (column (2)) reduces acceptances by around 10 percentage points among the applicants offered the low wage. For those offered the higher wage, an extra death per 1,000 inhabitants only reduces acceptance rates by 2.2 percentage points.

Shifting a job from the municipality with the highest Human Development Index value (0.78) to that with the lowest (0.44) lowers acceptance rates by around 50 percentage points, and again the effect of the wage increase is sufficient to undo the effect of the worse municipal environment. When we estimate the effects of all three characteristics jointly, we find that the differential effect by drug violence falls in magnitude and loses precision (see column (4)). Overall, these estimates demonstrate that the municipal environment has substantial effects on the cost of doing business facing an employer.

As a way to gauge sensitivity to the exclusion of the candidates who could not be reached, in column (5) we reestimate the specification presented in column (4) using the entire sample. This specification preserves the experimental design and except for the addition of municipal characteristics (and the interaction terms) it is similar to the regressions presented in Table V, in which we estimate the effects on recruitment. In this context, this specification implicitly assumes that candidates who were not reached still learned the job conditions. This assumption is obviously inaccurate and is likely to attenuate the findings in columns (1)–(4). As shown in column (5), while the point estimates do attenuate slightly, the effects remain quite similar.[35]

Overall these findings highlight the importance of financial incentives in not only attracting qualified individuals but also inducing them to work in hard-to-fill positions.

VIII. CONCLUSIONS

In June 2011, Mexico's federal government set out to hire 350 public servants. These individuals were to work in a program designed to strengthen the state's presence in some of the country's most marginalized communities. As part of the recruitment process, two different wage offers were randomly assigned across recruitment sites, and applicants were administered a screening test designed to measure their aptitudes and motivations. Based

35. One may wonder about why high-wage offers do not shift acceptance rates up for all levels of job attributes, including the very best. As we discuss in the Online Appendix, the model does not make a prediction about the level effects of wages, only on the effects of job attributes and their interaction with wages. As was made clear in Proposition 2(b), the level effects of wages on acceptance rates are ambiguous in the presence of selection effects.

on the experimental design, we show that offering higher wages attracts individuals with higher previous earnings and who have both higher IQ and more desirable personality traits, as measured by the Big 5 personality and PSM tests.

These novel findings have implications for policy that ultimately depend on the screening capabilities of the state. On one hand, in places where the ability of the state to screen candidates is low, finding instruments that improve the average quality of the applicant pool would be useful. On the other hand, if the state's ability to screen candidates is high, then costly instruments (such as high wages) would be attractive only if they extend the support and/or affect the upper tail of the quality distribution. We find that wages favorably impact the upper tail of the quality distribution, and they do so without lowering the public sector inclination of applicants. In other words, we do not find a trade-off between quality in terms of features valued by the market and PSM. Of course, whether a trade-off would have occurred at different levels of wage offerings or different job types remains an interesting area for future research.

The power of wages is not limited to attracting a larger and better applicant pool. Higher wages also increase the state's ability to fill vacancies. We estimate what we believe to be the first experiment-based elasticity of the labor supply curve facing a firm or government. We show, consistent with a large nonexperimental literature, that the labor supply facing an employer is far from infinitely elastic, with an elasticity of 2.15. It is worth noting that this is a short-run elasticity that may be reduced once competitors adjust, and it may also change as the RDP reaches its employment steady state.

Presumably, the wage is not the only aspect of a job that influences a person's willingness to accept the position. Our findings highlight the importance of other job attributes in the acceptance decision. Distance and bad characteristics of the municipal environment appear to be important hurdles to filling vacancies. Fortunately, higher wages appear to be an effective instrument to overcome these hurdles. These causal estimates allow us to quantify the effects on the cost of doing business of the general socioeconomic environment facing employers.

Our findings have important implications for those concerned with the development of state capabilities. Attracting individuals with the characteristics valued by markets and personnel specialists is probably a necessary first step toward

building a competent public bureaucracy. However, our results do not necessarily imply that those who appear to be more able individuals will perform better once hired in the context of a program like the RDP—more research is certainly needed. Hopefully our approach, combining the measurement of individual characteristics with the randomization of wages and job offers, offers a useful blueprint for personnel studies. A natural next step is to extend our approach by linking the exogenous variation it generates (e.g., in incentives and individual characteristics) with bureaucratic performance.

APPENDIX: DATA

The data used for our analysis come from three sources. The first is the information that was gathered as part of the recruitment exam. The second source is Mexico's National Statistical Office (Instituto Nacional de Estadística y Geografía, INEGI, http://www.inegi.org.mx/), which collects and maintains many of the country's official data sets, including the population censuses. These variables are defined in the relevant tables. Some other variables, such as *Drug-related deaths per per 1,000 inhabitants*, which records the number of homicides that are drug related per 1,000 inhabitants, were confidential government data. Other confidential data from government sources, used in the Online Appendix, are indicator variables for the presence of drug organizations and of subversive movements at the municipal level.

