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ISSN: 2365-9793

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ABSTRACT

Gender Wage Gap - A Matching Analysis for Three MENA Countries: Egypt, Jordan and Turkey*

We investigate the gender wage gap in three neglected MENA countries: Egypt (1980-2018), Jordan (2010-2016), and Turkey (2014-21017). We use repeated cross-sections and propensity score matching as the best way to control for observed heterogeneity. We find a much more sizeable gap than in advanced economies, but with a downward trend similar to advanced economies, reaching in Jordan a low of -0.18.

JEL Classification: C31, J16, J31, K38

Keywords: gender wage gap, propensity score matching, Turkey, Jordan, Egypt

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* We thank ERF and TurkStats to providing the necessary datasets for this article.

Introduction

This paper investigates the gender wage gap in three developing countries by means of the propensity score matching estimator, which provides us with the best way of controlling for observable heterogeneity across individuals belonging to different genders (Meara et al., 2020).

The gender gap is a hot topic, extensively debated in the current literature (for a recent and comprehensive survey, see Blau and Kahn, 2017). Weichselbaumer and Winter-Ebmer (2005) use a meta-analysis of 263 papers and find that a reduction of the gender wage gap over the world. Such evidence is valid also for other countries, such as the US (see Meara et al. 2020; Beaudry and Lewis, 2014; Borghans et al., 2014; Flory et al., 2014) and the UK (see Olsen and Walby, 2004; Livanos and Pouliakas, 2012).).

The factors that might increase the gap include: female segregation in low-paid jobs (Jurajda, 2005; Ogloblin, 1999); labour hoarding practices (Koumakhov and Najman, 2000; Namazie, 2003); and the increased dispersion of the overall wage distribution (Brainerd, 2000). For MENA countries, only a few studies have examined the glass ceiling and gender pay gap for the case of the MENA countries (the studies are Jamali et al., 2007; Kandil, 2015; Ghorbani and Tung, 2007). Therefore, the present study offers a different and new insight on the gender pay gap in the MENA countries.

Over the last two decades, the countries that we cover in this study have experienced a reduction in the female labor force participation, from a level which was already very low, according to an ILO (2012) Report.

Data and Methodology

In our analysis, we use three datasets. For Egypt, we use the Economic Research Forum (ERF)'s Labor Market Panel Survey which covers the 1980-2018 period, with the following rounds: 1980, 1998, 2006, and 2018. For Jordan, the same dataset covers only the 2010 and 2016 rounds. For Turkey, we use TurkStats' household income survey which covers the period between 2014 and

2017 without any break. Therefore, although cross-section in nature, our dataset has a temporal dimension for all the countries that we cover in the present study, which allows us studying also the trend of the gap over the considered period.

In our psm analysis, we follow Meara et al. (2020)'s approach, although using different variables, as based on the available data and, therefore, for shortness' sake, we omit to present in detail the methodology used. We summarize our approach in the following way. In our first step, we estimate a logit model for being a woman in the three countries, separately. We use age, educational qualifications (we use a dummy variable for each education level), and work experience as determinants in the first step.

At step two, we extract by psm a sample of men with the same characteristics as the women in our sample and estimate gender wage differences among these two samples which are very similar by construction under all observed characteristics but gender. The outcome variable is the logarithm of the monthly basic income s, Log(wage), as reported by the ERF dataset for Jordan, and Egypt. For Turkey, Log(wage) is obtained by dividing by 12 the annual wage. We take Log(wage) variable as a dependent variable in the second step of the PSM estimations.

