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Economic Growth and Role of 'The Missing Half': A Cross-Country Analysis with Specific Reference to India

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ABSTRACT

Women's employment is an imperative factor in their advancement towards economic independence yet there is relatively inadequate and mixed evidence on the relationship between economic growth and female labour force participation rates. This study examines the impact of economic growth on female workforce participation in South Asian Nations (SANs) from 2000-2015 within the outline of U-shaped hypothesis using panel data modelling. The impact of several key macro-economic variables on female labour force participation is also examined in different econometric model specifications. The effects of economic development, literacy, urbanization and different unemployment patterns on female labour force participation are found to be negative whereas Gini coefficient is found to be positive. The findings suggest that most of the SANs are still experiencing the downward portion of U-shaped (while India being close to attaining the tipping point sooner as compared to other nations) may be, due to being at the early stages of economic development. In the present scenario, policy interventions should handle a variety of issues, including reconstructing access to and significance of education and training programmes and boosting private sector development in industries and regions that would escalate job opportunities for women in developing countries.

Keywords: *Female labour force participation; Economic development; U-shaped hypothesis; Fixed effects model; Dynamic panel modelling; South Asian Nations.*

1.0 Introduction

Female labour force participation ratios differ widely among countries, and it is established by now that it is comparatively high in industrialised economies. Women's employment is a fundamental factor in their progress towards economic independence. The same is considered as an indicator of their inclusive status in the society (Mammen and Paxson 2008)[1].

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The swift change in female workforce participation among developing and developed nations has pushed many economists towards pursuit behind the evolution of female labour force participation in cross-countries. Additionally, the gender gap in labour workforce has crucial macroeconomic inferences as well. The United Nations Economic and Social Commission for Asia and Pacific (ESCAP)[2] estimates that if India's female workforce participation managed uniformity with that of United States (86%), its gross domestic product (GDP) would soar by 4.2% annually and growth rate by 1.08% exhibiting an annual gain of 19 billion USD.

Supplementary to above, U-shaped female participation curve is the eminent postulation that examines the female labour force participation deeply to find its macroeconomic associations. The linkage through U-shaped female participation curve has been investigated and documented by many economists[3]. U-shaped hypothesis, simply, reveals the linkage between economic growth and female labour force participation and it is proposed that female labour force participation rates first decline, and then rise as the country fosters. Female labour force participation is a principal driver as well as a key outcome of economic growth and development, and therefore participation rates necessarily reflect a country's potential to advance more rapidly. However, to the best of our understanding, such a comprehensive exercise to examine the relationship between economic growth and female labour force participation; remains largely un-attempted for South Asian Nations (SANs). Furthermore, women's employment is also believed to be strongly associated with income inequality across time and countries for all income groups which has been ignored so far in the existing studies. The study becomes a pioneering one to incorporate Gini coefficients in the model as one of the main controlling variables, thereby accounting for income inequalities among the countries being studied. To sum-up, the current paper contributes to the present state of knowledge by providing comprehensive evidence on the re-examination of the U-shaped hypothesis, specifically in the context of region of emerging nations i.e. South Asian Nations.

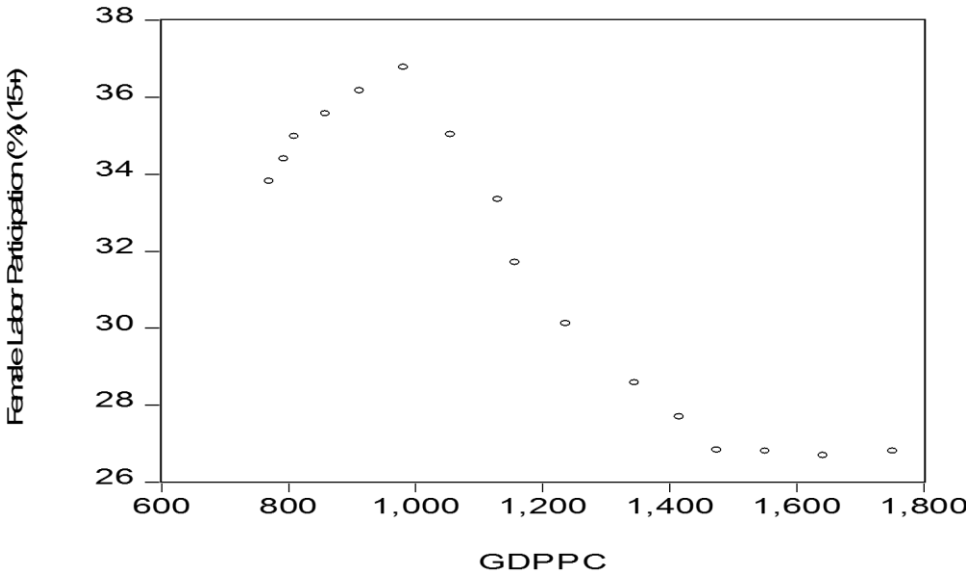
Figure 1 represents the relationship between labour force participation by female and per capita GDP (proxy for economic growth) for selected South Asian Nations[4] for the period 2000 to 2015. The scatter plot depicts somewhat a mixed picture and hence ambiguous linkage for the selected regions[4] and period. The same seems to be contrary to the U-shaped probable affiliation.

