Networks at Work: How Entry-level Job Links Shape Civil Servants’ Careers and Performance*

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Abstract

Promotion mechanisms have significant implications for organizational efficiency. In this paper I investigate a promotion mechanism within the public sector and ask whether the current seniority of links established at the entry-level job have an effect on informal promotions and performance of civil servants. I use an instrumental variables strategy and empirically investigate this for Pakistan Administrative Services (PAS) officers who are allocated Assistant Commissioner (AC) jobs in Punjab, Pakistan as their first job. In order to identify the causal effect of seniority of entry-level job links I exploit a quasi-experiment in Pakistan based on the government’s Tenure/Transfer Policy for Assistant Commissioners (ACs) and build the instrument seniority of potential entry-level job link. I compile a novel, historical panel dataset of tenure and vacancy of Assistant Commissioner (AC) jobs, seniority of entry-level job links, tax performance and overall career trajectories of PAS civil servants in Punjab, Pakistan from 1983-2013. I find that a one rank increase in the current seniority of the potential entry-level job link leads to a 18% increase in the probability of informal promotions. The effect is differentially positive for those in the top 10% of the civil services entrance exam ranking. Moreover, seniority of potential entry-level job link has a scale effect on the performance distribution and increases its dispersion. A one rank increase in the seniority of the potential link at the entry-level job leads to a negative effect at the 10th to 70th quantile of the performance distribution, while it has a positive effect at the 80th and 90th quantile. I rule out productivity spillovers as the mechanism for the effect on performance.

JEL codes: D85, D73, H83, J45, M54, O1

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1 Introduction

Information relevant for personnel management in organizations is generally dispersed amongst its many members. An important question in organizational design is whether this decentralized information should be used in designing contracts for workers. On the one hand the use of decentralized information reduces information asymmetries while on the other hand it opens the door to a possibility of collusion amongst the ‘nexus of the informed parties’ (Tirole, 1986). In the presence of an efficiency-collusion trade-off any use of decentralized information can have significant implications for incentives and overall organizational efficiency. Promotion mechanisms in organizations is one such that potentially faces this trade-off with significant ramifications for incentives and efficiency. This is especially true when market fails and non-price based promotion mechanisms emerge.

In this paper I investigate a promotion mechanism and ask whether links that workers get in the entry-level job affect their future career progression and whether that has an impact on their early-career performance. I empirically investigate this in the context of public sector workers in Pakistan.

Public sector labour markets are potentially highly reliant on non-price or rule based promotion and incentivizing mechanisms with limited use of information from co-workers or supervisors. Public sector workers operate under low powered incentives defined by rules and regulations including flat wage structures, job security, limited censure for shirking, multiple tasks and outcome measures that are hard to quantify, multiplicity of principals with conflicting interests and lack of competition and profit motive. The fraction of internal promotions in the public sector is quite significant. These features of the public sector are precisely the reason that findings in the personnel economics literature that focus on the private sector can rarely be extrapolated to the public sector context (Dixit (2002); Finan et al. (2015)).

Having said that it is very difficult to incentivize public sector workers, one cannot overstate the importance of doing so. Understanding their incentives has significant implications for development. In a vast majority of the world, especially the developing world, civil servants are tasked with the implementation of policies that have substantial welfare implications such as decreasing infant mortality, improving education outcomes, increasing revenue collection, ensuring secure property rights, adjudicating on property right disputes, maintaining property right documents etc. Needless to say that the effectiveness of these tasks ultimately relies on the incentives of the civil servants to exert effort on the job. Thus, it is crucial for any development effort to understand how countries can effectively incentivize public sector employees and how changes in the institutional design has an impact on the incentives for public service delivery.

In this paper I study promotions of one group of civil servants, the Pakistan Administrative Services (PAS) civil servants that were allocated Assistant Commissioner (AC) jobs in Punjab, Pakistan as their first one. ACs head the revenue administration in tehsils in Punjab, Pakistan. A civil servant is meant to work as an AC at the very start of their career in grade 17. The

\[1\] In most public services, conditional on competitively entering the civil services, rules dictate that only serving public servants can be considered for senior public sector jobs.

\[2\] For instance, performance pay which seems like an obvious choice to incentivise effort in the private sector has provided mixed results in the public sector context (cf. Jacob & Levitt (2003); Jacob (2005); Cullen & Reback (2006); and Neal & Shanzenbach (2010); Dufflo, Dupas & Kremer (2012); Freyer (2013); Lavy (2002); Glewwe et al. (2010); Muralidharan & Sundararaman (2010); Khan et al. (2016)). The incentive effects of non-financial incentives is also not straightforward within the public sector context. While importance or seniority of entry-level job links, career concern, idealism and professionalism can be an inexpensive, informal, non-financial incentivising tools for budget constraint developing countries, it has been argued that increasing extrinsic rewards, financial or non-financial can crowd out pro-social preference to work (Benabou & Tirole (2003); Benabou & Tirole (2005); Dixit (2002); Besley & Ghatak (2005)).

\[3\] There are 36 district with 141 tehsils in the whole of Punjab.
average time spent as an AC is 2.4 years. Restricting attention to this group of civil servants has a couple of advantages. First, I can exploit the initial placement and promotion rules of the government to create an instrument for entry-level job links and identify a causal effect. Second, unlike the other jobs that are pure ‘paper pushers’, a big part of the performance of ACs is quantifiable. By rule, PAS civil servants are meant to work as an AC at the very start of their career in rank 17. Approximately, 315 out of 417 PAS new recruits i.e. 75.5% are allocated AC jobs.

I compile a novel and historical panel dataset of tenure and vacancy of Assistant Commissioner (AC) positions as well as a novel, historical panel dataset of career progression, performance and seniority of entry-level job links from 1983-2013. The two outcomes I investigate are informal promotions and tax performance. Informal promotions are defined as a dummy that turns on whenever the actual rank of the job they occupy is greater than their official rank. Informal promotions are centralized and are completely at the Chief Minister’s discretion. The spell also lasts as long as the Chief Minister pleases. Although informal promotions have no bearing on official promotions it does entail a lot of benefits like a greater sphere of influence, more manpower reporting to them, bigger office space, higher wage allowance in the specific cases of telephone, car and petrol. Informal promotion is quantified from the career charts of civil servants available from the S&GA Department of Government of the Punjab. Tax performance is monthly tax collected as a percentage of annual target set by the provincial Board of Revenue. The performance measure is compiled from historical records of the Board of Revenue on Land Revenue/Agriculture Income Tax (AIT).

For the purpose of this study what I call entry-level job links are objective professional links and I only consider the set of direct links. I classify the endogenous measure as the 75th percentile of the seniority of those set of links that new recruits get in the very first month of their very first job as an Assistant Commissioners (AC). I consider the set of links fixed over time. What changes is the seniority or rule based official promotions of these set of links.

In order to identify a causal effect of seniority of job link I employ an instrumental variables strategy and exploit a quasi-experiment in Pakistan based on the Tenure/Transfer Policy of the Government of the Punjab. Various versions of this policy state that Assistant Commissioners may not be transferred from their job before the end of at least 1 year. This means that when cohorts of new recruits enter they can only be allocated AC positions that are either vacant.

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5 Assistant Commissioners mainly supervise a team of ‘Patwaris’, ‘Naib-tehsildars’ and ‘Tehsildars’ all of whom are referred to as revenue officers in general. The jurisdiction of the ‘Patwaris’ spans a couple of villages grouped together to form a ‘patwar’ circle. The ‘Naib-Tehsildar’ is the supervisory tier for a team of ‘Patwaris’. There is one or two designated ‘Tehsildars’ in tehsils. ACs work under the supervision of the Collector, who further works under the Commissioner. The Board of Revenue (BOR) is the provincial oversight body. Restricting attention to Assistant Commissioner positions has a couple of advantages. First this position is the one that the majority of the new recruits are meant to occupy at least in the 17 grade, by rules. 160 out of 189 new recruits i.e. approximately 85% occupy Assistant Commissioner positions in their first job. The nature of the job remains the same across ACs and any heterogeneity stems from being in a different location eg. AC Lahore City versus AC Multan city. Second, unlike the other grade 17 jobs which are pure ‘paper pushers’, a big part of the performance of ACs is quantifiable. ACs are mainly responsible for collection of land revenue/agricultural income tax (AIT) against annual targets set by the provincial Board of Revenue (BOR). Third, restricting attention to AC positions has the added benefit that I can exploit a tenure/transfer policy of the government of the Punjab to identify a causal effect of job links that I explain later.

6 Inter-provincial Transfers of DMG/PSP Officers, Government of Pakistan, Cabinet Secretariat, Establishment Division, 10th April, 1988, (5/9/86-E.5)

7 If I restrict attention to those for whom I have the performance measure 162 out of 191 PAS new recruits i.e. approximately 85% are allocated AC positions.

8 Ranks are called grades within civil services and I use rank and grade interchangeably.

(so the policy doesn’t apply) or where the incumbent ACs have worked for at least 1 year. What further aids identification is the fact that the end of on-the-job training of the PAS new recruits is centrally determined. Approximately 62% of new recruits get allocated Assistant Commissioner positions following this policy.

This policy allows me to classify a cohort level instrument i.e. seniority of potential job links, which is the 75th percentile of the official rank of all those civil servants that, in the month of end of training of the new recruits, worked in a district where either any AC had already enjoyed a tenure greater than equal to one year or any AC position was vacant. I freeze the potential job links in the month that training ended for the new recruits. Time variation in the measure comes through changes in their official rank. The reason that there is variation is because job links at different points in their career trajectory. Both the endogenous measure and the instrument is quantified from the career charts of civil servants available from the S&GA Department of Government of the Punjab. Moreover, to categorize the instrument it is important to observe the tenure of AC positions and vacancies across all of Punjab and not just for the set of civil servants in my sample. Therefore, I collected data on incumbency boards from Assistant Commissioner offices in the Punjab. Incumbency boards are placed in AC offices and contain the name of past civil servants who acted as ACs in that location. They also contain information on the start and end dates of the tenures of ACs.

I find that a one rank increase in the seniority of the potential job link leads to an 18% increase in the probability of informal promotions of civil servants. For the most part the effect is heterogeneous according to ability. I classify ability from the recruitment exam based cohort ranking of civil servants. I find that the top 10% having a differentially higher probability of informal promotions. This is quite interesting and counter-intuitive given the context. What is more interesting is the fact that those top 10% who have junior colleagues have a negative probability of being informally promoted. It is only through a senior set of links that the overall probability of informal promotions for the top 10% is positive. I then look at the direct heterogeneous effect of seniority of job link on the performance distribution of new recruits. I estimate quantile treatment effects following Koenker (2005), Parente & Santos Silva (2016) and Canay (2011). The reduced form quantile treatment effects suggest that the seniority of potential job link has a scale effect and increases the dispersion of the distribution of the tax performance. A one rank increase in the seniority of potential job link leads to a negative and statistically significant at the 10th quantile all the way till the 70th quantile, while it has a positive and statistically significant at the 90th quantile. In other words changes in seniority of potential job link results in an increase in inequality in performance with the lower and middle of the performance distribution shifting further left and the higher tail shifting rightwards. I find a somewhat similar scale effect using another measure of performance i.e. subjective performance evaluation. Results remain robust to a battery of robustness checks.

I also investigate the mechanism of the effect on performance. I investigate whether productivity spillovers or provision of information for promotions by the links is the main mechanism through which seniority of potential job link has an affect on performance. For that purpose I restrict attention to the seniority of those set of links that work in the CM secretariat in the provincial capital away from the new recruits. Results show that a rise in the seniority of the potential link leads to a reduction in performance at almost all quantiles of the performance distribution. I also find that seniority of the links in the CM secretariat only results in a differentially positive probability of informal promotions for those in the top 10% of their cohort ranking. Results

Incumbency boards are a tradition inherited from the colonial times. There is an incumbency board in nearly all of the Pakistani civil services offices. Owing to the special attention paid by each civil servant to ensure his/her name is added to the list of past civil servants in any office there is very small chance of errors in the incumbency board. 138 out of 141 AC offices supplied their incumbency board information which was then digitized.
suggest that productivity spillovers do not appear to be the mechanism through which seniority of job links has an effect on performance especially. First, productivity spillovers seem less plausible from links that are working far off in the provincial capital. Second, productivity spillovers should be smooth over the career of civil servants and it seems less plausible for them to change discontinuously with the official promotion of the entry-level links. Third, the reduced form quantile treatment effects show that a rise in the seniority of the potential link leads to a reduction in performance at almost all quantiles of the performance distribution. If it were productivity spillovers then performance effects would have been non-negative in the least. Fourth, I see that the high ability have a differentially positive probability of being informally promoted with a rise in the seniority of their job link despite the fact that the top end of the performance distribution did not have a positive performance effect. Overall, it seems less plausible that productivity spillovers are the main mechanism through which seniority of job links has an effect on performance.

This study has significant policy implications. Although this paper is based in the context of the public sector of a developing country it sheds light on the potential use of decentralized information and its efficiency effects in other situations eg. job committees-PhD supervisors-PhD students; shareholders/auditor/managers (Kofman & Lawarree (1993)), CEO and internal suppliers (LaFont & Martimort (1998)).

This paper uses quasi-experimental variation in entry-level links to provide empirical evidence on not just short run but long run career progression effects. Note that the effect of the links that I investigate are the set of links that the new recruits get in the very first month of their very first job. Chaos Theory in mathematics, with applications in many fields including economics, argues that seemingly insignificant differences in initial conditions can result in vastly different outcomes over time. I have different set of initial conditions for the set of new recruits i.e. their entry-level links. I observe these new recruits not just in the first 5 years but throughout most of their career as civil servants. This allows me to investigate whether these different initial conditions have any long run career impact.

Methodologically the paper makes the following contributions. First, using quasi-experimental variation in seniority of entry-level links ensures that, unlike other studies that use pre-existing college or school links to study outcomes, there is no omitted variable bias from a third omitted link resulting in a spurious correlations. In addition, I do not have to make strong assumptions around why two people self-selected into a network at t – k (for k> 0), and why at time t these unobservable characteristics are uncorrelated with their potential outcomes. Second, I make a clear distinction between the subjects of network effects i.e. the newly recruited civil servants and the link which potentially provides the variation to identify a causal effect overcoming reflection problems typical of the networks literature (Manski (1993); Angrist (2014)). Third, since who works, when and with whom is objectively quantifiable this study overcomes the measurement error and subjectivity bias that results from self-reported network data (Jackson (2013)). Finally, it compiles a novel and historical dataset of career progression and performance as well as seniority of job links of public servants in a developing country.

This paper will contribute to the literature on public sector work incentives (Benabou & Tirole (2003); Bénabou & Tirole (2005); Dixit (2002); Besley & Ghatak (2005); Ashraf, Bandiera & Lee (2014); Ashraf, Bandiera, Lee et al. (2014); Ashraf, Bandiera & Jack (2014) and Iyer & Mian (2012)). While this literature investigates the incentives of public sector workers in general it has not focused on the incentive effects of the seniority of entry-level job links. It will also contribute to the literature on incentive effects of social connections (Bandiera et al. (2008); Ashraf, Bandiera, Lee et al. (2014)). However, while this literature is focused on the private sector, in this paper I consider the incentive effects of seniority of job links in the public sector. Moreover, even for the private sector workers the literature focuses in the most part on short
run outcomes while this study is able to look at the effect on the long run career progression outcomes for civil servants. This paper also indirectly contributes to the literature on social capital at workplace (Fernandez et al. (2000); Suzuki et al. (2010)). This paper is also related to the literature on nepotism and performance (Pérez-González (2006); Scoppa (2009); Jia et al. (2015); Xu (2016)). What differentiates this paper from others in the literature is both the methodology used and the effects that seniority of job links has on outcomes.

The paper is organized as follows: Section 2 describes the institutional background, while Section 3 discusses the Tenure/Transfer Policy of the government. Section 4 explains the theoretical framework. Section 5 and 6 has data and descriptive statistics and Section 7 to 9 describes all the main results. Section 10 discusses mechanism and Section 11 robustness checks.

2 Institutional Background

2.1 Civil Services of Pakistan - Pakistan Administrative Services

Like the Indian Administrative Services, Pakistan Administrative Services is a successor of the Indian Civil Services (ICS). Pakistan Administrative Services officers are responsible for non-specialist administrative jobs. They are recruited through the Central Superior Services (CSS) examination conducted by the Federal Public Service Commission (FPSC). They start their careers in grade 17. The maximum grade is 22. Both male and female including disabled persons having at least 2nd Division Bachelors degree between the ages of 21 to 28 years are eligible to sit the CSS exam. Entry into PAS is highly competitive. According to the results announced by the Federal Public Service Commission (FPSC), only 238 candidates out of a total of 12,176 cleared the CSS examination and were recommended for final appointments in 2015. Only 0.3% i.e. 36 were appointed to Pakistan Administrative Services.

2.1.1 Training after recruitment and definition of cohorts

After recruitment, the new recruits form part of the federal government’s ‘pool’ of civil servants. They undergo two types of training i.e. academic and on-the-job training. The academic training lasts for 1.5 years. After academic training the federal government allocates the new recruits to various provinces based on the Rotation Policy of the government. Provincial governments are responsible for on-the-job training and further job allocations as per their own requirements and rules and regulations. The on-the-job training (called Assistant Commissioner (Under Training) (AC (UT))) currently lasts for 22 weeks (historically it ranged from 18 weeks to 37 weeks). Despite all practicalities being arranged by the provincial government, the duration and date of termination of training is still determined by the Director General of the federal government training academy. The civil servants are still considered on probation till the termination of the training period by the Director General.

Although in principle all civil servants in a cohort should start and end their on-the-job training together, in practise, in most cases, the end of AC (UT) is decided for a cohort in a staggered fashion (see appendix figure A.1). To ensure a clean identification of a causal effect and a correct classification of the ‘potential’ network, I, therefore, consider each cohort as those new recruits that have completed their UT period together. For instance if a, b, c and x, y, z are all part of one cohort of civil services i.e. they took the exam and academic training together but if the DG notified x, y and z to have completed their on-the-job training in March 1999 and a, b, c in April 1999, they are classified as two separate cohorts. I discuss the potential identification concerns that can stem from this definition of cohorts in Section 11.2.
2.1.2 Job allocation post-recruitment

Human resource function in the Punjab is carried out by the Services and General Administration Department (S&GAD) under the Chief Minister (CM) of the province. S&GAD has detailed information on all civil servants (PAS and PMS), including their CSS and academic training exam based merit position within their cohort, their performance evaluation reports, education, training, age, experience etc. The jobs against which PAS and PMS civil servants can be allocated are mainly administrative in nature but they are hugely heterogenous and range from tax collection, to education and health management, project management etc. Total number of government positions is determined by the Finance Department through rules. Generally creating new positions requires a long procedure vetted by the a committee of government departments.

