Business and Economics

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Determining Factors Influencing Female Labor Force Participation in the South Caucasus

The effects of various socio-economic variables on female labor force participation were examined by estimating a logit model for Armenia, Azerbaijan, and Georgia. The data obtained from the Caucasus Barometer household survey for 2010 conducted by the Caucasus Research Resource Center (CRRC) regional offices were used. The sample consisted of female respondents aged 18 or older. According to the estimation results, residing in the capital city was inversely related to female labor force participation in Armenia. Having at least higher education and secondary technical education positively affected female labor force participation in Armenia, Azerbaijan, and Georgia. In Armenia, being divorced or separated or widowed was positively associated with female labor force participation. Having monthly household income of $401 or more positively impacted female labor force participation in Armenia, Azerbaijan, and Georgia. An attitude of rather agreeing with the statement that men should have more right to a job when jobs are scarce was negatively associated with female labor force participation in Armenia and Georgia. An attitude of completely agreeing with the statement that men should have more right to a job in case of job scarcity was negatively associated with female labor force participation in Azerbaijan. A negative relationship was found between age and female labor force participation in Armenia, Azerbaijan, and Georgia. Finally, household size and female labor force participation were negatively related in Azerbaijan.

Keywords: female labor force participation, logistic regression, Caucasus Barometer household survey

Introduction

After the collapse of the Soviet Union, the three countries of the South Caucasus (Armenia, Azerbaijan, and Georgia) began the process of transitioning from a centrally planned economy to a market economy. The process had devastating consequences for the economies of the three countries with one of the consequences being the unemployment. Reducing the level of unemployment is still one of the main objectives pursued by the macroeconomic policy implemented by the governments of Armenia, Azerbaijan, and Georgia.

Traditionally, the societies of Armenia, Azerbaijan, and Georgia are largely perceived as male-dominated (Gharibyan and Gunsaulus, 2006; United Nations Population Fund, 2012; Sumbadze and Tarkhan-Mouravi, 2003). However, the provision of equal rights to both the male and female populations is at the heart of the gender equality issue and is the groundwork for social, economic, and cultural success. For instance, restricting female labor participation implies inefficient use of available labor resources which prevents a country from reaching its full potential in terms of growth and development. While relatively low levels of female labor force participation are present in Armenia, Georgia, and Azerbaijan, another employment-related challenging issue is that Armenia and Georgia face an aging population (European Commission, 2011).

The major objective of this study is to provide empirical evidence of the socio-economic determinants influencing female labor force participation in Armenia, Azerbaijan, and Georgia. The objective is accomplished by estimating a binary logit model (hereinafter logit model) for Armenia, Azerbaijan, and Georgia using data collected by the regional offices of the Caucasus Research Resource Center (CRRC) within the framework of the Caucasus Barometer program for 2010 (CRRC, 2010). This analysis gains an utmost significance taking into consideration the relatively low rate of female labor force participation. In needs to be noted that, in 2010, the female labor

force participation rate (the proportion of the population ages 15 and older that is economically active) in Armenia was at 49%, in Azerbaijan was at 61%, and in Georgia at 56% (World Bank, 2012a). These numbers registered virtually no change when compared to the same numbers from 2009.

The results of this study can be used by governments, policy-makers, various non-governmental organizations, international organizations and other interested parties which attempt to promote equal opportunities and rights, to reduce poverty, and to efficiently utilize available labor resources thus contributing to a decrease in unemployment and to a possible enhancement in the self-esteem of the female population in the South Caucasus. Information obtained from this study will enable interested parties to target specific demographic groups when developing and designing different programs geared toward the improvement of female labor force participation in the South Caucasus.

The remainder of the paper is organized as follows. The next section presents a literature review on studying the influence of socio-economic factors affecting female labor force participation. Following the empirical specification of the model, the data used in this study are presented and discussed. The subsequent section provides the interpretation of the estimation results. A summary and recommendations are presented in the final section.