2.0 Literature Review

Various empirical studies with the precedence and borrowings from the experiences of many developed nations and cross country citations (including Boserup,

1970; Durand, 1975; Goldin, 1990; Mammen and Paxson, 2000; Mincer, 1985; Pampel and Tanaka, 1986; Schultz, 1991; Tam, 2011) list the much-discussed U-shaped association (although the U-shape is not a necessary outcome of the basic static labour supply model) between female labour force participation and economic growth.

Figure 1: Female Labour Force Participation Curve with GDP per capita for South Asian Nations



Source: Authors' expression from EViews 9.5 graphical, scatter plot on South Asia from 2000 to 2015.
Note: The y-axis represents the FLFP (in % over 15 years) & x-axis denotes the economic growth measure, proxied by per capita GDP

This relationship is the outcome of amalgamation of factors such as sectoral shifts in the economy, urbanization and socioeconomic transformation, for example, changes in education and fertility, and income and substitution effects. Simultaneously, empirical evidence for the U-shaped hypothesis is primarily based on cross-country analysis, where a direct link is spotted between economic growth and women's participation in the labour market (Cagatay and Ozler, 1995; Mammen and Paxson, 2000; Pampel and Tanaka, 1986). On the other hand, panel data analysis has produced ambiguous results (Gaddis and Klasen, 2014; Luci, 2009; Tam, 2011). Other studies noted a linear or no direct relationship.

Individual-level empirical studies indicate that the U-shaped relationship is not (yet) obvious (Bhalla and Kaur, 2011; Lahoti and Swaminathan, 2013; Rao et al., 2010) in the case of India, while others locate such an association in case of Pakistan (Mujahid

et al., 2012). Similar to puzzling falling participation rates in India, such trends have been endorsed elsewhere too, markedly in Turkey, which has faced declining women participation rates, from 36.1 per cent in 1989 to 23.3 per cent in 2005. This downward trend has been narrated by the process of structural transformation & urbanization: as households moved to urban areas and husbands shifted out of agriculture, resulting in a withdrawal of women from the labour force (hinting an increased engagement in domestic duties) (World Bank, 2009). Overall, literacy level has a crucial impact on an individual's decision to participate in the labour market (Tansel, 2001). Contrary to our testing results, the existing literature on human capital claims that higher literacy rate leads to greater participation in the labour force and also increased productivity (Ejaz, 2007; Psacharopoulos and Tzannatos, 1989; Tansel, 2001). Several studies so far have revealed higher returns to education for women than for men (Duraisamy, 2000). Additionally, attractive job opportunities with higher wages encourage better-educated women to work and stigmas attached to taking up employment may be lower for these women (Klasen and Pieters, 2012). Various studies in South Asia list such a relationship (Das, 2006; Olsen and Mehta, 2006), while many others also capture a positive relationship (Bhalla and Kaur, 2011; Faridi, Malik and Basit, 2009). Some of the ancient studies even discover a negative relationship between the two (Das and Desai, 2003; Dasgupta and Goldar, 2005; Kingdon and Unni, 1997; Kottis, 1990).