The civil services has centralised job allocations. The final authority for job allocations is determined by rank of the job not rank of civil servant. Rank 17 jobs are allocated by a senior civil servant in grade 21, Additional Chief Secretary (ACS). While rank 18 jobs are allocated by the senior most civil servant in grade 22, the Chief Secretary. The Chief Minister (CM) of the province is responsible for all other job allocations. In addition, all rank 17 and 18 jobs that are not in the secretariat sometimes need the informal nod of the CM despite the formal authority being with the ACS and CS respectively. Under the rules once a position is allocated, civil servants cant walk away from their allocation and have to start work within a pre-set time period.

Assistant Commissioner jobs

Rules dictate that PAS new recruits should be allocated Assistant Commissioner (AC) jobs when they start off their careers in rank 17. Approximately 315 out of 417 PAS new recruits i.e. 75% were allocated AC jobs. The average PAS new recruit spends 2.4 years of their career acting as ACs. The minimum length of time that civil servants are meant to be in rank 17 is 5 years and approximately 2 years is spent under training. This means that after training new recruits spend 80% of their rank 17 years acting as Assistant Commissioners. Assistant Commissioners head the revenue administration in tehsils in Punjab, Pakistan. They mainly supervise a team of ‘patwaris’, ‘naib-tehsildars’ and ‘tehsildars’ all of whom are referred to as revenue officers in general. ACs work under the supervision of the Collector, who further works under the Commissioner. The Board of Revenue (BOR) is the provincial oversight body.

Many different legal and civil services reforms have resulted in a change in the role played by ACs over the years. Pre-1997, the functions carried out by the office of the AC fell under two main heads: Revenue and maintenance of law and order. Post Legal Reforms Act 1997, Local Government Act 2001, and various executive orders, the law and order aspect of the job has mostly been withdrawn and replaced with other miscellaneous responsibilities. The set of miscellaneous activities depends on the prerogative of the government and can change from time to time, however, they are generally allocated to all ACs in Punjab together. There can be spurts of responsibilities like an anti-encroachment drive, organising activities around Islamic

\[\text{11}^\text{Patwari’ (grade 5) is the official at the lowest rung of the revenue collection machinery. Their jurisdiction spans a couple of villages grouped together to form a ‘patwar’ circle. The ‘Naib-Tehsildar’ is the supervisory tier for a team of ‘Patwaris’ and is generally a grade 14 official. There is one or two designated ‘Tehsildars’ in tehsils and depending on their seniority are generally a grade 16/17 official.}

\[\text{12}^\text{Deputy Commissioner (grade 18) was the Collector before 2001. Post 2001 this post was restructured and redesignated as the District Officer (Revenue). During 2001-2011 the Executive District Officer (Revenue) (grade 19) performed the functions of the Commissioner. The post of Executive District Officer (Revenue) was abolished in April 2011 and replaced again with Commissioners.}
festivals or more general coordination and monitoring activities. Since AC is the linchpin of the government in the tehsil the usual practise is to refer to the AC for any queries.

2.1.3 Official promotions

I study outcomes of Pakistan Administrative Services new recruits. However, their entry-level job contacts can be from any branch of civil service i.e. Provincial Management Services (PMS), Provincial Secretariat Services (PSS), Provincial Civil Service (PCS) or even Pakistan Administrative Services (PAS)\footnote{With the introduction of the PMS Rules, 2004, PMS was created and there was no further hiring under Provincial Secretariat Services (PSS) or Provincial Civil Service (PCS). These services were to be called ex-PCS and ex-PSS and came under the same rules as PMS.}. In all cases promotions are based on rigid rules and are largely carried out cohort-by-cohort in a sequential manner. The process is not very far from the Indian Administrative Services case described in Bertrand et al. (2015). In general, seniority is respected for promotions within all civil services. There are two kinds of seniority i.e. inter-cohort and intra-cohort both of which play a role in determining who gets promoted first. In the case of PAS civil servants, the intra-cohort seniority is drawn according to the result of the CSS exam, academic training and final passing out exam (FPOE) which takes place before starting the first job. For PCS and PSS, the intra-cohort seniority is based on the PCS and PSS exam respectively. Same was the case with PMS till 2012. From 2012 onwards new cohorts of PMS had their intra-cohort seniority drawn according to the result of the PMS exam (50% weight), academic training (25% weight) and final passing out exam (FPOE) (25% weight). In all cases, once drawn up, intra-cohort seniority is set in stone for the rest of the career of the civil servant and cannot be changed. The senior cohort as well as the senior civil servant within each cohort, conditional on meeting the eligibility criteria for promotion, has a right to be considered for promotion before juniors. Officers are considered superseded if they are unable to meet the threshold requirements for promotions. A civil servant, once superseded for promotion is eligible for promotion after he gets one more PER. Once promoted superseded officers are still considered senior to the juniors who superseded them. In the case of next round of promotions these superseded seniors are considered before the juniors. In addition, sometimes civil servants’ promotion decisions are deferred for the following potential reasons: if they have not undergone the prescribed training; they have not submitted the required PERs; there are disciplinary or departmental proceedings pending against the officer; they are on deputation abroad to a foreign government, private organization or international agency; or if their intra-cohort seniority is being contested in a court of law. The civil servant whose promotion has been deferred is considered for promotion as soon as the reason on the basis of which deferment took place ceases to exist. However, in the case of deputation the civil servant is considered for promotion only on their return to Pakistan and after earning at least one PER for one full year (for details refer to Appendix C).

2.1.4 Informal Promotions

When jobs are notified by the government the rank of the civil servant meant to occupy these jobs is also specified. Formally the official rank of the civil servant and the notified rank of the job must match. However, the Chief Minister exercises considerable discretion in allocating a higher ranked position to a junior civil servant, resulting in an informal promotion of the junior civil servant. Informal promotions is a practice sometimes owing to a shortage of officers in the higher grade but mostly to incentivise performance by creating heterogeneity of the actual rank of the civil servants within the same cohort. Informal promotions are not linear i.e. the spell lasts as long as the Chief Minister pleases. I reiterate that while temporary, informal
promotions happen, civil servants are officially promoted only on the basis of the promotion policy as outlined in appendix table A1 and these informal promotions do not have a bearing on the official promotions. As already explained, while official promotions alone dictate the basic wage rate enjoyed by civil servants as well as most of the allowances they enjoy, informal promotions have their own benefits. They provide a greater sphere of influence for the junior officer, bigger office space in most cases, higher manpower reporting to them, higher wage allowance in the specific cases of telephone\textsuperscript{14}, car and petrol\textsuperscript{15}. In general, informal promotions are at least weakly preferred by the junior officers to their correct official rank positions.

3 The Tenure/Transfer Policy of the government

The Punjab Government Transfer Policy, 1980 followed by the Inter-Provincial Transfers of DMG/PSP Officers Policy, 1988 dictated that Assistant Commissioners may not be transferred from their job before the end of 3 years\textsuperscript{16}. However, practical considerations resulted in the de facto policy being different from de jure. First, at a given point in time there are fewer civil servants than jobs. As explained, recruitment is carried out by a Public Service Commission on behalf of the government. In most cases it takes at least 4 years from the time of request for recruitment to the start of the first job of the new recruits. In addition to that, in some years, despite the Public Service Commission’s efforts, if they do not find the right candidates such vacancies are left unfilled. They are then aimed to be filled in the next round of recruitment, which is once a year in the case of PAS. The number of rank 17 positions left unfilled by the FPSC have been increasing over the years. They were 45 in 2011, 30 in 2012, 71 in 2013 and 82 in 2014\textsuperscript{18}. Second, policy makers have the role of allocation of existing civil servants to AC jobs. Owing to the shortage of civil servants, they face the tradeoff between ensuring no one AC job is vacant for too long and ensuring tenure of Assistant Commissioners. Third, since civil servants have security of jobs, similar to the Indian Administrative Services (IAS) case (cf. Iyer & Mani \textsuperscript{2012}), the threat of transfers is used to sometimes incentivize effort on the job. Fourth, like any other labour market, there is some amount of ‘frictional’ vacancy resulting in the tenure policy not being followed\textsuperscript{19}. Civil servants get promoted to rank 18 and so can no longer work as an AC or quit the civil service or take long leave for training courses or for personal reasons. This may or not be before 3 years of working as an AC. Recognising that de facto tenures under the policy were different from de jure AC tenures, the Punjab government issued a circular letter where the tenure under the policy was officially brought close to the de facto tenure of 1 year\textsuperscript{20}. The Tenure Policy stated:

‘The Provincial Cabinet in its meeting held on 06.10.2004 approved a minimum tenure of one year for government servants for all grades/scales.’

\textsuperscript{14}Revision of Mobile Phone Policy, Government of Pakistan, Cabinet Secretariat, Cabinet Division, 15\textsuperscript{th} April, 2016, (OM, No. 3(30)/T&M/2015-RA-IV)

\textsuperscript{15}Rules for the Use of Staff Cars, 1980, Government of Pakistan, Cabinet Secretariat, Cabinet Division, October, 2008

\textsuperscript{16}The Punjab Government Transfer Policy, Services & General Administration Department, Government of the Punjab, 16\textsuperscript{th} March, 1980; Inter-Provincial Transfers of DMG/PSP Officers Policy, Establishment Division, Government of Pakistan, 10\textsuperscript{th} April, 1988

\textsuperscript{17}The de facto policy is such that the average tenure of an AC in Punjab in any one tehsil is approximately 1 year.


\textsuperscript{19}I am not referring to the vacancy against which fresh recruitment would be carried out by the FPSC. Instead I am referring to those tehsils that don’t have an AC as yet, as the S&GAD has not allocated that job to any civil servant, conditional on recruitment.

\textsuperscript{20}Government of Punjab circular letter No. SI.1-1/2003 dated 18\textsuperscript{th} Jan, 2005, on Tenure Policy
This was further reiterated in guidelines for transfer of Assistant Commissioners, which stated:

‘The Cabinet Committee in its meeting held on 05.07.2013, decided that before completion of at least one year tenure, an Assistant Commissioner may not be transferred.’

The Tenure/Transfer Policy for Assistant Commissioners offers a source of quasi-experimental variation that I exploit to causally identify the effect of work networks on outcomes of PAS new recruits. As already discussed the end of on-the-job training of the PAS new recruits is decided by the Director General of the federal government training institute. When PAS new recruits finish their on-the-job training, by rules, they have to be allocated AC jobs. Since the Tenure/Transfer Policy aims to guarantee a tenure of at least 1 year to those ACs that are already working in the Punjab, the new recruits can only be allocated AC positions that are either vacant (so the Policy doesn’t apply) or where the incumbent ACs have worked for at least 1 year.\footnote{In this subsection when I refer to an AC vacancy, I am not referring to the vacancy against which fresh recruitment would be carried out by the FPSC. Instead I am referring to those tehsils that don’t have an AC as yet, as the S&GAD has not allocated that job to any civil servant, conditional on recruitment.}

Figure A.3 presents evidence for the compliance of the Tenure/Transfer Policy. On the vertical axis is the percentage of new recruits that are allocated Assistant Commissioner positions. On the horizontal axis is the tenure of the incumbent Assistant Commissioners, whom the new recruits replaced. It also shows what percentage of the newly recruited were allocated AC jobs that were already vacant. The first thing to note is that there is partial compliance with the Tenure/Transfer Policy. New recruits have replaced ACs in the 3rd or even the 1st and 2nd quarter of their AC tenure. This means that tenures of all ACs in this setting, despite the Policy, are not perfectly predictable. In compliance of the Policy there is a spike at 1 year as well as a spike for those ACs allocated vacant positions. Approximately 30 percent of new recruits replace Assistant Commissioners that have worked for 1 year as an AC in a particular location. Around 12 percent and 2 percent replace ACs whose tenures have been 2 and 3 years respectively. 18 percent are allocated AC positions that were already vacant. Taken together a systematically higher percentage of new recruits i.e. approximately 62% get allocated Assistant Commissioner jobs that are either vacant or where the incumbent AC’s tenure has been at least 1 year. I discuss potential concerns stemming from my definition of cohorts as well as the endogenous supply of vacancies for PAS new recruits in section 11.2.

4 Theoretical Framework

In this section I present a simple theoretical framework to illustrate how supervisory discretion over workers’ promotions affects effort levels of workers. The principal i.e. the Chief Minister wants to maximize expected tax collection by the workers and grants them promotions. He observes the types of the worker but cant observe effort. However, he can hire a supervisor who has an information advantage and can observe both type and effort of the workers. Supervisors are meant to refer the more productive worker for promotion to the CM. For simplicity instead of referrals I assume that the supervisor has complete discretion over worker promotions and the CM completely delegates the task to the supervisor. Although delegation of the promotion decision helps the CM overcome information asymmetry there is the possibility of collusion between the supervisor and worker. Supervisor’s utility depends on reputation from being linked to the more productive workers and that makes his incentives in line with the CM. However, the supervisor can receive kickbacks or bribes from the workers for promotions and
therefore, promote a worker despite observing low effort. We can think of kickbacks as monetary or non-monetary favors that the workers can commit to for the supervisor. Supervisory discretion over workers’ promotion can have an ambiguous effect on effort by workers of different types. The higher the reputation gains from being linked to a productive worker, the better the chance of CM-supervisor incentive alignment, resulting in the first best effort and promotion decisions. However, if the reputation gains for the supervisor are low, effort decreases for all types and promotions are not a function of effort of the workers. The framework illustrates the implications of using decentralized information for decision making within organizations. If reputation gains for supervisory tiers are not important then centralized decision making might be a superior option than allowing discretion, despite the information loss it entails.

4.1 The set up

Consider a risk neutral Chief Minister (CM) that hires a risk averse worker to collect taxes. The worker is of two types $i \in \{L, H\}$. Types are observable by the CM, however, effort is not. Taxes are random and can be $y \in \mathbb{R}_+$ with probability $e_i$ and 0 with probability $1 - e_i$ where $e \in [0, 1)$ and $i \in \{L, H\}$. The effort cost of type $H$ is $c_H = \frac{\theta}{\overline{R}}$ where $\theta > 1$ is an ability parameter. The effort cost of the low type is $c_L = e_l$. The CM maximises expected taxes and grants promotions to workers of both types. The agent does not directly care about taxes but effort increases the probability of a higher tax collection and that results in promotions. Promotions are $R_i \in \mathbb{R}_+$ where $i \in \{L, H\}$. $R_i$ can be thought of as wages that workers can get at the higher position. The outside option of both type of workers is assumed to be zero for simplicity. As is the case in most bureaucracies rules protect the payoffs of the workers. The agent, therefore, has limited liability i.e. the payoff of the worker is non negative in all states of the world. It is $\overline{R_i} \geq 0$ on observing $y$ and $\overline{R_i} \geq 0$ on observing 0 for $i \in \{L, H\}$.

The CM can delegate the task of promotions and hire a supervisor from the market at the exogenous wage rate $w \in \mathbb{R}_+$. The supervisor manages the workers and does not produce any output. He observes both type and effort of the workers and promotes them for the CM. The supervisor’s outside option is zero for simplicity. The supervisor cares about his own reputation in the organisation. Repute is based on expected tax collection of the workers. However, the supervisor can collude with the worker, receive kickbacks or bribes $\sigma_i \in \mathbb{R}_+, i \in \{L, H\}$ and promote them despite observing low effort. For simplicity, reputation gains from expected tax collection by the workers and kickbacks are assumed to be perfect substitutes for the supervisor.

4.2 Observable effort

The Chief Minister observes effort and grants promotions. His problem is:

$$\max_{e_h, e_l, R_h, R_l} e_h y - R_h + e_l y - R_l$$

subject to

$$\sqrt{R_h} - \frac{e_h}{\theta} \geq 0 \quad (1)$$

$$\sqrt{R_l} - e_l \geq 0 \quad (2)$$

where equation $1$ and $2$ are the participation constraints of $H$ and $L$ respectively.
Proposition 4.1. Under perfect information the effort level of the high type is higher than the effort level of the low type $e_h^{FB} > e_l^{FB}$. Promotions are a function of the effort of each type and therefore, the high type receive more promotions than the low type $R_h^{FB} > R_l^{FB}$. Moreover, as $\theta$ increases the effort and promotion of the high type goes up.

Proof. The proof is straightforward. The participation constraint of both H and L, equations 1 and 2 respectively, will always bind. Otherwise the CM can reduce $R_h$ and $R_l$ a little, increase his payoff and the agent will still accept the contract. Using the participation constraints and substituting for $R_h$, $R_l$ in the objective function and maximizing with respect to effort results in $e_h^{FB} = \frac{\theta^2}{2}$ and $e_l^{FB} = \frac{\theta^2}{2}$. Using these values in the expressions for $R_h$ and $R_l$ gives $R_h^{FB} = (\frac{\theta^2}{2})^2$ and $R_l^{FB} = (\frac{\theta^2}{2})^2$. As $\theta$ increases so does the effort exerted by the H type as it is now cheaper for him to exert effort. As effort $e_h$ increases so does promotions $R_h$.

4.3 Unobservable effort - without supervisor

In this case the Chief Minister maximizes expected taxes minus promotions subject to participation, incentive compatibility and limited liability constraint of the worker.

$\max_{R_h, R_l, \bar{R}_h, \bar{R}_l} e_h(y - \bar{R}_h) + (1 - e_h)(0 - R_h) + e_l(y - \bar{R}_l) + (1 - e_l)(0 - R_l)$

subject to

$\sqrt{e_h \bar{R}_h + (1 - e_h) R_h - \frac{e_h}{\theta}} \geq 0 \quad (3)$

$\sqrt{e_l \bar{R}_l + (1 - e_l) R_l - e_l} \geq 0 \quad (4)$

$\max_{e_h} \sqrt{e_h \bar{R}_h + (1 - e_h) R_h - \frac{e_h}{\theta}} \quad (5)$

$\max_{e_l} \sqrt{e_l \bar{R}_l + (1 - e_l) R_l - e_l} \quad (6)$

$\bar{R}_h, R_h \geq 0 \quad (7)$

$\bar{R}_l, R_l \geq 0 \quad (8)$

3 and 4 are the participation constraints, 5 and 6 the incentive compatibility constraints and 7 and 8 are the limited liability constraints of H and L respectively.

