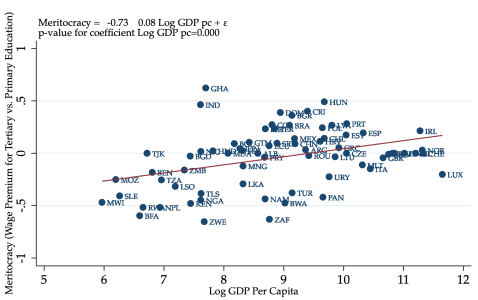
Online Appendix

Promotions and Productivity: The Role of Meritocracy and Pay Progression in the Public Sector

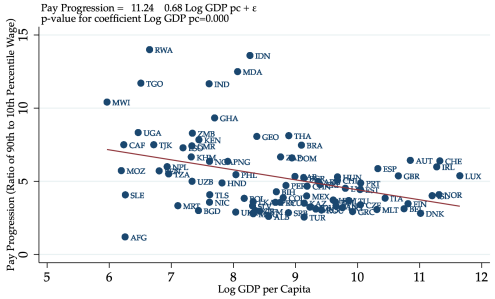
Erika Deserranno, Philipp Kastrau, and Gianmarco León-Ciliotta

FIGURE A.1. CROSS-COUNTRY ANALYSIS OF MERITOCRACY, PAY PROGRESSION AND GOVERNMENT PERFORMANCE BY GDP PER CAPITA

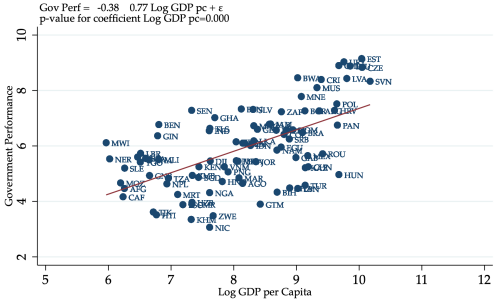
Panel A: Correlation between Meritocracy and GDP per Capita



Panel B: Correlation between Pay Progression and GDP per Capita

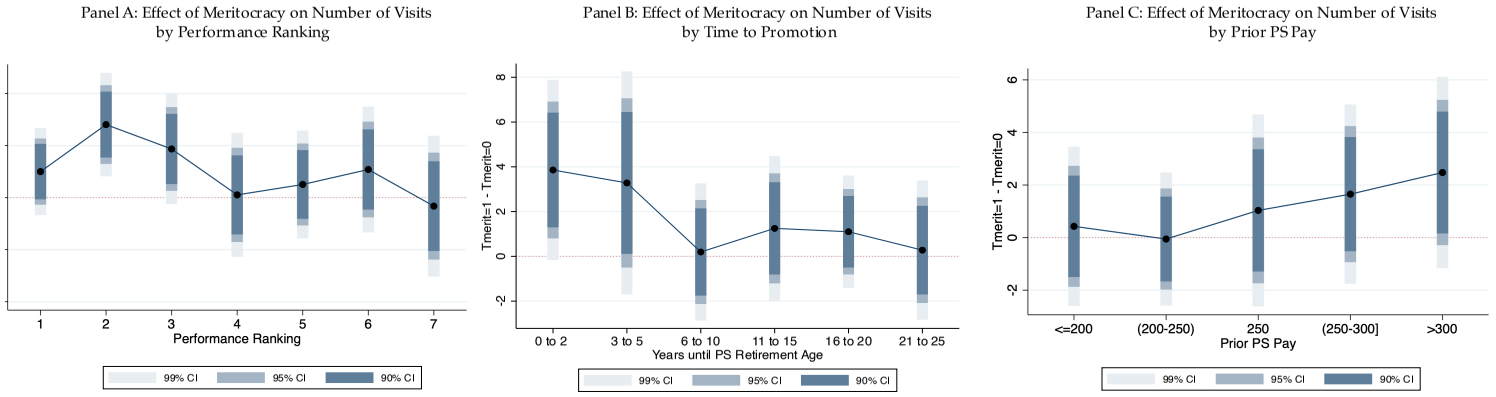


Panel C: Correlation between Government Performance and GDP per Capita



Notes: One observation per country. The red solid line represents the linear regression of meritocracy (Panel A), pay progression (Panel B) and government performance (Panel C) on log GDP per capita, with robust standard errors and no controls. For each country, we use data for the most recent year for which we have information on meritocracy, pay progression, government performance and GDP per capita (2018 or 2017 in most countries). Pay progression is measured by the World Bank's Worldwide Bureaucracy Indicators as the ratio of the 90th percentile wage to the 10th percentile wage in the public sector. Meritocracy is measured by the World Bank's Worldwide Bureaucracy Indicators as the average wage premium for workers with a tertiary education vs. a primary education in the public sector relative to the private sector. (Differences between the public and private sectors are used to hold fixed country-level characteristics such as the fraction of workers with a tertiary or primary education.) Government performance is measured by the Gothenburg's Quality of Government Indicators as an index of 4 government scores (1-10): steering capability, resource efficiency, consensus building, and international cooperation. Log GDP per capita is measured by the World Development Indicators.

FIGURE A.2. EFFECT OF MERITOCRACY ON THE NUMBER OF VISITS BY PERFORMANCE RANKING, TIME TO PROMOTION AND PRIOR PS PAY



Notes: This figure plots the effect of Tmerit by performance ranking (Panel A), time to promotion (Panel B) and prior about PS pay (Panel C). In Panel A, we plot the coefficients from regressing the number of visits on Tmerit, dummy variables for a worker's rank (see x-axis) and the interaction of Tmerit with each dummy variable, controlling for the stratification variables and with standard errors clustered at the PHU level. In Panel B, we plot the coefficients from regressing the number of visits on Tmerit, dummy variables for different times to promotion (see x-axis), and the interaction of Tmerit with each dummy variable, controlling for the stratification variables and with standard errors clustered at the PHU level. In Panel C, we estimate an extended version of equation (3) with five different level of priors PS pay and we report the estimates of the β's coefficients. "Number of Visits" is the average number of household visits provided by the CHW (as reported by the households).