Most of the available existing literature has endorsed married women's decision to participate in the labour market. Due to the same, the linkage between fertility and female labour force participation remains largely debated. Contrary to our results, promoting female education is known to reduce the number of children born to a woman. With declining fertility levels, women place greater importance on working, which in turn raises their probability of participation in the labour market and has a positive impact on economic growth (Ejaz, 2007; Klasen and Lamanna, 2009). As noted by Cunningham (2001), unmarried women in Mexico participate in large numbers in the labour market, while married women's decision to participate depends largely on the presence of young children. Bardhan (1979) found that, in rural West Bengal in India, female labour force participation is negatively affected by the number of dependents in the household. Dasgupta and Goldar (2005) have established that women's labour force participation in rural India is negatively influenced by the number of young children (below 5 years) in households) using NSSO's 1999-2000 data. Recent analysis by Masood and Ahmad (2009) has stated the negative impact of the number of young children on women's participation in both rural and urban India.

As per Klasen and Pieters (2012) (who focus on the situation of women in urban India) have noticed that higher social status has a negative impact on women's work-

force participation which is in line with the "Sanskritization" process. Women also have to play the role of caregiver in the family and are, therefore, burdened with housework, a situation that is influenced by gender norms. In the same context, Badgett and Folbre (1999) debate that these gender norms are strengthened by occupational segregation. Segregation is the tendency for women and men to be employed in different occupations. Such separation creates gendered occupations which are disproportionately "female" or "male". In other words, occupational segregation by gender refers to the inequality in the distribution of men and women across different occupational categories. Gender segregation of jobs has been a widely discussed issue in various studies (Anker, 1998; Swaminathan and Majumdar, 2006; Rustagi, 2010).

Higher female labour participation rate (FLPR) exhibits the necessity to work in the absence of social protection programs at lower levels of per capita income. With higher household income and increasing social protection, women can withdraw from the market in favor of household work and childcare. At advanced country income levels, labour force participation rebounds as a result of better education, lower fertility rates, access to labour-saving household technology, and the availability of market-based household services (Duflo, 2012; World Bank, 2011). The U-shaped relationship has been found to remain stable over time and to hold when controlling for country characteristics. Mammen and Paxson (2000) replicate the U-shaped relationship found by Golden (1995) for cross-country data from 1970, 1975, 1980, and 1985 and state that similar patterns can be found irrespective of whether labour force participation is restricted to women aged 45-59 or includes younger women. When pooling the data and including country-fixed effects, the study shows that the quadratic fit still predicts the data well.

3.0 Objectives of the Study

The current study proposes to examine and revisit the relationship between economic growth and female labour force participation rates in the context of selected South Asian Nations (SANs) from 2000-2015 within the broad framework of U-shaped hypothesis. In addition, other relevant gender based statistical variables and macroeconomic variables related to female labour force participation (FLP) have also been analyzed in three different sets of dynamic econometric model specifications. The theoretical model is based on Cakir (2008), but varies in numerous important dimensions. The study also aims to outline the probable reasons that might stimulate or impede female labour force participation.

4.0 Data Sources and Methodology

The study is secondary in nature. Data for female labour force participation rates has been collected from the International Labour Organization; data for Gini coefficient has been extracted from SWIID database whereas data for most of the variables has been collected from the World Bank's World Development Indicators (WDI) database. To undertake the analysis, we deploy two distinct variable sets.

Dependent Variable: We take into account, Female labour force participation which is defined as the number of females aged 15 and up who are in the labour force divided by the total female population.

Independent Variables: Economic growth is controlled for using GDP per capita growth based on constant 2010 USD. Additionally, different model specification employs control variables for literacy, fertility rates, urbanization, population growth, Gini and unemployment rates. The control variable for literacy used is the gross enrollment ratio. Fertility is proxied for using the fertility rate in each nation. The total fertility rate is the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children during that time. Unemployment rates are defined by the share of the labour force that is without work and is available and seeking employment. Urbanization is controlled for with the urban population percentage, or the total number of people living in urban areas over the total population of each country. Population growth for year 't' is defined as the exponential rate of growth of midyear population from year 't-1' to 't' (expressed as a percentage). Income inequalities are controlled for by making use of Gini coefficient.

In order to examine the U-shaped hypothesis stated in the previous section, the researchers proceeded with using a different set of panel dynamic modeling including system GMM estimates for a set of 5 selected SAARC nations (namely India, Pakistan, Bangladesh, Nepal and Sri Lanka) over the period 2000-2015. Both FE and GMM estimates have provided the best results (contradictory to Hausman specification to support RE estimates). The data set used is a strongly balanced panel. Keeping in mind, the sensitivity of the estimation procedures to a high number of instruments, the study has used a compressed version of our sample, consisting of 5 year averages, which also helped in handling with missing observations of the Gini coefficients. The researchers even have tried using time-series approach for analysis at the country level, but the estimates didn't fit well. Contrary to cross-section and time series models, panel data estimates control for heterogeneity so as not to take the risk of biased results.