It is straightforward to see that if the limited liability constraint binds then only $R_h, R_l = 0$ and $\bar{R}_h, \bar{R}_l > 0$. In the good state of the world the CM would like to reward the agent so that the agent exerts effort. Moreover, if all the limited liability constraints for each type bind then the participation constraint is not satisfied. Therefore, $R_h, R_l = 0$ and $\bar{R}_h, \bar{R}_l > 0$ whenever the limited liability constraint binds.

Lemma 4.2. Either the participation constraint or the limited liability constraint for each type binds.

Proof. See Appendix A.
Proposition 4.3. When the limited liability constraint does not bind for both types but participation constraint binds then \( R_h - R_h \) and \( R_l - R_l \) is such that the agent exerts the first best level of effort.

Proof. See Appendix B

Proposition 4.4. If the limited liability constraint binds and the participation constraint doesn’t bind, then promotions are the same for each type \( R_{CM}^h = R_{CM}^l \). The effort exerted by each type is less than the first best level of effort \( e_i^{*CM} < e_i^{*FB} \) for \( i \in \{L, H\} \). Under imperfect information the effort of the high type is still higher than the low type as \( \theta > 1 \).

Proof. See Appendix C

When the CM can observe effort he can condition promotions on observable taxes. On observing \( y > 0 \) the CM grants \( R_{CM}^h = R_{CM}^l = \frac{y^2}{2} \) and on observing \( y = 0 \) he grants \( R_{CM}^h = R_{CM}^l = 0 \) for H and L respectively. The high type exerts more effort as effort is cheaper for him. However, it is still not equal to the first best level.

In the next subsection I will discuss the case of unobservable effort by the CM where he hires a supervisor for promotion decisions. To compare equilibrium effort and promotions with and without supervisor I will focus on the more interesting case where, without a supervisor, the limited liability constraint binds and the agent does not exert the first best level of effort.

4.4 Unobservable effort - with supervisor

The CM decides whether to hire a supervisor at wage \( w \). The supervisor on the other hand observes effort and type of the worker and has the following objective function:

\[
\max_{e_h, e_l, \sigma_h, \sigma_l, R_h, R_l} \quad w + e_h y + \sigma_h - R_h + e_l y + \sigma_l - R_l
\]

subject to

\[
\sqrt{R_h} - \frac{e_h}{\theta} - \sigma_h \geq 0 \quad (9)
\]

\[
\sqrt{R_l} - e_l - \sigma_l \geq 0 \quad (10)
\]

where equations 9 and 10 are the participation constraints of type H and L respectively. Using similar arguments as before I know that the participation constraint of both type of workers will bind. If not then the supervisor can increase his payoff by reducing promotions and the workers will still accept. Expected tax collection and kickbacks are perfect substitutes for the supervisor. Therefore, there will be a corner solution depending on the ratio of marginal benefit of e and \( \sigma \) versus the ratio of their marginal cost.
Proposition 4.5. If \( y > 1 \) then kickbacks \( \sigma_h, \sigma_l = 0 \) and workers exert the first best level of effort with \( e_{i}^{*S} > e_{i}^{*CM} \) for \( i \in \{L, H\} \). Promotions are also at their first best level and are a function of effort of the workers with \( R_{h}^{S} > R_{l}^{S} \). The CM hires a supervisor and the supervisor accepts the job if \( 0 \leq w < \frac{y^2(3\theta^2 - 1)}{2} \).

Proof. If \( y > 1 \implies y > \frac{1}{\theta} \) where \( \theta > 1 \). Put simply if the supervisor would like the low type to exert effort then it implies that he would also want the high type to exert effort since the cost of effort of the high type is lower than that of the low type. Intuitively, if \( y > 1 \) then there are sufficient reputation gains from a higher expected tax collection by the workers. The ratio of marginal benefit of effort to kickbacks is higher than the marginal cost of effort to kickbacks for both types. Thus, \( \sigma_h, \sigma_l = 0 \). Substituting this into the supervisor’s problem and using the fact that the participation constraints of both type bind I get:

\[
\begin{align*}
\max_{e_h, e_l, R_h, R_l} & \quad w + e_h y - R_h + e_l y - R_l \\
\text{subject to} & \quad \sqrt{R_h} - \frac{e_h}{\theta} = 0 \quad (11) \\
& \quad \sqrt{R_l} - e_l = 0 \quad (12)
\end{align*}
\]

Equations (11) and (12) give \( R_h = \left( \frac{e_h}{\theta} \right)^2 \) and \( R_l = e_l^2 \). Using the expressions for \( R_h, R_l \) in the supervisor’s objective function and maximizing with respect to \( e_h, e_l \) I get the following FOC:

\[
\begin{align*}
y - 2\frac{e_h}{\theta^2} &= 0 \quad (13) \\
y - 2e_l &= 0 \quad (14)
\end{align*}
\]

This results in \( e_{h}^{*S} = e_{h}^{*FB} = \frac{y\theta^2}{2} \) and \( e_{l}^{*S} = e_{l}^{*FB} = \frac{y}{2} \), which suggests that the effort level under a decentralized system of promotions will be higher than the effort level under a Chief Minister led centralized promotion system i.e. \( e_{i}^{*S} > e_{i}^{*CM} \). To be more precise \( e_{i}^{*S} = 4e_{i}^{*CM} \) for \( i \in \{L, H\} \). Using the expression for effort in promotions gives \( R_{h}^{*S} = R_{h}^{*FB} = \left( \frac{y\theta}{2} \right)^2 \) and \( R_{l}^{*S} = R_{l}^{*FB} = \left( \frac{y}{2} \right)^2 \). This implies that \( R_{h}^{*S} > R_{l}^{*S} \) as \( \theta > 1 \) and \( \frac{\partial R_{i}^{*S}}{\partial \theta} > 0 \). Therefore, in equilibrium we will see promotions by supervisors go up with ability. Moreover, there will be a positive promotion level even for the low type.

When for both H and L, the limited liability constraint binds and the participation constraint doesn’t bind, the expected utility of the CM without a supervisor is \( \frac{y^2(3\theta^2 + 1)}{16} \). The expected utility of the CM from hiring a supervisor is \( \frac{y^2(3\theta^2 - 1)}{2} - w \). Therefore, the CM will hire the supervisor and the supervisor accepts the job if \( 0 \leq w < \frac{y^2(3\theta^2 - 1)}{2} \).

Proposition 4.6. If \( \frac{1}{\theta} < y < 1 \) then the high type exerts the first best level of effort and \( \sigma_h = 0 \) whereas the supervisor grants promotions to the low type in exchange for kickbacks and \( e_l = 0 \). As compared to the centralized decision making under the CM, hiring a supervisor increases effort of the high type while reducing the effort of low type i.e. \( e_{h}^{*S} = e_{i}^{*FB} > e_{h}^{*CM} \).
but \( e^*_i < e^*_i < e^*_i \). Promotions of both types of workers are positive with \( R^*_h = R^*_l \), \( R^*_S = \frac{1}{3} \). However, promotions of the high type are more than the promotions of the low type \( R^*_h > R^*_l \) as \( \theta > 1 \). The CM hires a supervisor and the supervisor accepts the job if \( 0 < w < y^2(12\theta^2 - 1) - 1 \).

\[ \text{Proof.} \] If \( \frac{1}{\theta} < y < 1 \) then the ratio of marginal benefit of effort to kickbacks is higher than the marginal cost of effort to kickbacks for the high type while it is the other way around for the low type. Thus, \( \sigma_h = 0 \) and \( e_l = 0 \). Substituting this into the supervisor’s problem and using the fact that the participation constraints of both type bind I get:

\[
\max_{e_h, \sigma_h, R_h, R_l} \ w + e_h y - R_h + \sigma_l - R_l
\]

subject to

\[
\sqrt{R_h} - \frac{e_h}{\theta} = 0 \quad (15)
\]

\[
\sqrt{R_l} - \sigma_l = 0 \quad (16)
\]

Using equations 15 and 16 I get \( R_h = \left( \frac{e_h}{\theta} \right)^2 \) and \( R_l = \sigma_l^2 \). Using these in the principal’s objective function and taking FOC I get:

\[
y - 2 \frac{e_h}{\theta^2} = 0 \quad (17)
\]

\[
1 - 2\sigma_l = 0 \quad (18)
\]

This results in \( e^*_h = e^*_l = \frac{y^2}{2} \) and \( \sigma^*_l = \frac{1}{2} \). Using this in the expression for promotions gives \( R^*_h = R^*_l = \left( \frac{y^2}{2} \right)^2 \) and \( R^*_S = \frac{1}{3} \). This implies that \( R^*_h > R^*_S \) as \( \theta > 1 \) and \( \frac{\partial R^*_S}{\partial \theta} > 0 \). Therefore, in equilibrium we will see promotion by supervisors go up with ability, with a positive promotion level even for the low type.

When for both H and L, the limited liability constraint binds and the participation constraint doesn’t bind, the expected utility of the CM from not hiring the supervisor is \( \frac{y^2(\theta^2 + 1)}{16} \). With \( \frac{1}{\theta} < y < 1 \), the expected utility of the CM from hiring a supervisor is \( \frac{y^2\theta^2}{3} - \frac{1}{3} - w \). Therefore, the CM will hire the supervisor and the supervisor accepts if \( 0 \leq w < y^2(12\theta^2 - 1) - 1 \).

Proposition 4.7. If \( y < \frac{1}{\theta} \), compared to a centralized decision making under the CM, hiring a supervisor decreases effort of both types of workers to zero and \( e^*_i < e^*_i < e^*_i \) for \( i \in \{ L, H \} \). Only kickbacks are used to grant promotions. Promotions of both types of workers are positive and the same for high and low type of worker with \( R^*_h = R^*_l = \frac{1}{4} \). The CM prefers not to hire a supervisor in this case as \( \frac{y^2(\theta^2 + 1)}{4} > -\left( \frac{1}{2} + w \right) \) always holds with \( w, y, \theta > 0 \)

\[ \text{Proof.} \] If \( y < \frac{1}{\theta} \) then the ratio of marginal benefit of effort to kickbacks is lower than the marginal cost of effort to kickbacks for both types. Thus, \( e_h, e_l = 0 \). Substituting this into the supervisor’s objective function and using the binding participation constraint of H and L I get:

\[
\max_{\sigma_h, \sigma_l, R_h, R_l} \ w + \sigma_h - R_h + \sigma_l - R_l
\]
subject to
\[ \sqrt{R_h} - \sigma_h = 0 \]  
\[ \sqrt{R_l} - \sigma_l = 0 \] \hspace{1cm} (19) \hspace{1cm} (20)

Using equations 19 and 20 I get \( R_h = \sigma_h^2 \) and \( R_l = \sigma_l^2 \). Using these in the principal’s objective function and taking FOC I get:
\[ 1 - 2\sigma_h = 0 \] \hspace{1cm} (21)
\[ 1 - 2\sigma_l = 0 \] \hspace{1cm} (22)

This results in \( \sigma^*_{h} = \sigma^*_{l} = 1/2 \). Using this in the expression for promotion gives \( R^*_{h} = R^*_{l} = 1/4 \). Moreover, \( \frac{\partial R^*_{h}}{\partial \theta} = 0 \). Therefore, in equilibrium we will see promotion by supervisors to be constant and the same for \( H \) and \( L \). In this case using the supervisor for promotion decisions is worse than a centralized decision making system under the CM, despite the information loss it entails. In this case supervisory discretion over promotions just generate incentives for exchange of kickbacks and no effort is exerted. When for both \( H \) and \( L \), the limited liability constraint binds and the participation constraint doesn’t bind, the expected utility of the CM without a supervisor is \( y^2(\theta^2 + 1) / 16 \). With \( y < \frac{1}{\theta} \), the expected utility of the CM from hiring a supervisor is \( -(\frac{1}{2} + w) \). Therefore, the CM will never hire a supervisor when \( y < \frac{1}{\theta} \) as \( w, y, \theta > 0 \).

5 Data

5.1 Seniority of entry-level job link

Seniority of entry-level job links is the 75th percentile of the official rank of all those civil servants that worked in the district, in the very first month that the new recruits joined the district as an Assistant Commissioner for the first time. I only consider outcomes for the new recruits and use the set of links to provide a source of variation.

Ranks are referred to as grades in the Pakistani bureaucracy. All federal and provincial civil servants start their career in grade 17 with 22 being the highest grade. The data on rank or promotions of the network link is compiled from the career charts of civil servants which I acquired from the S&GAD, Punjab (refer to appendix figure A.7 for an illustration of a career chart). This data is not publicly available. Section 19 of the chart titled ‘date of entry/promotion’ contains details of the rank and date of promotion. I use the promotion date in section 19 of the career charts to categorize changes in rank of all civil servants. Ranks in civil services range from 17-22. To aid interpretation I normalize promotions from 0-5 so that the variable promotion stays zero for a civil servant in grade 17. It is 1 when the civil servant is promoted to grade 18, 2 in grade 19, 3 in grade 20, 4 in grade 21 and 5 in grade 22.

I provide an illustration of how I built the variable in figure 1. Consider a cohort of new recruits that finished training together i.e. A B C. Imagine from within that cohort, A is allocated an AC job in district 7. All these nodes are people who are already working there. I will classify the actual set of links of new recruit A as all those civil servants that were working in dist 7 in the very first month that A starts working in dist 7 as an AC. For completeness I also consider other new recruits B and C as part of A’s actual link. I freeze these set of links and only use the time variation that comes from arguably exogenous changes in their official rank or seniority. The reason there is variation in the seniority of the set of links is because of the fact that all these people that are working in dist 7 are at different points in their career trajectories.
have spent 4 yrs in rank 17 and so will be promoted next yrs. Others might have just been promoted to rank 18 and so they wont be promoted for a long time. This allows me to build the variable seniority of entry-level job links.

5.2 Seniority of potential entry-level job link

I use the Tenure/Transfer policy of the government to classify the instrument seniority of potential entry-level job link. It is a cohort level instrument and it is the 75th percentile of the official rank of all those civil servants that in the month of end of training of the new recruits, worked in a district where either any AC had already enjoyed a tenure greater than equal to one year or any AC position was vacant. For completeness it also includes those that finished their training together. I only consider the set of direct links. As already discussed the date of end of training of the new recruits is also exogenously determined by the Director General of the training institute. I only consider outcomes for the new recruits and use the set of links to provide a source of exogenous variation in the seniority of job link.

The set of links don’t change over time. The variation over time in the ‘potential’ set of job links, just like the ‘actual’ links, stems from a change in their official promotion. In the first step I use the promotion date in section 19 of the career charts to categorize changes in rank of all civil servants. As with the endogenous measure, to aid interpretation, I normalize promotions so that the variable promotion stays zero for a civil servant in grade 17. It is 1 when the civil servant is promoted to grade 18, 2 in grade 19, 3 in grade 20, 4 in grade 21 and 5 in grade 22.

In order to correctly classify the ‘potential’ entry-level job links it is important that I correctly classify the tenure of ACs already working in Punjab on the date of end of training of the new recruits. In addition I need to have a correct classification of AC positions that are vacant on that date. This classification needs to be not just for the set of civil servant ACs in my sample but for the whole of Punjab. I reiterate that when I refer to vacancy I am not referring to jobs requiring fresh recruitment by the FPSC but those AC positions to which an AC has not been allocated by the S&GAD or the CM.

For that purpose I collected incumbency board data from nearly all the AC offices in Punjab. Incumbency boards are placed in AC offices and contain the name of civil servants who acted as ACs in that location in the past as well as the dates on which they started and ended work. Incumbency boards are a tradition inherited from the British colonial times. In the civil bureaucracy in Pakistan there is an incumbency board in nearly all of the offices. There is special attention paid by each civil servant to ensure his/her name is added to the list of past civil servants in any office and so the chance of error in the incumbency board information is very low.

To acquire the data all ACs in Punjab were telephonically contacted. 138 out of 141 AC offices supplied their incumbency board pictures. These were then converted to electronic form. Appendix figure A.8 contains an example of an incumbency board. It can be seen that the Board has the name of the office, name of the past ACs as well as the start and end date in day-month-year format. This allows me to build a daily tehsil level panel of AC offices and the tenure of civil servants that worked there. I classify those time periods when there was no AC listed in the incumbency board as vacant. This tehsil panel of vacancies and tenures of AC was then combined with the administrative data on new recruits to observe whether on the date of end of training, the new recruit was allocated a vacant position or replaced an AC with a tenure greater than equal to 1 year. Note that there will be a first stage only if the new recruit was allocated an AC position that was either vacant or where the previous ACs tenure was greater than 1 year. These will be the set of compliers of the Tenure Policy. Any effect that I identify will be the Local Average Treatment Effect (LATE) for the set of new recruits for whom the
seniority of entry-level job link changes as the seniority of potential entry-level job link changes. I provide an illustration of the variable in figure [2]. Consider the same cohort of A, B, C that we had previously. I consider a time-line for an actual cohort that was recruited in 2005. In October 2005 they are recruited and they start their centrally administered academic training. In March 2007 they finish their academic training and begin their on the job training. 15th of August 2007 is the end of their on the job training. On 16th August is when say one of the new recruits starts working and that is when the actual set of job links are characterized. In August 2007, the month in which their training ends is when I classify the potential entry-level job links. Imagine there are 3 districts in Punjab districts 1, 7 and 10. In dist 1 there is neither an AC vacancy and all AC that are working there have a tenure of \( \leq 1 \) yr. So say a new recruit is allocated this position against the tenure policy this person will not be in my set of compliers in an instrumental variables strategy way. Civil servants in district 1 will not be part of the potential job links of this cohort. However, since in district 7 there is a vacancy and in dist 10 the tenure of one of the ACs is more than 1 yr then these 2 districts and all the people that work there will be the set of potential entry-level job links for the new recruits A, B and C. I freeze the ‘potential’ entry-level job links in the month that training ended for the new recruits. Time variation then comes through changes in their official seniority or rank of these links. The reason there is time variation is because these job links at different points in their career trajectory. Seniority of ‘potential’ entry-level job links is an IV for seniority of the actual set of entry-level job links.

