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Economic Development and Gender Inequality in Work Participation: A Spatial Assessment of the Relationship in India

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Abstract:
It is often alleged that the benefits of economic development are not evenly distributed among the all sections of the society and particularly among the women. The behavioural pattern of work participation among male and female are different and situations are seemed to be bias towards male. This paper uses the indicator of per capita consumption expenditure to refer the economic development and to infer the gender inequality, the difference in the worker population ratios between male and female has been used. The National Sample Survey data on consumption expenditure, employment and unemployment for the states and union territories of India are used in the study. The study attempts to find out the relevance of the established 'U- shaped' relationship found in the literature between female labour force participation and economic development, in case of the women workers of Indian states and union territories. This paper tries to find out the relationship between the monthly per capita consumption expenditure and gender gap in the worker population for the all India level as well as for the states and union territories of India. The study uses the xy scatter diagram and Karl Pearson's method of correlation to find out the relation. It is found that in rural areas as household monthly per capita expenditure increases, the female worker population ratio decreases and the male-female difference in the worker population ratio increases. While, in urban areas the gender gap in worker population ratio does not increase with the increase in the household consumption expenditure. To find out the effect of household income in terms of household consumption expenditure on gender gap in worker population ratio, simple linear regression model has been used in the study, where the model gets a bad fit with very low R^2

Keywords: Economic development, gender gap in work participation, worker population ratio and monthly per capita consumption expenditure

1. Introduction

The notion of 'gender' is very broad as well as debated. In general, gender is a term that refers to social and cultural distinctions associated with being male and female. Gender, unlike sex, is not biologically determined but is constructed by the society FAO (1997). Gender is often misunderstood as pertaining to women only whereas gender issues focus not only on women but also examine the relationship between men and women, their roles, their access to and control over resources, division of labour, interests and needs Bravo-Baumann (2000). Discourses on Gender also demand that it should include not only the two broad gender groups-men and women, but also the bi-sexual, the transgender and those who question the accepted patriarchal norm of heterosexuality-the lesbians and the gays. Similarly. discussions and debates has been prevailing there also on the issue of gender equality. Gender Inequality refers to the differential access to the all the spheres (from relating to health to access to work), institutions, rights associated with being male and female. Sen (2001) identified seven types of gender inequality viz Mortality inequality, Natality Inequality, Basic Facility Inequality, Special Facility Inequality, Professional Inequality, Ownership Inequality and Household Inequality. This paper addresses this sphere of professional inequality as gender inequality, by the indicator of the difference between worker population ratio for male and female (gender gap in Worker Population Ratio). This paper uses the indicator of increase in the monthly per capita consumption expenditure to refer the economic development. This paper is an attempt to examine the relationship between professional gender inequality and economic development measured by the per capita consumption expenditure. There exists an assumption that with the economic development, the agents of the economy will get better access to work and income and as in consequence, the overall wellbeing of the people will rise. But available literature depicting the relation between economic development and gender based access to of access to work shows a contradictory result. Literature (Tzannotes,1989; Schulz1991, Golden,1995) shows that across the process of development the female labour force participation rate is U shaped. Similarly, Lincove (2008) and Mammen and Paxson (2000) state the U-shaped relationship between national income and female labour force participation rate. The common explanation for this structure in all the literature is that as the economy develops, the increase in household income first leads to a decline in female labour force participation through the effect of household income. As households become wealthier, a large number of women move out of the labour force since they now do not want to be a part of low productivity,