Figure 1, 2, and 3 depict the unconditional average wages by gender in the countries considered. The gap is clearly persistent and even increasing over time everywhere. In what follows, we test whether these differences persist also when controlling for observed heterogeneity

[Insert Figure 1,2, and 3 here]

Findings

The findings based on PSM suggest that gender differences in wages are sizeable and statistically significant in the case of Egypt over the entire period (Table 1), despite controlling in the best possible way for all individual characteristics. Moreover, the gap is increasing over the period from -0.27 to a high of -0.43 up until 2012, at the time of the Arab Spring, to slightly shrink in the

following period down to the pre-Arab spring level of -0.39 in 2018. This is quite a sizeable gap compared to other countries, including advanced economies: Meara et al. (2020) find a gap of -15% in the log of hourly wages for the USA using the same methodology. Moreover, the Egyptian gap is sizeable especially considering the very low participation rate of women in Egypt. As Olivetti and Petrongolo (2008) argue, in fact, there is a positive relationship between the gender gap in earnings and in female participation: in fact, with increasing participation, also the least motivated women find a job, although they tend to accept lower wages and, therefore, to increase the average gender gap.

[Insert Table 1 here]

For Turkey, the like-for-like gender gap is extremely high and sizeable over the period 2014-2017, ranging between -0.41 in 2017 and an astonishing -0.57 in 2014 (Table 2). However, interestingly, we notice a reduction of the gap over the years, rather than an increase, probably because the gap in the first year was extremely high: in 2014, a woman earned less than half of the earnings of a male peer. The observation numbers are increasing from the first to the last estimate, which suggests that some adjustment may be due to better data available in recent years. However, still the gap remains high, by international standards and also considering the low participation rate of women.

[Insert Table 2 here]

Table 3 shows that there was a sizeable gender wage gap also in Jordan in 2010 (-0.38), but that it is reducing down to –0.20 in 2016, a reduction of about a half. In other words, the gap is smaller than in the other two considered countries and further decreasing over time like in Turkey rather than Egypt (Table 3). At the end of the period, at least in absolute value the gap in Jordan is comparable to that of more advanced economies, such as the USA and the UK.

[Insert Table 3 here]

CONCLUSION

In this study, we investigate the gender wage gap for three MENA countries: Egypt, Jordan, and Turkey. We use repeated cross-sections and propensity score matching analysis to carry out our estimations. Quite surprisingly, for those used to think of these countries as part of the same MENA culture and economy, we find that the gender wage gap is different across the three countries considered both in absolute values and as a trend. The gap is sizeable in all three countries, but especially sizeable in Turkey in 2014(-0.57). However, the gap is increasing in Egypt from -0.27 in 1998 up to -0.43 in the post-Arab spring period, to slightly reduce in the following years down to -0.38 in 2016). In Turkey (2014-2017) and in Jordan (2010-2016) the gap is importantly decreasing over the period. In Jordan, at the end of the period it almost reaches the level of advanced economies, at about -0.20.

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Table 1. Estimation Results for Egypt

Year	Egypt
1998	-0.27 (0.06) [-3.11] T=383 C=1252
2006	-0.42 (0.07) [-4.91] T=466 C=1609
2012	-0.43 (0.08) [-5.66] T=568 C=2210
2018	-0.39 (0.06) [-4.59] T=519 C=2332

Note: The estimations are based on bootstrapped standard errors with 50 replications.

Table 2. Estimation Results for Turkey

Year	Turkey
2014	-0.57 (0.05) [-9.98] T=1455 C=3528
2015	-0.46 (0.03) [-12.10] T=2893 C=6958
2016	-0.38 (0.03) [-10.02] T=4508 C=10494
2017	-0.41 (0.03) [-11.01] T=4647 C=10787

Note: The estimations are based on bootstrapped standard errors with 50 replications.

Table 3. Estimation Results for Jordan

Year	Jordan
2010	-0.38 (0.05) [-4.65] T=817 C=3251
2016	-0.20 (0.06) [-2.20] T=886 C=3726

Note: The estimations are based on bootstrapped standard errors with 50 replications.