Literature Review

There have been many studies attempting to explain female labor force participation by applying various estimation procedures (Mincer, 1962; Bowen and Finegan, 1969; Leuthold, 1978; Cogan, 1980; Greenhalgh, 1980; Layard, Barton, and Zabalza, 1980; Schultz, 1980; Smith, 1980; Killingsworth, 1983; Mroz, 1987; Fair and Macunovich, 1997). As well, determinants affecting female labor force participation in a number of developing countries

have been examined in previous studies some of which are reviewed below. In particular, Mon (2000) estimated three alternative specifications of a logit model with different sets of independent variables to investigate the impact of household socio-economic characteristics on female labor force participation in urban area of Burma. In this study, data from June to the middle of July of 1998 were utilized and the sample consisted of women between 17 and 65 years of age. The estimation results showed that across all specifications marital status, husband's (or total family) income, and the number of working people in the family were statistically significant factors at the 5% significance level with marital status positively affecting and the husband's income and the number of working people in the family negatively affecting female labor force participation. Also, family size was positively associated with female labor force participation across all the specifications at the 10% significance level. Finally the number of years of schooling had a positive influence on female labor force participation at the 10% significance level, as suggested by a couple of model specifications.

Ntuli (2007) empirically identified socio-economic factors affecting female labor force participation in South Africa by estimating three logit models. The data employed in this study came from the nationally representative 1995 (sample size: 30,507), 1999 (sample size: 26,596) October Household Surveys (OHS) and the September 2004 Labor Force Survey of African females (sample size: 28,233) between ages 15 and 65 years old. The first logit model used the data from 1995 survey, the second logit model used the data from the 1999 survey, and the third logit model used the data from the 2004 survey. Overall, the findings from the three models were consistent at the 5% significance level. The results showed that various education levels had positive effects on female labor force participation. Living in the urban area was positively associated with female labor force participation. Married women negatively contributed and divorced women positively contributed to female labor force participation. The findings concerning other marital statuses were not consistently significant across the three models. The presence of children under the age of 15 was negatively associated with

female labor force participation. Estimation results revealed a negative relationship between non-labor income and female labor force participation. Living in the provinces was found to mainly have a negative impact on female labor force participation. Finally, there was a positive relationship between age and female labor force participation and a negative relationship between age-squared term and female labor force participation.

Faridi, Malik, and Basit (2009) studied the influence of different levels of education on female labor force participation in Pakistan by estimating a logit model. In addition, the impact of variables such as age, education level of parents and spouse, marital status, presence of financial and physical assets, family set up (belonging to joint family), region of residence, and household size on female labor force participation was assessed. The primary data employed in this analysis included 164 females aged 15-64 and were collected from urban and rural areas using stratified random sampling and simple random sampling techniques. Various education levels (matric, intermediate, graduate) had positive effects on female labor force participation at different significance levels. A spouse's education also positively affected female labor force participation at the 5% significance level. Presence of household assets had a negative influence on female labor force participation at the 1% significance level. Finally, both region of residence and household size positively impacted female labor force participation at the 10% and the 1% significance levels, respectively.

The issue of female labor force participation was evaluated in the study by Dayıoğlu and Kirdar (2010), where the authors ascertained the effects of socio-economic characteristics on female labor force participation in Turkey. A logit model was estimated using the 2006 Household Labor Force Surveys of the Turkish Statistical Institute with a sample size of 167,033. The following discussion of the results is presented at the 1% significance level. The results indicated that education had a positive impact on female labor force participation starting at high school level and above. Also, female labor force participation was positively affected by women's age starting from 20 years

and above. Married, separated and widowed women were estimated to be negatively associated with female labor force participation. The number of children present in the household was inversely associated with female labor force participation. Different regions in Turkey had a varying influence on female labor force participation. Finally, women residing in rural areas had a positive influence on female labor force participation.

A few studies utilized s descriptive approach when discussing female labor force participation in Armenia, Azerbaijan, and Georgia (European Commission, 2011; World Bank, 2012b; World Bank and International Finance Corporation, 2012). In utilizing a logit model, the approach employed in the present study is similar to the country-specific studies discussed above; however, in this analysis female labor force participation is discussed for Armenia, Georgia and Azerbaijan, which, to the best of our knowledge, has yet to be analyzed using the discrete choice model approach. This approach assists in showing the relative impacts of the factors influencing female labor force participation.