subsistence employment. Only after attaining a certain point of development when an economy becomes able to create a large number of employment opportunities and which are acceptable for the women with higher household income then again the female labour force participation starts to increase with development.) Kapsos, S., Silberman, A., & Bourmpoula, E. (2014, August) shows that there exists an inverse relationship between per capita household expenditure and female labour force participation rates in India. It reveals that labour force participation rates are highest among the poorest individuals in terms of lower per capita household expenditure and lowest among women living in households with high monthly per capita expenditure. On the basis of this established U shaped relationship between economic development and female labour force participation, this paper tries to find out the structure of the relationship between female worker population ratio and per capita consumption expenditure in India. This paper attempts to see the effect of economic growth not among the labour force of women rather among the actual employment of women and the inequality the women are facing in this regard in comparison to men. The Worker Participation Ratio refers to the estimates of employed (or worker). This ratio may be in the form of either in usual status(ps) or in usual status(ps+ss). The WPR(ps) [Worker Population Ratio in Principal Status] gives the number of persons who worked for a relatively long part of the 365 days preceding the date of survey. While WPR(ps+ss) [Worker Population Ratio in principal and subsidiary status] includes (a)the persons who worked for a relatively long part of the 365 days preceding the date of survey and (b) those persons from among the remaining population who had worked at least for 30 days preceding the date of survey. Thus, WPR denotes the no. of persons/person days employed per 1000 persons/person days. It is differed from labour force participation rate since labour force refers to the population which supplies or offers to supply labour for pursuing economic activities for the production of goods and services and, therefore, includes both 'employed' and 'unemployed' persons/person-days. Labour-force participation rate(LFPR) is defined as the proportion of persons/person-days in the labour-force to the total persons/person-days. These ratios are given in per 1000 of persons/person-days. [NSSO 68thRound, Key Indicators of Employment and Unemployment in India]
 This paper uses the male –female difference in the WPR to indicate gender inequality. The MPCE (Monthly Per Capita Consumption Expenditure) is used in the paper as a proxy for per capita income. Per capita consumption expenditure is used in per capita income data is not available and it is used for comparison of average living standards between countries, between regions, and between social or occupational group. The NSS concept of MPCE, is defined at the household level(household monthly consumer expenditure ÷ household size). This measure serves as the indicator of the household's level of living. Next, each individual's MPCE is defined as the MPCE of the household to which the person (man, woman or child) belongs. [NSSO 68th Round, Key Indicators of Household Consumption Expenditure]. There has been made some specific modifications regarding the reference period of the consumption expenditure in the subsequent rounds of NSSO. The necessary specification is also adopted in the paper regarding the use of the data of AMPCE. (for e.g. for the 66th and 68th NSSO the AMPCEs of modified mixed reference period have been used in the paper). This paper considers the increase in the AMPCE as the economic development.

1.1. Objective
This paper aims to
   i.   To find out the relationship between economic development and gender gap in worker population and the cause of that resultant relationship.

1.2. Research Questions
This paper has two research questions:
(1) Does the relationship between growth in average monthly per capita expenditure and female worker population ratio in India show same U shaped relationship that has been existed between economic development and female labour force participation ratio?
 (2) Does the growth in per capita consumption expenditure alone cause significant gender inequality?

2. Methodology
This paper uses 13 rounds of NSSO data (50th,51st,52nd ,53rd ,54th,55th,56th,57th,60th,62nd,64th,66th,68th) for all India level as well as for all the States and Union Territories of India. For the analysis part, XY (scatter) chart and Karl Pearson's two tailed correlation and two variable linear regression model are used.

3. Results and Findings

3.1. Relationship between Economic Growth and Gender Inequality
The following table1 shows the statistics on average monthly per capita expenditure (rural) and(urban)and male and female worker population ratios in rural as well as urban areas for both principal status and principal+subsidiary status and table 2 shows the male-female difference in worker population ratio for both rural and urban areas.

NSSO Rounds	Year	Average MPCE (R	RFWPR(PS)	RFWPR(PS+SS)	RMWR(PS)	RMWR(PS+SS)	Average MPCE(U)	UFWPR(PS)	UFWPR(PS+SS)	UMWPR(PS)	UMWP (ps+ss)
50	(July1993-June94)	281	234	328	538	553	458	121	155	513	521
51	(July1994-June95)	309	237	317	547	560	508	112	136	514	519
52	(July1995-June96)	344	234	295	542	551	599	107	124	522	525
53	1997(January-December)	395	222	291	541	550	645	111	131	516	521
54	1998(January-June)	382	207	263	530	539	684	99	114	506	509
55	1999(July-December)	484	231	299	522	531	839	117	139	513	518
56	(July2000-June2001	495	221	287	532	544	914	116	140	525	531
57	(July 2001-June 02)	498	241	314	531	546	933	110	139	547	553
60	(January-June 2004)	565	228	315	527	542	1060	121	150	531	540
62	(July2005-June06)	625	224	310	537	549	1171	121	143	534	540
64	(July 2007-June 08)	772	216	289	538	548	1472	118	138	550	554
66	(July2009-June10)	1054	202	261	537	547	1984	119	138	539	543
68	(July2011- June12)	1430	176	248	535	543	2630	125	147	542	546

Table 1: Average monthly per capita consumption expenditure and Worker Population
Ratio out of 1000 by (PS & PS+US) by gender for both rural and urban areas at all India level.
Author's calculation: GPRWPR and GPUWPR
Source: NSSO rounds