Further, given our literature review and our explanation of the core and control variables (as well as the possible empirical links between them), we investigate the U-shaped curvilinear-relationship, defining $FLPR_{it}$ as the response variable and $GDPpc_{it}$ as the independent variable by applying panel analysis. Where 'i' stands for *country* and 't' for *year*. Firstly we adopt random GLS regression, to test whether the presence of 2nd-degree polynomial, expressed as: (Model 1 - 6)

$$\mathrm{FLPR}_{\mathrm{it}} = \alpha + \beta_1 \mathrm{GDPpc}_{\mathrm{it}} + \beta_2 \mathrm{GDPpc}^2{}_{\mathrm{it}} + \epsilon_{\mathrm{it}}$$

is suitable to assess the relationship between assumed variables. Secondly, we have considered other variables in the above to re-examine the U-shaped relationship along with probable dynamic association due to endogeneity and multicollinearity. (Model 2 - 6)

$$\begin{aligned}\mathrm{FLPR}_{\mathrm{it}} = \alpha &+ \beta_1 \mathrm{GDP}_{\mathrm{PC_G}} + \beta_2 \mathrm{GDP}_{\mathrm{PC_{G^2}}} + \beta_3 \mathrm{Pop}_{\mathrm{G}} + \beta_4 \mathrm{Literacy} + \beta_5 \mathrm{Fertility} + \beta_6 \mathrm{Gini} \\ &+ \beta_7 \mathrm{Urbanisation} + \beta_8 \mathrm{GrossEnrolmentRatio} + \beta_9 \mathrm{Unemployment} \\ &+ \epsilon_{\mathrm{it}}\end{aligned}$$

5.0 Empirical Results

Before we have turned to presenting our model and estimation techniques, we have confirmed the evidence of the association through scatter plot charts in order to capture the basic empirical regularities within our data for the preliminary investigation of U-shaped linkage between 'female labour force participation' and 'GDP_G'.

Further, the same is followed by preliminary analysis of the variables considered for the study through descriptive statistics (Table 1) and correlation analysis (Table 2).

Table 1 results indicate that the dependent variable, Female labour force participation rate varies from 15.95 to 81.46 with an average value of 42.72. Among the independent variables, unemployment, literacy, primary female completion rate and adolescent female rate depict the wide range of variations for the selected SANs. The same is supported by their average and measure of dispersion in Table 1.

Table 2 displays the correlation testing outcomes on the selected variables for SANs between 2000 and 2015. Pertinent observations that emerge out of the same have been listed below.

Table 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Female Labour Force Participation	80	42.7201	20.7977	15.9510	81.4570
GDP Per Capita	80	5.0152	1.9487	-1.5454	9.1446
Population Growth	80	1.4058	0.4731	0.6615	2.2764
Urbanisation	80	25.7941	7.7406	13.4310	38.7580
Gini	70	36.7129	5.1660	29.8000	49.1000
Unemployment	80	9.9948	6.8033	3.1530	27.9320
Literacy	59	51.9890	17.9311	28.0896	101.9733
Primary Completion Rate Female	59	82.9042	18.1998	53.6769	111.1951
Adolescent Fertility Rate	80	59.1371	31.1057	14.1530	117.7428

Source: Authors' testing results using Stata 13 on variables used in the study

Table 2: Correlation Matrix

Variables	*FLPR*	*GDPPC*	*Pop_G*	*PCRF*	*Literacy*	*Unemployed*	*Urbanisation*	*Gini*	*AF Rate*
GDPPC_G	-0.1205	1							
Pop_G	-0.273***	-0.264***	1						
PCRF	0.0307	0.242*	-0.753***	1					
Literacy	-0.0031	0.447***	-0.778***	0.810***	1				
Unemployed	-0.370***	0.0414	-0.416***	0.353***	0.407***	1			
Urbanisation	-0.722***	0.0322	0.632***	-0.352***	-0.301**	-0.216*	1		
Gini	0.270**	0.0833	-0.285***	0.191	0.0111	-0.015	-0.510***	1	
AF Rate	0.717***	-0.1137	0.210**	-0.429***	-0.359**	-0.54***	-0.211**	-0.018	1

*Source: Authors' testing results using Stata 13 on correlation exercise on studied variables where '***' is 1% significance, '**' is 5% significance and '*' is 10% significance.*

(a) Female workforce participation is found to have negative significant and strong association with urbanisation whereas the same is weak and negatively significant with population growth and unemployment. Gini coefficient is found to be positively but weakly associated with female participation in labour force.