Empirical Specification

Female labor force participation may be impacted by socio-economic factors such as employment status, settlement type, education, marital status, presence of male or female decision-makers in the household, household income, perception toward having a job, age, and household size.

Defining Pr as the probability that the respondent female is employed (i.e., is in the labor force), the estimated logit model (see Appendix A for the discussion of a logit model) for Armenia, Azerbaijan, and Georgia is specified as follows:

$$\Pr(lfp=1)=F(\beta_0 + \beta_1 capital + \beta_2 edu\_atleast\_higher + \beta_3 edu\_sec\_tech + \beta_4 single + \beta_5 div\_sep\_wid + \beta_6 wom\_equal + \beta_7 inc\_401\_more + \beta_8 jobatt\_rath\_disag + \beta_9 jobatt\_rath\_ag + \beta_{10} jobatt\_cmpl\_ag + \beta_{11} age + \beta_{12} hhsize), \quad (1)$$

where *lfp* is a binary dependent variable equal to 1 if the respondent is currently employed (part-time or full-time, official, informal, or self-employment, but it brings monetary income) and 0 otherwise;

capital is a dummy variable equal to 1 if the respondent resides in the capital city and 0 otherwise;

edu_atleast_higher is a dummy variable equal to 1 if the respondent has at least higher education and 0 otherwise;

edu_sec_tech is a dummy variable equal to 1 if the respondent has secondary technical education and 0 otherwise;

single is a dummy variable equal to 1 if the respondent is single and 0 otherwise;

div_sep_wid is a dummy variable equal to 1 if the respondent falls within divorced or separated or widowed categories and 0 otherwise;

wom_equal is a dummy variable equal to 1 if the respondent thinks that the main decision-maker in the family should be either a woman or a man and a woman jointly and 0 otherwise;

inc_401_more is a dummy variable equal to 1 if the respondent's monthly household income is $401 or more and 0 otherwise;

jobatt_rath_disag is a dummy variable equal to 1 if the respondent rather disagrees with the statement that men should have more right to a job in case of job scarcity and 0 otherwise;

jobatt_rath_ag is a dummy variable equal to 1 if the respondent rather agrees with the statement that men should have more right to a job in case of job scarcity and 0 otherwise;

jobatt_cmpl_ag is a dummy variable equal to 1 if the respondent completely agrees with the statement that men should have more right to a job if there is job scarcity and 0 otherwise;

age is the respondent's age in years; and

hhsize is the respondent's household size measured in number of members. Additionally, F is the logistic cumulative distribution function and βs are the parameters to be estimated.

The interpretation of logit parameter estimates does not provide substantive intuition. As such, in this study, the actual interpretation of the estimation results was done in terms of percent change in odds ratios. Odd ratios are exponentiated values of the logit parameter estimates (i.e., $e^{\beta i}$) and the percent change in the odds ratios are calculated as $(e^{\beta i}-1)*100$.

Women from capital cities were expected to have a greater probability of participating in the labor force relative to women from other urban and rural areas due to a comparatively larger concentration of job opportunities in the capital cities. As for education, it was expected that educated women had a greater probability to participate in the labor force. Hence, a positive relationship was expected between labor force participation and education.

The parameter estimates associated with marital status (single and divorced or separated or widowed) were anticipated to be positive, since self-supporting women have to work to earn their living. The parameter estimate associated with the presence of female or male and female household heads was expected to be positive suggesting a greater probability of labor force participation because household heads are oftentimes perceived as breadwinners.

Higher income level was expected to negatively impact the probability of labor force participation for women based on the neoclassical theory of labor. The variables associated with females' agreement with the statement that men should have more right to a job when jobs are scarce were expected to negatively affect the probability of labor force participation for women. Conversely, the variables associated with females disagreeing with the statement that men should have more right to a job when jobs are scarce were expected to positively affect the probability of labor force participation for women.

It was expected that age would positively affect the probability of female participation in the labor force because of experience and skills that women presumably gain with age. However, the influence of other determinants may lead to a different outcome for women in the age group. The parameter estimate associated with household size was expected to be positive as well as negative. It may be positive if a child care is available creating an opportunity for a woman to be employed. It may also be negative if a woman decides to be a stay-at-home mom.