NSSO Rounds	Year	Average MPCE (R)	GPRWPR(PS)	GPRWPR(PS+SS)	Average MPCE(U)	GPUWPR(PS)	GPUWPR (PS+SS)
50	(July1993-June94)	281	304	225	458	392	366
51	(July1994-June95)	309	310	243	508	402	383
52	(July1995-June96)	344	308	256	599	415	401
53	1997(January-December)	395	319	259	645	405	390
54	1998(January-June)	382	323	276	684	407	395
55	1999(July-December)	484	291	232	839	396	379
56	(July2000-June2001	495	311	257	914	409	391
57	(July 2001-June 02)	498	290	232	933	437	414
60	(January-June 2004)	565	299	227	1060	410	390
62	(July2005-June06)	625	313	239	1171	413	397
64	(July 2007-June 08)	772	322	259	1472	432	416
66	(July2009-June10)	1054	335	286	1984	420	405
68	(July2011- June12)	1430	359	295	2630	417	399

Table 2: Average monthly per capita consumption expenditure and Gender Gap in
Worker Population Ratio (PS & PS+US) for both rural and urban areas at all India level.
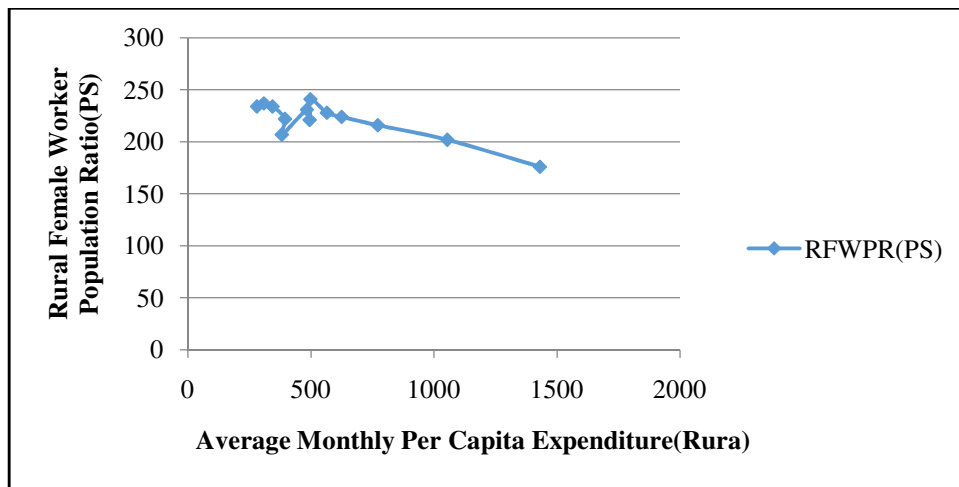*Author's Calculation, [Source: NSSO Rounds]*

Figure 1: Relationship between RAMPCE & RFWPR(PS)

Figure 1 reveals that though at lower levels of average monthly per capita consumption expenditure, the female worker population ratio (principal status) shows fluctuating trend but at higher levels of average monthly per capita consumption expenditure, the FWPR decreases in rural areas of India and till now have not shown any increasing trend.
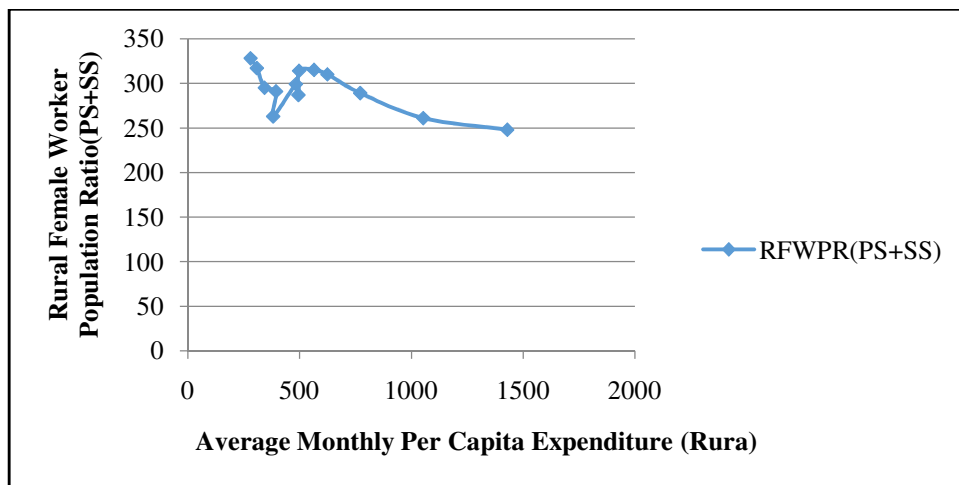