5.3 Tax Performance

The performance measure is compiled from historical records of the provincial Board of Revenue (BOR) on Land Revenue/Agriculture Income Tax (AIT) from 1983-2013. The record is not publicly available (see appendix figure A.4 for an illustration of the files in their original form as well as the record room from which they were extracted). The Punjab Agricultural Income Tax (AIT) Act 1997 replaced the Punjab Land Revenue Act,1967. While land revenue was a tax on area cultivated, AIT was meant to be a tax on the agricultural income of an owner in a tax year. However, for all practical purposes it remained a tax on area sown (Nasimi (2013)). Section 4 of AIT Act, 1997 states that every person:

a) whose total agricultural income or the total agricultural income of any other person in respect of which he is assessable under this Act, for any income year (hereinafter referred to as the said income year) exceeds the maximum amount\(^{22}\) which is not chargeable to tax under this Act; or (emphasis added)

b) who himself or any other person on whose behalf he is assessable under this Act, has, during the said income year, cultivated land measuring (i) fifty acres or more of irrigated land; or (ii) one hundred acres or more of unirrigated land; or (iii) irrigated and unirrigated land the aggregate area of which is equal to or more than fifty acres of irrigated land, one acre of irrigated land being reckoned as equivalent to two acres of unirrigated land, shall file a return of his total agricultural income or the agricultural income of such other person, as the case may be, for the said income year in such form and by such date as may be prescribed.

In the rural economy of Pakistan agricultural income is very hard to track and document by the authorities. On the other hand the revenue administration by law has to keep a detailed

\(^{22}\)The Punjab Agricultural Income Tax Rules 2001 states that this threshold is Rs. 80,000.
record of land owned. Thus, the only one which is enforceable in practise is the one for which the revenue authorities keep a detailed record i.e. farmland owned. The BOR sets annual tax collection targets based on official record of size and number of farmlands and farm income. Targets are conveyed to various tiers of the government till they reach the Assistant Commissioner and his/her team of revenue officers all the way down to the ‘patwari’. Assistant Commissioners are supposed to report back the tax collected each month against these annual targets. This gives me a performance measure for the newly recruited ACs:

\[\text{Tax performance} = \frac{\text{Tax collected in the month}}{\text{Annual tax target}}\]

Appendix figures A.5 and A.6 contain an example of the official form that I used to quantify tax performance. As can be seen there are two kinds of targets. One is for the current financial year and the other is for arrears from all the past financial years. The two heads can be seen as ‘current’ and ‘previous’ in the form. For the purpose of this study I restrict attention to the performance against targets set for the current financial year. Since the current financial year is the main priority of the government, ACs expend more effort trying to meet these targets. Moreover, arrears collection is not just a function of the effort of the AC but other factors as well, for example, whether the landowners have left the district and can no longer be traced. Annual targets are provided in the column titled ‘demand’. Tax collected each month is under the title ‘current recovery’ or under ‘recovery during the month’. Appendix figure A.6 shows that sometimes the District Account Officer also verifies the deposit of the taxes with the government. It is interesting to note that tax collection is not part of the official performance evaluation of the ACs.

5.4 Long run career progression: Informal promotions

To classify informal promotions I use the career charts of civil servants from the S&GAD, Punjab (refer to appendix figure ??). The section on ‘Service’ contains details of ‘post held’. If the notified grade of the ‘post held’ is higher than the official grade of the civil servant then the dummy variable of informal promotions turns on 1, it stays zero otherwise.

5.5 Ability

I use a proxy for pre-determined ability. I compile the ability measure from the Federal Public Service Commission’s intra-cohort ranking of civil servants based on the recruitment exam (CSS exam) of each cohort. I categorize ability as a dummy that turns on 1 for those civil servants that are in top (bottom) 10% of the civil services entrance exam ranking. It remains zero otherwise.

6 Descriptive Statistics

Table I shows descriptive statistics of the data. The dataset is a civil servant-month panel. ‘New recruits’ category includes federal Pakistan Administrative Services (PAS) officers that were allocated Assistant Commissioner positions on entry. The ‘all civil servants’ category includes PAS officers other than the new recruits as well as Provincial Management Services (PMS) officers.

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23 This form is part of the correspondence between the BOR and the ACs and DCs regarding taxes.
24 For some posts for which I was not sure of the notified grade I telephonically consulted civil servants in the S&GAD Sometimes if a position had a notified grade of say 18/19 I picked the conservative one i.e. 18.
Table 1 shows that on average the new recruits have a slightly higher probability of being informally promoted as compared to other civil servants. New recruits have a 12.7 percent chance of being informally promoted while other civil servants have a 10.3 percent chance of being granted an informal promotion in a month. They also collect more taxes on average in a month than other civil servants. The new recruits collect on average 8.6 percent monthly tax as a percentage of the annual target. The other civil servants collect approximately 7 percent. Tax performance appears to be a noisy measure. The standard deviation is approximately 14 for new recruits Appendix figure A.9 shows the distribution of tax performance for both categories of civil servants.

Seniority of entry level job link is the main endogenous explanatory variable. The seniority of the entry-level links is on average 0.2 and 0.8 for the early career of the new recruit as an AC and when we consider their full career respectively. Official rank was normalized to be between 0 to 5. This suggests that the links that new recruits get on their entry-level job are not very senior. There appears to be sufficient variation in the network measure in the early career as an AC. The standard deviation is 0.384. However, if we consider the complete career of new recruits the standard deviation is 0.932.

The CM secretariat is the office that is de facto responsible for the informal promotions of the civil servants. The subset of links that are in the CM secretariat are relatively senior. The average seniority is 0.4 for the early career of the new recruits, while it is approximately 1 when we consider the entire career of the new recruits.

Seniority of the potential set of links is on average 0.2 and 0.6 for the early and complete career of the new recruits. This again suggests that the potential links are also not very senior. When I consider those potential links that are working in the CM secretariat I again see that they are relatively senior. On average the seniority of the potential link in the CM secretariat is approximately 0.7 for the duration of the early career of the new recruit. It is approximately 1 when I consider the full career of the new recruit.

In my sample of PAS civil servants, other than the new recruit, I see that 2 percent are those that were in the top 10 percent of their cohort. Only 0.5 percent are in the bottom 10 percent. However, when I restrict the sample to new recruits 7% are in the top 10% of the recruitment exam ranking and 14 percent are in the bottom 10%.

To have another measure of performance I also compiled data on subjective performance evaluation of the new recruit by their immediate supervisors. I quantify subjective performance evaluation from the summary measures in the career charts of the civil servants (refer to appendix figure A.7). I use the section on ‘Service’ and ‘ACR assessment’ in the career charts. The variable subjective performance evaluation turns on 1 if the civil servant is ranked outstanding. It remains zero otherwise. On average there is a 2.5% chance that other civil servants are ranked outstanding by their immediate boss. The new recruits in particular have a higher probability of being considered outstanding. They have a 10% chance that they will be ranked as an outstanding civil servant by their immediate boss. On average the data suggests that the new recruits collect more taxes and also get better subjective performance evaluation from their immediate boss.

\[25\] I included the Services and General Administration Department (S & GAD) in the definition of CM secretariat as the department is key in helping the CM make informal promotion decisions. S & GAD is also the main HR department of the provincial government. Background details of civil servants are with the department.

\[26\] PERs were initially referred to as annual confidential reports (ACR).
7 Seniority of Job Link and Informal Promotions

Methodology

\[
P_{icrt} = \kappa_c + \kappa_r + \kappa_{cr} + \kappa_t + \pi JL_{icrt} + \epsilon_{icrt} \tag{23}
\]

\[
P_{icrt} = \xi_c + \xi_r + \xi_{cr} + \xi_t + \alpha JL_{icrt}^p + \nu_{icrt} \tag{24}
\]

Equations 23 and 24 are the structural and reduced form equations. \( P_{icrt} \) is the probability of informal promotion of the new recruit \( i \), of cohort \( c \), in rank \( r \), in month \( t \). \( \kappa_c, \xi_c \) are cohort fixed effects. \( \kappa_r, \xi_r \) are rank fixed effects. \( \kappa_{cr}, \xi_{cr} \) are cohort rank fixed effects. \( \kappa_t \) and \( \xi_t \) are month fixed effects. \( JL_{icrt}, JL_{icrt}^p \) is the seniority of the entry-level job links and seniority of the potential entry-level job links of a new recruit \( AC \) \( i \), of cohort \( c \), in rank \( r \), in month \( t \) respectively. \( \epsilon_{icrt}, \nu_{icrt} \) are the error terms clustered at the level of the cohort.

The main coefficient of interest in the structural and the reduced form equations are \( \pi \) and \( \alpha \) respectively. \( \pi \) captures the local average treatment effect. It captures the effect on the set of compliers i.e. those new recruits for whom the seniority of the job link changes owing to a change in the seniority of the potential job link. On the other hand, \( \alpha \) captures the intention to treat (ITT) effect i.e. the effect on informal promotions of being offered a senior set of potential links. The variation exploited in the structural equation is within cohort across civil servants over time. While the variation exploited in the reduced form is within cohort over time.

Results

Table 2 reports results for the effect of seniority of the link on career progression of new recruits. The dependent variable is informal promotions. Column (1) reports the first stage, column (3) the second stage, column (2) reports OLS and column (4) the reduced form. In all specifications I include cohort, rank, cohort-rank and month fixed effect. The Angrist- Pischke F-stat for the first stage is 37 suggesting that the instrument doesn’t suffer from a weak instrument bias.

In column (1) a one rank increase in the seniority of the potential job link leads to a 0.29 increase in the rank of the actual job link. The effect is precisely estimated and statistically significant.

Column (3) reports the second stage. It shows that a one rank increase in the seniority of the entry-level job link leads to a 61% increase in the probability of getting informal promotions. The effect on informal promotions is nearly 5 times the mean.

OLS results in column (2) shows that a one rank increase in the seniority of job links is associated with a 15% increase in the probability of informal promotions. The effect is highly statistically significant and precisely estimated. A comparison of the OLS and IV results would suggest that OLS is downward biased. It would seem to suggest negative selection i.e. those cohorts with a more senior set of actual links has a differentially lower probability of being informally promoted than the one with junior links. That does not seem to be plausible. More than negative selection, the high magnitude of the IV results are consistent with a local average treatment effect. The set of compliers in this setting are those civil servants for whom the seniority of the job link changes because the rank of the potential link changes i.e. these are those civil servants that followed the tenure/transfer policy of the government. Since these are the ones that follow the policy it suggests that they did not have many powerful outside networks that could allow them to flout the rules. Thus, for these civil servants the first set of people that they work with are their first set of professional links within the organization. It is quite possible that for these set of people the seniority of the entry-level job link plays a much more important role in their career progression than the average civil servant. Thus, the
high magnitude of the IV is a result of heterogeneous treatment effect. Reduced form results in Column (4) suggest that a one rank increase in the rank of the potential job link leads to an 18% increase in the probability of informal promotions of new recruits. The effect is precisely estimated.

8 Seniority of Job Link, Ability and Informal Promotions

In this section I will look at the heterogeneous effect of seniority of job links according to ability. Propositions 4.5 and 4.6 suggested that promotions through the supervisor are positive for both high and low ability worker, however, they will be higher for the high than the low ability. Figure 3 presents descriptive evidence to that effect. The y-axis has the probability of informal promotions, while the x-axis has seniority of potential job links. The red line reports the average effect for those in the top 10% of their cohort. The blue, pink, black and green line is the average effect for those at the 90th, 50th, 30th and the 10th percentile respectively. Consistent with theoretical prediction, preliminary descriptive evidence suggests that a rise in the seniority of the entry-level link leads to a better career progression for the high ability. Although this is just descriptive evidence it does appear striking given that this is the public sector within a developing country with little or no incentivizing tools and a huge potential for the nepotist role of links. However, despite the fact that promotions are higher for high ability workers, as theory suggests this doesn’t necessarily suggest that links play an efficiency enhancing role. It is possible that there is collusion and the better career progression of the higher ability is the result of collusion at the supervisor-worker level. Below I explore the heterogeneous effect in more detail.

Results

Table 3 presents results of the heterogeneous effect of seniority of job link on career progression of new recruits. The ability measure capture both the top and bottom end of the ability distribution. Top (bottom) 10% are those civil servants that were in the top (bottom) 10% of their cohort in the recruitment exam. Column (1), (3), (5) (7) report results including the ability measure as explanatory variables in addition to the seniority of (potential) job link, while column (2), (4), (6) and (8) contains the interaction effect of ability and seniority of (potential) job link. Column (1) and (2) report the first stage, column (3) and (4) OLS, (5) and (6) report IV results and (7) and (8) report the reduced form results. The F-stat in all the first stage in column (1) and (2) are greater than 35 on average. This suggests that the estimates don’t suffer from a weak instrument bias.

OLS results in column (4) suggest that seniority of job link does have a heterogeneous effect according to ability. Consistent with the descriptive evidence presented earlier, a one rank increase in the seniority of job link is associated with a 15% increase in the probability of informal promotions, however, the effect is 25% for those that are in the top 10% of their cohort. The effect is differentially lower for those that are in the bottom 10% of their cohort, however, the effect is not statistically significant.

Reduced form results in column (8) suggest a similar effect. A one rank increase in the seniority of the potential link leads to a 17% increase in the probability of informal promotions for the new recruit, however, the effect is 14% more for the top 10%. Interestingly, the top% have a 5% negative probability of being informally promoted without a senior set of potential links. However, the top 10% have a 9% probability of being informally promoted if they also have a senior set of links. Thus, seniority of entry-level job links lead to a better outcome for the top 10%. The bottom 10% have a differentially negative probability of being informally promoted.
as their links rise in rank in the organization. However, the effect is not precisely estimated or statistically significant. The bottom 10% have a 17% chance of being informally promoted and it is the same as the mid 80%. Thus, consistent with theory both the top and the bottom 10% have a positive probability of being informally promoted. However, the top 10% have a higher probability of being informally promoted as their link rises in seniority within the organization. The second stage results in column (6) suggest that the top 10% have a 6% differential probability of being informally promoted as their link rises in seniority. However, the effect is imprecisely estimated and not statistically significant. Same is the case with the bottom 10%. The bottom 10% have a differentially negative effect of the seniority of the job link. A one rank increase in the seniority of the job link leads to a 22% decrease in the probability of informal promotions for the bottom 10%. However, the effect is not statistically significant. Interestingly, the bottom 10% have a lower chance of being informally promoted as their link rises in seniority, while the top 10% have a positive probability of being informally promoted with the seniority of their link.

Overall the results in table 3 suggests that as the link rises in seniority it allows the more able civil servants to have a better career trajectory. The efficiency aspect of this remains to be investigated further. What causes these heterogeneous effects? It is possible that this is the result of simple human capital externalities from the senior set of links to the new recruits and a consequent better performance at the lower tiers resulting in better career trajectory for the new recruits. However, consistent with the theoretical model, it is equally possible that this is the result of information provision by the link to the CM and that results in the high ability rising faster. In the next section I investigate the direct effect of the seniority of the job link on early career performance of civil servants.

9 Seniority of Job Link and Performance

This section sheds light on the early career incentives of new recruits as their links rise in the organization. I directly tested whether seniority of job links determine allocation of new AC positions to new recruits. I find that seniority of links has no linkage with AC job allocations. This gives me some confidence in saying that the performance results below work along the incentive rather than the selection margin.

I investigate the effect of the seniority of the job link on the distribution of early career performance of civil servants. I implement quantile regression estimates using standard methods described in Koenker (2005) and Parente & Santos Silva (2016) and express the quantiles of the conditional distribution as linear functions of the independent variables. I implement the quantile regression estimates with fixed effects following Canay (2011) that proposes a simple transformation of the data that gets rid of the cohort effects under the assumption that these effects are location shifters.

Methodology

I estimate the conditional distribution of tax performance of new recruit AC i, of cohort c, in month t as a percentage of target set by the BOR, at different quantiles, θ. I therefore estimate the following specification:

$$\text{Quant}_\theta(y_{ict} | .) = \gamma_c + \gamma_t + \mu_\theta J L_{ict} + \delta exp_{ict} + \kappa exp_{ict}^2$$  \hspace{1cm} (25)$$

Following Canay (2011) I use the residuals of a regression of tax performance on cohort fixed effects, experience and experience*^ as the explanatory variable.
Equation 25 is the quantile regression while equation 26 is the reduced form quantile treatment effects. $y_{ict}$ is the tax performance of new recruit AC $i$, of cohort $c$, in month $t$ as a percentage of target set by the BOR. $\gamma_c, \rho_t$ are cohort fixed effects. $\gamma_{lt}, \rho_{lt}$ are month fixed effects. $\mu_\theta$ is the quantile specific effect of the seniority of the entry-level job link on the $\theta$ quantile of the tax performance distribution of the new recruit. $JL_{ict}, JL_{pict}, exp_{ict}, exp^2_{ict}$ are as described earlier.

Results

Table 4 presents the quantile regression estimates and figure 4 plots the coefficient and confidence interval. Table 5 reports the reduced form quantile treatment effects while figure 5 plots the coefficient and confidence interval. The performance distribution is conditional on experience, month and cohort fixed effects. I consider all deciles from 10th to the 90th. Bootstrapped standard errors with 1000 replications are reported in parenthesis. All standard errors are clustered at the cohort level. Column (1) in both tables report the mean effect while columns (2) - (10) present the quantile effects. Since tax performance is only measured in the first part of the civil servant’s career when they work as ACs, there are only 1479 observations which is a significant drop from the previous results.

Column (1) of table 4 presents the mean effect. A one rank increase in the seniority of the job link is associated with a 1.75% reduction in tax collected by new recruits in a month. However, the effect is not statistically significant. Moreover, there also appears to be no heterogeneous effect across the performance distribution. Table 5 and figure 5 show that the seniority of job link has no effect on the performance distribution. All confidence intervals include zero. The quantile regression coefficients are descriptive and do not have a causal interpretation. I therefore, consider the reduced form effects in table 5 and 5.

The quantile treatment effect report a different result from the quantile regressions. Column (1) of table 5 reports the mean effect. It shows that a one rank increase in the seniority of potential job link leads to a 1% increase in tax performance. However, the effect is imprecisely estimated and not statistically significant. A clearer illustration of the quantile effects can be seen in figure 5. On the x-axis I have quantiles and on the y-axis is the quantile specific effect of the seniority of the potential job links on the performance distribution. The mean effect masks heterogeneity of the effect across the performance distribution.

Results in figure 5 suggests that the seniority of the potential job link has a scale effect and increases the dispersion of the distribution of the tax performance. A one rank increase in the seniority of the potential job link leads to a negative and statistically significant effect at the 10th quantile all the way till the 70th quantile, while it has a positive effect at the 80th and 90th quantile of the tax distribution. However, the effect at the 80th quantile is not statistically significant. In other words, changes in seniority of the potential job link results in an increase in inequality in performance with the lower and middle of the performance distribution shifting further left and the higher tail shifting right-wards. The results are consistent with proposition 4.6. While the high ability increase effort, owing to the possibility of collusion, promotions through supervisors can result in the low ability worker reducing effort.
10  Mechanism: Productivity spillover or referral for promotion?