Table A.1—Summary Statistics and Balance Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Tmerit		Tpay		Tmerit × Tpay	
	Mean	S.D.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.
Panel A: PS characteristics (N=372)								
Male = {0, 1}	0.919	0.273	0.043	(0.031)	-0.000	(0.037)	-0.105*	(0.054)
Age (in years)	37.84	8.856	0.433	(1.336)	-1.449	(1.281)	0.715	(1.785)
Completed primary education = {0, 1}	0.739	0.440	-0.001	(0.066)	0.031	(0.065)	0.015	(0.091)
Completed secondary education or above = {0, 1}	0.253	0.435	0.022	(0.065)	-0.010	(0.065)	-0.047	(0.091)
Wealth score (0 to 8)	3.013	1.227	0.128	(0.169)	-0.092	(0.175)	0.117	(0.240)
Health knowledge score (0 to 7)	3.481	1.371	0.045	(0.198)	0.100	(0.202)	-0.119	(0.282)
Number of years as PS	3.529	2.734	-0.139	(0.377)	-0.072	(0.386)	0.122	(0.521)
Number of CHWs PS is responsible for	7.984	2.861	-0.381	(0.405)	-0.441	(0.407)	0.743	(0.575)
Number of hours worked as PS per week	11.16	33.97	-0.420	(5.636)	-5.758	(4.217)	9.114	(7.459)
Number of years as CHW before promotion	1.823	1.978	-0.007	(0.345)	-0.243	(0.338)	-0.284	(0.458)
Number of years PS has known PHU in-charge for	4.073	6.521	1.890	(1.247)	1.038	(1.570)	-1.961	(2.000)
Panel B: CHW characteristics (N=2,009)								
Male = {0, 1}	0.726	0.446	-0.017	(0.034)	-0.023	(0.030)	-0.001	(0.048)
Age (in years)	37.03	11.22	0.111	(0.848)	-0.731	(0.780)	1.255	(1.117)
Completed primary education = {0, 1}	0.713	0.453	-0.024	(0.036)	0.018	(0.035)	0.009	(0.050)
Completed secondary education or above = {0, 1}	0.083	0.275	0.019	(0.020)	-0.018	(0.019)	-0.001	(0.027)
Wealth score (0 to 8)	2.496	1.157	0.084	(0.083)	0.008	(0.068)	0.025	(0.116)
Health knowledge score (0 to 7)	2.895	1.425	-0.065	(0.115)	-0.039	(0.110)	0.111	(0.155)
Number of years as CHW	2.212	2.828	0.346	(0.218)	0.083	(0.180)	-0.164	(0.280)
Number of households CHW is responsible for	56.90	73.98	0.944	(6.278)	-1.014	(5.520)	2.109	(8.457)
Number of hours worked as CHW per week	17.78	34.71	-0.070	(3.010)	-2.410	(2.979)	2.824	(3.832)
Number of household visits provided per week	21.47	19.93	0.350	(1.753)	0.775	(1.606)	-1.488	(2.198)
Satisfied with the PS = {0, 1}	0.762	0.426	0.073**	(0.034)	0.058	(0.036)	-0.040	(0.046)
Number of years CHW has known PS for	7.774	8.430	0.038	(0.706)	-0.283	(0.632)	0.843	(0.949)
Ever talked to the PHU in-charge = {0, 1}	0.530	0.499	-0.022	(0.048)	-0.032	(0.048)	-0.040	(0.067)
Number of years CHW has known PHU in-charge for	2.926	4.645	-0.652	(0.479)	-0.825*	(0.491)	0.613	(0.599)
PS was best-performing CHW when promoted = {0, 1}	0.411	0.492	-0.045	(0.074)	-0.022	(0.075)	0.127	(0.105)
Panel B (continued): CHW perceptions at baseline (N=2,009)								
Prior Meritocracy = {-1, 0, 1}	0.498	0.548	-0.032	(0.030)	-0.041	(0.034)	0.030	(0.044)
Prior PS Pay (in 1,000 SLL)	261.7	64.23	0.352	(3.634)	-4.474	(3.731)	0.744	(5.029)
C. Household characteristics, aggregated at village level (N=2,009)								
Age (in years)	29.15	4.990	0.115	(0.396)	0.288	(0.364)	-0.829	(0.527)
Completed primary education = {0, 1}	0.284	0.292	0.041*	(0.021)	0.024	(0.023)	-0.028	(0.032)
Number of children under 5	0.731	0.280	0.015	(0.022)	-0.020	(0.023)	-0.017	(0.033)
Wealth score (PCA)	-0.220	2.175	0.280	(0.194)	0.225	(0.189)	-0.268	(0.259)
Main occupation is farming = {0, 1}	0.605	0.369	-0.017	(0.027)	-0.045	(0.028)	0.011	(0.041)
Knew the CHW at baseline = {0, 1}	0.971	0.121	-0.005	(0.007)	-0.003	(0.007)	0.001	(0.012)
CHW is located <30 min = {0, 1}	0.870	0.273	-0.002	(0.021)	0.002	(0.022)	0.000	(0.028)
Government hospital is located <30 min = {0, 1}	0.389	0.409	0.046	(0.037)	0.031	(0.031)	-0.060	(0.047)

Notes: This table presents summary statistics and balance checks for PS, CHW and household characteristics. PS and CHW characteristics are measured at baseline, except for the last variable in Panel A and the three last variables in Panel B, which are retrospective variables from the endline survey. Household characteristics are measured at endline (retrospective questions). Each row states the sample mean and standard deviation of a variable, as well as the estimates from a regression, where the variable is regressed on an indicator for Tmerit, Tpay and Tmerit × Tpay. All regressions control for stratification variables and cluster standard errors at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.2—Effect of the Meritocracy Treatment on Beliefs Updating