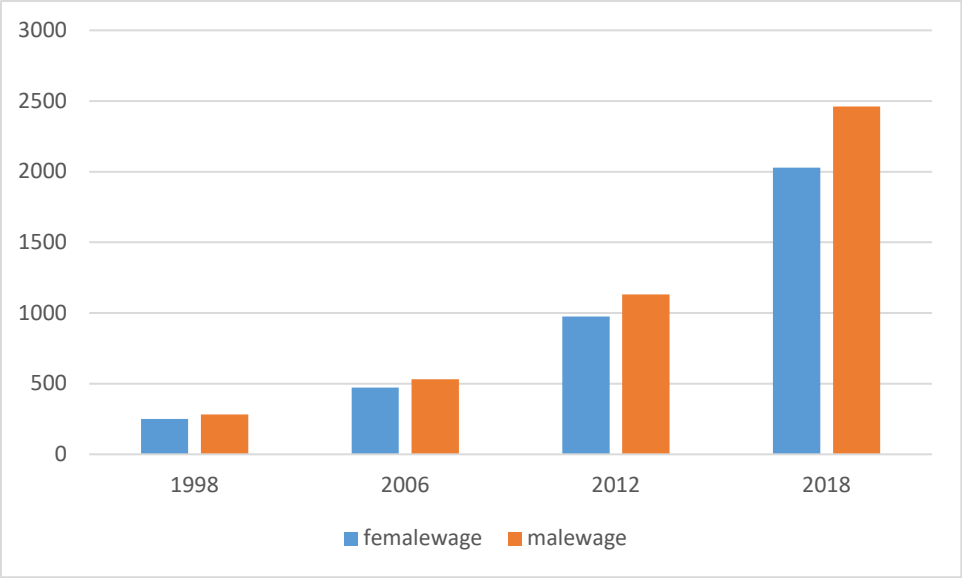


Figure 1. Average Monthly Wage for Female and Male, By Year, Egypt

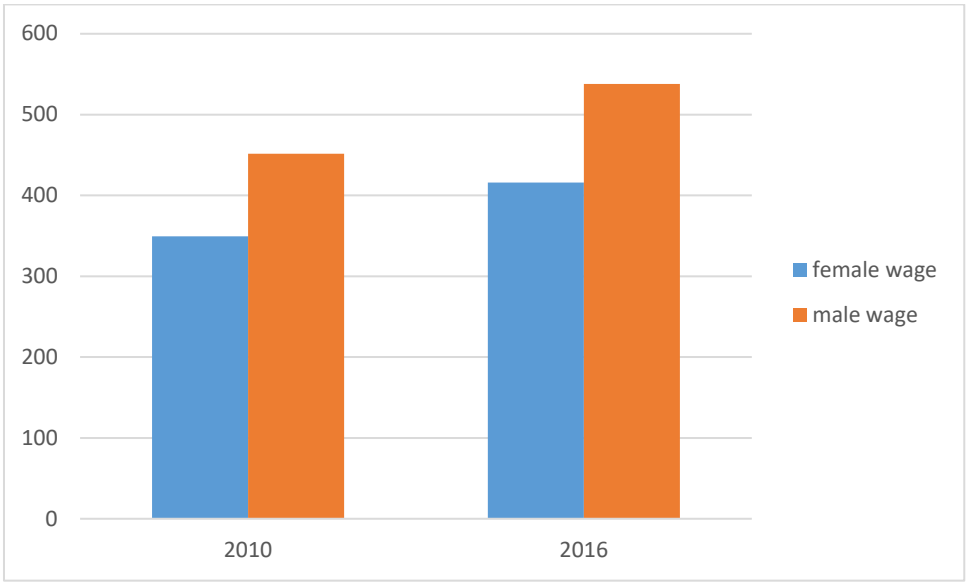