Productivity spillovers and referrals for informal promotion can be the two major channels through which seniority of the entry-level job link affects performance of the new recruit. Referrals can generate career incentives and affect performance as discussed in the theoretical framework and as seen in section 9. On the other hand productivity spillovers from the more senior colleague can result in a reduction in the cost of effort and thus, increase effort on the job.

In this setting productivity spillovers appear to be a less plausible reason for the effect on performance in section 9. First, if productivity spillovers are at work then it ought to have a non-increasing effect on the cost of effort and hence on performance. However, the quantile treatment effects suggest that a rise in seniority of the link leads to a fall in performance from the 10th to the 70th quantile.

Second, seniority is based on the official rank of the entry-level job links. For the most part this official rank follows a predetermined, rigid set of rules based on years of experience and mandatory training. Seniority of job link is not smooth and changes at fixed times in the civil servant’s careers (see appendix figure A.2 for details). If it is learning or productivity spillovers from the more senior set of links, it remains unclear why this spillover takes place in such discontinuous fashion.

To shed light on a possible mechanism I compile a measure of the seniority of the subset of links that work in the CM secretariat. Officers working in the CM secretariat are no longer working with the new recruits in the district offices. They work in the provincial capital. Moreover, since the CM makes nearly all the decisions regarding informal promotions of civil servants, the CM secretariat consists of civil servants that help him make those decisions. It is the office through which case files of informal promotions are routed. Having a senior link in the CM secretariat means the link can refer the worker for informal promotions to the CM. However, despite the distance there is still the possibility of productivity spillovers, potentially through informal channels.

I use the ‘service’ section of the career charts (refer to appendix figure A.7) and observe whether the link was working in the CM secretariat. I then compile the seniority of the entry-level job link in a similar fashion as before restricting them to those links that work in the CM secretariat.

10.1  Seniority of Job Link in CM Secretariat and Informal promotion

Methodology

\[
P_{icrt} = \theta_c + \theta_r + \theta_{cr} + \theta_t + \omega J_{i_{icr}} + e_{icrt}
\]

\[
P_{icrt} = \eta_c + \eta_r + \eta_{cr} + \eta_t + \phi J_{L_{icr}} + u_{icrt}
\]

equations 27 and 28 are the structural and reduced form equations. \(P_{icrt}\) is the probability of informal promotion of the new recruit \(i\), of cohort \(c\), in rank \(r\), in month \(t\). \(\theta_c, \eta_c\) are cohort fixed effects. \(\theta_r, \eta_r\) are rank fixed effects. \(\theta_{cr}, \eta_{cr}\) are cohort-rank fixed effects. \(\theta_t\) and \(\eta_t\) are month fixed effects. \(J_{i_{icr}}, J_{L_{icr}}\) is the seniority of the entry-level job links and seniority of the potential entry-level job links in the CM secretariat. \(e_{icrt}, u_{icrt}\) are the error terms clustered.

\[28\] As already discussed for the higher grades it also includes a score on efficiency index.
at the level of the cohort. The main coefficient of interest in the structural and the reduced form equations are \( \omega \) and \( \phi \) respectively.

**Results**

As a first step I test whether the seniority of these subset of links has an effect on the probability of informal promotions. Table 6 reports the results. Column (1) reports the first stage, column (3) the second stage and column (2) and (4) report the OLS and reduced form respectively. In all specifications I control for cohort, rank, cohort-rank and month fixed effect. The number of observations are less than before as I am restricting to a subset of links. Thus, there is less power to detect an effect than before. The Angrist-Pischke F-stat in column (1) is 14 which is not as high but still suggests that the instrument does not suffer from a weak instrument bias. OLS results in column (2) suggest that a one rank increase in the seniority of a job link that works in the CM secretariat is associated with an 8% increase in the probability of informal promotions. Second stage results in column (3) suggests that a one rank increase in the seniority of the job link that works in the CM secretariat results in a 25% increase in the probability of informal promotions. However, the result is not statistically significant. The reduced form results in column (4) are also marginally significant. A one rank increase in the seniority of potential job link in the CM secretariat leads to a 3% increase in the probability of informal promotions. In the next subsection I explore the heterogeneity of the effect across different ability levels.

10.2 Seniority of Job Link in CM Secretariat, Ability and Informal promotion

Similar to figure 6 presents descriptive evidence to that effect. The y-axis has the probability of informal promotions, while the x-axis has seniority of potential job links in the CM secretariat. The red line reports the average effect for those in the top 10% of their cohort. The blue, pink, black and green line is the average effect for those at the 90th, 50th, 30th and the 10th percentile respectively. Consistent with theoretical prediction as well as the main results in section 8, preliminary descriptive evidence suggests that a rise in the seniority of the potential entry-level link that works in the CM secretariat leads to a better career progression for the high ability. Below I explore the heterogeneous effect in more detail.

**Results**

Table 7 reports results similar to table 3. However, I restrict the set of links to those that work in the CM secretariat. The ability measure is again the top and bottom end of the ability distribution. Top (bottom) 10% are those civil servants that were in the top (bottom) 10% of their cohort in the recruitment exam. Column (1), (3), (5) (7) report results including the ability measure as explanatory variables in addition to the seniority of (potential) job link, while column (2), (4), (6) and (8) contains the interaction effect of ability and seniority of (potential) job link. Column (1) and (2) report the first stage, column (3) and (4) OLS, (5) and (6) report IV results and (7) and (8) report the reduced form results. OLS results in column (4) suggest that seniority of job link in the CM secretariat does not have a heterogeneous effect according to ability. A one rank increase in the seniority of job link is associated with a 6% increase in the probability of informal promotions. The effect is differentially positive for both the top and bottom 10%. However, the differential effect is not statistically significant.
Columns (5) and (7) suggest that the introduction of ability does not change the main effect in table 6. The more interesting results are in columns (6) and (8). Column (6) show that a one rank increase in the seniority of the job link in the CM secretariat leads to a 27% differential increase in the probability of informal promotions of the top 10% civil servants. The effect for the bottom 10% is positive but not statistically significant. Interestingly those top 10% civil servants that do not have a senior set of links in the CM secretariat have a negative probability of being informally promoted. However, they have an overall 5% probability of being informally promoted as their link in the CM secretariat rises in seniority. The trend remains the same when I consider the reduced form results in column (8). The top 10% with a junior set of links in the CM secretariat have a negative probability of being informally promoted. However, the overall effect is positive for those top 10% civil servants whose link rises in seniority while working in the CM secretariat. Overall the results in table 7 suggest that as the link in the CM secretariat rises in seniority it allows the more able civil servants to have a better career trajectory. However, whether it is the result of referrals or simple productivity spillovers is still not clear. The following section considers the effect of seniority of the link in the CM secretariat on the performance distribution of the new recruits.

10.3 Seniority of Job Link in CM Secretariat and Tax performance

In this section I look at the direct effect on the tax performance distribution of the seniority of the entry-level job links in the CM secretariat. I re-define the (potential) job links as the 75th percentile of the subset of (potential) entry-level job links that are currently working in the Chief Minister’s (CM) secretariat. The CM secretariat makes de facto decisions regarding informal promotions of civil servants.

Methodology

Below I implement quantile regression estimates using similar methods as discussed in section 9. As before I express the quantiles of the conditional distribution as linear functions of the independent variables. I estimate the conditional distribution of tax performance of new recruit AC _i_ of cohort _c_, in month _t_ as a percentage of target set by the BOR, at different quantiles, _θ_. I therefore estimate the following specification:

\[
\text{Quant}_\theta(y_{ict} | .) = \alpha_c + \alpha_t + \beta_\theta JL_{ict} + \gamma exp_{ict} + \kappa exp_{ict}^2
\]  
\[29\]

\[
\text{Quant}_\theta(y_{ict} | .) = \phi_c + \phi_t + \tau_\theta JL_{pct} + \pi exp_{ict} + \mu exp_{ict}^2
\]  
\[30\]

Equations 29 is the quantile regression while equation 30 is the reduced form quantile treatment effects. _y_{ict}_ is tax performance of new recruit AC _i_ of cohort _c_, in month _t_ as a percentage of target set by the BOR. _α_c_, _ϕ_c_ are cohort fixed effects. _α_t_, _ϕ_t_ are month fixed effects. _β_θ is the quantile specific effect of the seniority of the entry-level job link in the CM secretariat on the _θ_ quantile of the tax performance distribution of the new recruit. _τ_θ is the quantile specific effect of the seniority of the potential entry-level job link in the CM secretariat on the _θ_ quantile of the tax performance distribution of the new recruit. I control for _exp_{ict}, exp_{ict}^2_ are as before. _JL_{ict}, JL_{pct}_ is the seniority of the entry-level job links and seniority of the potential entry-level job links in the CM secretariat respectively.
Results

Table 8 presents the quantile regression estimates and Figure 7 plots the coefficient and confidence interval. Table 9 reports the reduced form quantile treatment effects while Figure 8 plots the coefficient and confidence interval. The performance distribution is conditional on experience, month and cohort fixed effects. I consider all deciles from 10th to the 90th. Bootstrapped standard errors with 1000 replications are reported in parenthesis. All standard errors are clustered at the cohort level. Column (1) in both tables report the mean effect while columns (2) - (10) present the quantile effects. Since I restrict it to the set of links that work in the CM secretariat the observations drop and I lose a bit of power.

The more interesting results are the reduced form quantile effects in Table 9 and Figure 8. Similar to Table 5 and Figure 5, a one rank increase in the seniority of the potential job link leads to a negative and statistically significant effect at the 20th quantile all the way till the 70th quantile. However, unlike the previous results, the effect at the top end of the distribution is negative and highly imprecisely estimated. In other words, changes in seniority of the potential job link results in a scale effect and increases the dispersion of the distribution of the tax performance. However, it is owing to a left-ward shift of the performance distribution with no effect on the top end.

Discussion

The results in section 10 suggest that productivity spillovers does not appear to be the mechanism through which seniority of job links has an effect on performance. First, productivity spillovers seem less plausible from links that are working far off in the provincial capital. Second, productivity spillovers should be smooth over the career of civil servants and it seems less plausible for them to change discontinuously with the official promotion of the entry-level links. Third, the reduced form quantile treatment effects show that a rise in the seniority of the potential link leads to a reduction in performance at almost all quantiles of the performance distribution. If it were productivity spillovers then performance effects would have been non-negative in the least. Note that I am not considering the act of moving away of the link, which can result in a reduction in productivity spillovers. The variation I am exploiting is the effect of a rise in seniority of the links that have already moved to the provincial capital to work in the CM secretariat. Productivity spillovers cannot explain a negative effect of the rise in seniority of the potential link in the CM secretariat. Fourth, although the effect at the top end of the distribution is imprecisely estimated assuming that the effect really is zero, if productivity spillovers was the mechanism then we should have seen a positive effect at the top end of the distribution and that could have then been argued to have resulted in a rise in informal promotions. However, in Table 7 I see that the high ability have a differentially positive probability of being informally promoted with a rise in the seniority of their job link despite the fact that the top end of the performance distribution did not have a positive performance effect. Overall, it seems less plausible that productivity spillovers are the main mechanism through which seniority of job links has an effect on performance. What seems more plausible is referrals for promotions by the entry-level links. Referrals only for the top 10% could plausibly generate negative incentives at other parts of the performance distribution.
11 Robustness Checks

11.1 Multitasking and the validity of the tax performance measure

Targets set by the BOR are based on official record of number of farmlands and farm incomes in the district and are independent of the unobservable characteristics of the new recruits. I later show that targets set by the BOR are orthogonal to the networks measure. The concern with this measure is that with miscellaneous responsibilities there could be multitasking problems. For instance, rank of networks might reduce tax collection but it could be a result of the AC shifting effort towards other responsibilities. Despite limitations, tax collection is a reasonable measure of performance for this study. First, any effect on tax performance conveys information about behavioural responses to changes in mean network rank. This has significant policy implications. In 2009-2010 in Pakistan while agriculture accounted for 21% of the GDP the cumulative collection of AIT was less than 1% of the total [Nasimi (2013)]. Moreover, Pakistan’s tax to GDP ratio was a mere 9.45 per cent in 2015. Though this study might not be able to examine how civil servants substitute between tasks in response to networks, it still highlights that developing countries like Pakistan that want to increase tax collection cannot discard the incentive effects of workplace networks. Second, in any case revenue collection is one of the core function of the office of the Assistant Commissioner. ACs entire team, particularly post 2001, comprises of revenue officers whose main raison d’etre is revenue. Third, this function is the only one that was not subject to major reforms throughout my sample period. Fourth, below I provide some evidence for the underlying assumption that performance on all measures is positively correlated. Fifth, of all the set of tasks this is the most objectively measurable. (subject to the same caveats as PP studies that then reward the more objectively verifiable tasks.

In some sense the arguments for the use of tax collection as a performance measure are not far from the way that teachers found actively teaching in class are considered a measure of teacher performance [Kremer et al. (2005); Muralidharan & Sundararaman (2009, 2013); Duflo, Hanna & Rya (2012), Duflo et al. (2015)]. Teachers dont just teach. In the production of learning, teachers write exams and assignments, provide feedback, organise extra-curricular events, hold meetings with parents and administration. However, active teaching is still considered a valid measure as it is objectively measured, forms a major part of the teacher’s overall set of tasks and provides useful information on behavioural responses to incentives.

11.1.1 Relationship of tax performance and other measures of performance and ability

Since there is multitasking in the context, for the performance measure to capture anything meaningful it has to be at least positively correlated with other aspects of performance. Column (1) and (2) of Table 10 reports the association between the objective and subjective measure of performance i.e. tax collection and performance evaluation of the new recruit by his or her immediate boss respectively. To be clear performance evaluation is a dummy that turns on 1 if the civil servant is ranked outstanding by the immediate boss. It remains zero otherwise. Column (1) does not control for civil servant or year fixed effects. It shows that a 1% increase in the tax performance is correlated with a 0.001 increase in the subjective performance evaluation of the new recruit by the immediate boss. The effect doesn’t change in magnitude when I include civil servant and year fixed effects, however, it does become more precisely estimated and statistically significant. The magnitude of the correlation is not very large. However, despite the low magnitude Table 10 does suggest that the tax performance captures something about performance of the new recruit.
Revenue court performance is the revenue court cases decided by the AC as a percentage of total cases pending in a month. I observe court performance of all civil servants for 489 civil servant-months. However, there are just 66 observations for new recruits. The correlation presented here is for all civil servants including new recruits for whom I have the tax performance data. The total overlap between the tax performance and revenue court performance is 123 observations.

Column (3) of Table 10 doesn’t control for civil servant and year fixed effects and exploits across civil servant-time variation. Column (3) shows that a 1% increase in targeted tax collection by the new recruits is associated with a 0.346% increase in the revenue court cases decided by the AC as a percentage of total cases pending in a month. However, the effect drops to 0.167 and is imprecisely estimated when I exploit within civil servant-year variation in Column (4).

Table 11 aims to provide further evidence in support of the use of tax collection as a measure of performance. In this table I test whether the objective and subjective measures of performance are positively correlated with ability. As before, I classify ability through the intra-cohort ranking of civil servants. Top 10% is a dummy that turns on 1 for those civil servants that are in top 10% of their cohort in the civil services entrance exam ranking. It remains zero otherwise. Table 11 column (1) suggests that for those civil servants that are in the top 10% of the entrance examination the chance that they will be ranked outstanding by their immediate bosses is almost 11%. The effect is precisely measured and is statistically significant at the 1% level. In the case of tax performance the top 10% on average collect 3.148% more taxes in a month as a percentage of the annual target set by the BOR. The effect is precisely estimated and statistically significant at the 1% level.

Results in column (2) suggests that in a year the top 10% collect approximately 36% more taxes than the bottom 90%. This is no trivial amount. This suggests two things. First, the method of selection of the new recruits is not completely useless and the exam rankings are a good predictor of on-the-job performance of civil servants. Those that are ranked higher also perform better on the job both in terms of objective and subjective performance evaluation. Second, the performance measures I use in the study carry meaningful information.

### 11.1.2 Subjective Performance Evaluation and Network Rank: Quantile Regression Estimates

The previous subsection showed that tax collection and other measures of performance are positively correlated. Here I aim to test whether the results in Section 9 are specific to tax performance or whether they are robust to using other measures of performance like subjective performance evaluation.

It is worth stating that since it can be presumed that a civil servant with a more senior set of links will potentially enjoy an overestimated subjective performance evaluation by their immediate bosses, any negative effect I estimate is potentially an underestimate of the true performance or any positive effect an overestimate. Moreover, for the same reason, negative estimates are potentially more credible than a positive effect.

#### Methodology

Using a similar methodology as in Section 9 I estimate the conditional distribution of subjective performance evaluation of new recruit AC i, of cohort c, in month t at different quantiles, α. I therefore estimate the following specification:

\[
 quant_{\alpha}(PER_{icrt}) = \mu_c + \mu_r + \mu_{cr} + \phi_a JL_{icrt} + \beta exp_{icrt} + \kappa exp_{icrt}^2
\]  

\[
 quant_{\alpha}(PER_{icrt}) = \xi_c + \xi_r + \xi_{cr} + \tau_a JL_{icrt} + \chi exp_{icrt} + \psi exp_{icrt}^2
\]  

(31)

(32)
where equations 31 and 32 are the structural and reduced form equations. $\mu_c, \xi_c$ are cohort fixed effects, $\mu_r, \xi_r$ are rank fixed effects and $\mu_{cr}, \xi_{cr}$ are cohort-rank fixed effects. $\phi_{\alpha}$ is the quantile specific effect of the seniority of job link on the $\alpha$ quantile of the subjective performance evaluation distribution. $\tau_{\alpha}$ is the quantile specific effect of the seniority of the potential job link on the $\alpha$ quantile of the subjective performance evaluation distribution. $JL_{icrt}, JL^{P}_{icrt}$ are as described earlier.