	(1)	(2)	(3)	(4)	(5)
	Post-Treatment Perceptions				
Dep. Var.:	Perceived Meritocracy = {-1, 0, 1}	Number of Months until Next Promotion	PS Pay (in 1,000 SLL)	PS Number of Hours Worked	PS Work-Related Expenses (in 1,000 SLL)
Tmerit	0.296***	0.653	2.848	0.104	1.840
	(0.025)	(5.049)	(1.880)	(0.594)	(3.015)
Observations	1,982	1,387	2,009	1,940	1,932
Mean Dep. Var. if Tmerit=0	0.471	46.35	253.8	14.14	95.43

Notes: All regressions control for stratification variables. "Work-related expenses" include communication and transportation costs. The sample size varies across columns because of CHWs answering "don't know" and their answer being coded as missing. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.3—Effect of the Pay Progression Treatment on Beliefs Updating

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
	Post-Treatment Perceptions					
	|PS Pay - Truth| (in 1,000 SLL)	PS Number of Hours Worked	PS Work-Related Expenses (in 1,000 SLL)	Prior Meritocracy = {-1, 0, 1}	Number of Months until Next Promotion	PS Pay (in 1,000 SLL)
Tpay	-34.838***	0.832	4.499	-0.035	-4.081	
	(1.480)	(0.600)	(2.999)	(0.030)	(5.039)	
Tpay × 𝟙(Prior PS Pay < Truth)						29.043***
						(1.823)
Tpay × 𝟙(Prior PS Pay > Truth)						-59.685***
						(3.427)
Tpay × 𝟙(Prior PS Pay = Truth)						0.848
						(0.929)
Observations	2,009	1,940	1,932	1,982	1,387	2,009
Mean Dep. Var. if Tpay=0	35.32	13.79	94.30	0.643	49.46	260.7
… & 𝟙(Prior PS Pay < Truth)						220.7
… & 𝟙(Prior PS Pay > Truth)						309.7

Notes: All regressions control for the stratification variables. Column (6) also controls for two dummy variables: 𝟙(Prior PS Pay < Truth) and 𝟙(Prior PS Pay > Truth). 𝟙(Prior PS Pay < Truth) [resp., 𝟙(Prior PS Pay > Truth)] equals one if the PS salary pre-treatment perception of the CHW is below (resp., above) the actual salary of SLL 250,000 and 0 otherwise. "Work-related expenses" include communication and transportation costs. The sample size varies across columns because of CHWs answering "don't know" and their answer being coded as missing. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.4—Effect of Meritocracy on the Number of Each Type of Visit

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	Number of Routine Visits				Number of Cases Treated				Number of Cases Referred				Number of Ante-natal Visits				Number of Post-natal Visits			
Tmerit	1.084**				0.874***				0.297***				0.040				-0.012			
	(0.522)				(0.333)				(0.101)				(0.092)				(0.022)			
Tmerit × High Rank [i]		1.403				1.216*				0.465***				-0.042				0.001		
		(0.978)				(0.632)				(0.155)				(0.232)				(0.028)		
Tmerit × Low Rank [ii]		0.827				0.724**				0.232*				0.069				-0.022		
		(0.563)				(0.344)				(0.131)				(0.054)				(0.034)		
Tmerit × Promotion Soon [i]			1.749				2.538**				0.665*				0.580*				0.092	
			(1.228)				(1.193)				(0.356)				(0.345)				(0.057)	
Tmerit × Promotion not Soon [ii]			1.013*				0.681*				0.251**				-0.023				-0.024	
			(0.576)				(0.351)				(0.102)				(0.091)				(0.023)	
Tmerit × 𝟙(Prior PS Pay > Truth) [i]				3.240*				2.238**				0.237				0.328				-0.024
				(1.653)				(0.986)				(0.263)				(0.243)				(0.056)
Tmerit × 𝟙(Prior PS Pay ≤ Truth) [ii]				0.303				0.350				0.203				-0.199				-0.007
				(0.823)				(0.552)				(0.189)				(0.237)				(0.024)
Observations	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966
Mean Dep. Var. if Tmerit=0	3.658	3.658	3.658	3.658	2.573	2.573	2.573	2.573	0.676	0.676	0.676	0.676	0.222	0.222	0.222	0.222	0.073	0.073	0.073	0.073
p-value H_0: [i] - [ii] = 0		0.574	0.597	0.061		0.472	0.141	0.045		0.224	0.265	0.911		0.641	0.089	0.120		0.615	0.055	0.787

Notes: The first column of each outcome variable reports the effect of Tmerit for the average worker (estimate for β in equation 1). The second column of each outcome variable reports the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. The third column of each outcome variable reports the effect of Tmerit by whether the supervisor of the CHW is within 5 years of retirement age at baseline ("Promotion Soon"). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. The last column of each outcome variable presents the effect of Tmerit by whether the prior about PS pay is above the median (actual salary of SLL 250,000) or not (i.e. "Prior PS Pay > or ≤ Truth"). These correspond to the estimates for β_{above} and $\beta_{at/below}$ in equation (3). All regressions control for the stratification variables and for the uninteracted x-variable (High Rank, Promotion Soon, Prior PS Pay depending on the column). The outcome variable is reported by the households. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5—Effect of Meritocracy on Household Targeting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Household Targeting											
Dep. Var.:	% Visits to Households Living Within 30 Minutes Walk of the CHW				Median Distance Between the Visited Households and the CHW				% Visits to Friends/Family of the CHW			
Tmerit	0.004				0.251				0.022			
	(0.016)				(0.512)				(0.020)			
Tmerit × High Rank [i]		0.013				0.525				0.011		
		(0.027)				(0.926)				(0.027)		
Tmerit × Low Rank [ii]		-0.004				0.201				0.024		
		(0.020)				(0.652)				(0.025)		
Tmerit × Promotion Soon [i]			-0.016				-0.855				0.049	
			(0.039)				(1.034)				(0.036)	
Tmerit × Promotion not Soon [ii]			0.005				0.389				0.019	
			(0.018)				(0.572)				(0.022)	
Tmerit × 𝟙(Prior PS Pay > Truth) [i]				-0.009				-0.126				0.030
				(0.027)				(0.627)				(0.033)
Tmerit × 𝟙(Prior PS Pay ≤ Truth) [ii]				0.035				0.450				0.028
				(0.033)				(0.772)				(0.039)
Observations	1,868	1,739	1,868	1,868	1,441	1,338	1,441	1,441	1,903	1,770	1,903	1,903
Mean Dep. Var. if Tmerit=0	0.879	0.879	0.879	0.879	2.069	2.069	2.069	2.069	0.439	0.439	0.439	0.439
p-value H_0: [i] - [ii] = 0		0.584	0.609	0.275		0.772	0.312	0.549		0.676	0.473	0.957