Figure 2. Average Monthly Wage for Female and Male, By Year, Jordan

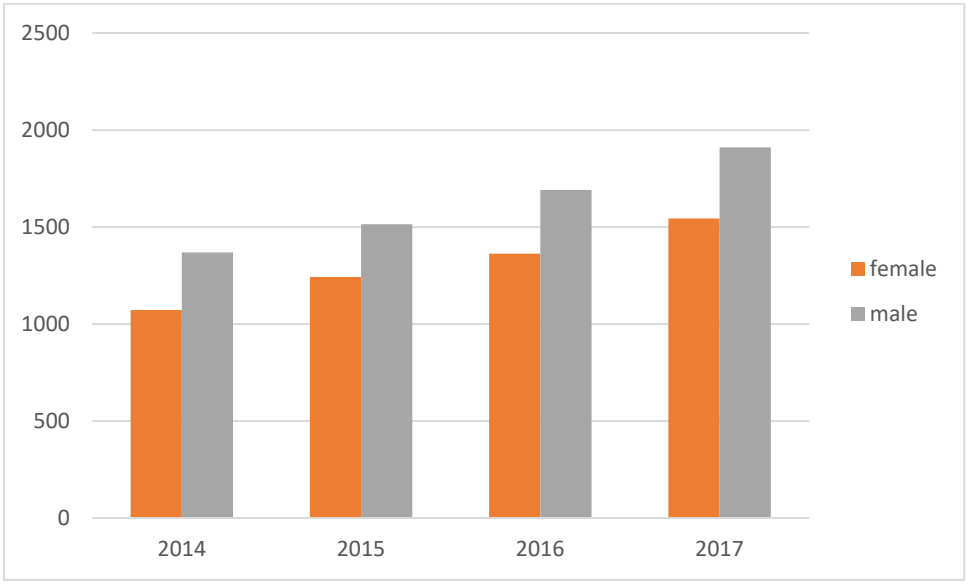
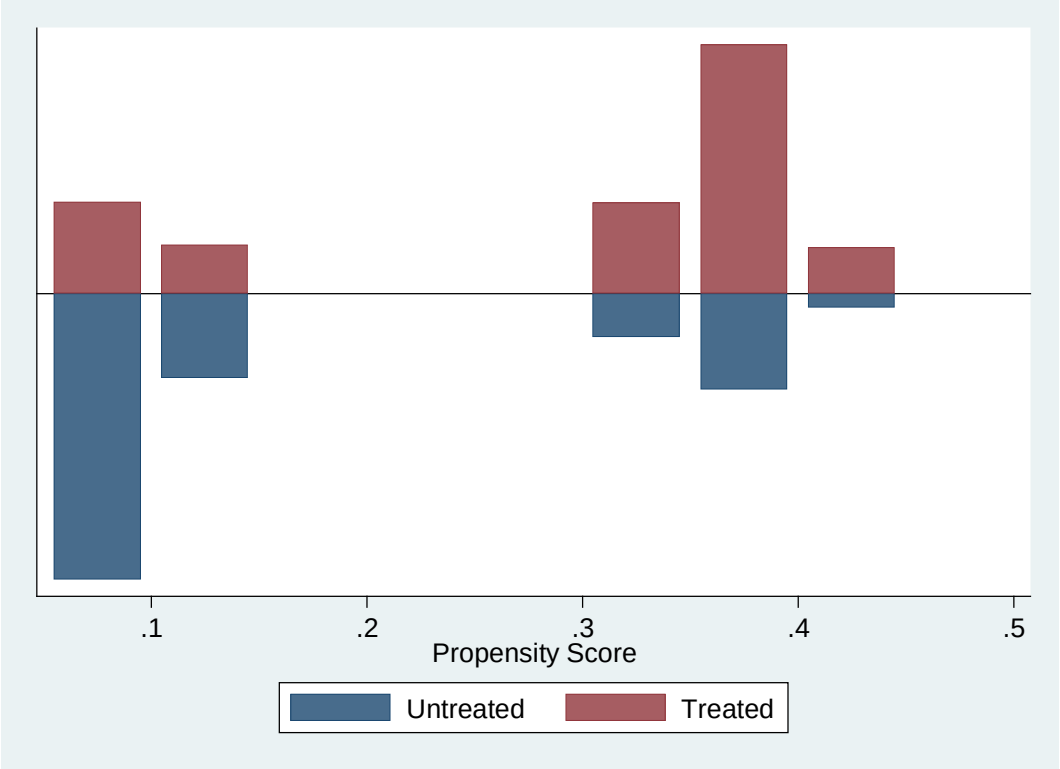
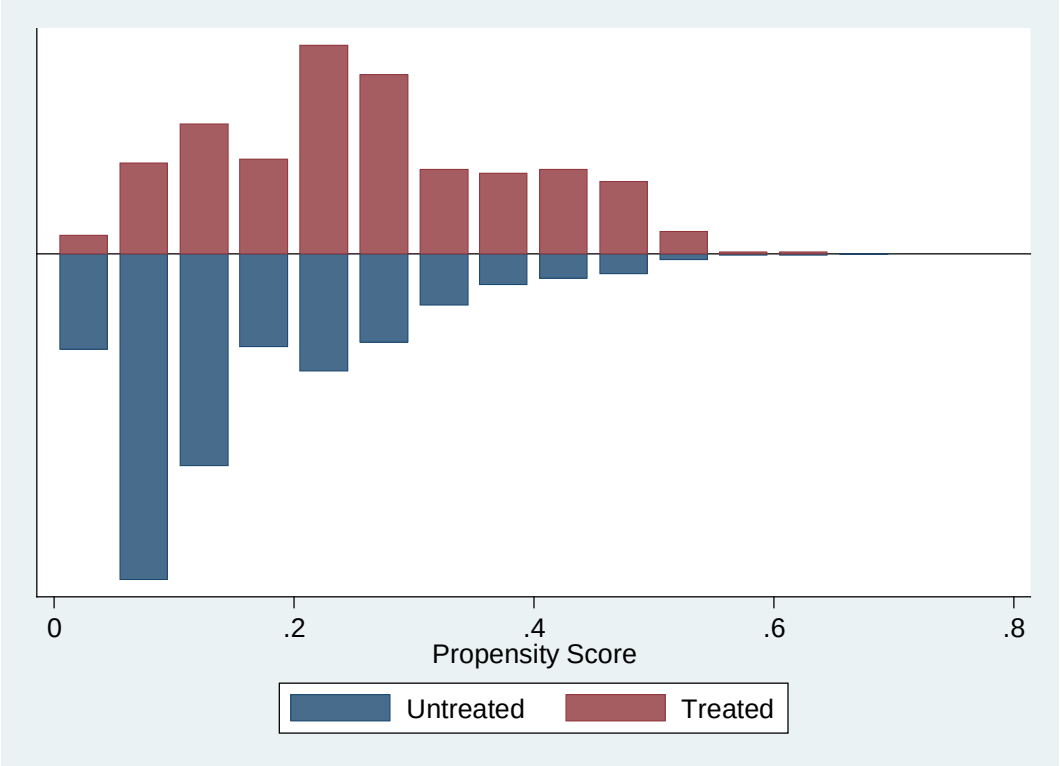