Results

Table 12 reports the estimates of the seniority of job link on performance evaluation. As a benchmark, the effect of the seniority of job link on the mean of the subjective evaluation distribution is presented in the first column of Table 12. Column (2) - (10) of Table 12 report the quantile regression estimates at different quantiles of the performance evaluation distribution conditional on experience, experience$^2$, cohort, rank and cohort*rank fixed effects. Figure 9 plots the quantile regression coefficients along with the confidence intervals. I consider all deciles from 10th to the 90th. Bootstrapped standard errors with 1000 replications are reported in parenthesis for the quantile regressions. All standard errors are clustered at the cohort level. Results in Table 12 suggest that the effect of the seniority of job link on performance evaluation is not very different from that on tax performance. The effect on the mean of the performance evaluation distribution is negative but not statistically significant. Seniority of job link appears to have a scale effect and increase the dispersion of the subjective performance evaluation distribution. Column (2) - (8) shows that a one rank increase in the actual network leads to a reduction in the probability of being evaluated outstanding by the immediate boss. In all cases the effect is precisely measured and highly statistically significant. Column (10) of Table 12 suggests that there is a positive effect of network rank on the 90th quantile of the performance evaluation distribution, however, the effect is imprecisely estimated and not statistically significant. Figure 9 shows that only the confidence intervals of 80th and 90th quantile estimates contains zero.

The reduced form estimates for subjective performance evaluation are presented in Table 13. The results presented in this table further provides support to the use of tax performance as a measure of performance. A thing that remains unchanged is that the seniority of potential job link leads to an increase in dispersion of performance, be it measured through tax collected or subjective performance evaluation. Column (1) shows that the effect of seniority of potential job link on the mean of the subjective performance evaluation distribution is negative and statistically significant. A one rank increase in the seniority of potential job link leads to a reduction in the probability of being evaluated as outstanding by the immediate boss of 8 percentage points. Column (2) - (8) of Table 13 suggests that the reduced form estimates are larger in magnitude than the results in Table 12. In column (9), however, we get a different result at the 80th quantile. A one rank increase in the seniority of potential job link leads to a reduction in the probability of being ranked outstanding by the immediate boss of 1% at the 80th quantile of the performance evaluation distribution. Column (10) Table 13 suggests that similar to Table 12 the magnitude of the reduced form effect is positive at the 90th quantile. However, the effect is more imprecisely estimated in the reduced form. Figure 10 shows the imprecision of the estimates at the 90th percentile. In the reduced form only the confidence intervals of the 90th quantile contains zero.

11.1.3 Tax targets and network rank

In this subsection I test whether the seniority of the (potential) entry-level job link has any correlation with the annual tax targets set by the Board of Revenue. All specifications in
Table 14 control for experience and cohort and time fixed effects. Results in Table 14 suggests that there is some correlation between the endogenous measure seniority of job link. However, when I control for job location fixed effect that too becomes insignificant. Columns (3) and (4) suggest that there is no correlation between seniority of potential job link and tax target. This holds whether or not we control for job location (tehsil) fixed effects. Table 14 provides further support to the validity of the use of the tax performance as a measure of performance.

11.2 Definition of cohorts

I consider each cohort as those new recruits that have completed their UT period together and not those that took the CSS exam together. The reasons for using such a classification are as follows. First, the set of districts that have AC vacancies (used to categorize the potential entry-level job links) could be drastically different from month to month. Considering a,b,c and x,y,z as one cohort will create issues of the month (of end of training) to pick to classify the ‘potential’ links with the results potentially being sensitive to the choice made. In addition, the set of AC positions with tenure greater than or equal to one year can also potentially change with the addition of a month or so. Second, for the most part the reason for the staggered end of the training period is administrative and based on coordination between different government agencies. Third, another reason for the observational difference in end of on-the-job training for cohorts are those civil servants which the bureaucracy refers to as ‘repeaters’. These civil servants retake the CSS exam to change their group from say Foreign Service of Pakistan to Pakistan Administrative Services. Since these civil servants have already gone through the Common Training at the Civil Services Academy (CSA), Lahore and just have to complete the Specialised Training for their newly allocated group, they end up starting and completing the on-the-job training quicker than the rest of their cohort. For instance, consider the 34th cohort in 2006 (see appendix figure A.1). Those that end their on-the-job training at the beginning of 2008 are repeaters followed by the rest of the cohort that end their training near the end of 2008. Since I exploit within cohort variation in ‘potential’ networks in my main specification, if I used CSS exam as a cohort identifier I would be identifying an effect based on a comparison of repeaters and the others, something that my classification of cohorts avoids altogether.

I would, however, still want to flag a few concerns with my classification of cohorts. It is reported that sometimes civil servants delay completing the training reports and that can be a factor leading to a delay of notification of end of training. This, unlike the administrative delay, can be problematic in so far as civil servants can delay the end of the training to ensure that a certain job location becomes part of his/her potential set of jobs he/she can select into. While AC vacancies in different districts is more or less centrally determined by senior civil servants or CM and less easily predicted, the bigger issue can be the tenure of the incumbent Assistant Commissioners. For instance, if a new recruit would really like to be allocated an AC position in Lahore and he/she knows that the current AC is nearing the 1 year tenure and so there is a higher chance that the AC can be replaced. By delaying the submission of the training reports he/she can ensure that Lahore is at least part of the set of potential districts, thereby, increasing his/her chances of being allocated Lahore.

There are a number of reassuring aspects of the civil services that reduce my concerns here. First, though the new recruit can delay their reports, whether it results in an actual delay in

While retaking the exam gives the impression that these civil servants were systematically of a lower ability than the regular cohorts that is not necessarily the case. ‘Repeaters’ are those civil servants that earlier took the exam and didn’t get the group they wanted owing to a lower merit position. They then retook the exam and qualified for a group of their choice eg. PAS. However, in the regular cohorts there are those who never qualified for the civil services earlier, thereby, potentially being of a lower ability than the ‘repeaters’. In addition, if exam ranking is any criteria of ability many ‘repeaters’ are ranked higher than others in their cohort.

32
the end of their training is not certain. There have been cases when the new recruits have not completed the reports and yet their training have been terminated by the training institute (see appendix figure A.10). Second, new recruits cannot delay the end of the training forever. A look at the dates of the end of the training in appendix figure A.1) suggests that most of the end dates are clustered together. It is still in the hands of the Director General of the training institute. Third, neither the vacancy creation process nor the tenure of the incumbent ACs are entirely predictable. Figure A.3 suggests that the Tenure Policy for Assistant Commissioners is not perfectly enforced. Whether an incumbent AC completes his/her tenure at a post or whether he is replaced with another even before that time is decided by S&GAD or the CM. Therefore, a new recruit can delay his report and find that the Lahore AC has already been replaced by a new AC. This discourages gaming the system. Fourth, since in my main specification I exploit within cohort variation, conditional on experience, any unobservable cohort characteristics that determines a delay in end of UT period and hence the network inherited will have to vary at the same frequency as the seniority of the potential entry-level job link. This seems less likely. In the next section I present evidence against any correlation between AC vacancies and end of training.

11.3 End of training and vacancy creation

In this subsection I test whether vacancy supply is correlated with the time of the end of on-the-job training of the new recruits. If the supply of vacancies are endogenous to the end of training of new recruits then the exogeneity of the potential network is questionable. Table 15 and 16 uses the incumbency board data that I describe in Section 5.2. In Table 15 training end (dummy) turns on 1 a day before the end of on-the-job training of newly recruited civil servants. It stays zero otherwise. While in Table 16 training end (dummy) turns on 1 a month before the end of on-the-job training of newly recruited civil servants. It stays zero otherwise. AC vacancy is a dummy that turns on 1 whenever the Assistant Commissioner (AC) position is vacant in a tehsil. It remains zero otherwise. Large districts include Rawalpindi, Lahore, Multan, Gujranwala, Faisalabad, Sargodha, Bahawalpur and Sialkot. Standard errors are clustered at the tehsil level. In all cases we can see that the supply of vacancies is not correlated with the end of on-the-job training of the new recruits irrespective of whether I include year and tehsil fixed effects or how I classify the end of on-the-job training.
References


Cohort of new recruits A, B, C finished training together:

A

B

C

District 7 civil servants in Revenue Dept.

Job links of A include:

1. All civil servants working in district 7 in the **first month** that A starts working in district 7 as an Assistant Commissioner
2. B & C as finished training together

Figure 1: Illustration of the entry-level job link

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<tbody>
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<td>1. Induction into civil services &amp; academic training</td>
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<tr>
<td>2. Start of on the job training</td>
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<tr>
<td>3. End of on the job training</td>
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<tr>
<td>4. Start of the first job</td>
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</table>

District 1

No AC vacancy & tenure of all ACs less than 1 yr

District 7

AC vacancy

'Development' Entry-level Job Links

District 10

AC tenure >1 yr

Figure 2: Illustration of the potential entry-level job link
<table>
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<tr>
<th>Table 1: Descriptive Statistics</th>
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<td>Full career</td>
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<td>Subjective performance evaluation</td>
</tr>
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<td>New recruits</td>
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</table>

Note: Informal promotions is a dummy that turns on 1 if the actual rank of the civil servant is greater than his or her official rank. It remains zero otherwise. Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job. Seniority of (potential) entry-level job link in the CM secretariat is the 75th percentile of the subset of (potential) entry-level job links that are currently working in the Chief Minister’s (CM) secretariat. The CM secretariat makes de facto decisions regarding informal promotions of civil servants. Ability is characterized from the cohort ranking based on the recruitment exam. Top (bottom) 10% is a dummy that turns on 1 for those civil servants that are in the top (bottom) 10% of their cohort in the recruitment exam. It remains zero otherwise. Subjective performance evaluation is a civil servant’s evaluation by the immediate boss. The variable performance evaluation turns on 1 if the civil servant is ranked outstanding. It remains zero otherwise.
Table 2: The effect of seniority of job link on career progression of new recruits

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Clustered standard errors in parenthesis

* p<0.10 ** p<0.05 *** p<0.01

Note: Informal promotions is a dummy that turns on 1 if the actual rank of the civil servant is greater than his or her official rank. It remain zero otherwise. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job.
Figure 3: The heterogenous effect of seniority of potential job link on career progression of new recruits
Table 3: The heterogeneous effect of seniority of job link on career progression of new recruits

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<td>16768</td>
<td>16768</td>
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<tr>
<td>Cohort FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rank FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cohort*rank FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Clustered standard errors in parenthesis

* \( p<0.10 \)  ** \( p<0.05 \)  *** \( p<0.01 \)

Note: Informal promotions is a dummy that turns on 1 if the actual rank of the civil servant is greater than his or her official rank. It remain zero otherwise. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job. Ability is characterized from the cohort ranking based on the recruitment exam. Top (bottom) 10% is a dummy that turns on 1 for those civil servants that are in the top (bottom) 10% of their cohort in the recruitment exam. It remains zero otherwise.
Table 4: The effect of seniority of job link at different tax performance quantiles

<table>
<thead>
<tr>
<th>Seniority of Job Link</th>
<th>Mean</th>
<th>10th</th>
<th>20th</th>
<th>30th</th>
<th>40th</th>
<th>50th</th>
<th>60th</th>
<th>70th</th>
<th>80th</th>
<th>90th</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1.75</td>
<td>-0.72</td>
<td>-0.40</td>
<td>-0.49</td>
<td>-0.08</td>
<td>-0.48</td>
<td>-0.25</td>
<td>-0.99</td>
<td>-1.20</td>
<td>-1.35</td>
</tr>
<tr>
<td></td>
<td>(2.22)</td>
<td>(0.54)</td>
<td>(0.54)</td>
<td>(0.56)</td>
<td>(0.61)</td>
<td>(0.52)</td>
<td>(0.64)</td>
<td>(0.69)</td>
<td>(1.46)</td>
<td>(2.17)</td>
</tr>
<tr>
<td>Obs</td>
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<td>1479</td>
<td>1479</td>
<td>1479</td>
<td>1479</td>
<td>1479</td>
<td>1479</td>
<td>1479</td>
<td>1479</td>
<td>1479</td>
</tr>
</tbody>
</table>

Bootstrapped standard errors in parenthesis (1000 replications)

* p < 0.10  ** p < 0.05  *** p < 0.01

Note: Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job.

Conditional Quantile Effects

Figure 4: The effect of seniority of job link at different quantiles of tax performance of new recruits conditional on exp, exp², month and cohort FE
Table 5: The reduced form effect of seniority of potential job link at different tax performance quantiles

<table>
<thead>
<tr>
<th>Tax performance conditional on exp, exp^2, mon &amp; cohort FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>JLp</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Obs</td>
</tr>
</tbody>
</table>

Bootstrapped standard errors in parenthesis (1000 replications)
* p<0.10 ** p<0.05 *** p<0.01

Note: Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job.

Figure 5: The reduced form effect of seniority of potential job link at different quantiles of tax performance of new recruits conditional on exp, exp^2, month and cohort FE

Conditional Quantile Treatment Effects

Figure 5: The reduced form effect of seniority of potential job link at different quantiles of tax performance of new recruits conditional on exp, exp^2, month and cohort FE
<table>
<thead>
<tr>
<th></th>
<th>First stage</th>
<th>OLS</th>
<th>IV</th>
<th>Reduced Form</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Seniority of Potential Job Link in the CM Secretariat</td>
<td>0.23***</td>
<td></td>
<td></td>
<td>0.03*</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td></td>
<td></td>
<td>(0.02)</td>
</tr>
<tr>
<td>Seniority of Job Link in the CM Secretariat</td>
<td>0.08***</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td></td>
<td>(0.17)</td>
<td></td>
</tr>
<tr>
<td>AP F Statistic-I</td>
<td>14.30</td>
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<td></td>
</tr>
<tr>
<td>AP p-value I</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>4988</td>
<td>6950</td>
<td>4988</td>
<td>10171</td>
</tr>
<tr>
<td>Cohort FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rank FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cohort*rank FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Clustered standard errors in parenthesis

* p<0.10 ** p<0.05 *** p<0.01

Note: Informal promotions is a dummy that turns on 1 if the actual rank of the civil servant is greater than his or her official rank. It remain zero otherwise. Seniority of (potential) entry-level job link in the CM secretariat is the 75th percentile of the subset of (potential) entry-level job links that are currently working in the Chief Minister’s (CM) secretariat. The CM secretariat makes de facto decisions regarding informal promotions of civil servants.
Figure 6: The heterogenous effect of seniority of potential job link in CM secretariat on career progression of new recruits

Note: P(informal promotion) uses residual variation after controlling for cohort, rank, cohort rank and time FE
Table 7: The heterogeneous effect of seniority of job link in CM secretariat on career progression of new recruits

<table>
<thead>
<tr>
<th>Informal promotions</th>
<th>First Stage OLS IV Reduced Form</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1{(actual rank_i - official rank_i) &gt; 0}</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seniority of Potential</td>
<td>0.23***</td>
<td>0.24***</td>
<td>0.03*</td>
<td>0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job Link in CM Secretariat</td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Top 10%</td>
<td>0.08</td>
<td>-0.04</td>
<td>0.04</td>
<td>-0.00</td>
<td>0.02</td>
<td>-0.22**</td>
<td>0.03</td>
<td>-0.08***</td>
</tr>
<tr>
<td></td>
<td>(0.18)</td>
<td>(0.08)</td>
<td>(0.07)</td>
<td>(0.08)</td>
<td>(0.06)</td>
<td>(0.10)</td>
<td>(0.05)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Bottom 10%</td>
<td>0.03</td>
<td>0.15</td>
<td>0.03</td>
<td>-0.02</td>
<td>0.06</td>
<td>-0.07</td>
<td>-0.01</td>
<td>0.00</td>
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<tr>
<td></td>
<td>(0.14)</td>
<td>(0.18)</td>
<td>(0.09)</td>
<td>(0.07)</td>
<td>(0.09)</td>
<td>(0.26)</td>
<td>(0.04)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Seniority of Potential</td>
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<td>0.05</td>
<td>0.27*</td>
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</tr>
<tr>
<td>Job Link in CM Secretariat*Top 10%</td>
<td>(0.15)</td>
<td>(0.13)</td>
<td>(0.04)</td>
<td>(0.14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seniority of Job Link in CM Secretariat*Bottom 10%</td>
<td>0.08***</td>
<td>0.06**</td>
<td>0.25</td>
<td>0.21</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.17)</td>
<td>(0.17)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seniority of Job Link in CM Secretariat*Top 10%</td>
<td>0.05</td>
<td>0.27*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seniority of Job Link in CM Secretariat*Bottom 10%</td>
<td>0.08</td>
<td>0.21</td>
<td></td>
<td></td>
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<td>(0.39)</td>
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<td>4988</td>
<td>10171</td>
<td>10171</td>
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<tr>
<td>Cohort FE</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rank FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cohort*rank FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time FE</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Clustered standard errors in parenthesis

* p<0.10 ** p<0.05 *** p<0.01

Note: Informal promotions is a dummy that turns on 1 if the actual rank of the civil servant is greater than his or her official rank. It remain zero otherwise. Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Seniority of (potential) entry-level job link in the CM secretariat is the 75th percentile of the subset of (potential) entry-level job links that are currently working in the Chief Minister’s (CM) secretariat. The CM secretariat makes de facto decisions regarding informal promotions of civil servants. Ability is characterized from the cohort ranking based on the recruitment exam. Top (bottom) 10% is a dummy that turns on 1 for those civil servants that are in the top (bottom) 10% of their cohort in the recruitment exam. It remains zero otherwise.
Table 8: The effect of seniority of job link in the CM secretariat at different tax performance quantiles

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>10th</th>
<th>20th</th>
<th>30th</th>
<th>40th</th>
<th>50th</th>
<th>60th</th>
<th>70th</th>
<th>80th</th>
<th>90th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seniority of Job Link</td>
<td>-0.96</td>
<td>0.14</td>
<td>0.42</td>
<td>0.57</td>
<td>-0.01</td>
<td>-0.63</td>
<td>-0.45</td>
<td>-1.15**</td>
<td>-1.59***</td>
<td>-3.04</td>
</tr>
<tr>
<td>Job Link</td>
<td>(1.27)</td>
<td>(0.52)</td>
<td>(0.67)</td>
<td>(0.58)</td>
<td>(0.50)</td>
<td>(0.53)</td>
<td>(0.52)</td>
<td>(0.50)</td>
<td>(0.60)</td>
<td>(2.98)</td>
</tr>
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<td>416</td>
<td>416</td>
<td>416</td>
<td>416</td>
<td>416</td>
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<td>416</td>
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</tbody>
</table>

Bootstrapped standard errors in parenthesis (1000 replications)

* p<0.10  ** p<0.05  *** p<0.01

Note: Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Seniority of (potential) entry-level job link in the CM secretariat is the 75th percentile of the subset of (potential) entry-level job links that are currently working in the Chief Minister’s (CM) secretariat. The CM secretariat makes de facto decisions regarding informal promotions of civil servants.
Table 9: The effect of seniority of potential job link in CM secretariat at different tax performance quantiles

<table>
<thead>
<tr>
<th>Tax performance conditional on exp, exp², mon &amp; cohort FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>JLp</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Obs</td>
</tr>
</tbody>
</table>

Note: Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Seniority of (potential) entry-level job link in the CM secretariat is the 75th percentile of the subset of (potential) entry-level job links that are currently working in the Chief Minister’s (CM) secretariat. The CM secretariat makes de facto decisions regarding informal promotions of civil servants.