Notes: The first column of each outcome variable reports the effect of Tmerit for the average worker (estimate for β in equation 1). The second column of each outcome variable reports the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. The third column of each outcome variable reports the effect of Tmerit by whether the supervisor of the CHW is within 5 years of retirement age at baseline ("Promotion Soon"). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. The last column of each outcome variable presents the effect of Tmerit by whether the prior about PS pay is above the median (actual salary of SLL 250,000) or not (i.e. "Prior PS Pay > or ≤ Truth"). These correspond to the estimates for β_{above} and $\beta_{at/below}$ in equation (3). All regressions control for the stratification variables and for the uninteracted x-variable (High Rank, Promotion Soon, Prior PS Pay depending on the column). The outcome variables aggregate household-level data at the CHW level. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.6—Heterogeneous Effects of the Meritocracy and Pay Progression Treatment on Beliefs Updating

	(1)	(2)	(3)	(4)	(5)	(8)
	Post-Treatment Perceptions					
Dep. Var.:	Perceived Meritocracy = {-1, 0, 1}				|PS Pay - Truth| (in 1,000 SLL)	
Definition of Z	Prior Meritocracy	High Rank	Promotion Soon	Prior PS Pay	|Prior PS Pay - Truth|	Tmerit
Z	0.739***	0.018	0.010	0.002	0.774***	0.690
	(0.028)	(0.036)	(0.050)	(0.003)	(0.048)	(2.889)
Tmerit	0.574***	0.322***	0.297***	0.274***		
	(0.030)	(0.032)	(0.026)	(0.093)		
Tmerit × **Z**	-0.543***	-0.053	-0.016	0.001		
	(0.039)	(0.047)	(0.074)	(0.004)		
Tpay					-3.449**	-33.956***
					(1.524)	(2.161)
Tpay × **Z**					-0.769***	-1.714
					(0.049)	(2.999)
Observations	1,933	1,842	1,982	1,982	2,009	2,009
Mean Dep. Var. if Tmerit=0	0.626	0.626	0.626	0.626		
Mean Dep. Var. if Tpay=0					17.90	17.90

Notes: All regressions control for stratification variables."High Rank" equals 1 if the CHW is ranked first, second or third in terms of performance by the PS at baseline and 0 otherwise. "Promotions Soon" equals 1 if the supervisor of the CHW is within 5 years of retirement age at baseline. "Prior PS Pay" is expressed in 10,000 SLL. |Prior PS Pay - Truth|" is also expressed in 1,000 SLL. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.7—Effect of Meritocracy on Worker Performance – Extra Controls

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
	Number of Visits			Visit Length (in minutes)		
Tmerit × High Rank [i]	2.329***			1.713*		
	(0.602)			(0.903)		
Tmerit × Low Rank [ii]	0.992*			1.642**		
	(0.563)			-0.796		
Tmerit × Promotion Soon [i]		3.478***			2.824	
		(1.240)			(1.896)	
Tmerit × Promotion not Soon [ii]		1.251**			1.611**	
		(0.510)			(0.686)	
Tmerit × 𝟙(Prior PS Pay > Truth) [i]			2.073**			2.825**
			(1.038)			(1.243)
Tmerit × 𝟙(Prior PS Pay ≤ Truth) [ii]			0.365			0.334
			(0.810)			(1.130)
Observations	1,812	1,959	1,951	1,717	1,861	1,853
Mean Dep. Var. if Tmerit=0	6.749	6.749	6.749	11.99	11.99	11.99
p-value H_0: [i] - [ii] = 0	0.042	0.100	0.101	0.945	0.545	0.077
p-value MHT correction for [i]	0.004	0.004	0.008	0.024	0.060	0.004
p-value MHT correction for [ii]	0.008	0.004	0.554	0.008	0.004	0.777

Notes: The first column of each outcome variable reports the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. The second column of each outcome variable reports the effect of Tmerit by whether the supervisor of the CHW is within 5 years of retirement age at baseline ("Promotion Soon"). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. The third column of each outcome variable present the effect of Tmerit by whether the prior about PS pay is above the median (actual salary of SLL 250,000) or not (i.e. "Prior PS Pay > or ≤ Truth"). These correspond to the estimates for β_{above}, and $\beta_{at/below}$ in equation (3). Effectively this means that we limit the comparisons to workers in T_{pay}=0, who did not receive information on PS pay. All regressions control for the stratification variables and for the uninteracted x-variable (High Rank, Promotion Soon, Prior PS Pay depending on the column). The regressions also control for the CHW characteristics that are correlated with the uninteracted x-variable and their interaction with Tmerit. The correlates of High Rank are: CHW gender, completed primary education, completed secondary education, wealth, health knowledge, experience, number of visits (self-reported), number of households she is responsible for, and years she has known the PS. The correlates of Promotion Soon are: CHW age, health knoweldge, and years she has known the PS. The correlates of Prior PS Pay are: CHW age and experience."Number of visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. At the bottom of the table, we present p-values adjusted for multiple hypothesis testing across all columns computed using Romano and Wolf [2016] step-down procedure. *** p<0.01, ** p<0.05, * p<0.1.