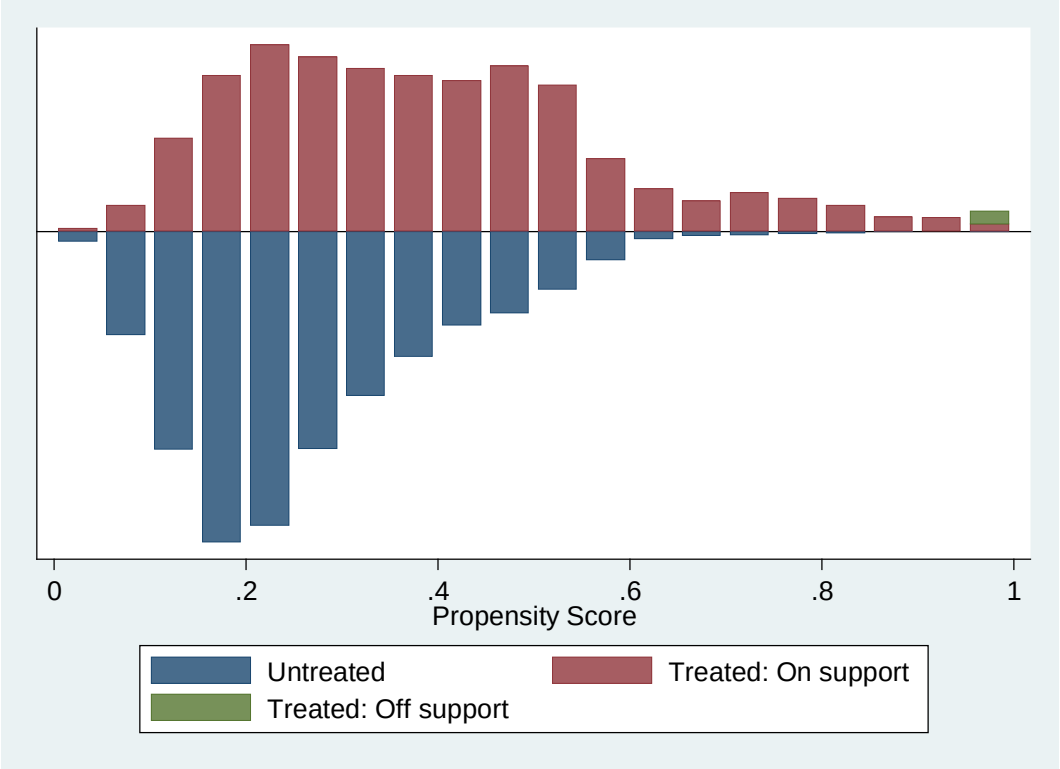
Figure 3. Average Monthly Wage for Female and Male, By Year, Turkey