Figure 8: The reduced form effect of the seniority of the potential job link in the CM secretariat at different quantiles of tax performance of new recruits conditional on exp, exp², month and cohort FE
Table 10: Relationship between different measures of performance of ACs

<table>
<thead>
<tr>
<th></th>
<th>Subjective Performance Evaluation</th>
<th>Revenue Court Performance</th>
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<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Tax performance</td>
<td>0.001 (0.001)</td>
<td>0.001** (0.000)</td>
</tr>
<tr>
<td>Observations</td>
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<td>910</td>
</tr>
<tr>
<td>Civil servant FE</td>
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<td>Yes</td>
</tr>
<tr>
<td>Year FE</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Standard errors in parenthesis

* p<0.10 ** p<0.05 *** p<0.01

Note: Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Subjective performance evaluation is a civil servant’s evaluation by the immediate boss. The variable performance evaluation turns on 1 if the civil servant is ranked outstanding. It remains zero otherwise. Revenue court performance is the number of court cases decided by the new recruit as a percentage of the total pending cases.

Table 11: Relationship between different measures of performance and ability

<table>
<thead>
<tr>
<th></th>
<th>Subjective Performance Evaluation</th>
<th>Tax performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Top 10%</td>
<td>0.109*** (0.008)</td>
<td>3.148*** (0.921)</td>
</tr>
<tr>
<td>Observations</td>
<td>38859</td>
<td>7614</td>
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</table>

Standard errors in parenthesis

* p<0.10 ** p<0.05 *** p<0.01

Note: Tax performance is monthly tax collected as a percentage of annual target set by the BOR. This measure is available for civil servants working as Assistant Commissioners (AC). It ranges from 0 to 100%. Top 10% is a dummy that turns on 1 for those civil servants that are in the top 10% of their cohort in the recruitment exam. It remains zero otherwise. Subjective performance evaluation is a civil servant’s evaluation by the immediate boss. The variable performance evaluation turns on 1 if the civil servant is ranked outstanding. It remains zero otherwise.
Table 12: The effect of seniority of job link at different quantiles of subjective performance evaluation of new recruits

<table>
<thead>
<tr>
<th>Performance evaluation conditional on exp, exp^2, cohort, rank &amp; cohort*rank FE</th>
<th>Mean</th>
<th>10th</th>
<th>20th</th>
<th>30th</th>
<th>40th</th>
<th>50th</th>
<th>60th</th>
<th>70th</th>
<th>80th</th>
<th>90th</th>
</tr>
</thead>
<tbody>
<tr>
<td>JL</td>
<td>-0.02</td>
<td>-0.03***</td>
<td>-0.03***</td>
<td>-0.04***</td>
<td>-0.04***</td>
<td>-0.02***</td>
<td>-0.01***</td>
<td>-0.01***</td>
<td>-0.01***</td>
<td>-0.00</td>
</tr>
<tr>
<td>(0.04)</td>
<td>(0.01)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
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<td>4008</td>
<td>4008</td>
<td>4008</td>
<td>4008</td>
<td>4008</td>
</tr>
</tbody>
</table>

Bootstrapped standard errors in parenthesis (1000 replications)

* p<0.10 ** p<0.05 *** p<0.01

The dataset is a civil servant - month panel. Performance evaluation is subjective evaluation by the immediate boss of the civil servant. The variable performance evaluation turns on 1 if the civil servant is ranked outstanding. It remains zero otherwise. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job. Experience is years spent in the civil services. Bootstrapped standard errors with 1000 replications are reported in parenthesis for the quantile regressions. All standard errors are clustered at the cohort level.
Table 13: The reduced form effect of the seniority of potential job link at different quantiles of performance evaluation of new recruits

<table>
<thead>
<tr>
<th>Performance evaluation conditional on exp, exp^2, cohort, rank &amp; cohort*rank FE</th>
<th>Mean</th>
<th>10th</th>
<th>20th</th>
<th>30th</th>
<th>40th</th>
<th>50th</th>
<th>60th</th>
<th>70th</th>
<th>80th</th>
<th>90th</th>
</tr>
</thead>
<tbody>
<tr>
<td>JLP</td>
<td>-0.08***</td>
<td>-0.07***</td>
<td>-0.06***</td>
<td>-0.07***</td>
<td>-0.06***</td>
<td>-0.05***</td>
<td>-0.03***</td>
<td>-0.02***</td>
<td>-0.01***</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.00)</td>
<td>(0.01)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.16)</td>
</tr>
</tbody>
</table>

Obs 4008 4008 4008 4008 4008 4008 4008 4008 4008 4008

Bootstrapped standard errors in parenthesis (1000 replications)

* p<0.10 ** p<0.05 *** p<0.01

The dataset is a civil servant - month panel except the potential network rank which is at the civil servant cohort-month level. Performance evaluation is subjective evaluation by the immediate boss of the civil servant. The variable performance evaluation turns on 1 if the civil servant is ranked outstanding. It remains zero otherwise. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job. Experience is years spent in the civil services. Bootstrapped standard errors with 1000 replications are reported in parenthesis for the quantile regressions. All standard errors are clustered at the cohort level.

Figure 10: The reduced form effect of seniority of potential job link at different quantiles of subjective performance evaluation of new recruits conditional on exp, exp^2, cohort, rank & cohort*rank FE
Table 14: The effect of seniority of the job link on tax targets set by BOR

<table>
<thead>
<tr>
<th></th>
<th>Tax Target (Rs. in million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Seniority of Job Link</td>
<td>-2.95*</td>
</tr>
<tr>
<td></td>
<td>(1.72)</td>
</tr>
<tr>
<td>Seniority of Potential Job Link</td>
<td>-1.44</td>
</tr>
<tr>
<td>Observations</td>
<td>1479</td>
</tr>
<tr>
<td>Experience</td>
<td>Yes</td>
</tr>
<tr>
<td>Experience²</td>
<td>Yes</td>
</tr>
<tr>
<td>Cohort FE</td>
<td>Yes</td>
</tr>
<tr>
<td>Time FE</td>
<td>Yes</td>
</tr>
<tr>
<td>Job location FE</td>
<td>No</td>
</tr>
</tbody>
</table>

Clustered standard errors in parenthesis
* p<0.10 ** p<0.05 *** p<0.01
Tax targets (rupees in million) is the annual tax target set by the Board of Revenue. Seniority of (potential) entry-level job link is the 75th percentile of the official promotion of the (potential) links that new recruits get at their entry-level job. Experience is years spent in the civil services. Standard errors are clustered at the cohort level.

Table 15: Correlation between end of training and AC vacancies

<table>
<thead>
<tr>
<th></th>
<th>AC Vacancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All districts</td>
</tr>
<tr>
<td>Training end (dummy)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td>Observations</td>
<td>1173784</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
</tr>
<tr>
<td>Tehsil FE</td>
<td>No</td>
</tr>
</tbody>
</table>

Clustered standard errors in parenthesis
* p<0.10 ** p<0.05 *** p<0.01
The dataset is a tehsil-month panel. Training end (dummy) turns on 1 a day before the end of on-the-job training of newly recruited civil servants. It stays zero otherwise. AC vacancy is a dummy that turns on 1 whenever the Assistant Commissioner (AC) position is vacant in a tehsil. It remains zero otherwise. Large districts include Rawalpindi, Lahore, Multan, Gujranwala, Faisalabad, Sargodha, Bahawalpur and Sialkot. Standard errors are clustered at the tehsil level.
<table>
<thead>
<tr>
<th>AC Vacancy</th>
<th>All districts</th>
<th>All districts</th>
<th>Large districts</th>
<th>Large districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training end (dummy)</td>
<td>-0.001</td>
<td>-0.000</td>
<td>-0.001</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Observations</td>
<td>1173784</td>
<td>1173784</td>
<td>387492</td>
<td>387492</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Tehsil FE</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Clustered standard errors in parenthesis

* p<0.10 ** p<0.05 *** p<0.01

The dataset is a tehsil-month panel. Training end (dummy) turns on 1 a month before the end of on-the-job training of newly recruited civil servants. It stays zero otherwise. AC vacancy is a dummy that turns on 1 whenever the Assistant Commissioner (AC) position is vacant in a tehsil. It remains zero otherwise. Large districts include Rawalpindi, Lahore, Multan, Gujranwala, Faisalabad, Sargodha, Bahawalpur and Sialkot. Standard errors are clustered at the tehsil level.
Appendix

A Proof of Lemma 4.2

Proof. Suppose both the PC and the LLC don’t bind. Then rewriting the CM’s problem without the non-binding constraints:

\[
\max_{\pi_h, \overline{R}_h, \pi_l, \overline{R}_l} e_h(y - \overline{R}_h) + (1 - e_h)(0 - \overline{R}_h) + e_l(y - \overline{R}_l) + (1 - e_l)(0 - \overline{R}_l)
\]

subject to

\[
\max_{e_h} \sqrt{e_h \overline{R}_h + (1 - e_h)\overline{R}_h} - \frac{e_h}{\theta} = 0 (33)
\]

\[
\max_{e_l} \sqrt{e_l \overline{R}_l + (1 - e_l)\overline{R}_l} - e_l = 0 (34)
\]

Taking the FOC of equation [33] i.e. the incentive compatibility constraint of H yields

\[
\frac{\overline{R}_h - \overline{R}_l}{2\sqrt{e_h \overline{R}_h + (1 - e_h)\overline{R}_h}} - \frac{1}{\theta} = 0
\]

\[
\Rightarrow e_h = \frac{(\overline{R}_h - \overline{R}_l)(\theta)^2}{4} - \frac{\overline{R}_h}{\overline{R}_h - \overline{R}_l} (36)
\]

Taking the FOC of equation [34] i.e. the incentive compatibility constraint of L yields

\[
\frac{\overline{R}_l - \overline{R}_l}{2\sqrt{e_l \overline{R}_l + (1 - e_l)\overline{R}_l}} - 1 = 0
\]

\[
\Rightarrow e_l = \frac{\overline{R}_l - \overline{R}_l}{4} - \frac{\overline{R}_l}{\overline{R}_l - \overline{R}_l} (38)
\]

Using equations [36] and [38] in the CM’s problem yields:

\[
\max_{\pi_h, \overline{R}_h, \pi_l, \overline{R}_l} \frac{(\overline{R}_h - \overline{R}_l)(\theta)^2 y}{4} - \frac{R_h y}{\overline{R}_h - \overline{R}_h} - \frac{R_l y}{\overline{R}_l - \overline{R}_l} - \frac{(\overline{R}_h - \overline{R}_l)(\theta)^2}{2} + \frac{(\overline{R}_l - \overline{R}_l)y}{4} - \frac{R_l y}{\overline{R}_l - \overline{R}_l} - \frac{(\overline{R}_l - \overline{R}_l)}{2}
\]

Taking FOC with respect to \(\overline{R}_h\) and \(\overline{R}_h\) respectively yields the following:

\[
\frac{\theta^2 y}{4} - \frac{R_h y(-1)}{(\overline{R}_h - \overline{R})^2} - \frac{(\overline{R}_h - \overline{R}_l)(\theta)^2}{2} = 0
\]

\[
- \frac{\theta^2 y}{4} - \frac{y}{\overline{R}_h - \overline{R}_h} - \frac{R_h y}{(\overline{R}_h - \overline{R}_l)^2} + \frac{(\overline{R}_h - \overline{R}_l)(\theta)^2}{2} = 0
\]

Solving equation [39] and [40] simultaneously gives \(y=0\) which is a contradiction as \(y \in \mathbb{R}_+\). A similar argument while taking the FOC for \(\overline{R}_l\) and \(\overline{R}_l\) also yields \(y=0\) which again is a contradiction. Hence, it can’t be that both LLC and PC don’t bind.

Now suppose that both the participation constraint and the limited liability constraint bind and \(\overline{R}_h = \overline{R}_l = 0\). Using \(\overline{R}_h = \overline{R}_l = 0\) in the CM’s problem I get:

\[
\max_{\overline{R}_h, \overline{R}_l} e_h(y - \overline{R}_h) + e_l(y - \overline{R}_l)
\]
subject to

\[ \sqrt{e_h R_h - \frac{e_h}{\vartheta}} = 0 \]  \hspace{1cm} (41)  \\
\[ \sqrt{e_l R_l - e_l} = 0 \]  \hspace{1cm} (42)  \\
\[ \max_{e_h} \sqrt{e_h R_h - \frac{e_h}{\vartheta}} \]  \hspace{1cm} (43)  \\
\[ \max_{e_l} \sqrt{e_l R_l - e_l} \]  \hspace{1cm} (44)

Maximising the agent’s incentive compatibility constraint I get the following FOC for \( e_h \) \( e_l \) respectively:

\[ \frac{R_h}{2 \sqrt{e_h R_h}} - \frac{1}{\vartheta} \]  \hspace{1cm} (45)  \\
\[ \Rightarrow e_h = \frac{R_h \theta^2}{4} \]  \hspace{1cm} (46)  \\
\[ \frac{R_l}{2 \sqrt{e_l R_l}} - 1 \]  \hspace{1cm} (47)  \\
\[ \Rightarrow e_l = \frac{R_l}{4} \]  \hspace{1cm} (48)

Use \( e_h \) and \( e_l \) above to rewrite the CM’s problem:

\[ \max_{R_h, R_l} \frac{R_h \theta^2}{4} (y - R_h) + \frac{R_l}{4} (y - R_l) \]

subject to

\[ \sqrt{\frac{R_h^2 \theta^2}{4} - \frac{R_h \theta}{4}} = 0 \]  \hspace{1cm} (49)  \\
\[ \sqrt{\frac{R_l^2}{4} - \frac{R_l}{4}} = 0 \]  \hspace{1cm} (50)

Simplifying the PC of H I get:

\[ \frac{R_h \theta}{2} - \frac{R_h \theta}{4} = 0 \]  \hspace{1cm} (51)  \\
\[ \frac{R_h \theta}{4} = 0 \]  \hspace{1cm} (52)  \\
\[ \Rightarrow R_h = 0 \]  \hspace{1cm} (53)  \\
\[ \Rightarrow e_h^* = 0 \]  \hspace{1cm} (54)

Similarly simplifying the PC of L I get:
\[
\frac{R_l}{2} - \frac{R_l}{4} = 0 \quad (55)
\]
\[
\frac{R_l}{4} = 0 \quad (56)
\]
\[
\Rightarrow R_l^* = 0 \quad (57)
\]
\[
\Rightarrow e_l^* = 0 \quad (58)
\]
As \(e_h, e_l, \bar{R}_h, \bar{R}_l\) are all equal to zero this results in the EU of the CM to be zero. In the case where PC doesn’t bind effort levels and promotions are positive and so is the CM’s expected utility. Therefore, it can’t be that both LLC and PC bind. Either the participation constraint or the limited liability constraint for each type binds.

\[\Box\]

**B Proof of Proposition 4.3**

*Proof.* Rewriting the CM’s problem without LLC and binding PC for H and L I get:

\[
\max_{R_h, R_l, \bar{R}_h, \bar{R}_l} e_h(y - \bar{R}_h) + (1 - e_h)(0 - \bar{R}_h) + e_l(y - \bar{R}_l) + (1 - e_l)(0 - \bar{R}_l)
\]

subject to

\[
\sqrt{e_h \bar{R}_h + (1 - e_h)R_h} - \frac{e_h}{\theta} = 0 \quad (59)
\]
\[
\sqrt{e_l \bar{R}_l + (1 - e_l)R_l} - e_l = 0 \quad (60)
\]
\[
\max_{e_h} \sqrt{e_h \bar{R}_h + (1 - e_h)R_h} - \frac{e_h}{\theta} \quad (61)
\]
\[
\max_{e_l} \sqrt{e_l \bar{R}_l + (1 - e_l)R_l} - e_l \quad (62)
\]

Taking the FOC of equation (61) i.e. the incentive compatibility constraint of H yields

\[
\frac{\bar{R}_h - R_h}{2\sqrt{e_h \bar{R}_h + (1 - e_h)R_h}} - \frac{1}{\theta} = 0 \quad (63)
\]
\[
\Rightarrow e_h = \frac{(\bar{R}_h - R_h)(\theta^2)}{4} - \frac{R_h}{\bar{R}_h - R_h} \quad (64)
\]

Taking the FOC of equation (62) i.e. the incentive compatibility constraint of L yields

\[
\frac{\bar{R}_l - R_l}{2\sqrt{e_l \bar{R}_l + (1 - e_l)R_l}} - 1 = 0 \quad (65)
\]
\[
\Rightarrow e_l = \frac{\bar{R}_l - R_l}{4} - \frac{R_l}{\bar{R}_l - R_l} \quad (66)
\]
Rearrange PC of H and L respectively:

\[ e_h \overline{R}_h + (1 - e_h) \overline{R}_h = \left( \frac{e_h}{\theta} \right)^2 \]  

(67)

\[ e_l \overline{R}_l + (1 - e_l) \overline{R}_l = e_l^2 \]  

(68)

Use equations 64, 66, 67 and 68 to rewrite the maximization problem of the CM for H and L respectively I get:

\[
\max_{\overline{R}_h, \overline{R}_l} \frac{(\overline{R}_h - \overline{R}_h)(\theta^2 y)}{4} - \frac{R_h y}{\overline{R}_h - \overline{R}_h} - \frac{1}{\theta^2} \left( \frac{R_h}{\overline{R}_h - \overline{R}_h} \right)^2
\]

\[
\max_{\overline{R}_l, \overline{R}_l} \frac{(\overline{R}_l - \overline{R}_l)(\theta^2 y)}{4} - \frac{R_l y}{\overline{R}_l - \overline{R}_l} - \frac{1}{\theta^2} \left( \frac{R_l}{\overline{R}_l - \overline{R}_l} \right)^2
\]