Figure 2: Relationship between RAMPCE &RFWPR(PS+SS)

Figure 2 shows the relation between rural average monthly per capita consumption expenditure and rural female worker population ratio for both principal and subsidiary statuses is same as of principal status.
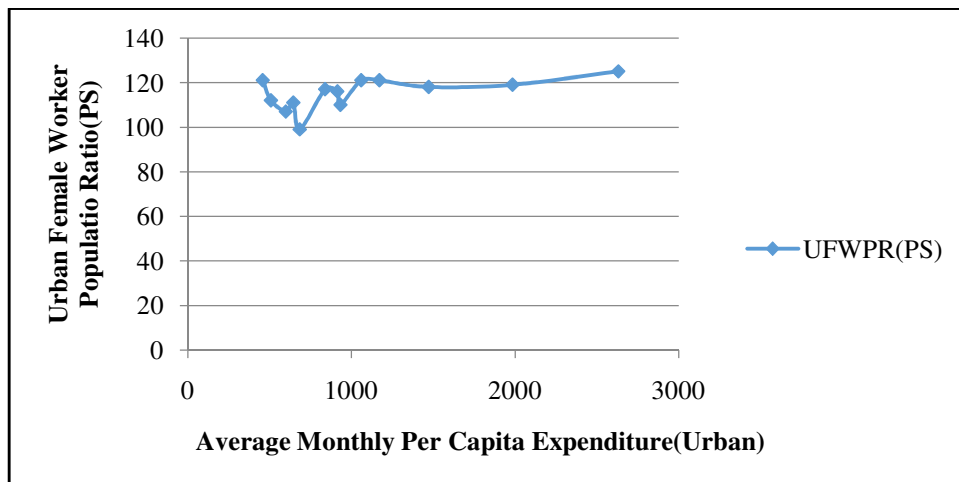

Figure 3: Relationship between UAMPCE and UFWPR(PS)

Figure 3 shows that as average monthly per capita expenditure increases in urban areas of India, the female worker population ratio (principal status) does not decrease as in the case of rural areas rather hangs around the same level or marginally increase.
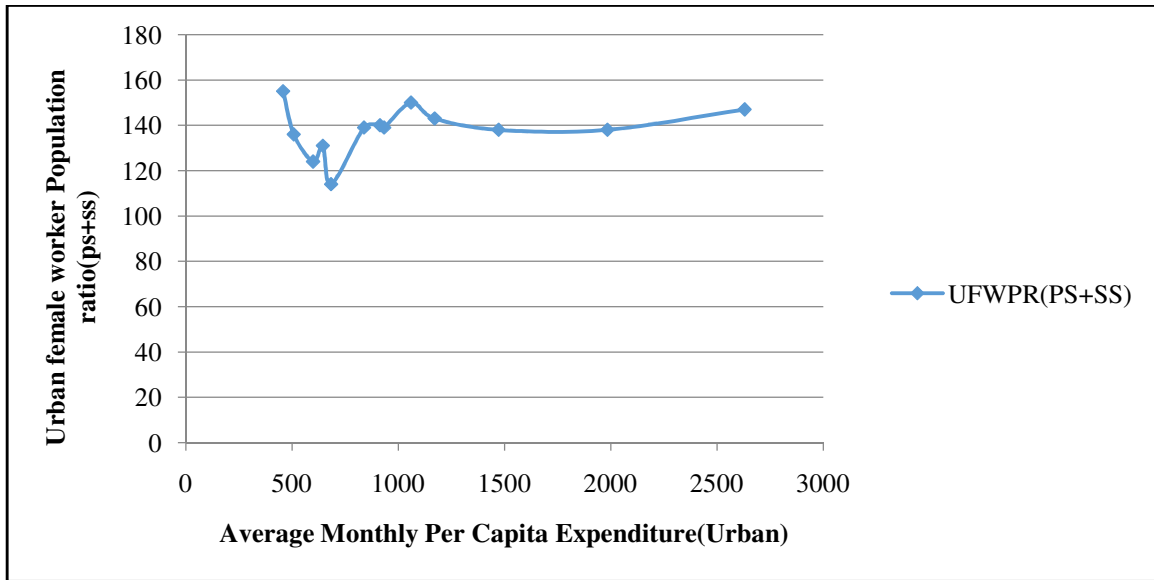

Figure 4: Relationship between UAMPCE and UFWPR (PS+SS)

The figure 4 shows the relationship between average monthly per capita consumption expenditure for urban areas and the urban female worker population ratio for both principal status and subsidiary status. It shows the same trend as of the urban female worker population ratio for both principal statuses. It refers that subsidiary status employment of women though it is greater than that of men, but is not to the extent to change the trend. The graphs show that there exists a negative relationship between average monthly per capita consumption expenditure and female worker participation ratio for both principal and principal+subsidiary status in rural areas. But such type of relationship does not exist for urban areas, though it also does not show a strong positive relationship. It hangs around the same level though the time.