Data

The data for this analysis were obtained from the Caucasus Barometer household survey for 2010 conducted by the CRRC's regional offices in Armenia, Azerbaijan, and Georgia (CRRC, 2010). The data cover a wide range of social, economic, and political information and allow a cross-country comparison. The socio-economic variables used in the study pertain to employment status, settlement type, education, marital status, the presence of male and/or female household heads, household income, respondent's attitude toward having a job, age, and household size of solely female respondents aged 18 and above. The sample size for Armenia was 842, for Azerbaijan 817, and for Georgia 958. The percentage of the respondents from

Armenia, Azerbaijan, and Georgia corresponding to each variable is depicted in Table 1.

As Table 1 shows, nearly three-quarters of the respondents were unemployed in Armenia (71%), Azerbaijan (75%), and Georgia (74%). Slightly more than two-thirds of the respondents in Armenia (68%), around three-quarters in Azerbaijan (74%), and the majority in Georgia (84%) lived in rural or urban areas. In Armenia, nearly half of the respondents (49%) had less than higher education, a quarter of the respondents had at least higher education, and the remaining quarter had secondary technical education. In Azerbaijan, less than three-quarters of the respondents (72%) had less than higher education, and the remaining 28% of the respondents had either at least higher education or secondary technical education. In Georgia, less than half of the respondents (45%) had less than higher education, less than one-third of the respondents (29%) had at least higher education, and around a quarter (26%) of the respondents had secondary technical education.

More than half of the respondents were married in Armenia (55%) and Georgia (56%) and 62% of the respondents were married in Azerbaijan. One-third of the respondents fell within the category of either divorced or separated or widowed in Armenia (33%), while 28% of the respondents in Azerbaijan and 30% of the respondents in Georgia belonged to the same category.

Less than three-quarters of the respondents in Armenia (69%), 61% of the respondents in Azerbaijan, and 59% of the respondents in Georgia believed that a man should be the main decision-maker in a household. The majority of the respondents reported a monthly household income of less than $400 in Armenia (85%), Azerbaijan (71%), and Georgia (92%). Less than half of the respondents in Armenia (46%) and Azerbaijan (46%) either completely disagreed or rather disagreed with the statement that men should have more right to a job if there is job scarcity, while more than half of the respondents in Armenia (55%) and Azerbaijan (54%) either completely agreed or rather agreed with the same statement. In Georgia, less than three-quarters (70%) of the respondents either completely disagreed or rather disagreed with the

Table №1. Percentage of Female Respondents by Socio-Economic Variables in Armenia, Azerbaijan, and Georgia

	Armenia, n=842, %	Azerbaijan, n=817, %	Georgia, n=958, %
Employment status			
employed	29.10	24.60	25.57
unemployed	70.90	75.40	74.43
Settlement type			
capital	32.07	25.83	16.28
rural or urban	67.93	74.17	83.72
Education			
less than higher education	49.17	71.73	45.30
at least higher education	25.42	14.08	29.02
secondary technical education	25.42	14.20	25.68
Marital status			
married	54.51	61.57	56.26
single	12.59	10.89	13.26
divorced or separated or widowed	32.90	27.54	30.48
Household decision-maker			
man	69.24	61.44	58.56
woman or equally	30.76	38.56	41.44
Monthly household income (U.S. dollars)			
0-400	85.39	71.48	91.96
401 or more	14.61	28.52	8.04

Attitude toward having a job			
completely disagree	23.75	26.19	39.45
rather disagree	21.50	19.46	30.38
rather agree	24.94	27.17	23.38
completely agree	29.81	27.17	6.78
Age			
age (average)	48.19	44.29	49.74
Household size			
household size (average)	3.80	3.98	3.43

*Within each category percentages may not add up to 100% due to rounding.

statement that men should have more right to a job when jobs are scarce, and less than one-third (30%) of the respondents either completely agreed or rather agreed with the same statement. The average age of the respondents in Armenia, Azerbaijan, and Georgia was 48, 44, and 50, respectively. Finally, the average household size was four in Armenia and Azerbaijan and was three in Georgia.