(b) GDP per capita has a significant positive correlation with literacy rate, which holds true; thereby implying more the literacy rate, more will be the GDP per

capita, whereas, it has a significant negative association with population growth rate.

(c) Population growth rate is found to be negatively significant and strongly correlated with primary completion rate and literacy rate of females while it is found to have positive, significant and strong relationship with urbanisation.

(d) Primary completion rate of females seems to have a strong, positive and significant correlation with the literacy rate of females in the economies, which obviously is a valid proposition. Whereas, it has a negatively significant but somewhat weak association with the fertility rate of females, the same relationship is reported between fertility rate and literacy rate of females too in the current study.

(e) Urbanisation is found to have a significant, negative and somewhat strong correlation with Gini coefficient, hence implying that the greater the degree of urbanisation, the lower the inequalities.

Table 3 summarizes the estimation results based on balanced panel data from the year 2000 to year 2015. There are a several notable results that surface from our analysis. We obtain strong support for a dynamic effect of female labour force participation in the model (as expressed by the lagged value of FLPR in GMM estimates). We started with testing the most fundamental model including GDP_PC_G and square term of GDP_PC_G to examine the U-shaped association among the two variables. The estimates turned out to confirm the current existing studies like Cakir (2008), Kim, Lee and Shin (2016) with ambiguous U-shaped relationship existence for the selected SANs between year 2000 and 2015. Though an overall negative association comes up between per capita GDP and FLFP.

Gini coefficient is found to be positive and significant in most of the models, indicating increasing female workforce with greater income disparities. Also, urbanization is found to be negative and significant across all the specifications, meaning thereby that the composition of transfers from rural to urban areas primarily are male-dominated & thereby leaving lower female participation.

The relationship of unemployed work-force and working females turned out to be negative and significant in most of the models tested, establishing a direct link between employment and female work-force participation.

On the other hand, Literacy (gross enrollment ratio) turned out to be positive and significant in most of the variants signaling that as literacy goes up, female participation follows the same.

Table 3: Results of Panel Data Estimates

Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
	FLPR	**FLPR**	**FLPR**	**FLPR**	**FLPR**	**FLPR**
	RE_Coeff	**RE_Coeff**	**RE_Coeff**	**RE_Coeff**	**RE_Coeff**	**Sys_GMM**
L1.FLPR						0.7153*** (0.0871)
GDPpc_G	-0.0088*	-4.6194*	-0.02301*	-2.4596*	-0.0224*	0.0102
	(0.0049)	(2.7412)	(0.0044)	(1.9877)	(0.0037)	(0.0094)
GDPpc_G_sq	0.0113	0.2596	0.0016	0.0538	0.0768	0.0195
	(0 .1967)	(0.3527)	(0.3427)	(0.2542)	(0.0943)	(0.0167)
Pop_G		-23.1369***	-15.530**	2.7572	21.6234	
		(6.7383)	(0.0137)	(4.6814)	(1.5879)	
Gini		1.1702***	0.1017**	0.9880***	0.3140**	0.2298***
		(0.3666)	(0.2027)	(0.2524)	(0.1663)	(0.0854)
Urbanisation			-2.6844** (0.1189)	- 2.0449** (0.2076)	-2.6670** (0.0972)	0.2909 (0.4146)
Literacy			0.1384*** (0.0617)	0.2584** (0.2534)	0.2256* (0.0563)	
AF Rate (female)			0.0156	0.5861***		
			(0.0302)	(0.0477)		
PCRF				0.5571**		-0.0702*
				(0.1324)		(0.0395)
Unemployment_below15					-1.9533***	0.0686
					(0.1785)	(0.1145)
Constant	49.260***	27.53123	50.1475*	-68.5396**	36.3378**	-5.8773
	(0.0014)	(0.9131)	(0.0134)	(0.1156)	(0.5472)	(9.1398)
Sargan Test	0.25	0.34	0.65	0.35	0.14	0.15
Wald Chi 2	9.07	144.45	1763.01	278.00	1473.12	269.24
Prob > Chi 2	0.0107	0.0000	0.0000	0.0000	0.0000	0.0000
No of Observations	80	53	53	50	70	39
No of Groups	5	5	5	5	5	5