This paper tries to find out the change in the worker population ratio for male too in response to the increase in the monthly per capita consumption expenditure. A positive relationship between AMPCE and MWPR implies increase in gender gap, the following figures show it.
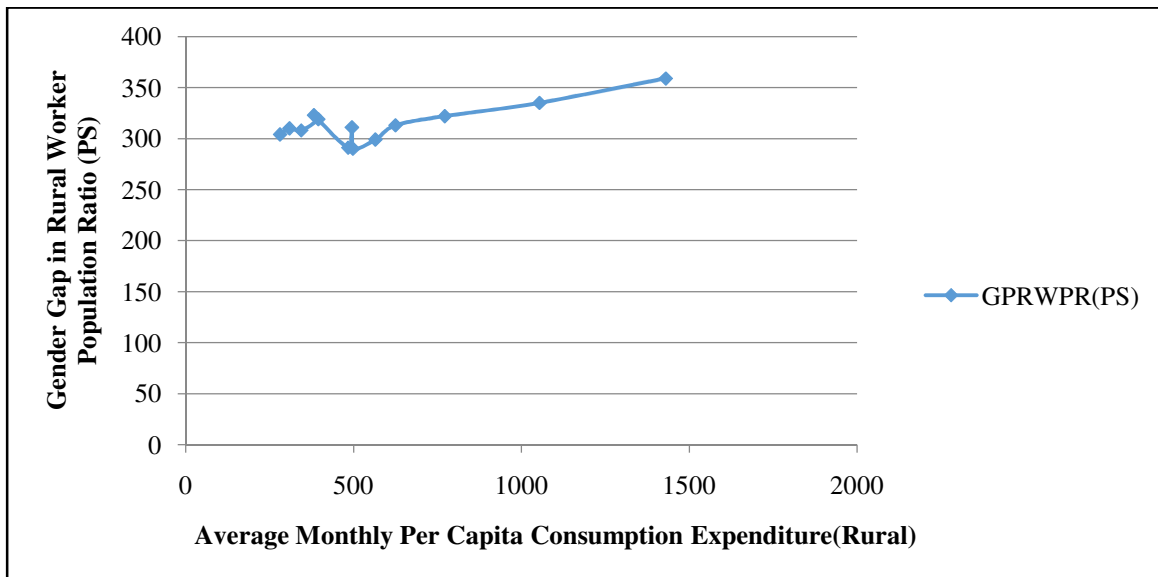

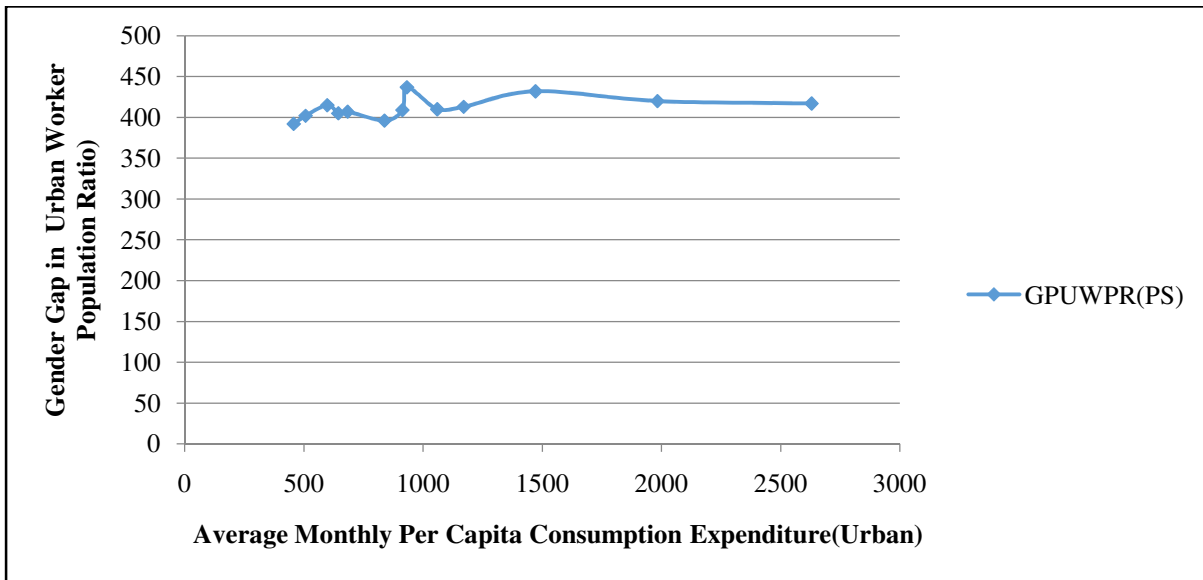*Figure 5: Relationship between RAMPCE and GPRWPR(PS)*