Overall, the results in Table 1 reveal a consistency in the respondents' profile across Armenia, Azerbaijan, and Georgia. In other words, a typical female respondent from the South Caucasus region would be a married unemployed woman, in her forties with less than higher education, living in rural or urban areas in the household with more than three members where a man is considered to be the main decision-maker and their monthly household income is $400 or less, and she would agree with the statement that men should have more right to a job when jobs are scarce (except in Georgia, where most respondents completely disagreed with that statement).

Estimation Results

Cross-tabulations

Before presenting and interpreting the results from the logit models, the relationship between female labor force participation and the socio-economic variables used in this study is discussed first. This relationship is discussed based on the cross-tabulation results for Armenia, Azerbaijan, and Georgia presented in Table 2. As revealed by the results in Table 2, overall the female labor force non-participation rate vastly dominated the participation rate throughout the socio-economic variables across the three countries with few exceptions (for example, female labor force participation rate exceeded the non-participation rate in Armenia and Azerbaijan for women with at least higher education, and, in Georgia, for women having monthly household income of $400 or more). Nonetheless, the discussion of the findings in Table 2 is done in terms of the participant women (i.e., women in the labor force).

According to the results in Table 2, around one-third of the participant women in Armenia (33%), Azerbaijan (35%), and Georgia (29%) lived in capital cities. Approximately, one-quarter of the participant women in Armenia (27%) and Georgia (25%) and about one-in-five of the participant women in Azerbaijan (21%) lived in rural or urban areas. More than half of the participant women in Armenia (53%), 61% of the participant women in Azerbaijan, and 44% of the participant women in Georgia had at least higher education. Also, having secondary technical education more than doubled female labor force participation in all the three countries relative to the women with less than higher education.

Table №2. Female labor force participation by Socio-Economics Variable in Armenia, Azerbaijan, and Georgia

	Armenia			Azerbaijan			Georgia		
	Non-participant	Parti-cipant	Total	Non-participant	Parti-cipant	Total	Non-participant	Parti-cipant	Total
Settlement type									
capital	181 (67.04)	89 (32.96)	270 (100)	138 (65.40)	73 (34.60)	211 (100)	111 (71.15)	45 (28.85)	156 (100)
rural or urban	416 (72.73)	156 (27.27)	572 (100)	478 (78.88)	128 (21.12)	606 (100)	602 (75.06)	200 (24.94)	802 (100)
Education									
less than higher education	351 (84.78)	63 (15.22)	414 (100)	501 (85.49)	85 (14.51)	586 (100)	382 (88.02)	52 (11.98)	434 (100)
at least higher education	101 (47.20)	113 (52.80)	214 (100)	45 (39.13)	70 (60.87)	115 (100)	155 (55.76)	123 (44.24)	278 (100)
secondary technical education	145 (67.76)	69 (32.24)	214 (100)	70 (60.34)	46 (39.66)	116 (100)	176 (71.54)	70 (28.46)	246 (100)
Marital status									
married	341 (74.29)	118 (25.71)	459 (100)	386 (76.74)	117 (23.26)	503 (100)	400 (74.21)	139 (25.79)	539 (100)
single	63 (59.43)	43 (40.57)	106 (100)	62 (69.66)	27 (30.34)	89 (100)	87 (68.50)	40 (31.50)	127 (100)
divorced or separated or widowed	193 (69.68)	84 (30.32)	277 (100)	168 (74.67)	57 (25.33)	225 (100)	226 (77.40)	66 (22.60)	292 (100)
Household decision-maker									
man	421 (72.21)	162 (27.79)	583 (100)	397 (79.08)	105 (20.92)	502 (100)	429 (76.47)	132 (23.53)	561 (100)
woman or equally	176 (67.95)	83 (32.05)	259 (100)	219 (69.52)	96 (30.48)	315 (100)	284 (71.54)	113 (28.46)	397 (100)