Table A.8—2 × 2 Specification

Dep. Var.:	(1) Number of Visits	(2) Visit Length (in minutes)
Tmerit [i]	0.978	1.295
	(0.745)	(0.944)
Tpay [ii]	-1.227**	-0.847
	(0.596)	(0.942)
Tmerit × Tpay [iii]	1.048	0.925
	(0.929)	(1.301)
Observations	1,966	1,868
Mean Dep. Var.	7.560	12.925
Mean Dep. Var. if Tpay=0 & Tmerit=0	7.455	12.479
p-value H_0: [i] + [iii] = 0	<0.001	0.014
p-value H_0: [ii] + [iii] = 0	0.803	0.932

Notes: All regressions control for the stratification variables. "Number of Visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.9—Effect of Pay Progression on Worker Performance by Meritocracy – Extra Controls

Dep. Var.:	(1) Number of Visits	(2) Visit Length (in minutes)
Panel A: Effects for Workers who Underestimated PS Pay at Baseline [Higher Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay < Truth) [i]	1.637	1.296
	(1.122)	(1.280)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay < Truth) [ii]	-1.993**	-2.118*
	(0.838)	(1.221)
Panel B: Effects for Workers who Overerestimated PS Pay at Baseline [Lower Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay > Truth) [iii]	-2.386**	-2.741**
	(1.016)	(1.219)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay > Truth) [iv]	-0.730	-0.667
	(0.838)	(1.320)
Panel C: Effects for Workers who Correctly Estimated PS Pay at Baseline [Same Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay = Truth) [v]	-0.343	1.476
	(1.025)	(1.441)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay = Truth) [vi]	-0.278	0.444
	(0.823)	(1.630)
Observations	1,938	1,840
Mean Dep. Var. if Tpay=0	7.965	13.191
p-value H_0: [i] - [ii] = 0	0.010	0.055
p-value H_0: [iii] - [iv] = 0	0.210	0.246
p-value H_0: [v] - [vi] = 0	0.960	0.636

Notes: This table presents the effects of Tpay on the number of visits in the meritocratic regime (Tmerit=1) and in the non-meritocratic regime (Tmerit=0), estimated from equation (3). Panel A reports the estimates for γ_{below} and δ_{below} (effects for workers who underestimated PS pay at baseline). Panel B reports the estimates for γ_{above} and δ_{above} (effects for workers who overestimated PS pay at baseline). Panel C reports the estimates for γ_{at} and δ_{at} (effects for workers who correctly estimated PS pay at baseline). All regressions control for the stratification variables, 𝟙(Prior PS Pay < Truth) and 𝟙(Prior PS Pay > Truth), and these last two variables multiplied with Tmerit (see equation 3). They also contol for the correlates of priors about PS pay and their interactions with Tpay, Tmerit and Tpay × Tmerit. 𝟙(Prior PS Pay < Truth) [resp., 𝟙(Prior PS Pay > Truth)] equals one if the pre-treatment perception about PS salary is below (resp., above) the actual salary of SLL 250,000 and 0 otherwise. "Number of visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. Differences in the number of observations is due to missing values. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.10—Summary Statistics and Balance Checks by PS Pay Priors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mean	S.D.	Tmerit		Tpay		Tmerit × Tpay	
			Coeff	S.E.	Coeff	S.E.	Coeff	S.E.
Panel A: CHW characteristics for CHWs with Prior PS Pay > Truth (N=673)								
Male = {0, 1}	0.736	0.441	0.008	(0.048)	-0.023	(0.049)	-0.002	(0.072)
Age (in years)	38.28	11.50	1.052	(1.339)	-0.627	(1.267)	2.042	(1.845)
Completed primary education = {0, 1}	0.689	0.463	0.034	(0.057)	0.054	(0.057)	-0.062	(0.081)
Completed secondary education or above = {0, 1}	0.068	0.253	-0.014	(0.027)	-0.051**	(0.025)	0.048	(0.038)
Wealth score (0 to 8)	2.366	1.064	0.191	(0.121)	-0.010	(0.116)	-0.177	(0.171)
Health knowledge score (0 to 7)	3.007	1.414	0.013	(0.167)	0.050	(0.168)	0.092	(0.231)
Number of years as CHW	2.534	3.041	0.346	(0.374)	0.099	(0.304)	-0.124	(0.512)
Number of households CHW is responsible for	56.39	80.98	6.446	(9.043)	-2.135	(8.216)	0.505	(12.702)
Number of hours worked as CHW per week	16.61	29.40	1.467	(3.858)	-5.572*	(3.248)	0.741	(4.269)
Number of household visits provided per week	21.81	21.90	2.667	(2.836)	1.807	(3.120)	-5.510	(3.717)
Satisfied with the PS = {0, 1}	0.761	0.427	0.058	(0.052)	0.022	(0.054)	-0.006	(0.075)
Number of years CHW has known PS for	8.215	8.654	-0.751	(1.048)	-1.454	(0.903)	1.103	(1.411)
Ever talked to the PHU in-charge = {0, 1}	0.508	0.500	-0.024	(0.066)	-0.074	(0.067)	0.031	(0.094)
Number of years CHW has known PHU in-charge for	2.657	4.469	-0.274	(0.615)	-0.330	(0.619)	0.022	(0.802)
Panel B: CHW characteristics for CHWs with Prior PS Pay = Truth (N=598)								
Male = {0, 1}	0.734	0.442	0.024	(0.053)	0.041	(0.048)	-0.122*	(0.070)
Age (in years)	35.54	10.69	0.018	(1.210)	-1.393	(1.118)	0.699	(1.675)
Completed primary education = {0, 1}	0.747	0.435	-0.032	(0.055)	0.066	(0.057)	0.002	(0.077)
Completed secondary education or above = {0, 1}	0.100	0.301	0.027	(0.044)	-0.053	(0.040)	-0.004	(0.054)
Wealth score (0 to 8)	2.599	1.162	-0.019	(0.141)	-0.104	(0.114)	0.182	(0.186)
Health knowledge score (0 to 7)	2.940	1.373	-0.080	(0.161)	-0.027	(0.154)	0.406*	(0.217)
Number of years as CHW	2.110	2.798	0.271	(0.294)	-0.244	(0.276)	0.218	(0.405)
Number of households CHW is responsible for	53.48	70.71	3.405	(10.761)	-8.216	(6.223)	1.765	(12.681)
Number of hours worked as CHW per week	17.96	23.28	3.300	(2.917)	1.636	(2.796)	-4.023	(4.071)
Number of household visits provided per week	22.97	21.61	-0.517	(3.418)	-1.949	(2.482)	1.070	(4.138)
Satisfied with the PS = {0, 1}	0.766	0.424	0.063	(0.055)	0.082	(0.056)	-0.064	(0.073)
Number of years CHW has known PS for	7.532	8.225	0.050	(0.943)	-0.581	(0.989)	0.567	(1.328)
Ever talked to the PHU in-charge = {0, 1}	0.538	0.499	0.031	(0.066)	0.001	(0.067)	-0.143	(0.091)
Number of years CHW has known PHU in-charge for	2.981	4.524	-0.994	(0.628)	-1.066*	(0.632)	0.810	(0.775)
Panel C: CHW characteristics for CHWs with Prior PS Pay < Truth (N=738)								
Male = {0, 1}	0.710	0.454	-0.085	(0.052)	-0.082	(0.052)	0.105	(0.075)
Age (in years)	37.10	11.25	-0.855	(1.246)	-0.418	(1.232)	1.489	(1.694)
Completed primary education = {0, 1}	0.706	0.456	-0.077	(0.050)	-0.055	(0.051)	0.077	(0.074)
Completed secondary education or above = {0, 1}	0.081	0.273	0.047*	(0.027)	0.042	(0.028)	-0.049	(0.043)
Wealth score (0 to 8)	2.533	1.224	0.061	(0.123)	0.132	(0.119)	0.069	(0.181)
Health knowledge score (0 to 7)	2.757	1.467	-0.097	(0.173)	-0.082	(0.160)	-0.165	(0.235)
Number of years as CHW	2.001	2.622	0.338	(0.291)	0.319	(0.291)	-0.426	(0.393)
Number of households CHW is responsible for	60.14	69.68	-9.165	(8.201)	3.420	(9.200)	7.861	(11.979)
Number of hours worked as CHW per week	18.70	45.32	-3.740	(4.396)	-3.044	(4.702)	10.453	(6.751)
Number of household visits provided per week	19.93	16.20	-1.565	(1.688)	2.292	(1.683)	-0.332	(2.415)
Satisfied with the PS = {0, 1}	0.760	0.427	0.090*	(0.050)	0.064	(0.054)	-0.046	(0.068)
Number of years CHW has known PS for	7.569	8.383	0.621	(1.077)	1.058	(0.974)	0.963	(1.470)
Ever talked to the PHU in-charge = {0, 1}	0.543	0.498	-0.072	(0.061)	-0.038	(0.056)	-0.005	(0.085)
Number of years CHW has known PHU in-charge for	3.126	4.888	-0.916	(0.667)	-1.204*	(0.635)	1.113	(0.851)

Notes: This table presents summary statistics of CHW characteristics in the three sub-samples: CHWs who overestimated PS pay at baseline (Panel A), CHWs who guessed PS pay correctly (Panel B), CHWs who underestimated PS pay (Panel C). Each row states the sample mean and standard deviation of a variable, as well as the estimates from a regression, where the variable is regressed on an indicator for Tmerit, Tpay and Tmerit × Tpay. All regressions control for stratification variables and cluster standard errors at the PHU level. All variables reported in this table are measured at baseline, except for the last 2 variables of each panel which are retrospective variables from the endline survey. *** p<0.01, ** p<0.05, * p<0.1

Table A.11—Effect of Pay Progression on Lobbying

Dep. Var.:	(1) Talked to PHU In-Charge = {0,1}	(2) Fraction of Time on Non-Patient-Related Activities
Effects for Workers who Underestimated PS Pay at Baseline [Higher Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) [i]	-0.043	-0.000
	(0.063)	(0.016)
Tpay × Non-Meritocratic (Tmerit=0) [ii]	-0.038	0.020
	(0.056)	(0.018)
Observations	738	715
Mean Dep. Var. if Tpay=0	0.556	0.210
p-value H_0: [i] - [ii] = 0	0.954	0.391

Notes: Sample restricted to workers who underestimated PS pay at baseline ("Prior PS Pay < Truth") for whom perceived pay progression increases in Tpay=1. All regressions control for stratification variables and for a dummy variable for "Meritocratic" (Tmerit=1). "Talked to PHU In-Charge" is self-reported by the CHW at endline. "Non-Patient Related Activities" include administrative tasks and liaising with PHU staff. The time spent on different tasks is self-reported by the CHW at endline. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.12—Incentives and Perceptions

Dep.Var.:	(1)	(2)	(3)	(4)
	Post-Treatment Perceived Meritocracy = {-1, 0, 1}		|Post-Treatment Prior PS Pay - Truth| (in 1,000 SLL)	
Supv Incentives	0.018	0.043	-1.409	-2.399
	(0.043)	(0.042)	(3.125)	(2.724)
Worker Incentives	0.023	0.042	0.389	3.740
	(0.041)	(0.040)	(3.254)	(2.902)
Shared Incentives	-0.005	0.027	2.517	4.140
	(0.041)	(0.038)	(3.273)	(2.872)
Tmerit		0.317***		
		(0.044)		
Tmerit × Supv Incentives		-0.007		
		(0.062)		
Tmerit × Worker Incentives		-0.013		
		(0.059)		
Tmerit × Shared Incentives		-0.035		
		(0.062)		
Tpay				-32.367***
				(2.578)
Tpay × Supv Incentives				2.760
				(3.460)
Tpay × Worker Incentives				-2.899
				(3.500)
Tpay × Shared Incentives				-2.333
				(3.642)
Observations	1,933	1,933	2,009	2,009
Mean Dep. Var. in Omitted Group	0.615	0.448	18.157	34.405

Notes: All regressions control for district fixed effects and the baseline value of the outcome variable. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.13—Main Results, Interactions with Incentives

Dep. Var.:	(1)	(2)	(3)	(4)
	Number of Visits			
Definition of Z:	-	High Rank	Promotion Soon	𝟙(Prior PS Pay > Truth)
Tmerit	0.849			
	(1.670)			
Tpay	-1.761			
	(1.474)			
Tpay × Tmerit	1.312			
	(2.067)			
Tmerit × Supv Incentives	2.772			
	(2.167)			
Tpay × Supv Incentives	0.378			
	(1.786)			
Tpay × Tmerit × Supv Incentives	-3.235			
	(2.675)			
Tmerit × Worker Incentives	-1.920			
	(2.296)			
Tpay × Worker Incentives	1.123			
	(1.967)			
Tpay × Tmerit × Worker Incentives	2.824			
	(2.869)			
Tmerit × Shared Incentives	-0.755			
	(1.833)			
Tpay × Shared Incentives	0.546			
	(1.682)			
Tpay × Tmerit × Shared Incentives	-0.527			
	(2.373)			
Tmerit × Z		1.945	1.127	1.958
		(1.301)	(1.212)	(1.438)
Tmerit × 1-Z		0.911	1.663	1.021
		(1.186)	(1.168)	(1.124)
Tmerit × Z × Supv incentives		0.937	2.309	1.007
		(1.752)	(1.630)	(1.932)
Tmerit × 1-Z × Supv incentives		1.909	0.044	1.784
		(1.599)	(1.803)	(1.510)
Tmerit × Z × Worker incentives		0.329	0.748	-1.776
		(1.647)	(1.778)	(1.849)
Tmerit × 1-Z × Worker incentives		-0.674	-1.516	0.622
		(1.689)	(1.570)	(1.651)
Tmerit × Z × Shared Incentives		0.215	-0.671	-1.778
		(1.540)	(1.402)	(1.586)
Tmerit × 1-Z × Shared Incentives		-0.872	-1.130	-0.385
		(1.370)	(1.368)	(1.289)
Observations	1,966	1,830	1,966	1,966
Mean Dep. Var.	7.560	7.560	7.560	7.560

Notes: Columns (2) to (4) control for the uninteracted Z variable, defined in the column heading. "Number of Visits" is the average number of household visits provided by the CHW (as reported by the households). Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Sections

Ethics Appendix

Following Asiedu et al. (2021), we detail key aspects of research ethics.

A1. Pre-Analysis Plan

The study was pre-registered on the AEA RCT Registry with the number 0003993. We follow the pre-analysis closely. The outcomes variables we use in the paper were mentioned in the AEA RCT Registry. In the pre-analysis plan, we specified that we would use the number of SMS reports, described in Appendix B.B6, as a secondary measure of worker performance. We ended up not using this variable because the average worker is found to underreport the visits provided. This measure is hence uninformative about worker performance. We decided to focus only on the primary measure of worker performance based on households' responses in the household survey.

The AEA registry is centered on the interaction between meritocracy and (perceived) pay progression. It also explicitly mentions the possible heterogeneous effect of the meritocratic treatment by performance ranking and social connections. In the paper, we put less emphasis on the latter because of the lack of a clear theoretical prediction. For sake of transparency, we describe the results here. We find that the meritocratic promotions treatment leads to an increase of 2.3 visits (35%) for workers not connected to the PHU in-charge (significant at the 1% level) and an increase of 0.8 visits for workers connected to the PHU in-charge, although this estimate is not significant. The difference between the two estimates is statistically significant at the 1% level.

A2. IRB and Research Ethics

The project received IRB from the University of Pompeu Fabra (CIREP Approval 107) and from the Sierra Leone Ethics and Scientific Review Committee (no IRB number assigned by this local institution).

We obtained informed consent from all participants prior to the study. The consent form described the participants' risks and rights, confidentiality, and contact information. Research staff and enumerator teams were not subject to additional risks in the data collection process. None of the researchers have financial or reputation conflicts of interest with regard to the research results. No contractual restrictions were imposed on the researchers limiting their ability to report the study findings.

On policy equipoise and scarcity, there was uncertainty regarding the net benefits from our treatments for any worker. The interventions under study did not pose any potential harm to participants and non-participants. The intervention rollout took place according to the evaluation protocol.

On potential harms to participants or nonparticipants, our data collection and research procedures adhered to protocols around privacy, confidentiality, risk-management, and informed consent. Participants were not considered particularly vulnerable (beyond some households residing in poverty). Besides individual consent from study participants, consultations were conducted with local representatives at the district levels. All the enumerators involved in data collection were recruited from the study districts to ensure they were aware about implicit social norms in these communities.

The presentation of the findings from the project to district and national level authorities in Sierra Leone was done in September 2022. No activity for sharing results to participants in each study village is planned due to resource constraints. We do not foresee risks of the misuse of research findings. Policy briefs have been created based on this project and have been distributed to policymakers through IGC, J-PAL and CEGA.

Institutional Details

B1. Extra Details on the Location of the Experiment

The experiment took place in 372 PHUs across six districts of Sierra Leone. One district is located in the south (Bo), one in the east (Kenema), three in the north (Bombali, Tonkolili and Kambia) and one in the west (Western Area Rural). Out of the existing 823 PHUs across the six districts, we excluded half because no up-to-date and verified list of health workers was available, and selected 372 PHUs from the remaining eligible PHUs to be part of the experiment. The 372 PHUs were cross-randomized into T_{merit} and T_{pay}, stratifying by district and the presence of temporary performance-based incentives, which are described below.