Source: Authors' regression results based on RE GLS regression, STATA 13 testing

Notes: 1. *** signifies 1%, ** 5% and * 10% levels of significance (*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

2. *Z* statistics in parentheses.
3. FE Model testing and Hausman test validation hinted for supremacy of RE estimates for the above variables.
4. GMM results were found to be ambiguous without clarifying on the direction and co-movement of the expected relationship among the variables. Model 6 displays the system GMM results of the testing for selected SA nations.
5. Certain other variables (not listed above like logarithmic combination and interacting variable relationship) are also tested but found to be statistically insignificant and hence deliberately not mentioned in the above table.
6. GDP per capita square term is found to be insignificant for all other regressions that were run before the final listing of the above six main models.

Surprisingly, adolescent fertility rate is found to be positive and significant in most of the models, validating the greater working-mother participation in female work-force. Some of the variables like fertility rates and primary school completion rate are found to be ambiguously linked with the female labour force participation. Lastly, we conducted robustness test for validation (using Sargan testing) and to examine the overall fit of the model.

6.0 Conclusions and Policy Implications

In the current paper, we have attempted to explain the relationship between economic growth and female labour force participation for South Asian Nations within the conventional framework of U-shaped hypothesis. In addition to the impact of economic growth, other determinants of female labour force participation, such as education (literacy and primary school completion rate), unemployment, population growth, urbanization rate, adolescent fertility rate and gini coefficient are also examined in six different econometric empirical models. The study upholds no approaching progress in participation of the female labour supply (in total labour) due to economic growth in the country-panel data set, thereby endorsing the de-feminization process of the labour force which follows economic growth. The results of the random effects models do not generate support for the U-hypothesis, which implicates that in early stages of economic growth female labour force participation tends to fall, as a country advances in economic development and its economy is gradually more service-based, it grows systematically.

Female labour force participation avenues to decent jobs are elementary and indispensable constituents of a sustainable development approach. Substantial research has revealed that capitalizing women's complete economic potential is critical for increased productivity and economic growth. In addition, mitigating gender barriers to decent work is essential to stimulating women's economic empowerment. Gender inequalities are not only embedded in the sociocultural customs of countries, they are also deep-seated in the policy and institutional frameworks that outline the employment opportunities of female labour force. Nonetheless it hovers like a persistent phenomenon, albeit to different degrees subject to regional, national and local contexts. Women continue to experience countless challenges relating to access to employment, choice of work, working conditions, employment security, wage parity, discrimination, and balancing the competing burdens of work and family responsibilities. In addition, women are profoundly exemplified in the informal economy where their vulnerability to

exploitation is usually highest and they have the slightest formal protection. In terms of the women labour force participation rates across South Asia, Bangladesh and Pakistan witnessed increased female labour participation rates in the past decade, whereas the rates continue to remain stable in Sri Lanka. Though, there has been a diminishing trend in the female labour participation rate in India regardless of strong economic growth, which illustrates a gush in participation rates in urban areas but an ongoing fall in rural areas. The econometric analysis of determinants related to employment outcomes divulges that higher education is demanding if women are to access steady wages and salaried jobs. Progressing beyond standard labour force participation rates, policy-makers should be more apprehensive about whether women are capable to access better jobs or commence a business, and secure benefit of new labour market opportunities as a country develops (and hence add to the development process itself).

In the present scenario, policy interventions should handle a variety of issues, including reconstructing access to and significance of education and training programmes, upholding childcare and other institutional/legal measures to simplify the burden of household duties, augmenting safety for women and boosting private sector development in industries and regions that would escalate job opportunities for women in developing countries.

Endnotes

1. Mammen, K., & Paxson, C. (2000). Women's work and economic development. The Journal of Economic Perspectives, 14(4), 141-164.
2. http://www.unescap.org/pdd/publications/survey2007/01_Survey_2007.pdf
3. For instance, see, Psacharopoulos and Tzannatos (1989), Schultz (1991), Goldin (1995), Kottis (1990) and Tansel (2001)
4. Due to fewer data points' availability, only five South Asian Nations are considered – Nepal, India, Bangladesh, Srilanka and Pakistan.

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