Table №2.
continued

	Armenia			Azerbaijan			Georgia		
	Non-participant	Parti-cipant	Total	Non-participant	Parti-cipant	Total	Non-participant	Parti-cipant	Total
Monthly household income (U.S. dollars)									
0-400	530	189	719	476	108	584	677	204	881
	(73.71)	(26.29)	(100)	(81.51)	(18.49)	(100)	(76.84)	(23.16)	(100)
401 or more	67	56	123	140	93	233	36	41	77
	(54.47)	(45.53)	(100)	(60.09)	(39.91)	(100)	(46.75)	(53.25)	(100)
Attitude toward having a job completely disagree	122	78	200	137	77	214	264	114	378
	(61.00)	(39.00)	(100)	(64.02)	(35.98)	(100)	(69.84)	(30.16)	(100)
rather disagree	136	45	181	121	38	159	212	79	291
	(75.14)	(24.86)	(100)	(76.10)	(23.90)	(100)	(72.85)	(27.15)	(100)
rather agree	167	43	210	173	49	222	186	38	224
	(79.52)	(20.48)	(100)	(77.93)	(22.07)	(100)	(83.04)	(16.96)	(100)
completely agree	172	79	251	185	37	222	51	14	65
	(68.53)	(31.47)	(100)	(83.33)	(16.67)	(100)	(78.46)	(21.54)	(100)
Age age (average in years)	49.37	45.29		45.07	41.91		50.93	46.25	
Household size household size (average in # of members)	3.86	3.64		4.12	3.54		3.47	3.32	

*Percentages from row totals are reported in parentheses.

Around one-quarter of the participant women were married in Armenia (26%), Azerbaijan (23%), and Georgia (26%). Forty-one percent of the participant women in Armenia, and about one-third of the participant women in Azerbaijan (30%) and Georgia (32%) were single. Finally, slightly less than one-third of the participant women in Armenia (30%) and about one-quarter of the participant women in Azerbaijan (25%) and Georgia (23%) were divorced or separated or widowed.

Approximately, one-quarter of the participant women came from households where a man was the decision-maker in Armenia (28%), Azerbaijan (21%), and Georgia (24%). Less than one-third of the participant women lived in the households where the decisions were made either by a woman or equally in Armenia (32%), Azerbaijan (30%), and Georgia (28%). Almost one-quarter of women participating in the labor force in Armenia (26%) and Georgia (23%) and about one-fifth of women in the labor force in Azerbaijan (18%) came from households that had monthly household incomes of $400 or less. Roughly 46% of the participant women in Armenia, 40% of the participant women in Azerbaijan, and 53% of the participant women in Georgia were from households with monthly household income of $401 or more.

Thirty-nine percent of the participant women in Armenia, 36% in Azerbaijan, and 30% in Georgia completely disagreed with the statement that men should have more right to a job in case of job scarcity. In addition, 31% of the participant women in Armenia and 22% of the participant women in Georgia completely agreed with the statement that men should have more right to a job if there is job scarcity, while 22% of the participant women in Azerbaijan agreed with the same statement. The average age of the participant women in Armenia, Azerbaijan, and Georgia was 45, 42, and 46, respectively. Finally, the average household size was four in Armenia and Azerbaijan, and was three in Georgia. Summarizing the findings in Table 2, it needs to be mentioned that the percentages were more or less close to each other throughout the socio-economic characteristics for Armenia, Azerbaijan, and Georgia, indicative of cultural similarities between the people of the three countries.

Logistic Regression

The logit parameter estimates, the associated p-values and percent change in odds ratios are presented in Table 3. In this section, the results are interpreted solely in terms of statistically significant percent change in odds ratios. The level of significance chosen for this analysis was 0.05. Based on the p-value of the likelihood ratio χ^2 statistic, we conclude that the parameter estimates of all the independent variables were not jointly equal to zero for Armenia, Azerbaijan, and Georgia. Pseudo R^2 estimates were 0.135, 0.182, and 0.118 for Armenia, Azerbaijan, and Georgia, respectively.