Jordan for 2016



Egypt for 2018



Turkey for 2017

Figure 4. Propensity Score Graphs for the countries

Appendix. Bias Reduction Tables

Egypt

1998

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
age	38.893	38.318	5.5	1.96	0.050	1.11*
Reads & Writes (Educ=2)	.07762	.07546	0.7	0.28	0.782	1.03
Less than Intermediate (Educ=3)	.11882	.11795	0.2	0.09	0.927	1.01
Intermediate (Educ=4)	.19167	.19428	-0.6	-0.22	0.823	0.99
Above Intermediate (Educ=5)	.0412	.03859	1.2	0.45	0.652	1.06
University (Educ=6)	.06982	.07589	-2	-0.79	0.428	0.93
Post-Graduate (Educ=7)	.00347	.0013	3	1.51	0.131	2.66*
workexp	27.141	26.487	5.1	1.74	0.081	1.07

* if variance ratio outside [0.92; 1.09]

2006

Variable	Mean	Treated Control %bias	t-test t	p>t	V(T)/ V(C)
age	38.893	38.318	5.5	-0.04	0.971	0.98
Reads & Writes (Educ=2)	.07762	.07546	0.7	0.38	0.705	1.33*
Less than Intermediate (Educ=3)	.11882	.11795	0.2	-0.26	0.795	0.88
Intermediate (Educ=4)	.19167	.19428	-0.6	-0.07	0.948	1
Above Intermediate (Educ=5)	.0412	.03859	1.2	0.45	0.655	1.08
University (Educ=6)	.06982	.07589	-2	-0.21	0.837	0.99
Post-Graduate (Educ=7)	.00347	.0013	3	0.38	0.705	1.33*

	27.141		-0.11	
workexp	26.487	5.1	0.914	0.98

* if variance ratio outside [0.83; 1.20]

2012

2012

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
	40.5			-0.04		
age	40.521		-0.2	0.971		0.98
	.00858			0.38		
Reads & Writes (Educ=2)	.00644		1.1	0.705		1.33*
	.01502			-0.26		
Less than Intermediate (Educ=3)	.01717		-0.8	0.795		0.88
	.47425			-0.07		
Intermediate (Educ=4)	.47639		-0.4	0.948		1
	.09871			0.45		
Above Intermediate (Educ=5)	.09013		3.1	0.655		1.08
	.34764			-0.21		
University (Educ=6)	.35408		-1.5	0.837		0.99
	.00858			0.38		
Post-Graduate (Educ=7)	.00644		2.1	0.705		1.33*
	21.519			-0.11		
workexp	21.588		-0.6	0.914		0.98

