

## EMPLOYEE LEARNING AND COMPANY PERFORMANCE IN WOMEN-RUN ENTERPRISES: EVIDENCE FROM CENTRAL ASIA

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**Abstract:** This study explores whether offering trainings to employees improves firm performance, and how the effectiveness of these trainings differs across firms led by male & female managers. Using the 2023 World Bank Enterprise Survey data for Central Asia, focusing on log sales per employee as the key indicator of performance. Using regression analysis with firm-level data from Uzbekistan, Kazakhstan, Kyrgyzstan, and Tajikistan, the study finds that training has a robust and significant positive effect on performance, while female leadership, on average, correlates negatively with a firm's sales. These findings highlight the need for more targeted support and deeper understanding of gender differences in management and workforce development.

**Keywords:** Training, firm performance, female managers, gender and productivity

### ОБУЧЕНИЕ СОТРУДНИКОВ И ЭФФЕКТИВНОСТЬ РАБОТЫ КОМПАНИЙ НА ПРЕДПРИЯТИЯХ, УПРАВЛЯЕМЫХ ЖЕНЩИНАМИ: ПРАКТИКА ИЗ ЦЕНТРАЛЬНОЙ АЗИИ

**Аннотация:** В данном исследовании рассматривается, способствует ли проведение тренингов для сотрудников повышению эффективности компаний, а также как различается результативность этих тренингов в фирмах, возглавляемых мужчинами и женщинами. Используются данные Обследования предприятий Всемирного банка 2023 года по Центральной Азии, где ключевым показателем производительности выступает объем продаж на одного сотрудника. На основе регрессионного анализа фирм из Узбекистана, Казахстана, Кыргызстана и Таджикистана установлено, что тренинги оказывают устойчивое и значимое положительное влияние на показатели деятельности компаний, в то время как женское руководство в среднем отрицательно коррелирует с производительностью фирм. Полученные результаты подчеркивают необходимость более целевой поддержки и глубокого понимания гендерных различий в управлении и развитии персонала.

**Ключевые слова:** обучение, производительность предприятий, женщины-руководители, гендер и производительность

### AYOLLAR BOSHQARAYOTGAN KORXONALARDA XODIMLARNI O'QITISH VA KOMPANIYA ISH SAMARADORLIGI: MARKAZIY OSIYODAN OLINGAN DALILLAR

**Annotatsiya:** Ushbu tadqiqot xodimlarga ta'lim berish firmalar samaradorligiga ta'sir qiladimi va bu ta'lim samaradorligi erkaklar va ayollar boshqaruvidagi firmalarda qanday farq qilishi mumkinligini o'rganadi. Tadqiqotda 2023-yilgi Jahon bankining Markaziy Osiyodagi korxonalar bo'yicha so'rovi ma'lumotlaridan foydalanilgan bo'lib, mehnat unumdorligini baholashda asosiy ko'rsatkich sifatida xodim boshiga to'g'ri keladigan log savdo hajmi tanlangan. O'zbekiston, Qozog'iston, Qirg'iziston va Tojikistondagi firmalar ma'lumotlariga asoslangan regressiya tahlili shuni ko'rsatadiki, treninglar firmalar samaradorligiga sezilarli va ijobiy ta'sir ko'rsatadi. Shu bilan birga, ayollar yetakchiligi o'rtacha hisobda firmalar unumdorligi bilan salbiy bog'liqdir. Ushbu natijalar boshqaruv va mehnat resurslarini rivojlantirishda gender farqlarini chuqurroq tushunish hamda maqsadli qo'llab-quvvatlash zarurligini ta'kidlaydi.

**Kalit so'zlar:** trening, firma samaradorligi, ayol menejerlar, gender va unumdorli

## Introduction

In the current era of globalization, the importance and role of women in society are undergoing significant changes. Before women were generally understood to carry only family responsibilities, however nowadays they are more active in labor market as well [6]. Number of female leaders, women managers, and women holding high political positions is steadily increasing [1]. Employee training helps people work better and get more done. Gary S. Becker's [3] Human Capital theory says that spending money on education and training is like investing in equipment—it helps people become more productive and earn more. According to his idea, trained employees are more efficient, creative, and productive. Companies that train their workers can do better than others, especially if employees stay with the company and the training matches the company's goals [3]. However, its effectiveness may depend on who leads the firm. Women are more likely to exhibit transformational leadership qualities, such as mentoring and inspiring subordinates, which are increasingly valued in modern organizations [4]. This suggests that employee training initiatives may be particularly effective in firms led by women, as their leadership style fosters a supportive environment that enhances learning, engagement, and the practical application of new skills [5].

This research investigates how training affects firm performance (measured as sales per employee), focusing on whether outcomes differ in female-managed firms. The study addresses three questions:

- (1) Does training improve firm performance?
- (2) Do female-managed firms perform differently than male-managed firms?
- (3) Is the effect of training weaker or stronger when the top manager is female?