In Armenia, living in the capital city decreased the odds of being employed by 34.7%, holding everything else constant. This finding was contrary to our expectations; however, women residing in the capital city and enjoying sufficient household income to the point where they do not need to work may have contributed to this result. Living in the capital city was statistically insignificant for Azerbaijan and Georgia. As anticipated, in Armenia, Azerbaijan, and Georgia having at least higher education increased the odds of being employed by 522.2%, 531.6%, and 414.1%, respectively, holding everything else fixed. As well, in Armenia, Azerbaijan, and Georgia, having secondary technical education increased the odds of being employed by 183.8%, 248.7%, and 177.7%, respectively, all else held fixed. (Table №3)

As expected, in Armenia, being divorced or separated or widowed increased the odds of being employed by 89.4%, everything else held constant. This factor was statistically insignificant for Azerbaijan and Georgia. Controlling for all other factors, having a monthly household income of $400 or more increased the odds of being employed by 94%, 108.6%, and 163.8% in Armenia, Azerbaijan, and Georgia, respectively. This result was not consistent with our expectations. However, an ever increasing cost of living that is forcing women to seek employment may possibly serve as an explanation for this finding.

Table №3. Logit Coefficients, Associated p-values and Percentage Change in Odds Ratios

	Armenia		Azerbaijan		Georgia	
	Coefficients	% change in odds ratios	Coefficients	% change in odds ratios	Coefficients	% change in odds ratios
Settlement type (base: rural or urban)						
Capital	-0.425*	-34.7*	0.378	46.0	-0.356	-30.0
	(0.027)		(0.077)		(0.112)	
Table №3 continued						
Education (base: less than higher education						
edu_atleast_higher	1.828*	522.2*	1.843*	531.6*	1.637*	414.1*
	(0.000)		(0.000)		(0.000)	
edu_sec_tech	1.043*	183.8*	1.249*	248.7*	1.021*	177.7*
	(0.000)		(0.000)		(0.000)	
Marital status (base: married)						
Single	0.439	55.1	0.038	3.8	0.038	3.8
	(0.089)		(0.900)		(0.875)	
div_sep_wid	0.639*	89.4*	0.236	26.7	0.171	18.6
	(0.003)		(0.334)		(0.428)	
Household decision-maker (base: man)						
wom_equal	-0.124	-11.7	0.227	25.5	-0.057	-5.6
	(0.501)		(0.232)		(0.730)	
Monthly household income (base: 0-400)						

						163.8*
inc_401_more	0.663*	94.0*	0.735*	108.6*	0.970*	
	(0.005)		(0.001)		(0.000)	
Attitude toward having a job (base: completely disagree)						
						-2.2
jobatt_rath_disag	-0.477	-37.9	-0.104	-9.9	-0.022	
	(0.051)		(0.695)		(0.907)	
						-36.0*
jobatt_rath_ag	-0.702*	-50.5*	-0.240	-21.4	-0.447*	
	(0.004)		(0.328)		(0.047)	
Table №3 continued						
						-11.9
jobatt_cmpl_ag	-0.207	-18.7	-0.672*	-48.9*	-0.126	
	(0.344)		(0.011)		(0.716)	
Age						
						-1.7*
age	-0.018*	-1.8*	-0.017*	-1.7*	-0.017*	
	(0.003)		(0.025)		(0.004)	
Household size						
hhsize	-0.056	-5.5	-0.202*	-18.3*	-0.099	
	(0.275)		(0.001)		(0.056)	
constant	-0.544		-0.467		-0.744	
	(0.227)		(0.323)		(0.079)	
						-9.5
Number of observations	842		817		958	
LR $\chi2(12)$	137.08		165.98		128.13	
Prob. > $\chi2$	0.00		0.00		0.00	
Pseudo R2	0.135		0.182		0.118	

*p-values are reported in parentheses.

*Asterisk indicates statistical significance at the 5% level.

Holding all other factors constant, in Armenia, the odds of being employed decreased by 50.5% for women who agreed with the statement that men should have more right to a job when jobs are scarce. Having the same attitude toward a job, decreased the odds of being employed by 36% for women in Georgia, holding all other factors fixed. In Azerbaijan, the odds of being employed decreased by 48.9% for women who completely agreed with the statement that men should have more right to job in case of job scarcity, all other factors held constant. All these results were consistent with our expectations.