2018

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
	42.091			-0.34		
age	42.318		-2.1	0.731		1.02
	.02119			0.69		
Reads & Writes (Educ=2)	.01541		2.9	0.488		1.37*
	.02697			-0.55		
Less than Intermediate (Educ=3)	.03276		-2.2	0.585		0.83*
	.30636			0.41		
Intermediate (Educ=4)	.2948		2.4	0.685		1.02
	.06744			-1.27		
Above Intermediate (Educ=5)	.08863		-9.6	0.203		0.78*

	.45472		-0.37	
University (Educ=6)	.46628	-2.5	0.709	1
	.04432		2.30	
Post-Graduate (Educ=7)	.01927	15	0.021	2.24*
	23.333		-0.46	
workexp	23.68	-2.9	0.643	1.02

Turkey

2014

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
age	1978.6	1979.1	-4.7	-1.33	0.183	1.1
Illiterate (Educ=1)	.04135	.03515	3.2	0.87	0.384	1.17*
Literate but not a graduate (Educ=2)	.23846	.20124	8.4	2.42	0.015	1.13*
Primary school graduate (Educ=3)	.10958	.10613	1	0.30	0.765	1.03
Secondary, vocatinal secondary or primary education school graduate (Educ=4)	.11234	.11027	0.6	0.18	0.860	1.02
High school graduate (Educ=5)	.09235	.09304	-0.2	-0.06	0.949	0.99
Vocational or technical high school graduate (Educ=6)	.357	.40179	-10	-2.49	0.013	0.96
workexp	13.738	13.545	1.7	0.47	0.639	1.19*

* if variance ratio outside [0.90; 1.11]

2015

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
age	1979.1	1979.9	-7	-2.84	0.004	1.08*
Illiterate (Educ=1)	.03814	.02184	8.5	3.63	0.000	1.72*
Literate but not a graduate (Educ=2)	.24029	.20804	7.3	2.94	0.003	1.11*
Primary school graduate (Educ=3)	.11616	.09882	4.7	2.13	0.034	1.15*
Secondary, vocatinal secondary or primary education school graduate (Educ=4)	.11269	.09743	4.8	1.89	0.059	1.14*
High school graduate (Educ=5)	.09223	.08287	3.1	1.26	0.209	1.10*
Vocational or technical high school graduate (Educ=6)	.3561	.41505	-13.2	-4.61	0.000	0.94
workexp	14.12	14.314	-1.7	-0.67	0.504	1.10*

2016

	Mean			t-test		V(T)/

Variable	Treated Control	%bias	t p>t	V(C)
	1979.6		-3.58	
age	1980.4	-7.1	0.000	1.11*
	.03808		3.50	
Illiterate (Educ=1)	.02516	6.9	0.000	1.49*
	.23447		4.87	
Literate but not a graduate (Educ=2)	.19238	9.7	0.000	1.16*
	.12781		2.17	
Primary school graduate (Educ=3)	.11289	4	0.030	1.11*
Secondary, vocatinal secondary or primary	.10532		1.37	
education school graduate (Educ=4)	.09664	2.8	0.172	1.08*
	.08773		-0.04	
High school graduate (Educ=5)	.08795	-0.1	0.970	1
Vocational or technical high school graduate			-3.35	
(Educ=6)	.3654 .39969	-7.6	0.001	0.97
	14.614		-0.35	
workexp	14.698	-0.7	0.724	1.14*

2017	Mean Treated		t-test	V(T)/
Variable	Control	%bias	t p>t	V(C)
	1980.2		-5.09	
age	1981.4	-10	0.000	1.11*
	.03858		4.41	
Illiterate (Educ=1)	.02276	8.6	0.000	1.67*
	.23082		6.31	
Literate but not a graduate (Educ=2)	.17794	12.2	0.000	1.21*
	.12549		2.29	
Primary school graduate (Educ=3)	.1101	4.1	0.022	1.12*
Secondary, vocatinal secondary or primary	.10446		2.61	
education school graduate (Educ=4)	.08843	5.2	0.009	1.16*
	.08929		0.74	
High school graduate (Educ=5)	.08496	1.4	0.460	1.05
Vocational or technical high school graduate			-4.92	
(Educ=6)	.373 .42306	-11	0.000	0.96
	15.074		-0.33	
workexp	15.153	-0.7	0.738	1.15*

Jordan

2010

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
age	34.67	34.807	-1.6	-0.34	0.733	0.99
Illiterate (Educ=1)	.02693	.02693	0	0.00	1.000	1
Reads & Writes (Educ=2)	.06487	.0612	1.2	0.31	0.760	1.06
Less than Intermediate (Educ=3)	.09425	.0967	-0.6	-0.17	0.866	0.98
Intermediate (Educ=4)	.10037	.10159	-0.4	-0.08	0.935	0.99
Above Intermediate (Educ=5)	.23745	.24969	-3.3	-0.58	0.565	0.97
University (Educ=6)	.41004	.41248	-0.6	-0.10	0.920	1
Post-Graduate (Educ=7)	.0661	.05141	6.7	1.26	0.207	1.27*
workexp	14.868	15.076	-2.1	-0.44	0.662	1

2016

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
age	35.581	35.581	0	0.00	1.000	0.95
Illiterate (Educ=1)	.0237	.0237	0	-0.00	1.000	1
Reads & Writes (Educ=2)	.04966	.04966	0	-0.00	1.000	1
Less than Intermediate (Educ=3)	.10045	.10045	0	-0.00	1.000	1
Intermediate (Educ=4)	.09255	.09255	0	-0.00	1.000	1
Above Intermediate (Educ=5)	.17269	.17269	0	0.00	1.000	1
University (Educ=6)	.47404	.47404	0	-0.00	1.000	1
Post-Graduate (Educ=7)	.08691	.08691	0	0.00	1.000	1
workexp	15.369	15.367	0	0.00	0.996	0.98

Jordan

2010

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
age	34.67	34.807	-1.6	-0.34	0.733	0.99
Illiterate (Educ=1)	.02693	.02693	0	0.00	1.000	1
Reads & Writes (Educ=2)	.06487	.0612	1.2	0.31	0.760	1.06
Less than Intermediate (Educ=3)	.09425	.0967	-0.6	-0.17	0.866	0.98
Intermediate (Educ=4)	.10037	.10159	-0.4	-0.08	0.935	0.99
Above Intermediate (Educ=5)	.23745	.24969	-3.3	-0.58	0.565	0.97
University (Educ=6)	.41004	.41248	-0.6	-0.10	0.920	1
Post-Graduate (Educ=7)	.0661	.05141	6.7	1.26	0.207	1.27*
workexp	14.868	15.076	-2.1	-0.44	0.662	1

2016

Variable	Mean Treated	Control	%bias	t-test t	p>t	V(T)/ V(C)
age	35.581	35.581	0	0.00	1.000	0.95
Illiterate (Educ=1)	.0237	.0237	0	-0.00	1.000	1
Reads & Writes (Educ=2)	.04966	.04966	0	-0.00	1.000	1
Less than Intermediate (Educ=3)	.10045	.10045	0	-0.00	1.000	1
Intermediate (Educ=4)	.09255	.09255	0	-0.00	1.000	1
Above Intermediate (Educ=5)	.17269	.17269	0	0.00	1.000	1
University (Educ=6)	.47404	.47404	0	-0.00	1.000	1
Post-Graduate (Educ=7)	.08691	.08691	0	0.00	1.000	1

	15.369		0.00	
workexp	15.367	0	0.996	0.98