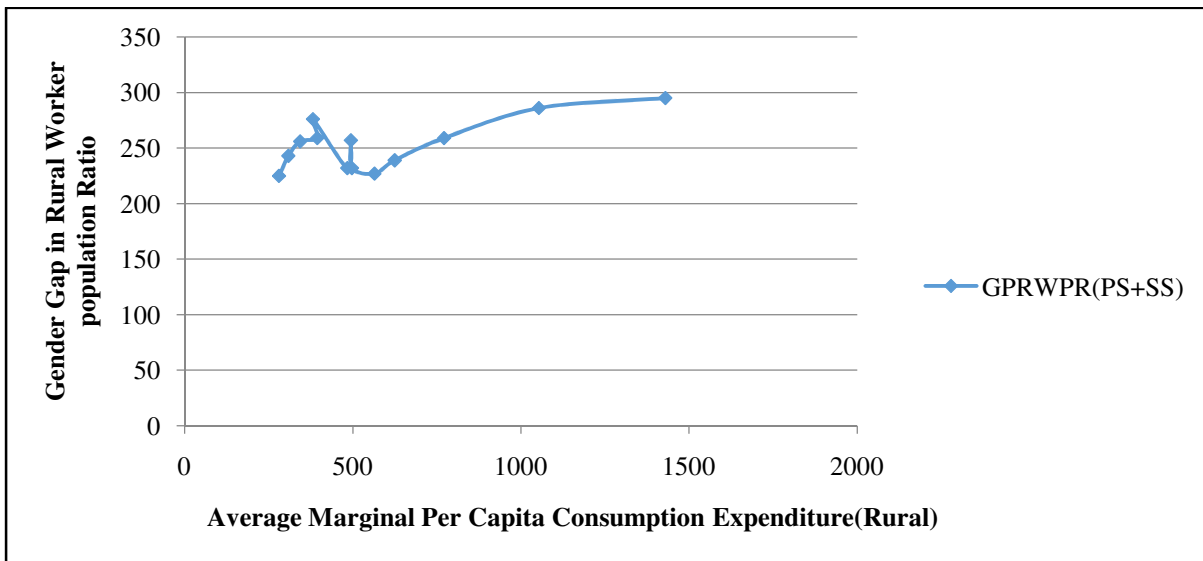*Figure 6: Relationship between UAMPCE and GPUWPR(PS)*

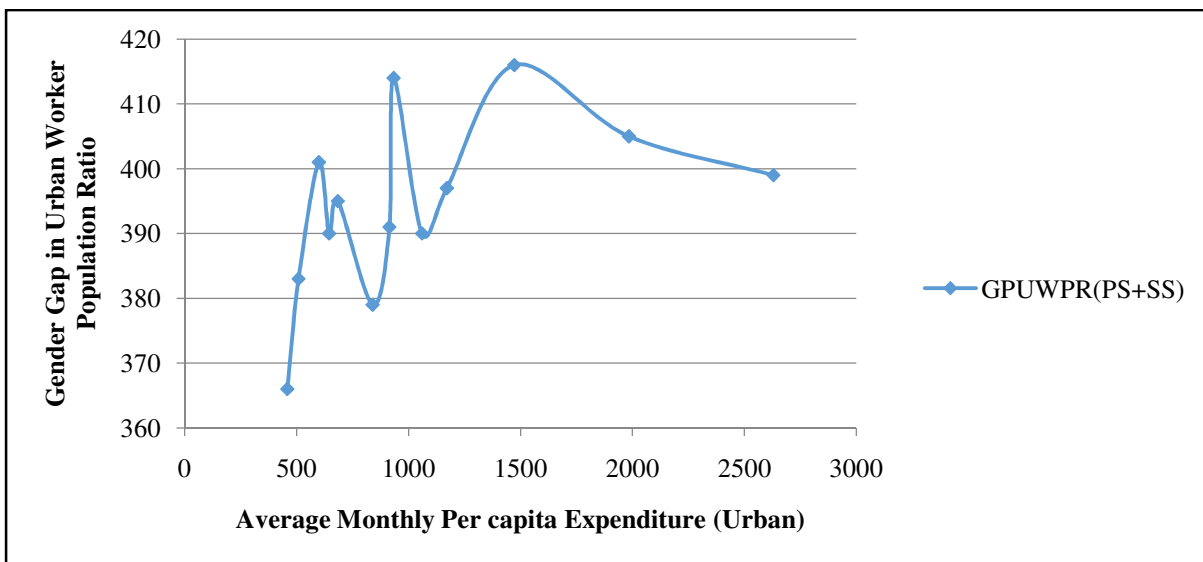*Figure 7: Relationship between RAMPCE and GPRWPR(PS+SS)*