Although gender and firm performance are often studied separately, little is known about how the two interact with human capital investments like training. This study contributes to the literature by examining the intersection of gender in leadership and employee development practices.

## Literature Review

Although direct studies on how formal training interacts with female leadership are sparse, related insights emerge from healthcare and broader sectors [7]. A comprehensive global review in *BMJ Global Health* (2025) found that female leaders—known for their transformational and participative styles—increase financial performance, innovation, ethical engagement, and organizational culture. This supports the hypothesis that women-led firms may derive heightened benefits from employee training due to more supportive environments [7].

Looi et al. (2025) [8] analyzed 279 Malaysian firms, showing that greater female representation in leadership positively correlates with firm performance—and that fair compensation acts as a significant moderating factor. This suggests that training initiatives need to be matched with equitable remuneration structures to amplify the positive impact of gender-diverse leadership [8].

Using the IGLO model, a recent study across Japanese firms (2023[ 9] linked female middle management to improved employee engagement, reduced stress, heightened job satisfaction, and made teamwork stronger. Better well-being can enhance the effectiveness of training by creating a culture where employees are more receptive to learning and applying new skills [9]. A study focused on Central Asia (2024) examined World Bank Enterprise Survey data across Uzbekistan, Kazakhstan, Tajikistan, and Kyrgyzstan and found that female leadership consistently improved firm performance, though it was not strongly mediated by innovation. This shows that gender-diverse management enhances productivity regardless of explicit innovation benefits [10].

## Data and Methods

The data come from the 2023 World Bank Enterprise Survey in Uzbekistan, covering 3,727 firms from various sectors and sizes. The dependent variable is sales per employee, a common measure of firm performance. The key independent variables include whether the firm offers formal training to employees and whether the top manager is a woman. An interaction term between these two variables is also included.

We apply Ordinary Least Squares (OLS) regression with robust standard errors to estimate the relationship between training, female leadership, and firm performance. The model controls for potential confounders such as firm size, sector, and founding year. The theoretical framework builds on human capital theory and gender-based leadership research.

## Methodology

This study adopts a **quantitative research design** to analyze the relationship between **Human Capital Management (HCM) practices** and **firm performance** under female leadership. The research uses data from the **World Bank Enterprise Survey 2023[2]**, which provides comprehensive information on business environments, leadership practices, and organizational performance metrics across multiple industries. By leveraging this dataset, the study aims to identify patterns and correlations between female leadership, HCM practices, and firm-level performance outcomes.

Data for this study is drawn from the **World Bank Enterprise Survey 2023[2]**, a widely recognized source that collects data on firms' operational practices, management strategies, and business performance in emerging economies, including Uzbekistan. The survey provides detailed information on various business factors, such as leadership structure, human resource practices, and financial performance. These aspects are essential for analyzing how female leadership impacts Human Capital Management and overall firm performance.

The data will be analyzed using **statistical methods** to test the relationships between key variables. Techniques such as Probit/Logit model for training participation and OLS regression for labor productivity analysis will be employed to examine how female leadership influences HCM practices and, in turn, firm performance. Regression models will help in understanding the extent to which female leadership contributes to improved organizational outcomes when mediated by human capital management strategies.

To calculate the effect of training on productivity with **female gender as a moderator**, **Becker (1964) [3]** used the following model:

$$\text{Productivity} = \beta_0 + \beta_1 \text{training} + \beta_2 \text{female} + \beta_3 (\text{training} * \text{female}) + e$$

**Independent Variables:** Employee participation in formal training, presence of a female manager, and the interaction between the two

**Dependent Variable:** Productivity (sales per employee)

**Control Variables:** Firm size, industry type, ownership, country-specific factors

### Theoretical framework:

The study is grounded in Human Capital Theory [3] and complemented by gender-in-leadership literature [4] which explores how gendered leadership styles may influence firm outcomes.

Variable	Full Sample Coef.	Uzbekistan Coef.	Kazakhstan Coef.
Training	0.404***	0.440***	0.325***
Female Manager	-0.352***	-0.575***	-0.285***
Training × Female Mgr.	0.064 (n.s.)	-0.094 (n.s.)	0.109 (n.s.)
R-squared	0.747	0.198	

**Table1. Interaction of Training and Female Leadership in Central Asian Firms.**

**Source:** Author's calculations based on World Bank Enterprise Surveys (2023) [2].

In the empirical estimation, we additionally include **country** and **year** dummy variables. This adjustment does not alter the theoretical model itself, but rather improves the robustness of the estimation:

**Country effects (i.country)** control for time-invariant differences across countries, such as institutional settings or structural economic factors.

**Year effects (i.year)** capture common shocks over time, including macroeconomic fluctuations and policy changes.

Therefore, while the core specification remains the same, the inclusion of these fixed effects ensures that our coefficients ( $\beta_1, \beta_2, \beta_3$ ) are not biased by unobserved heterogeneity across countries or over time.

## Main Results

Based on the results on Table 2, there are given several key findings:

<pre>. reg ln_sales_usd_per_employee training female_manager training_femmanager i.country_id i.year, r &gt; obust</pre>						
Linear regression		Number of obs		=	3,727	
		F(9, 3717)		=	1055.68	
		Prob > F		=	0.0000	
		R-squared		=	0.7470	
		Root MSE		=	1.3819	
ln_sales_usd_per_~e	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
training	.4045122	.0656812	6.16	0.000	.2757375	.5332869
female_manager	-.3516363	.0666285	-5.28	0.000	-.4822682	-.2210043
training_femmanager	.0648331	.1288714	0.50	0.615	-.1878324	.3174986
country_id						
Kyrgyz Republic	-1.86057	.0677875	-27.45	0.000	-1.993474	-1.727666
Tajikistan	-4.496141	.0763542	-58.89	0.000	-4.645841	-4.346441
Uzbekistan	2.314617	.0565119	40.96	0.000	2.203819	2.425414
year						
2009	.9072816	.1625573	5.58	0.000	.5885713	1.225992
2013	1.477411	.1251482	11.81	0.000	1.232045	1.722777
2019	2.080994	.1203724	17.29	0.000	1.844991	2.316996
_cons	4.061149	.1249927	32.49	0.000	3.816088	4.30621

**Table 2. Regression analysis on Stata**



**Source:** Author's calculations based on World Bank Enterprise Survey (WBES) data, analyzed using Stata.

The regression findings for the factors influencing firm-level productivity, as determined by the natural logarithm of sales per employee, are shown in Table 2. The results demonstrate that staff training improves business performance in a way that is both positive and statistically significant. In particular, the training coefficient is 0.405 ( $p < 0.001$ ), indicating that companies that offer training report higher levels of production than those that don't.

The coefficient for female top management, on the other hand, is negative and highly significant ( $-0.352$ ,  $p < 0.001$ ), suggesting that companies with female managers often have lower sales per employee than those with male managers. Crucially, despite being positive (0.065), the interaction term between training and female management is not statistically significant ( $p = 0.615$ ).

This suggests that the advantages of training are universal across businesses, irrespective of the gender of the management.

There are significant country-specific consequences as well. With values of  $-1.861$  and  $-4.496$ , respectively, businesses in the Kyrgyz Republic and Tajikistan are much less productive than those in Kazakhstan (the reference group) (both  $p < 0.001$ ). The productivity of Uzbek businesses, on the other hand, is significantly higher, with a coefficient of 2.315 ( $p < 0.001$ ). These findings demonstrate significant variations in company performance between nations.

Additionally, temporal effects show that productivity has been increasing over time. Businesses report increased log-sales per employee in 2009 (0.907), 2013 (1.477), and 2019 (2.081) compared to the base year (all  $p < 0.001$ ).

According to the regression results, the model accounts for approximately 74.7% of the variation in sales per employee ( $R\text{-squared} = 0.747$ ), suggesting that the explanatory variables provide a very strong fit to the data.

In summary, while employee training is linked to higher productivity, female-managed firms continue to face significant performance gaps. These findings highlight the need for targeted policies to address the underlying barriers faced by women in management, in addition to promoting training program

## Conclusion

This study provides strong evidence that employee training directly boosts company performance in Central Asia and explores how gender influences management success. Using the latest World Bank Enterprise Survey data, the authors show that businesses running formal training sessions achieve noticeably higher productivity, measured as sales per worker. The result lines up well with Human Capital Theory, which argues that upgrading skills feeds straight into better organizational output.

Yet the same analysis finds that firms with female managers, on average, remain less productive than those headed by men, even after controlling for several company traits. Crucially, the link between female leadership and the benefits of training was not statistically meaningful, meaning the skill programs help everyone alike and the managers gender does not change that picture. This finding pushes against the simple idea that hiring women at the top automatically makes training work better and points to the larger institutional, structural, and cultural hurdles still faced by female leaders in the region. The lower productivity of female-led firms should not be read as proof that women managers lack ability. That said, obstacles such as uneven access to finance, heavy reliance on low-margin industries, and lingering biases about women in charge still hold many firms back. When these barriers persist, the payoffs from skill-building efforts shrink and the cycle of inequality stays firmly in place.

The policy message is straightforward. Companies wanting to lift productivity must keep investing in training, but they also need focused steps that support women leaders. Such steps include widening access to capital, curbing bias, and shaping workplaces where mixed-gender teams truly excel. Scholars should follow up by studying the day-to-day realities inside firms-leadership style, staff perceptions, office culture-to reveal exactly how gender and learning opportunities meet. By joining these dots, the research deepens our grasp of how gendered human-capital choices drive firm results in emerging markets and reminds policymakers that fair, data-driven plans are essential for unleashing the full potential of women leaders across Central Asia.

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