For each additional year of age, other things equal, the odds of being employed decreased by 1.8% and 1.7% in Armenia, and Azerbaijan and Georgia, respectively, other things equal. While this finding was not anticipated; however, as it was mentioned above, the influence of other factors may have led to this situation. For each additional household member, the odds of being employed decreased by 18.3% in Azerbaijan, other things equal. The impact of household size on the odds of being employed for Armenia and Georgia was statistically insignificant. Being single as well as the presence of female or both male and female decision-makers in the household had a statistically insignificant impact on the odds of being employed in all the three countries.

In summary, it needs to be pointed out that while the absolute values of the statistically significant logit coefficients were different across socio-economic variables, the signs of the coefficients were consistent across Armenia, Azerbaijan, and Georgia. This finding is suggestive of cultural similarities between Armenia, Azerbaijan, and Georgia.

Summary and Recommendations

Using the 2010 survey data compiled by the regional offices of the CRRC, a logit model was estimated to assess the effects of different socio-economic variables on female labor force participation for Armenia, Azerbaijan, and

Georgia. The results of the study showed that a set of socio-economic variables were key determinants of female labor force participation in the three countries. In particular, the results suggested that women residing in capital cities were less likely to participate in the labor force relative to women residing in rural or urban areas in Armenia, holding everything else fixed. In all the three countries, women with at least higher education and secondary technical education were more likely to participate in the labor market than women with less than higher education, holding everything else constant.

In Armenia, divorced or separated or widowed women had higher participation rates than married women, controlling for all other factors. Women whose monthly household income was more than $401 were more likely to participate in the labor force compared to women with monthly household income of $400 or less in Armenia, Azerbaijan, and Georgia, other things equal.

In Armenia and Georgia, women who rather agreed with the statement that men should have more right to a job when jobs are scarce had a lower participation rate in the labor force relative to women who completely disagreed with the same statement, everything else held constant. In Azerbaijan, women who completely agreed with the statement that men should have more right to job in case of job scarcity were less likely to participate in the labor force compared to women who completely disagreed with the same statement, other things equal.

Each additional year of age decreased the odds of women participating in the labor force in Armenia, and Azerbaijan and Georgia, all other factors held constant. Each additional household member decreased the odds of women participating in the labor force in Azerbaijan, all other factors held fixed. Being single as well as the presence of female or both male and female decision-makers in the household were found to be statistically insignificant in Armenia, Azerbaijan, and Georgia. Overall, the estimation results point to the

cultural similarities between the people of Armenia, Azerbaijan, and Georgia. Based on the findings of this study, the following is recommended to ensure maximum female labor force participation in the South Caucasus:

- implement strategies aimed at encouraging female labor force participation in the capital cities;
- increase investments in education and establish more educational facilities;
- create jobs with flexible working hours to fit the schedule of married women;
- implement strategies geared toward enhancing women's self-esteem and social status that will result in breaking the cultural stereotype that men are more entitled to jobs when jobs are scarce; and
- invest in child care facilities and make them affordable to women.

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Appendix A

Logit model looks as follows:

$$P(y = 1|x) = \frac{\exp(\beta \boldsymbol{x})}{1-\exp(\beta \boldsymbol{x})}, \quad \text{(A.1)}$$

where P is the probability of the event taking place, y=1, (a woman participating in the labor force), **x** is a vector of explanatory variables (a set of socio-economic variables), and β is a conformable vector of parameters to be estimated. Consequently, the probability of the event not taking place, y=0, (a woman not participating in the labor force), is computed as:

$$P(y = 0|x) = 1 - P(y = 1|x). \quad \text{(A.2)}$$

In the actual estimation of a logistic regression, the dependent variable is transformed into the log of the odds ratio, ln{p/(1-p)}, and the model to be estimated with the ε random error term looks as follows:

$$\ln\left(\frac{P}{1-P}\right) = \boldsymbol{x}\beta + \varepsilon. \quad \text{(A.3)}$$

After specifying the explanatory variables, the β parameters are estimated using the maximum likelihood approach. Since the interpretation of logit parameter estimates does not provide substantive intuition, odds ratios are used. Odd ratios are exponentiated values of the logit parameter estimates (i.e., $e^{\beta i}$) and the percent change in the odds ratios are computed as $(e^{\beta i}-1)*100$.