Taking the FOC for \( \overline{R}_h, \overline{R}_h \) respectively:

\[
\frac{\theta^2 y}{4} - \frac{R_h y(-1)}{(\overline{R}_h - \overline{R}_h)^2} - \frac{2}{\theta^2} \left( \frac{\overline{R}_h - R_h}{\overline{R}_h - \overline{R}_h} \right) \left( \frac{\theta^2}{4} - \frac{R_h(-1)}{(\overline{R}_h - \overline{R}_h)^2} \right) = 0 \]  

(69)

\[
- \frac{\theta^2 y}{4} - \frac{R_h y}{\overline{R}_h - \overline{R}_h} - \frac{2}{\theta^2} \left( \frac{\overline{R}_h - R_h}{\overline{R}_h - \overline{R}_h} \right) \left( - \frac{\theta^2}{4} - \frac{R_h}{(\overline{R}_h - \overline{R}_h)^2} - \frac{1}{\overline{R}_h - \overline{R}_h} \right) = 0 \]  

(70)

Solving 69 and 70 yields:

\[
\frac{y \theta^2}{2} = \frac{(\overline{R}_h - R_h)(\theta^2 y)}{4} - \frac{R_h}{\overline{R}_h - \overline{R}_h} \]  

(71)

From equation 64 the RHS of 71 is \( e_h \) and the LHS from Proposition 4.1 is \( e_h^{FB} \). Therefore, effort is first best in this case. Similarly taking FOC with respect to \( \overline{R}_l, \overline{R}_l \) respectively:

\[
\frac{y}{4} + \frac{R_l y}{(\overline{R}_l - \overline{R}_l)^2} - \frac{2}{\theta^2} \left( \frac{\overline{R}_l - R_l}{\overline{R}_l - \overline{R}_l} \right) \left( \frac{1}{4} + \frac{R_l}{(\overline{R}_l - \overline{R}_l)^2} \right) = 0 \]  

(72)

\[
- \frac{y}{4} - \frac{R_l y}{\overline{R}_l - \overline{R}_l} - \frac{2}{\theta^2} \left( \frac{\overline{R}_l - R_l}{\overline{R}_l - \overline{R}_l} \right) \left( - \frac{1}{4} - \frac{R_l}{(\overline{R}_l - \overline{R}_l)^2} - \frac{1}{\overline{R}_l - \overline{R}_l} \right) = 0 \]  

(73)

Solving 72 and 73 simultaneously yields:

\[
\frac{y}{2} = \frac{\overline{R}_l - R_l}{\overline{R}_l - \overline{R}_l} \]  

(74)

The LHS of 74 is \( e_l^{FB} \) from Proposition 4.1 and the RHS is \( e_l \) from equation 66. Therefore, effort is first best in this case for both H and L.

\[ \square \]
C Proof of Proposition 4.4

Proof. Using $R_h, R_l = 0$ and the fact that both PCs don't bind I can rewrite the CM’s maximization problem as:

$$\max_{\tilde{R}_h, \tilde{R}_l} e_h(y - \tilde{R}_h) + e_l(y - \tilde{R}_l)$$

subject to

$$\max_{e_h} \sqrt{\epsilon_h(R_h - \frac{e_h}{\theta}}$$

$$\max_{e_l} \sqrt{\epsilon_l(R_l - e_l}$$

Maximising the agent’s incentive compatibility constraint I get the following expressions for $e_h$ and $e_l$ respectively:

$$\frac{R_h}{2\sqrt{e_hR_h}} - 1 = 0$$

$$\Rightarrow e_h = \frac{\tilde{R}_h\theta^2}{4}$$

$$\frac{R_l}{2\sqrt{e_lR_l}} - 1 = 0$$

$$\Rightarrow e_l = \frac{\tilde{R}_l}{4}$$

Use $e_h$ and $e_l$ above to rewrite the CM’s problem:

$$\max_{\tilde{R}_h, \tilde{R}_l} \frac{\tilde{R}_h\theta^2}{4}(y - \tilde{R}_h) + \frac{\tilde{R}_l}{4}(y - \tilde{R}_l)$$

The first order conditions for $\tilde{R}_h, \tilde{R}_l$ respectively are:

$$\frac{\theta^2y}{4} - 2\tilde{R}_h\frac{\theta^2}{4} = 0$$

$$\Rightarrow \tilde{R}_h^{CM} = \frac{y}{2}$$

$$\frac{y}{4} - 2\tilde{R}_l\frac{\theta^2}{4} = 0$$

$$\Rightarrow \tilde{R}_l^{CM} = \frac{y}{2}$$

Using expressions for $\tilde{R}_h, \tilde{R}_l$ in effort I get

$$e_h^{CM} = \frac{y\theta^2}{8} = \frac{e_h^{FB}}{4}$$

$$e_l^{CM} = \frac{y}{8} = \frac{e_l^{FB}}{4}$$

Although $\frac{\partial e_h^{CM}}{\partial \theta} > 0$, however, $\frac{\partial R_l^{CM}}{\partial \theta} = 0$. Even if the high type becomes more efficient, as $\theta$ rises, it doesn’t translate into an increase in promotions.

\[\square\]
Figure A.1: End of on-the-job training of PAS cohorts
Figure A.2: Rank by years for 1981-2005 cohorts
Figure A.3: Compliance with the Tenure/Transfer policy
Figure A.4: Historical tax collection record in the Board of Revenue
Figure A.5: The BOR tax collection pro forma

Figure A.6: The BOR tax collection pro forma duly verified by District Accounts Officer
Figure A.7: Career Chart of civil servants in Punjab

Figure A.8: Incumbency board - Assistant Commissioner office Multan City
Figure A.9: Kernel density of tax performance of all civil servants and new recruits

Figure A.10: Example of termination of training despite a delay in report submission
Figure A.11: The actual network of all civil servants for all months

Figure A.12: The actual network of new recruits in the first month of ACship
Figure A.13: The potential network of all civil servants for those months where on the job training ended.

Figure A.14: The potential network of new recruits at the end of on the job training.
Table A1: Criteria for promotion for federal and provincial civil services

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Federal civil servants</th>
<th>Provincial civil servants</th>
<th>Provincial civil servants</th>
<th>Provincial civil servants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAS</td>
<td>PMS (starting 2004)</td>
<td>PCS</td>
<td>PSS</td>
</tr>
<tr>
<td>Determination of intra-cohort seniority</td>
<td>Pre-2012: Entry exam,</td>
<td>Post-2012: Entry exam</td>
<td>Same as PMS</td>
<td>Same as PMS</td>
</tr>
<tr>
<td></td>
<td>academic training</td>
<td>Training - 50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp; Final Passing exam</td>
<td>Final Passing - 25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(FPOE)</td>
<td>(FPOE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum experience</td>
<td>Pre-1989: 5 years in</td>
<td>Post-1989: none</td>
<td>Same as PAS</td>
<td>Same as PMS</td>
</tr>
<tr>
<td></td>
<td>grade 17</td>
<td></td>
<td>Pre-1989: none</td>
<td>Post-1989: none</td>
</tr>
<tr>
<td></td>
<td>grade 18</td>
<td></td>
<td>Post-1989: Same as PAS</td>
<td>Post-1989: Same as PAS</td>
</tr>
<tr>
<td></td>
<td>grade 19</td>
<td></td>
<td>Same as PAS</td>
<td>Same as PMS</td>
</tr>
<tr>
<td></td>
<td>grade 20</td>
<td></td>
<td>Pre-2007: 1. grade 19 &amp;</td>
<td>Pre-2010: no PER</td>
</tr>
<tr>
<td></td>
<td>grade 21</td>
<td></td>
<td>- below - 50</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td>grade 20, 21 - 70 &amp; 75</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. 100% wt to PER</td>
<td></td>
</tr>
<tr>
<td>Final remarks in performance evaluation</td>
<td>Pre-2007: 1. grade 18</td>
<td>Pre-2010: grade 18 - none</td>
<td>Same as PMS</td>
<td>Same as PMS</td>
</tr>
<tr>
<td>report (PER) quantified &amp; used as a threshold</td>
<td>grade 19</td>
<td>grade 19 - 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>grade 20</td>
<td>grade 20 - 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>grade 21</td>
<td>grade 21 - 75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 (a) 100 % wt to PER</td>
<td></td>
<td>70 % PER</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in grade 18,19</td>
<td></td>
<td>Weight:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) in grade &gt;20</td>
<td></td>
<td>15 % training eval.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 % PER</td>
<td></td>
<td>15 % PSB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 % training eval.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 % CSB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality &amp; Output of Work &amp; Integrity remarks</td>
<td>Pre-2007: no</td>
<td>Pre-2007: no</td>
<td>Same as PMS</td>
<td>Same as PMS</td>
</tr>
<tr>
<td>in PER quantified</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>grade 18 - no</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>grade 19 - no</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>grade 20 - yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>grade 21 - yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 (a) 100 % wt to PER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>in grade 18,19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) in grade &gt;20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 % PER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 % training eval.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 % CSB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandatory</td>
<td>grade 18 - CTP &amp; STP</td>
<td>grade 18 - induction trg</td>
<td>Pre-2004</td>
<td>Pre-2004</td>
</tr>
</tbody>
</table>

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Table A1 – Criteria for promotion for federal and provincial civil servants - Cont’d

<table>
<thead>
<tr>
<th>Training</th>
<th>Grade 19 - MCMC (since 2009)</th>
<th>Grade 19- MCMC</th>
<th>Grade 20 - SMC</th>
<th>Grade 21 - NMC</th>
<th>Post-2004</th>
<th>Post-2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MCMC</td>
<td>no</td>
<td>SMC</td>
<td>NMC</td>
<td>same as PMS</td>
<td>same as PMS</td>
</tr>
</tbody>
</table>

Note: Quantification of PER is 10, 8, 7, 5, 1 and 0 for outstanding, very good, good, average, below average and poor respectively.

Promotions of Provincial Civil Services: PMS, PCS and PSS

The minimum length of service criteria was first introduced for PCS and PSS in 1989. PMS has always faced the minimum experience requirement for promotions. For promotions to grade 18, 19, 20, 21 the minimum length of service required is 5, 12, 17, 22 years in grade 17 respectively. In addition, training became mandatory for all provincial civil servants with the creation of PMS. For promotion to grade 18 all provincial civil servants were meant to complete the induction training. Moreover, with the creation of PMS, promotion to grade 19, 20 and 21 required Mid Career Management Course (MCMC), Senior Management Course (SMC) and National Management Course (NMC) respectively. Government nominates civil servants cohort-by-cohort for training. Once nominated for training, sometimes civil servants request for a deferment for personal or professional reasons. Although training became mandatory for provincial civil services in 2004 the actual implementation has been significantly delayed.

Nominations of provincial civil servants have been very slow and so this delays their promotions considerably.

Unlike the PAS, quality, output of work and integrity remarks in the performance evaluation reports have never been part of the promotion criteria for any provincial civil service. Moreover, till 2010, efficiency index never played a role in promotions of provincial civil servants. However, Promotion Policy, 2010 changed that. Under the policy grade 19 and above were classified as selection posts and efficiency index based on PER (70%), training (15%) and remarks by the Provincial Selection Boards (PSB) (15%) were introduced as eligibility criteria for consideration for promotion. For the purposes of quantification of PER, summary remarks from the immediate boss on the overall performance of the civil servant are used. These include outstanding, very good, good, average, below average and poor. Quantification is carried out as 10, 8, 7, 5, 1 and 0 for outstanding, very good, good, average, below average and poor respectively with differential weights given to more recent PERs. For promotion to grade 19, 20 and 21 a civil servant should have a total of 60, 70 and 75 respectively on the efficiency index. Promotions for grade 18 remained on the principle of seniority-cum-fitness, without efficiency index considerations. It is worth noting that although efficiency index were introduced for grade 19 and above it was still only an eligibility condition. Seniority is respected for promotions for those civil servants that become eligible for promotion. This is irrespective of the efficiency index.

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31Punjab Provincial Management Services (PMS) Rules, 2004
32Punjab Civil Servants Minimum Length of Service for Promotion, Rules, 1989, 2003 and 2010
33Chaudhry Aamer Waqas ‘Govt finalises recommendations for ‘disappointed’ PCS officers’, The Nation, 7th May 2010
34PERs are to be completed by the immediate boss if he or she has remained the boss for at least 3 months. However, after 3 months there is one PER from the immediate boss every calendar year.
Promotions of Pakistan Administrative Services (PAS)

Depending on the rank, PAS civil servants become eligible for promotions based on completing three sets of requirements: mandatory training, a minimum number of years of experience in any one grade and getting the requisite aggregate score on an efficiency index. The civil servants that cross the eligibility threshold are then promoted based on seniority. Like the provincial civil services, once eligible for promotion PAS civil servants are never superseded no matter what his or her score was on the efficiency index. Similar to the provincial civil services, for promotions to grade 18, 19, 20, 21 the minimum length of service required is 5, 12, 17, 22 years in grade 17 respectively. The mandatory training requirements for promotion to different grades is as follows: For PAS the Specialized Training Programme (STP) for PAS and the Common Training Programme (CTP) for promotion from grade 17 to 18; a Mid-Career Management Course (MCMC) for promotion from grade 18 to 19; Senior Management Course (SMC) for promotion from grade 19 to 20; National Management Course (NMC) for promotion from grade 20 to 21; Executive Development Course for promotion from grade 21 to 22.

For promotion to grade 18, 19, 20 and 21 the efficiency index threshold is 50, 60, 70 and 75 respectively. The way that the efficiency index is drawn depends on whether the grade for promotion is a selection or a non-selection grade. Section 9 (2) and (3) of Civil Servants Act, 1973 states:

(2) A post......may either be a selection post or a non selection post to which promotions shall be made as may be prescribed:(a) in the case of a selection post, on the basis of selection on merit; and (b) in the case of a non-selection post, on the basis of seniority-cum-fitness. (3) Promotion to posts in basic pay scales 20 and 21 and equivalent shall be made on the recommendations of a Selection Board which shall be headed by the Chairman, Federal Public Service Commission.

For both selection and non-selection grades the sections of the PER on overall remark is quantified as 10, 8, 7, 5, 1, 0 for outstanding, very good, good, average, below average and poor respectively. Moreover, for selection grades the 'quality and output of work' section of the PERs is also quantified in a similar fashion. The other difference is the weight attributed to PER. While in the case of non-selection grades 100% weight is given to PERs, in the case of selection grades only 70% weight is given to PERs. The rest is split equally between training evaluations and evaluation of Central Selection Board (CSB).

A quantification of 50 required for promotion from 17 to 18 grade means that the civil servant is rated at least as an average civil servant by the superiors. In my sample 0% get an overall PER remark below average. 6.4% are rated as average, 40.07% good, 47.72% very good and only 5.81% are rated as outstanding. The lower efficiency threshold for lower grades mean that for promotion to grade 18 the real hurdle is minimum experience and training.

Figure A.2 below shows the mean rank of the PAS civil servants for different cohorts over years. A perfect step function would mean that there were enough vacancies so that the entire cohort was promoted together in any particular year. Anything less than that means that the promotions have been sequential for each cohort, with some individuals in the cohort being promoted before others. In the figure it can be seen that promotions from grade 17 to 18 are in sync with the minimum length of experience requirement i.e. 5 years of recruitment in

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35 O.M.No.1/9/80-R-II(A), dated 12th January, 1981
36 All PERs and training reports in the present grade and previous grade(s) should be weighted 60:40 (Section 4 of the Revision of Promotion Policy 2007, read with Promotion Policy 1982).
37 Till 2007 grade 19 was also a selection post. In 2007, it was reverted to a non-selection post (Revision of the Promotion Policy (October 2007) Secretariat Instruction number 162-A).
38 Section 7 (b) of the Revision of the Promotion Policy (October 2007) Secretariat Instruction number 162-A
this case and are mostly a step function (with the exception of the 1993-94 cohort). However, delays start occurring in the later stages of the civil servant’s career when there are more civil servants that have achieved the requisite threshold needed to be promoted than vacancies and there are threshold requirements. In addition the lines for each cohort should run in parallel if promotions are cohort by cohort. This holds true for promotion to 18, however, it can be seen that there have been instances in promotions to grade 19 and above when a junior cohort is promoted before the senior. This can be the result of lower value in the efficiency index so that the officer of the senior grade is not considered eligible for promotion or for any of the reasons for deferment of promotion listed earlier. However, it can also be seen that after a short while the situation is self correcting so that the cohort-by-cohort promotions largely stay in tact.
### Table A2: Network Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Actual Network Overall</th>
<th>New recruits</th>
<th>Potential Network Overall</th>
<th>New recruits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>across months-yrs in civil service (undirected graph)</td>
<td>in first months of the first AC job (directed graph)</td>
<td>across the month of end of on the job training (undirected graph)</td>
<td>end of on the job training (directed graph)</td>
</tr>
<tr>
<td>Average degree</td>
<td>92.743</td>
<td>5.180</td>
<td>318.478</td>
<td>52.665</td>
</tr>
<tr>
<td>Degree centralization</td>
<td>0.191</td>
<td>0.055</td>
<td>0.402</td>
<td>0.189</td>
</tr>
<tr>
<td>Density</td>
<td>0.047</td>
<td>0.003</td>
<td>0.161</td>
<td>0.027</td>
</tr>
<tr>
<td>Average distance</td>
<td>2.222</td>
<td>4.080</td>
<td>1.706</td>
<td>2.808</td>
</tr>
<tr>
<td>Diameter</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Overall clustering coeff</td>
<td>0.435</td>
<td>0.336</td>
<td>0.805</td>
<td>0.235</td>
</tr>
<tr>
<td>Wtd. overall clustering coeff</td>
<td>0.378</td>
<td>0.227</td>
<td>0.668</td>
<td>0.052</td>
</tr>
<tr>
<td>Average eigenvector centrality</td>
<td>0.014</td>
<td>0.004</td>
<td>0.016</td>
<td>0.014</td>
</tr>
<tr>
<td>Eigenvector centralization percentage</td>
<td>11.236</td>
<td>34.164</td>
<td>4.894</td>
<td>11.633</td>
</tr>
<tr>
<td>Freeman betweenness centrality</td>
<td>978.451</td>
<td>390.919</td>
<td>331.515</td>
<td>36.391</td>
</tr>
<tr>
<td>Freeman nbetweenness centrality</td>
<td>0.050</td>
<td>0.010</td>
<td>0.017</td>
<td>0.001</td>
</tr>
<tr>
<td>Network centralization index (%)</td>
<td>0.67</td>
<td>0.63</td>
<td>0.47</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Note: