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Research article

Gender differences in the effect of employee-manager friendships on salary dynamics in CPA firms

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ABSTRACT

We study the effect of employee-manager relations on salary increases. We use data obtained from a longitudinal survey, carried out among auditing team members in leading Israeli CPA firms (which are subsidiaries of American firms). Our main findings suggest that the degree of friendship with the team manager is positively correlated with the rate of the salary increase, particularly among female workers whose team manager is also a female. We also find that upon being hired to the job, male workers gain a higher return to experience compared with female workers.

1. Introduction

Gender gaps in wages are persistent in the labor markets for a long time (Blau and Kahn 1997, 2000; O'Neill, 2003; Azmat et al., 2006; Manning and Swaffield, 2008; Olivetti and Petrongolo, 2008; Blau and Kahn, 2017). The wage gaps are also prevalent at the top of the income distribution (George-Levi et al., 2012), where women are underrepresented in the top of firms' management and earn lower wages. Besides contradicting values of equal opportunities, gender discrimination has substantial effects on economic growth, where an increase of 50% in the gender wage gap is projected to lead to a decrease of 35% in output per-capita at the steady-state (Cavalcanti and Tavares, 2016).

Beyond legal bans on discrimination, legislators and regulators sometimes impose affirmative actions such as requiring a minimum number of females on boards of directors. The legislative actions combined with technological change (Black and Spitz-Oener, 2010; Beaudry and Lewis, 2014; Blau and Kahn, 2016), the pill (Bailey et al., 2012) and also divorce laws (Fernández, and Wong, 2014) have reduced the wage gap over the years (Black and Spitz-Oener, 2010; Heathcote et al., 2011; Mulligan and Rubinstein, 2008). Indeed, most of nowadays' wage differentials between the genders are attributed to gender differences in occupations and industries and differences in gender roles and family division of labor by gender. Psychological attributes and non-cognitive skills also account for the wage gap, although their effect seems to be small to moderate (Blau and Kahn, 2016).

The experimental literature documented some gender differences in altruism, competitiveness, patience, and bargaining. Females tend to be more altruistic than males (Andreoni and Vesterlund, 2001) and more future-oriented (Silverman, 2003). Women in matrilineal societies seem to be as competitive as men in patriarchal societies (Gneezy et al., 2009). Nevertheless, children of both genders in matrilineal societies seem to be equally competitive, whereas girls become less competitive around puberty in patriarchal societies (Andersen et al., 2013). In Western societies, females were found to be less efficient in a competitive environment (Gneezy et al., 2003). Females were also found to shy away from competitive work settings more often than males (Flory et al., 2015).

Females and males negotiate their salaries differently. Experimental

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evidence points out that females are more inclined than males to avoid negotiation over salaries (Babcock and Laschever, 2009; Bowles et al., 2007), particularly when there is uncertainty whether wages are negotiable (Croson and Gneezy, 2009; Leibbrandt and List, 2014). Females also tend to underperform compared to males in bargaining as employees (Mazei et al., 2015; Stuhlmacher and Walters, 1999) but not as employers (Dittrich et al., 2014). The tendency of females to avoid wage negotiation and to underperform in negotiations and their tendency to be less confident than males are some of the reasons for the gender wage gap (Card et al., 2016; Santos-Pinto, 2012).

Experiments also documented some differences between female and male directors. Adams and Funk (2012) found experimental evidence suggesting that female directors are more benevolent and universally concerned but not more risk-averse. Hoogendoorn and Oosterbeek (2013) found that equal gender mix teams achieve higher sales, profits, and earning per share than unisex teams. Nevertheless, evidence also suggests that an obligated quota of female representation in boards of directors might result in a significant decrease in the stock price and deterioration in operating performance (Ahern and Dittmar, 2012).

In this paper, we study the correlation between personal relations of employees and their managers, sorted by gender, and the rate of salary increases. We surveyed 419 auditing workers of leading Israeli CPA firms (which are subsidiaries of American firms) at the early stage of their careers.[1] The auditing workers work in teams of 3–6 workers and are supervised by either female of male team managers. We exploited the fact that at the end of each year, a worker undergoes a performance review by his team manager. As part of the evaluation process, the team manager may increase the worker's salary. We followed the audit workers for three years and documented their initial salary, experience, salary growth, marital status, and births. Uniquely to our research, we surveyed the auditing workers each year, *prior to the performance review*, and asked them to report the level of friendship with their team manager.

Our main findings suggest that the degree of friendship between a team manager and his employee is positively correlated with salary increases, primarily when both the team manager and the employee are females. We also find that upon being hired, females gain a lower return to experience compared to males.

The article proceeds as follow: Section 2 describes the data. Section 3 describes the data and regression outcomes when the team workers are initially hired, Section 3.2 analyzes the relationship between salary growth and the friendship variables based on the panel data structure covering 2012–2015, and Section 4 concludes and summarizes.

2. Materials and methods

2.1. Description of the data

The sample consists of responses obtained from a sample of 419 auditing workers, hired by leading Israeli CPA firms (which are subsidiaries of American firms) in 2012, who stayed for three years in the same team under the same team manager.[2] The longitudinal survey included data on the workers' initial salary and salary growth in 2013, 2014, and 2015. We also asked the workers in each of these years to report the gender of their team manager, their years of experience, age, family status, and the number of children they have. Uniquely to our research, we also asked the workers to rank the degree of friendship with their boss in 2013, 2014 and 2015 on a Likert scale of one (the lowest degree) to seven (the highest degree).

All of the auditing workers in the sample have a BA degree, and most of them finished their two-year internship period required for a CPA license in Israel. They work in mixed-gender teams, and audit mainly financial reports of corporations traded in Tel-Aviv or New York stock exchanges. Each team worker audits several sections in the financial statements. The team manager occasionally meets with the team workers, monitors their work, and guides them to meet the deadlines and requirements of the American or Israeli securities and tax authorities.

As part of a formal procedure, the team manager conducts personal evaluation meetings with the team workers at the end of each year. Based on the evaluation, the team manager decides whether to terminate the worker's employment and decides about the worker's salary increase for the next year (assuming he stays in the firm). If the worker retains his job, the team manager may increase his salary by 0%–15%. A higher salary increase requires the formal approval of a higher authority.

We conducted the longitudinal survey as follows: In 2012, after receiving the consent of the CPA firms, their managements granted us access to the respondents' salaries and enabled us to keep confidential and anonymous data of the workers and their responses. We randomly selected new auditing workers and asked them to participate in the longitudinal survey. After receiving their consent, we asked them in October 2012, before their firm's evaluation meeting, to fill out the questionnaire. Thanks to the cooperation of the CPA firms, we obtained the salary data using the workers' ID numbers directly from the firms. In March 2013, we returned to the workers and completed the question regarding the salary increase. We repeated the survey process with the same set of workers in October 2013 and 2014, and March 2014 and 2015. We maintained a time gap between the evaluation talk and the report on the level of friendship and strict confidentiality of the respondents and their answers to encourage honest reporting and to preclude a possible dependency between last year salary increase and the current level of friendship.

2.2. Descriptive statistics segmented by the gender of the team manager (upon being hired)

Table 1 displays the descriptive statistics segmented by the gender of the team manager. 62.56% of the 227 workers under female managers are females, compared to only 51.04% of the 192 workers under male managers (FEM_WORKER). The 11.52% difference is statistically significant at the 5% significance level. Also, the average age in years of employees under male managers is slightly higher (AGE).

A comparison of the other variables segmented by the gender of the managers reveals no significant differences between female and male managers. Specifically, we find no statistical differences in the initial salary (SALARY_2012) and experience (EXPERIENCE).

Approximately 60.94%–63.88% of the workers are married (MARRIED), and 41.15%–45.81% have at least one child (CHILDREN_DUM). The average number of children among the 183 workers with at least one child in 2012 is two (CHILDREN1).

3. Results and discussion

3.1. Initial hiring conditions

3.1.1. Initial salary regressions

Table 2 reports the regressions outcomes based on the model: $Y_i = \theta_1 X_i^2 + \theta_2 + \mu_i$ applied separately to female and male workers, where $Y_i = SALARY_i$; $X_i^2 = EXPERIENCE\_SQ_i$; θ_1, θ_2 are parameters; and μ_i is the random disturbance term.[3] The table is split into four categories based on the gender of the manager and worker.

[1] Approximately 1400 CPAs in Israel received their license in 2014. Our sample consists of new CPAs and therefore represents about third of the annual cohort of new Israeli CPAs.

[2] We surveyed 472 workers, 439 of them stayed to the second year in their original team (namely, they did not quit, were not fired, and did not change team), 425 stayed to the third year and 419 stayed to the fourth year.

[3] The coefficient of the experience variable is statistically insignificant, therefore, we omitted it from the model.

Table 1
Descriptive statistics segmented by the gender of the team manager.

Variable	Definition	Obs.	Female Manager	Male Manager	Difference
FEM_WORKER	1 = female worker; 0 = male worker	419	62.56% (0.0322)	51.04% (0.0362)	11.52%** (0.0483)
SALARY_2012	The annual salary measured in US Dollars workers got in the first year of teamwork	419	19,080.40 (422.00)	19,476.56 (483.55)	-396.16 (638.99)
ln*(SALARY_2012)*	Natural logarithm of the annual salary	419	9.81 (0.0213)	9.83 (0.0219)	-0.02 (0.0307)
ln*(SALARY_2012)* *FEMALE_WORKER=1*	Natural logarithm of the annual salary for female worker	240	9.7378 (0.0284)	9.7535 (0.0265)	-0.0157 (0.0406)
ln*(SALARY_2012)* *MALE_WORKER=1*	Natural logarithm of the annual salary for male worker	179	9.9176 (0.0336)	9.9072 (0.0275)	0.0104 (0.0440)
EXPERIENCE	Years of work at the office	419	4.27 (0.1056)	4.53 (0.1131)	-0.26 (0.1549)
AGE	Age of the worker in years	419	28.63 (0.1459)	29.05 (0.1531)	-0.42** (0.2121)
*MARRIED*1	1 = Married in the first year; 0 = otherwise	419	63.88% (0.0320)	60.94% (0.0353)	2.94% (0.0476)
CHILDREN_DUM1	1 = the team worker has at least one child in the first year; 0 = otherwise	419	45.81% (0.0331)	41.15% (0.0356)	4.66% (0.0487)
CHILDREN1 (CHILDREN_DUM1=1)	Number of children in the first year	183	2.29 (0.1116)	2.13 (0.0871)	0.16 (0.1489)
Observations			227	192	

Notes: The descriptive statistics refer to the difference between 227 (192) team workers who work under a female (male) manager. Standard errors are displayed in parentheses. * significant at the 10% significance level. ** significant at the 5% significance level. *** significant at the 1% significance level.

Table 2
Relationship between projected initial salary and experience. The regression outcomes that correspond to Figs. 1 and 2 are (numbers in parentheses are *p*-values).

	Female Managers ($N = 227$)	Male Managers ($N = 192$)
Female Workers ($N = 240$)	$\widehat{Y}_i = 71.96X_i^2 +$ 16,424.77(0.031) (<0.001)	$\widehat{Y}_i = 46.75X_i^2 +$ 16,732.27(0.133) (<0.001)
Male Workers ($N = 179$)	$\widehat{Y}_i = 109.16X_i^2 +$ 18,793.02(0.026) (<0.001)	$\widehat{Y}_i = 175.57X_i^2 +$ 17,186.29(0.001) (<0.001)

where $\boldsymbol{Y_i = SALARY_i . X_i^2 = EXPERIENCE\_SQ_i}$

According to the results reported in Table 2, the only case in which the square of experience was not found to be statistically significant in the projected 2012 salary equation, is the case of male managers and female workers.

3.1.2. Initial salary graphs

Fig. 1 displays the relationship between the projected initial salary in teams which are managed by females, and the square of experience, segmented by gender. Fig. 2 displays the corresponding relationship for male managers. Projections are based on the following equation, whose parameters were found to be statistically significant and are reported in Table 2:

$Y_i = \theta_1 X_i^2 + \theta_2 + \mu_i$ where $Y_i = SALARY_i$; $X_i^2 = EXPERIENCE\_SQ_i$; θ_1, θ_2 are parameters; and μ_i is the random disturbance term.[4] We separately applied this equation on female and male workers. For $X_i = 0, 1, 2, 3, 4, 5, 6, 7, 8$ years of experience, $X_i^2 = 0, 1, 4, 9, 16, 25, 36, 49, 64$ respectively. The initial annual salaries are measured in NIS (the local Israeli currency, where 1 NIS equals to approximately 0.25 US Dollars).

The figures show that regardless of the manager's gender, there are no significant wage gaps between inexperienced female and male workers. However, regardless of the gender of the manager, starting from 3 - 4 years of experience (*EXPERIENCE_SQ* = 9 and 16 respectively), there is a significant initial wage gap (at the 5% significance level) in favor of the male worker.

3.1.3. The initial salary equation upon recruitment with control variables

Consider the following model**:**

$$\ln(SALARY)_{i,2012} = \alpha_1 + \alpha_2 EXPERIENCE_{i,2012} + \alpha_3 EXPERIENCE\_SQ_{i,2012} + \alpha_4 MARRIED_{i,2012} + \alpha_5 CHILDREN0_{i,2012} + u_{1,i,2012} \quad (1)$$

where $ln(SALARY)_{i,2012}$, is the natural logarithm of the initial annual salary in US dollars.; $EXPERIENCE_{i,2012}$ and $EXPERIENCE\_SQ_{i,2012}$ denote the years of experience and its square in 2012, when the worker was hired; $MARRIED_{i,2012}$ equals 1 if the worker was married when he or she was hired and 0 otherwise; $CHILDREN_{i,2012}$ denotes the number of children in 2012; $\alpha_1; \alpha_2; \alpha_3; \alpha_4$ are parameters; and $u_{1,i,2012}$ is the classical random disturbance term.

To measure the differences by the gender of managers and workers, we define the parameters of the model as follows:

$$\alpha_j = \alpha_{j,1} + \alpha_{j,2} FEM\_MANAGER_{i,2012} + \alpha_{j,3} FEM\_WORKER_{i,2012} + \alpha_{j,4} FEM\_MANAGER_{i,2012} \cdot FEM\_WORKER_{i,2012} \quad (2)$$

where. $j = 1, 2, 3, 4$

3.1.4. Initial salary regression outcomes

Table 3 displays the 2012 salary regressions obtained from the estimation of Eq. (1) segmented by the gender of the worker and the manager. The results show a significant return of 1.38%–9.24% for an additional year of experience of male workers (significant at the 5%–1% significance level). By comparison, the return for an additional year of experience of female workers is significantly lower by 3.81%–5.08% regardless of her manager's gender (significant at the 10% and 1% significance levels). Nevertheless, we find no statistically significant differences across the gender of the manager. Finally, the status of married is associated with a significant increase of 6.89% in the initial salary. The positive effect of the marital status on the initial salary may be attributed to a firmer salary negotiation conducted by individuals who support other people.

3.2. Dynamics of friendship evolvement: methodology and results

3.2.1. Descriptive statistics stratified by gender of the team manager (panel structure)

Table 4 displays the descriptive statistics segmented by the gender of the team manager. Interestingly, on the one hand, female managers show a higher tendency than male managers do to abstain from a wage increase to female workers (7.28% vs. 4.42% of the female workers), although the difference is statistically insignificant (*NO_GROWTH*). On the other hand, female managers seem to be more generous in giving annual wage increases to female workers compared to male managers

[4] The coefficient of the experience variable is statistically insignificant, therefore, we omitted it from the model.

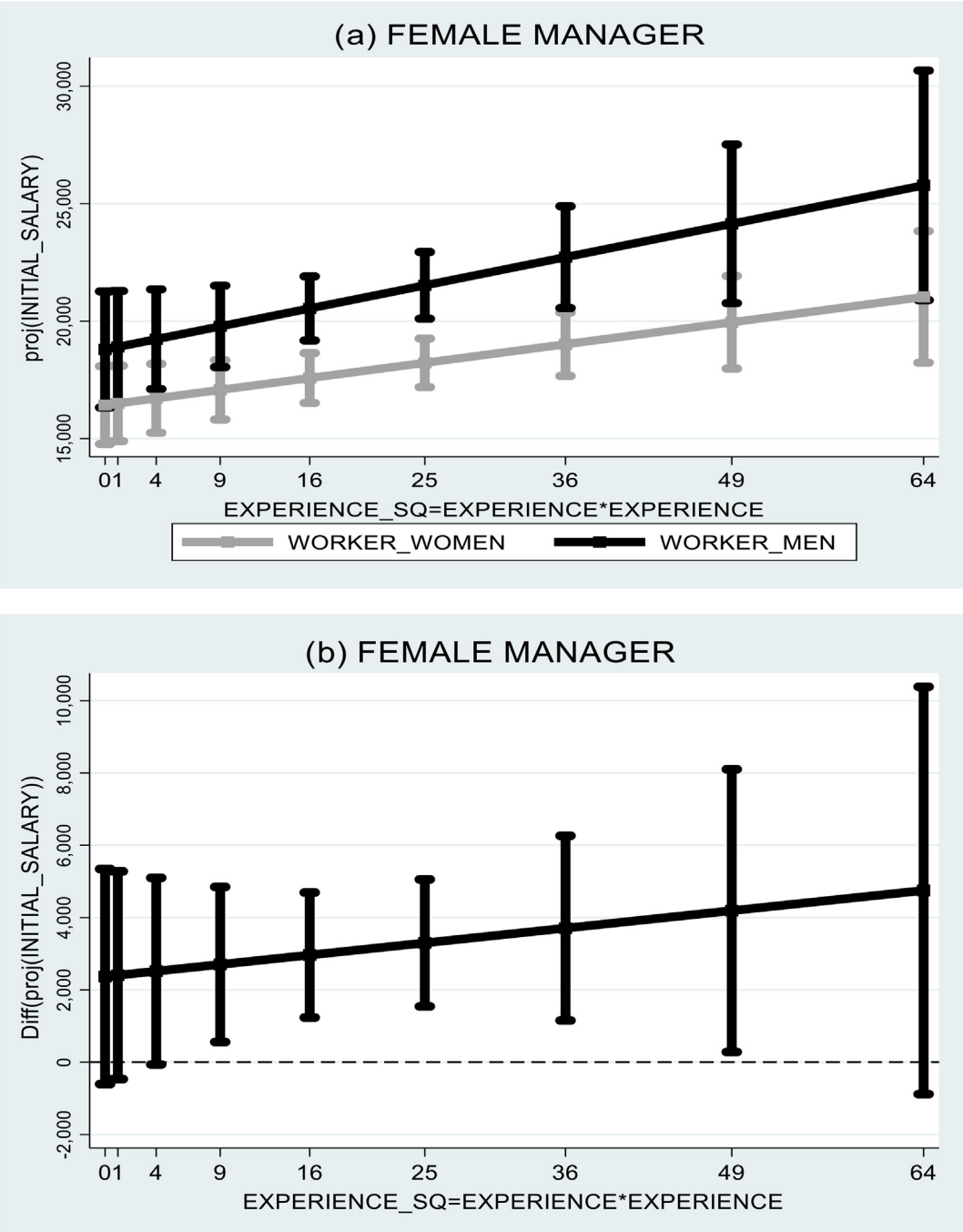

Fig. 1. Relationship between projected initial salary and experience - female managers. Notes: Fig. 1a presents the projected values of annual initial salaries applied separately to female workers and male workers and obtained from estimation of the following equation: $Y_i = \theta_1 X_i^2 + \theta_2 + \mu_i$, where $Y_i = SALARY_i$; $X_i^2 = EXPERIENCE\_SQ_i$; θ_1, θ_2 are parameters; and μ_i is the random disturbance term. For $X_i = 0, 1, 2, 3, 4, 5, 6, 7, 8$ years of experience, $X_i^2 = 0, 1, 4, 9, 16, 25, 36, 49, 64$ respectively. Fig. 1b presents the male-female projected annual initial sallary differences for $X_i^2 = 0, 1, 4, 9, 16, 25, 36, 49, 64$ and their 95% confidence intervals. Annual initial salaries are measured in NIS (the local Israeli currency, where 1 NIS roughly equals 0.25 US Dollars).

(7.08% vs. 4.73%). The 2.35% difference is statistically significant at the 1% significance level (*GROWTH*).

Table 4 also reveals a higher tendency of low friendship levels among female managers toward male workers (50.59% vs. 31.91% of the male workers). The 18.68% difference is statistically significant at the 1% significance level (*LOW_FRIEND*). At the other extreme, there is a lower tendency of high friendship level toward male workers among female managers (8.63% vs. 14.54% of the male workers). The 5.91% difference is statistically significant at the 5% significance level. In contrast, there is a higher tendency of high friendship level toward female workers among female managers (28.17% vs. 10.88% of the female workers). The 17.28% difference is statistically significant at the 1% significance level (*HIGH_FRIEND*).

We also control for changes in the marital status and parenthood of the workers over the years. 75.29% of the male workers hired by female managers are married, compared to only 62.41% of male workers hired by male managers. The 12.88% difference is statistically significant at the 1% significance level (*MARRIED*). 63.17% of the male workers hired by

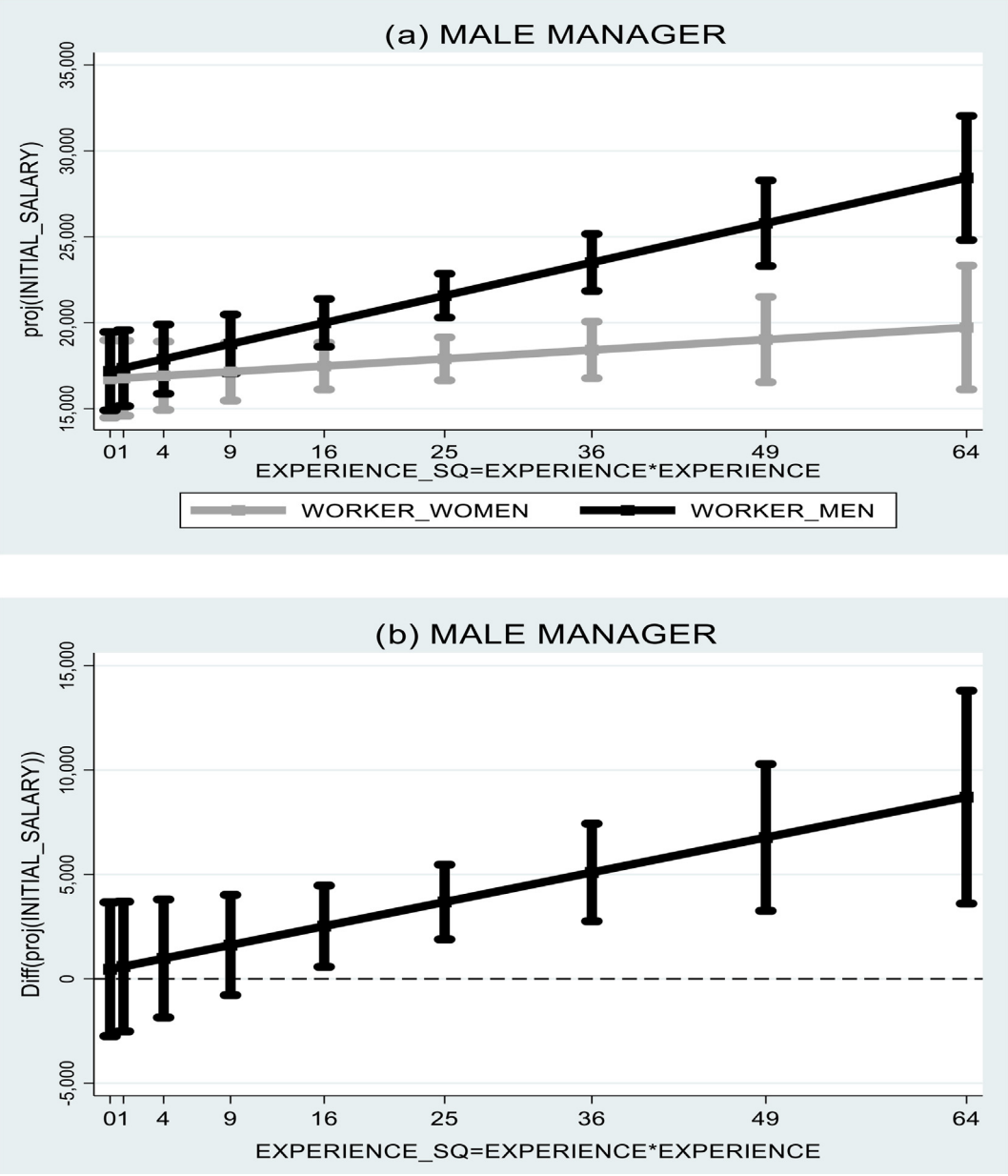

Fig. 2. Relationship between projected initial salary and experience – male managers. Notes: Fig. 2a presents projected values of annual initial salaries applied separately to female workers and male workers and obtained from estimation of the following equation: $Y_i = \theta_1 X_i^2 + \theta_2 + \mu_i$, where $Y_i = SALARY_i$; $X_i^2 = EXPERIENCE\_SQ_i$; θ_1, θ_2 are parameters; and μ_i is the random disturbance term. For $X_i = 0, 1, 2, 3, 4, 5, 6, 7, 8$ years of experience, $X_i^2 = 0, 1, 4, 9, 16, 25, 36, 49, 64$ respectively. Fig. 2b presents the male-female projected annual initial sallary differences for $X_i^2 = 0, 1, 4, 9, 16, 25, 36, 49, 64$ and their 95% confidence intervals. Annual initial salaries are measured in NIS (the local Israeli currency, where 1 NIS roughly equals 0.25 US Dollars).

female managers have at least one child, compared to only 51.42% of the male workers hired by male managers. The 11.72% difference is statistically significant at the 1% significance level (*CHILDREN_DUM*). The average number of children per household with at least one child is about 2. Of the 696 households with at least one child, 70.69% have 1–2 children during the sample period (*CHILDREN*).[5]

[5] Under the Israeli law, the length of the fully paid obligatory maternity leave was 14 weeks. Mothers can extend their maternity leave up to 26 weeks (the extra 12 weeks being unpaid). Although males are entitled to a parental leave under some restrictions, in practice most Israeli fathers do not use this possibility.

3.2.2. *Friendship with the boss and salary dynamics*

To test the effect of friendship with the team manager on the salary growth, we arranged the data according to a conventional structure of a 3-year panel dataset. The following equation describes the fixed effects model:

$$SALARY\_GROWTH_{i,t} = \beta_1 + \beta_2 MID\_FRIEND_{i,t} + \beta_3 HIGH\_FRIEND_{i,t} + \beta_4 \ln(SALARY)_{i,t} + \beta_5 MARRIED_{i,t} + \beta_6 CHILDREN_{i,t} + \beta_7 EXPERIENCE_{i,t} + \beta_8 EXPERIENCE\_SQ_{i,t} + IFE \cdot \vec{\delta} + u_{2,i,t} \quad (3)$$

where $SALARY\_GROWTH_{i,t}$ is the annual salary growth of individual i

Table 3
Initial salary regressions.

VARIABLES	(1)	(2)
	ln (SALARY)	ln (SALARY)
	full	Stepwise
Constant	9.785***	9.719***
	(0.151)	(0.0318)
FEM_MANAGER	0.192 (0.159)	
FEM_WORKER	0.0537	
	(0.145)	
FEM_MANAGER · FEM_WORKER	-0.269	
	(0.199)	
EXPERIENCE	-0.0403	
	(0.0519)	
EXPERIENCE_SQ	0.0116**	0.00688***
	(0.00486)	(0.00103)
EXPERIENCE · FEM_MANAGER	-0.0281	
	(0.0313)	
EXPERIENCE · FEM_WORKER	-0.0508*	-0.0381***
	(0.0276)	(0.00624)
EXPERIENCE · FEM_MANAGER · FEM_WORKER	0.0441	
	(0.0394)	
*MARRIED*1	0.0601	0.0689**
	(0.0791)	(0.0295)
*MARRIED*1 · *FEM_MANAGER*	-0.0402	
	(0.119)	
*MARRIED*1 · *FEM_WORKER*	-0.0366	
	(0.109)	
*MARRIED*1 · *FEM_MANAGER · FEM_WORKER*	0.108 (0.152)	
*CHILDREN*1	0.00500	
	(0.0319)	
*CHILDREN*1 · *FEM_MANAGER*	-0.0153	
	(0.0456)	
*CHILDREN*1 · *FEM_WORKER*	0.0533	
	(0.0459)	
*CHILDREN*1 · *FEM_MANAGER · FEM_WORKER*	-0.0461	
	(0.0596)	
Observations	419	419
R^2	0.148	0.132
F-Statistic	4.379	21.06

Notes: The data refer to 2012 (the initial year of teamwork). Standard errors are given in parentheses. * significant at the 10% significance level. ** significant at the 5% significance level. *** significant at the 1% significance level. The following table provides is the projected return for single male workers based on years of experience:

(1)	(2)	(3)	(4) = 2×(1)×(3)	(5)
EXPERIENCE	EXPERIENCE_SQ	Multiply by	Projected return	Standard Errors
1	1	0.00688–0.0116	1.38%–2.31%	(0.21%)-(0.97%)
2	4	0.00688–0.0116	2.75%–4.62%	(0.41%)-(1.94%)
3	9	0.00688–0.0116	4.13%–6.93%	(0.62%)-(2.92%)
4	16	0.00688–0.0116	5.50%–9.24%	(0.83%)-(3.89%)

$(i = 1, 2, \cdots, 419)$ at time t $(t = 2013,\ 2014,\ 2015)$; $MID\_FRIEND_{i,t}$ and $HIGH\_FRIEND_{i,t}$ are equal to 1 for a reported middle (high) friendship level with the boss of individual i at time t and 0 for a reported low friendship level.[6] $ln(SALARY)_{i,t}$ is the natural logarithm of the annual salary of individual i at time t in US dollars; $MARRIED_{i,t}$ equals 1 if the worker is married at time t and 0 otherwise; $CHILDREN_{i,t}$ denotes the number of children of individual i at time t; $EXPERIENCE_{i,t}$ denotes the years of experience; $\beta_1;\beta_2;\beta_3;\ \beta_4;\beta_5;\beta_6;\ \beta_7$ are parameters; *IFE* is a matrix of individual fixed effects dummies; $\vec{\delta}$ is a vector of parameters that correspond to the *IFE* matrix, and $u_{2,i,t}$ is the classical random disturbance term.

To measure the differences by the gender of managers and workers, we define the parameters of the model as follows:

$$\beta_j = \beta_{j,1} + \beta_{j,2} FEM\_MANAGER_{i,t} + \beta_{j,3} FEM\_WORKER_{i,t} + \beta_{j,4} FEM\_MANAGER_{i,t} \cdot FEM\_WORKER_{i,t} \quad (4)$$

Where. $j = 1, 2, 3, 4, 5, 6, 7$

3.2.3. Friendship with the boss and salary increase: regression analysis

Table 5 reports the estimation results of the fixed effects regressions. Model (A) is the full model given by Eq. (3), which includes 25 explanatory variables (column (1) in Table 5). The full model is decomposed to Model (B), which includes only the eight friendship variables and omits the 17 control variables (column (3) in Table 5), and model (C), which includes all the remaining 17 explanatory variables and excludes the friendship variables (column (4) in Table 5). The stepwise model (column (2) in Table 5) starts with model (A) and gradually omits explanatory variables whose coefficients are statistically insignificant at the 5% significance level. This procedure may be justified on the grounds of high collinearity among the interaction variables in the full model. While the average VIF measure of the full model is equal to 18.54, which provides a clear indication of high collinearity (VIF>10), the VIF of the stepwise model drops to VIF = 5.42 < 10.

The outcomes indicate that compared with the OLS with one constant term, the model with individual effect dummies is empirically supported.[7] The null hypothesis $\delta_2 = \delta_3 = \cdots = \delta_P = 0$ indicates lack of generic heterogeneity. The corresponding calculated F-values in columns (1)–(4) are 3.94, 4.34, 3.63, and 4.18, respectively. The critical F-values at the 1% level with 418 degrees of freedom at the numerator and 813, 833, 830, 821 degrees of freedom at the denominator are 1.21–1.22. Thus, we reject the null hypothesis at the 1% significance level.

The Wu-Hausman test examines the null hypothesis that the random effects estimator is consistent and efficient and more appropriate than the fixed effects estimator. The result of the Wu-Hausman test applied on the full model (the calculated χ^2 with 25 degrees of freedom equals 560.46 and is statistically significant at the 1% significance level (the critical $\chi^2_{1\%}(25) = 44.31$), indicating that compared with the random effects estimator, the fixed-effects estimator is supported empirically.

The results stress the role of the level of friendship with the team manager in determining the wage increases, particularly among female workers whose team managers are also females. Consider the bottom part of columns (1) and (3) in Table 5, where the null hypotheses

$$coef(MID\_FRIEND \cdot FEM\_MANAGER) + coef(MID\_FRIEND \cdot FEM\_WORKER) + coef(MID\_FRIEND \cdot FEM\_WORKER \cdot FEM\_MANAGER) = 0$$

and

[6] Consequently, β_2 reflects the difference betweem low and middle friendship level; and β_3 reflects the difference betweem middle and high friendship level.

[7] Johnston and DiNardo (1997) note that when the true model is the random effect model with individual heterogeneity, OLS will produce consistent but inefficient estimates.

Table 4
Descriptive statistics segmented by the gender of the team manager: Panel data.

Variable	Definition	Obs.×Years	Female Manager	Male Manager	Difference
FEM_WORKER	1 = female worker; 0 = male worker	1,257	0.6256	0.5104	0.1152***
			(0.0186)	(0.0208)	(0.0278)
NO_GROWTH	1 = the worker got 0% raise; 0 = otherwise	1,257	0.0631	0.0486	0.0145 (0.0131)
			(0.0093)	(0.0090)	
NO_GROWTH	1 = for the female group the worker got 0% raise; 0 = otherwise	720	0.0728	0.0442	0.0286 (0.0182)
FEMALE_WORKER=1			(0.0126)	(0.0120)	
NO_GROWTH	1 = for the male group the worker got 0% raise; 0 = otherwise	537	0.0471	0.0532	-0.0061 (0.0189)
MALE_WORKER=1			(0.0133)	(0.0134)	
GROWTH (NO_GROWTH=0)	Percent of salary increase (if the worker got a raise)	1,186	0.0694	0.0559	0.0135***
			(0.0016)	(0.0015)	(0.0022)
GROWTH (NO_GROWTH=0)	Percent of salary increase (if the female worker got a raise)	676	0.0708	0.0473	0.0235***
FEMALE_WORKER=1			(0.0022)	(0.0019)	(0.0031)
GROWTH (NO_GROWTH=0)	Percent of salary increase (if the male worker got a raise)	510	0.0670	0.0651	0.0019 (0.0031)
MALE_WORKER=1			(0.0022)	(0.0021)	
ln*(SALARY)*	Natural logarithm of the annual salary	1,257	9.8544	9.8763	-0.0219 (0.0182)
			(0.0127)	(0.0129)	
ln*(SALARY)*	Natural logarithm of the annual salary for female worker	720	9.7820	9.7920	-0.0100 (0.0239)
FEMALE_WORKER=1			(0.0168)	(0.0154)	
ln*(SALARY)*	Natural logarithm of the annual salary for male worker	537	9.9752	9.9642	0.0110 (0.0261)
MALE_WORKER=1			(0.0166)	(0.0197)	
LOW_FRIEND	1 = Low degree of friendship with the team manager (1, 2 or 3 on a scale of 1–7); 0 = otherwise	1,257	0.4684	0.4149	0.0535*
			(0.0191)	(0.0255)	(0.0281)
LOW_FRIEND	1 = Low degree of friendship with the team manager (1, 2 or 3 on a scale of	720	0.4460	0.5068	-0.0608 (0.0378)
FEMALE_WORKER=1	1–7) for the female worker; 0 = otherwise		(0.0241)	(0.0292)	
LOW_FRIEND	1 = Low degree of friendship with the team manager (1, 2 or 3 on a scale of	537	0.5059	0.3191	0.1868***
MALE_WORKER=1	1–7) for the male worker; 0 = otherwise		(0.0314)	(0.0278)	(0.0418)
MID _FRIEND	1 = Middle degree of friendship with the team manager (4, 5 on a scale of 1–7); 0 = otherwise	1,257	0.3231	0.4583	-0.1352***
			(0.0179)	(0.0208)	(0.0273)
MID_FRIEND	1 = Middle degree of friendship with the team manager (4, 5 on a scale of	720	0.2723	0.3844	-0.1121***
FEMALE_WORKER=1	1–7) for the female worker; 0 = otherwise		(0.0216)	(0.0284)	(0.0351)
MID_FRIEND	1 = Middle degree of friendship with the team manager (4, 5 on a scale of	537	0.4078	0.5355	-0.1277***
MALE_WORKER=1	1–7) for the male worker; 0 = otherwise		(0.0308)	(0.0298)	(0.0429)
HIGH_FRIEND	1 = High degree of friendship with the team manager (6 or 7 on a scale of 1–7); 0 = otherwise	1,257	0.2085	0.1267	0.0818***
			(0.0156)	(0.0139)	(0.0212)
HIGH_FRIEND	1 = High degree of friendship with the team manager (6 or 7 on a scale of	720	0.2817	0.1088	0.1728***
FEMALE_WORKER=1	1–7) for the female worker; 0 = otherwise		(0.0218)	(0.0182)	(0.0303)
HIGH_FRIEND	1 = High degree of friendship with the team manager (6 or 7 on a scale of	537	0.0863	0.1454	-0.0591**
MALE_WORKER=1	1–7) for the male worker; 0 = otherwise		(0.0176)	(0.0210)	(0.0277)
MARRIED	1 = Married; 0 = otherwise	1,257	0.7224	0.6736	0.0488*
			(0.0172)	(0.0195)	(0.0259)
MARRIED	1 = Married for the female worker; 0 = otherwise	720	0.7042	0.7211	-0.0169 (0.0344)
FEMALE_WORKER=1			(0.0221)	(0.0262)	
MARRIED	1 = Married for the male worker; 0 = otherwise	537	0.7529	0.6241	0.1288***
MALE_WORKER=1			(0.0271)	(0.0289)	(0.0398)
CHILDREN_DUM	1 = the team worker has at least one child; 0 = otherwise	1,257	0.5727	0.5313	0.0414 (0.0281)
			(0.0190)	(0.0208)	
CHILDREN_DUM	1 = the team worker has at least one child for the female worker; 0 =	720	0.5376	0.5476	-0.0100 (0.0378)
FEMALE_WORKER=1	otherwise		(0.0242)	(0.0291)	
CHILDREN_DUM	1 = the team worker has at least one child for the male worker; 0 =	537	0.6314	0.5142	0.1172***
MALE_WORKER=1	otherwise		(0.0303)	(0.0298)	(0.0426)
CHILDREN	Number of children for team workers with at least one child	696	2.5077	2.3105	0.1972**
(CHILDREN_DUM=1)			(0.0658)	(0.0578)	(0.0902)
EXPERIENCE	Years of work at the office	1,257	5.2709	5.5260	-0.2551**
			(0.0685)	(0.0735)	(0.1006)
Observations×Years			681	576	

Notes: The descriptive statistics refer to the difference between 720 (537) female×years (male×years) who work under a female (male) manager. Standard errors are given in parentheses. * significant at the 10% significance level. ** significant at the 5% significance level. *** significant at the 1% significance level.

$$coef(HIGH\_FRIEND \cdot FEM\_MANAGER) + coef(HIGH\_FRIEND \cdot FEM\_WORKER) + coef(HIGH\_FRIEND \cdot FEM\_WORKER \cdot FEM\_MANAGER) = 0$$

are tested empirically. Compared with the base category $FEM\_MANAGER = FEM\_WORKER = MID\_FRIEND = HIGH\_FRIEND = 0$, an increase in the level of friendship of the female worker with her female manager from low (1–3 on the 1–7 scale) to medium (4–5) degree, is associated with 1.74%–2.40% projected salary growth (statistically significant at the 10%–1% levels in the two columns). Compared with the base category $FEM\_MANAGER = FEM\_WORKER = MID\_FRIEND = HIGH\_FRIEND = 0$, an increase in the level of friendship of a female worker with her female manager from low (1–3 on the 1–7 scale) to high (6–7) degree, is associated with 4.08%–4.25% projected salary growth (statistically significant at the 1% level in the two columns).

An additional year of experience is projected to increase the salary growth by additional 1.52%–1.54% for male workers hired by female managers (significant at the 5%–1% levels) and by additional 1.96% for female workers hired by female managers.

Table 6 reports the results of two Likelihood Ratio tests designed to

Table 5
The fixed effects model.

VARIABLES	(1)	(2)	(3)	(4)
	SALARY_GROWTH	SALARY_GROWTH	SALARY_GROWTH	SALARY_GROWTH
	Full Model (A)	Stepwise Model (A)	Model (B)	Model (C)
Constant	2.449*** (0.294)	2.529*** (0.279)	0.0424*** (0.00127)	2.606*** (0.312)
MID_ FRIEND	0.00636 (0.00521)	–	0.0100** (0.00403)	–
MID_FRIEND · FEM_MANAGER	0.00711 (0.00732)	–	0.00653 (0.00573)	–
MID_FRIEND · FEM_WORKER	0.00392 (0.00723)	–	0.00746 (0.00572)	–
MID_FRIEND · FEM_MANAGER · FEM_WORKER	0.00998 (0.00974)	–	0.0178** (0.00791)	–
HIGH_FRIEND	0.0130 (0.00937)	–	0.0179** (0.00882)	–
HIGH_FRIEND · FEM_MANAGER	0.0212 (0.0131)	–	0.0130 (0.0123)	–
HIGH_FRIEND · FEM_WORKER	0.00834 (0.0131)	–	0.00986 (0.0120)	–
HIGH_FRIEND · FEM_MANAGER · FEM_WORKER	0.0157 (0.0168)	–	0.0368** (0.0152)	–
ln (*SALARY*)	-0.182*** (0.0627)	-0.148*** (0.0392)	–	-0.203*** (0.0658)
ln(*SALARY*) · *FEM_MANAGER*	-0.275*** (0.0925)	-0.211*** (0.0563)	–	-0.258*** (0.0980)
ln(*SALARY*) · *FEM_WORKER*	0.0605 (0.0961)	–	–	0.0780 (0.102)
ln(*SALARY*) · *FEM_MANAGER · FEM_WORKER*	0.132 (0.127)	–	–	0.0803 (0.135)
MARRIED	-0.00198 (0.00648)	–	–	-0.00247 (0.00699)
MARRIED · FEM_MANAGER	0.00494 (0.00918)	–	–	0.00401 (0.00989)
MARRIED · FEM_WORKER	-0.00340 (0.0102)	–	–	-0.00452 (0.0110)
MARRIED · FEM_MANAGER · FEM_WORKER	0.0120 (0.0133)	–	–	0.0111 (0.0143)
CHILDREN	0.00625* (0.00358)	–	–	0.00604 (0.00386)
CHILDREN · FEM_MANAGER	-0.00128 (0.00489)	–	–	-0.000580 (0.00527)
CHILDREN · FEM_WORKER	-0.00429 (0.00491)	–	–	-0.00379 (0.00526)
CHILDREN · FEM_MANAGER · FEM_WORKER	-0.00455 (0.00648)	–	–	-0.00238 (0.00694)
EXPERIENCE	0.00374 (0.00561)	–	–	0.00353 (0.00544)
EXPERIENCE · FEM_MANAGER	0.0152** (0.00704)	0.0154*** (0.00371)	–	0.0180*** (0.00668)
EXPERIENCE · FEM_WORKER	-0.00143 (0.00640)	–	–	-0.000843 (0.00603)
EXPERIENCE · FEM_MANAGER · FEM_WORKER	0.000787 (0.00891)	0.0196*** (0.00260)	–	0.0135 (0.00848)
EXPERIENCE_SQ	0.000582** (0.000270)	0.00116*** (0.000186)	–	0.000932*** (0.000289)
Method	Fixed-Effect	Fixed-Effect	Fixed-Effect	Fixed-Effect
Individual-Effect Dummies F-Test: $\delta_2 = \cdots = \delta_P = 0$; df (1)=(418,813); df (2)=(418,833); df (3)=(418, 830); df4=(418, 821)	3.94***	4.34***	3.63***	4.18***
Wu Hausman Test	560.46***	356.02***	87.01***	352.62***
coef (*MID_FRIEND · FEM_MANAGER*) + *coef* (*MID_FRIEND · FEM_WORKER*) + *coef* (*MID_FRIEND · FEM_WORKER · FEM_MANAGER*)	0.0174* (0.0089)	–	0.0240*** (0.007)	
coef (*HIGH_FRIEND · FEM_MANAGER*) + *coef* (*HIGH_FRIEND · FEM_WORKER*) + *coef* (*HIGH_FRIEND · FEM_WORKER · FEM_MANAGER*)	0.0425*** (0.0160)	–	0.0408*** (0.0148)	
Observations	1,257	1,257	1,257	1,257
R^2	0.472	0.367	0.387	0.377
VIF (OLS without individual-effect dummies)	18.54	5.42	5.58	22.13
Number of Clusters	419	419	419	419
F-Statistic	29.06***	96.77***	65.59***	29.25***
Log-likelihood	3158.33	3045	3064.99	3054.65

Notes: The fixed effects model is supported empirically by the rejection of the null hypothesis that all the constant terms of the 419 individuals ($P = 419$) are equal (at the 1% significance level) and by the outcomes of the Wu-Hausman test. Standard errors are given in parentheses. * significant at the 10% significance level. ** significant at the 5% significance level. *** significant at the 1% significance level.

examine the explanatory power of the friendship variables. We conducted two Likelihood Ratio tests. Model (A) is the full model, which includes 25 explanatory variables (column (1) in Table 3). The full model is decomposed to model (B), which includes only the eight friendship variables and omits the 17 control variables (column (3) in Table 5), and model (C), which includes all the remaining 17 explanatory variables (column (4) in Table 5).[8] The LR tests yield two calculated statistics, based on which we derive the percentage of contribution for each group

Table 6
Explanatory power of the models.

	Calculated Chi^2	%
LR (d.f. = 17) Models (A) vs. model (B)	186.69	47.38%
LR (d.f. = 8) Models (A) vs. model (C)	207.35	52.62%
Total	394.04	100%

Notes: Model (A) is the full model, which includes 25 explanatory variables (column (1) in Table 5); The full model is decomposed to Model (B), which includes only the eight friendship variables and omits the 17 control variables (column (3) in Table 5), and model (C), which includes all the remaining 17 explanatory variables and excludes the friendship variables (column (4) in Table 5). The general formula for the calculated LR statistics is: $LR = -2ln\lambda = 2[lnL(\widehat{\beta}, \widehat{\sigma}^2) - lnL(\tilde{\beta}, \tilde{\sigma}^2)]$, where $\widehat{\beta}, \widehat{\sigma}^2$ are the parameters and variance of the unrestricted model, and $\tilde{\beta}, \tilde{\sigma}^2$ are the parameters and variance of the restricted model (e.g., Johnston and DiNardo (1997), p. 147).

[8] The general formula for the calculated LR statistics is: $LR = -2ln\lambda = 2[lnL(\widehat{\beta}, \widehat{\sigma}^2) - lnL(\tilde{\beta}, \tilde{\sigma}^2)]$, where $\widehat{\beta}, \widehat{\sigma}^2$ are the parameters and variance of the unrestricted model, and $\tilde{\beta}, \tilde{\sigma}^2$ are the parameters and variance of the restricted model (e.g., Johnston and DiNardo (1997), p. 147).

of variables. This calculation demonstrates the high explanatory power of the friendship variables. 47.20% of the variance of the dependent variable is explained by the independent variables in model (A). The explained part of the variance is decomposed into eight friendship variables, which contribute 52.62%, and the remaining 17 variables which contribute 47.38%.

4. Conclusions

We examined the correlation of personal relations between team managers and their employees on the employees' salary dynamics. We studied the dynamics of salary increases over three years of 419 auditing workers in leading Israeli CPA firms (which are subsidiaries of American firms) at an early stage of their careers.

We found that friendship with the team manager is positively correlated with salary increases, particularly among female workers whose team managers are also females. Auditing workers work in small teams and have a large extent of autonomy. In this kind of work environment, a manager must count on his team members and therefore tends to promote workers with whom he feels comfortable to work. We conjecture that female managers tend to promote their female friend workers for two additional motives. First, female managers tend to help other females (Cohen and Huffman, 2007; Matsa and Miller, 2011). Second, female leadership style tends to be more participative (Eagly and Johnson, 1990). This managing style further underlines the importance of personal relations at the workplace.

We also found that upon being hired, females gain an average lower return to experience compared to their male counterparts. One possible reason may be the stronger inclination of females to avoid negotiation over salaries, particularly under uncertainty whether wages are negotiable (Croson and Gneezy, 2009; Leibbrandt and List, 2014).

Our findings are consistent with evidence suggesting that the presence of women in firms' management helps other women. Matsa and Miller (2011), for example, found a positive correlation between the female share in the board of directors in the previous year and the female share in the firm's top executives in the current year. Cohen and Huffman (2007) found a narrowing wage gap in the presence of high-status female managers. Nevertheless, other evidence suggests that a female worker is less likely to be hired by a committee where the share of female evaluators is relatively high since the female evaluators overestimate the quality of male candidates (Bagues and Esteve-Volart, 2010). Our findings may also be explained by the tendency of females to adopt a more participative leadership style (Eagly and Johnson, 1990), which underlies the importance of personal relations at the workplace.

Declarations

Author contribution statement

Yossef Tobol: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Ronen Bar-El: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Yuval Arbel: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Ofer H. Azar: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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