B2. Extra Details on the Sample Size

The surveys cover 372 PSs and 2,009 CHWs, which were surveyed at baseline and endline.[15] At endline, we also surveyed three eligible households per household, which account for nearly 10% of the households in the village. The respondent of the survey was the female household head, who is typically the most knowledgeable about health topics. In the absence of a full listing of households in each village, the sampling was done through a random walk starting from the house of the CHW and with pre-specified sampling intervals between households. To cover a random sample of households across the entire village (and not only households who live near the CHW), the intervals were calculated based on the total number of households in the community. In order to be eligible for the household survey, the respondent had to be female, one of the primary caregivers, between 18 and 49 years old, and have lived in the household for at

[15] 72 CHWs we contacted by phone refused to be interviewed at baseline and were excluded from the sample.

least 6 months during the study period. We set these eligibility criteria so that sampled households would belong to the group targeted to receive the services of the CHW.

B3. Extra Details on Script Reading

The scripts in $T_{merit} = 1$ and $T_{merit} = 0$ were read by the same operator and were delivered by phone. The operators were hired by the research team and were trained to read the script in similar ways across the two treatments. Before reading the script, the phone operators explicitly mentioned that the information they were conveying was officially approved by the DHMT and the MoHS. The fact that CHWs in $T_{merit} = 1$ updated their perception of meritocracy upward after receiving the information in the script (see Figure 1, Panel A), indicates that CHWs trusted and understood the information. The scripts in $T_{pay} = 1$ and $T_{pay} = 0$ were also read by the same operator. The script was read immediately after the "T_{merit} script."

B4. Extra Details on the Accuracy of the Performance Measure and Collusion with Households

All CHWs (both in $T_{merit} = 1$ and $T_{merit} = 0$) were made aware at baseline that we would measure their performance by interviewing households on the visits they received. As explained, the CHWs in $T_{merit} = 1$ were also aware that this information would then be used by the DHMTs to decide on promotions.

To avoid collusion with the households on misreporting visits, CHWs were not informed about how many households we would interview, which ones, and when. In line with the absence of collusion, we show in Table A.5 that the share of respondents who report having received a visit is comparable among friends or family members (higher probability of collusion) than among the rest of the respondents. To limit collusion, a random 25% of households each week were "back-checked" either by phone or in-person (unannounced visits) by a team of field monitors, who asked the households to confirm the date and the type of the household visit.

Importantly, the effectiveness of performance-based promotions (or any other type of performance-based incentives) depends on the organization's ability to measure worker performance accurately. The noisier is the measure of performance, the lower is the worker incentive to exert effort. While our measure of worker performance is not entirely accurate – as it relies on the visits received by a random sample of the potential patients rather than the full population – it is likely more accurate than in the many settings in which it is measured by governments that lack resources to monitor workers closely. The fact that worker performance was measured by outside researchers may also have helped maintain fidelity to the design (Banerjee, Duflo, and Glennerster 2008; De Ree et al. 2018). In Section III, we show that the measure of performance is accurate enough to affect CHW effort in $T_{merit} = 1$.

B5. Extra Details on the Promotion System

The set of skills required for the PS and CHW jobs do not perfectly overlap – e.g., the PS position requires managerial skills that the CHW position does not require. As a result, promoting CHWs based on their current performance (as in the new meritocratic system discussed below) is not necessarily the best possible system to select high-performing PSs; e.g., see the "Peter Principle" (Peter, Hull et al. 1969; Benson, Li, and Shue 2019). It might be more effective, for example, to promote CHWs based on their "potential" as a good manager. Such systems are however more subjective and have been shown to lead to more discrimination (Benson, Li, and Shue 2021). Understanding which promotion system leads to selecting the best supervisor is outside the scope of this paper and a good avenue for future research.

That said, the promotion system we implement in $T_{merit} = 1$ is likely more effective than the status-quo system in $T_{merit} = 0$, which puts more weight on connections. The PS work is indeed mostly independent of the PHU in-charge and having a connection to the PHU in-charge has limited added value in our context. In contrast, promoting a high-performing CHW presumably implies selecting someone who is highly motivated and with good health knowledge, both of which predict PS performance in our sample of workers.

B6. Extra Details on the Temporary Performance-Based Incentives

A subsample of the CHWs and PSs in this study received a temporary performance-based incentive scheme paid by an external organization which is the focus of Deserranno et al. (2022). This incentives randomization was done at the PHU level. In the Shared Incentives Treatment, CHWs received an incentive of 1,000 SLL for each service performed and the PS received an incentive of 1,000 SLL for each service performed by a CHW under her supervision. In the Worker Incentives Treatment, CHWs received an incentive of 2,000 SLL for each service performed while the PS received no incentives. In the Supervisor Incentives Treatment, the PS received an incentive of 2,000 SLL for each service performed by a CHW under her supervision while the CHWs received no incentives. In the control group, neither the CHWs nor the PS received an incentive. In each treatment, the number of services a CHW provided was measured with an SMS reporting system, which required the CHW to report the date and type of service and the contact information of the patient by sending an SMS to a toll-free number. This reporting system played no role in the main experiment of this paper.

As mentioned in the body of the paper, the randomization of the meritocracy and pay progression information treatments was stratified by the above-mentioned incentives treatments. Still, one may be concerned that the main effects shown in the paper are driven by specific interactions between the treatments in the two projects. We address this concern directly in Table A.12, where we first show that the impact of the meritocratic promotion and pay progression information

treatments on perceptions of meritocracy and pay progression are orthogonal to the presence of these incentives. This is not surprising as these incentives are short-run and are provided by an external organization with no connection with the government, and thus should not affect the perceptions about the promotion criteria or perceptions about the pay PSs receive from the government. Accordingly, Table A.13 shows that the effects of the meritocracy and pay progression information treatments on the number of visits do not interact with the incentives treatments (column 1). The effects of the meritocracy treatment by high rank, promotion expected soon or perceived PS pay – which we presented in Section III – also appear orthogonal to the incentives treatments (columns 2-4).