Figure 8: Relationship between UAMPCE and GPUWPR(PS+SS)

Figure 5 shows that gender gap in rural worker population ratio (principal status) exhibits a distinct upward trend after attaining some level of per capita consumption expenditure. However, gender gap in rural worker population ratio(principal status and subsidiary status) also shows increasing trend, but the gap exists by lower amounts since the male are being employed lesser in number in subsidiary status than female. However, such type of relationship does not exist for urban areas between average monthly per capita expenditure and female worker population ratio though it also does not show a strong positive relationship. It moves around the same level through higher levels of consumption expenditure. While in case of GPUWPR(PS+SS), at higher levels of consumption expenditure it decreases as the number of urban females engaged in subsidiary status is higher in comparison to the very low level of urban male engaged in the subsidiary employment and interestingly in the urban areas when the income increases the subsidiary employment of female also increases.

The downward tendency of rural female WPR can be interpreted with the following Goldin (1994) statement, "When incomes are low, women often work with other household members of family farms, in home workshop production, and as own account workers. As incomes rise, various parallel changes occur that affects women labour force participation."However, the cause behind this rural-urban difference can be attributed to the difference in the occupational distribution between the rural and urban female. As India is experiencing a service sector driven growth, the rural female is not able to get the benefits of service sector employment opportunities. Moreover, since India is experiencing a very low agricultural growth therefore as household income increases, the rural female shows the tendency of driving out from the subsistence, low productive agriculture. The available literature on this regard, Marshal (June,1985) states that, "...the subsequent expansion of the cash economy frequently recruits more while leaving female to labour in subsistence production where they are denied opportunities for upward mobility and independence from patriarchal control......the restriction of   employment opportunities particularly displaces women, who function as a reserve army of labour, most commonly as casual workers in the over-crowded tertiary sector."

As an economy transforms from an agricultural economy to an industrial economy, a decline in participation of female labour force is observed. This is attributed to the shift from family-based production to large-scale production in industrial units. The womenfolk being mostly illiterate or with low levels of education face shortage of work in the home turf and have inhibitions in working as manual labour in the non-agricultural sector. [Sanghi, Srija, Vijay,2015] This is the case for the particularly rural women in India. Similarly, the rural women engagement in manufacturing sector also refers to the decrease in worker's demand in the traditional manufacturing and consequence loss in jobs for women.

Broad Industry Division	NSSO Rounds	Rural Female WPR(PS)	Urban Female WPR(PS)
Agriculture	68th	745	87
	66th	789	118
	61st	814	147
Manufacturing	68th	96	266
	66th	76	258
	61st	87	254
Trade, Hotel & Restaurant	68th	36	131
	66th	31	124
	61st	28	131
Transport, Storage and Communications	68th	2	32
	66th	3	16
	61st	2	15
Other Services	68th	67	427
	66th	57	427
	61st	46	402

Table 3: Per 1000 distribution of employed females by broad industry division in rural and urban areas
Source: NSSO rounds

Since urban women are mostly employed in the service sector and in the manufacturing sector, where actually the number of rural female are very less, therefore the higher consumption expenditure come out service sector driven Indian economy shows positive relation with urban female worker population ratio and negative relation with rural worker population ratio.

The paper tries to show the relationship between relationship between economic growth (growth in average monthly per capita expenditure) and gender inequality (gender gap between worker participation ratios) with the evidence of all the states and union territories also.