Here we describe the variables that we constructed using information obtained through the recruitment exam. These data are defined at the level of the individual. They were collected during a three-hour exam held at the schools in which the ads had been distributed, during a three-week period in July 2011. We use the following variables from these data.

- Indicator variables for *Male*, *Speaks indigenous language*, *Indigenous* (equals 1 if the person declares to be of indigenous origin, 0 otherwise), *Uses computer*, *Currently attending school*, *Currently employed*, *Has work experience* (equals 1 if the person has ever held a job, 0 otherwise), *Previous job was white collar*, *Chose dominated risk option* (equals 1 if person chose a certain

outcome of 2.5 million pesos instead a lottery with equally probable prizes of 2.5 and 5 million pesos, 0 otherwise), *Voted* (equals 1 if person voted in the last federal elections, 0 otherwise), *Volunteer* (equals 1 if person reports having done any volunteer work, 0 otherwise), *Charity* (equals 1 if person reports having done charity work in the last year, 0 otherwise), *Belongs to a political party* (equals 1 if the person reports being a member of a political party, 0 otherwise).

- *Age*: Age measured in years, constructed from the applicant's birth year.
- *Years of schooling*: Measured in years and constructed based on the individual's highest education level. We assumed the following formula: preschool = 3 years; primary education = 6 years; secondary education = 9 years; high school = 12 years; college = 16 years; postgraduate = 20 years.
- *Height*: Person's self-reported height measured in meters.
- *Wage in previous job*: Monthly wage the person reported receiving in their last job.
- *Years of experience in the past three spells*: Adds up the years of experience in the last three jobs held by the person.
- *Raven*: The number correct (out of 12) the person correctly answered in the Raven Progressive Matrices, Set I (source: Pearson).
- *Extravert*: An orientation of one's interests and energies toward the outer world of people and things rather than the inner world of subjective experience; characterized by positive affect and sociability (VandenBos and American Psychological Association [APA] 2007). Computed as the average response to eight questions from the BFI.
- *Agreeable*: The tendency to act in a cooperative, unselfish manner (VandenBos and APA 2007). Computed as the average response to nine questions from the BFI.
- *Conscientious*: The tendency to be organized, responsible, and hardworking (VandenBos and APA 2007). Computed as the average response to nine questions from the BFI.
- *Neurotic*: Neuroticism is a chronic level of emotional instability and proneness to psychological distress. Emotional stability is predictability and consistency in

emotional reactions, with absence of rapid mood changes (VandenBos and APA 2007). Computed as the average response to eight questions from the BFI.

- *Open*: The tendency to be open to new aesthetic, cultural, or intellectual experiences (VandenBos and APA 2007). Computed as the average response to 10 questions from the BFI.

- *Big 5 Index*: An index of the Big 5 as an equally weighted average of the z-scores of each dimension, reversing neuroticism, which is widely considered to be a negative characteristic.

- *PSM Index*: This measure relies on a questionnaire in which the subject must express agreement or disagreement with 40 statements. The questionnaire elicits opinions on the attractiveness of politics, public service, and prosocial activities. The questionnaire is subdivided into six modules labeled "Attraction to Policy Making" (which includes items such as 'Politics is a dirty word'), "Commitment to Policy Making," "Social Justice," "Civic Duty," "Compassion," and "Self-Sacrifice." We then create an equally weighted average of the z-scores of each dimension.

- *Cooperation*: Contribution in a hypothetical voluntary contribution game where the person must decide how much out of 50 pesos to contribute to a joint account and how much to keep. Money in the joint account is multiplied by a factor of 1.4 and then divided between the two people participating. While the Pareto-efficient allocation is to contribute all 50 pesos, the Nash equilibrium is to contribute 0.

- *Altruism*: Amount the person gave out of 50 pesos in a hypothetical dictator game.

- *Negative reciprocity*: An indicator equals 1 if person would reject an offer of 1 peso in a hypothetical ultimatum game where the proposer keeps 49 pesos.

- *Wealth important*: One of the seven components of the Aspiration Index (see Kasser and Ryan 1996). It is intended to measure how important wealth is to the individual. It is constructed based on the average of answers to five questions that were asked on a 7-point response scale.

- *Fame important*: One of the seven components of the Aspiration Index (see Kasser and Ryan 1996). It is intended to measure how important fame is to the individual. It is constructed based on the average of answers to five questions that were asked on a 7-point response scale.
- *Integrity (projection bias)*: Constructed based on the following three questions: "If a person found your wallet with 200 pesos in it, what is the probability that it gets returned to you with all the money in it, if it was found a 1) neighbor; 2) policeman, 3) a stranger?" The answers to these three questions are then averaged.
- *Integrity (simple)*: An indicator equals 1 if person agreed with the statement "Laws are meant to be broken," 0 otherwise.

SUPPLEMENTARY MATERIAL

An Online Appendix for this article can be found at QJE online (qje.oxfordjournals.org).

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