Regions	(68-66) Round				(68-64) round			
	GAMPCER$_1$	GAMPCEU$_1$	Change in GPRWPR$_1$	Change in GPUWPR$_1$	GAMPCER$_2$	GAMPCEU$_2$	Change in GPRWPR$_2$	Change in GPUWPR$_2$
India	376	646	26	-10	658	1158	224	167
Delhi	694	644	-225	-55		1470	97	115
Haryana	666	1496	114	-21	1142	2189	320	205
Himachal Pradesh	498	605	-70	-40	886		-16	163
Jammu & Kashmir	399	726	7	35	750	1088	194	168
Punjab	696	685	9	-25	1072	1161	250	152
Rajasthan	419	779	-52	-42	797	1177	165	161
Uttaranchal	-21	594	180	28	825		105	243
Chhattisgarh	243	221	-225	-55	429	365	131	87
Madhya Pradesh	249	392	50	-72	518	868	269	216
Uttar Pradesh	257	477	98	43	476	930	270	214
Bihar	347	269	-21	-51	529	427	342	187
Jharkhand	181	434	101	48	414	623	401	275
Orissa	185	393	56	-33	444	503	273	197
West Bengal	339	626	-38	-42	589	1139	194	149
Arunachal Pradesh	236	707	10	27	695	1194	134	164
Assam	216	434	54	14	420	737	241	208
Manipur	475	377	23	-29	659	475	248	188
Meghalaya	365	807	-123	1	571	976	18	118
Mizoram	382	621	2	15	842	768	211	147
Tripura	158	273	-62	-13	411	684	174	162
Nagaland	583	422	29	-84	724	824	211	130
Sikkim	244	458	-218	-217	642	1148	-126	114
Goa	343	407	-27	-160				
Gujarat	426	672	42	32	661	1110	214	189
Maharashtra	466	752	43	-21	751	1480	158	135
Andhra Pradesh	548	416	2	2	966	1104	65	150
Karnataka	541	973	71	-6	742	1358	222	134
Kerala	834	995	10	37	1286	1460	196	126
Tamil Nadu	533	674	102	-9	859	1212	193	168
Andaman & Nicober Islands	780	1773	-69	24	1581	2664	116	48
Chandigarh	406	-467	284	50	1502	1379	181	271
D &N Haveli	208	924	-331	-103	-8	693	-15	211
Daman & Diu	850	646	410	-9	1305	410	364	255
Lakshadweep	1130	900	45	195	1793	1309	311	265
Pondicherry	537	526	140	63	1042	1238	215	183

Table 4: Region wise growth in average monthly per capita expenditure and change in the gender gap in WPR during the periods (68-66) round and 68-64) round

Author's calculation

Source: NSSO Data (for 64th NSSO round the data for some the states are not available and data of union territories are available as Group of UTs only, therefore the necessary modification has been done in constructing the table.

Applying Karl Pearson's correlation analysis to these data, the following results are found:

Correlations		GPRWPR1	GAMPCER1
GPRWPR1	Pearson Correlation	1	.151
	Sig. (2-tailed)		.378
	N	36	36
GAMPCER1	Pearson Correlation	.151	1
	Sig. (2-tailed)	.378	
	N	36	36
		GPRWPR2	GAMPCER2
GPRWPR2	Pearson Correlation	1	.161
	Sig. (2-tailed)		.364
	N	34	34
GAMPCER2	Pearson Correlation	.161	1
	Sig. (2-tailed)	.364	
	N	34	34
		GPUWPR1	GUAMPCE1
GPUWPR1	Pearson Correlation	1	.126
	Sig. (2-tailed)		.466
	N	36	36
GUAMPCE1	Pearson Correlation	.126	1
	Sig. (2-tailed)	.466	
	N	36	36
		GPUWPR2	GUAMPCEU2
GPUWPR2	Pearson Correlation	1	-.340
	Sig. (2-tailed)		.053
	N	33	33
GUAMPCE2	Pearson Correlation	-.340	1
	Sig. (2-tailed)	.053	
	N	33	33

Table 5

The above correlation table shows that there does not exist significant positive and negative correlation between the growth in average monthly per capita consumption expenditure and change in the gender gap. Though except the gender gap in urban worker participation ratio for (68-64) all the correlation show insignificant positive correlation between the variables. Therefore, it should conclude though there is not such definiteness, but even there are evidences which show that as monthly per capita expenditure increases the rural female worker population ratio decreases and there exists difference with the urban female worker population.

To find out the answer of the second research question that if the growth in per capita consumption expenditure is alone a significant cause of the gender gap in the WPR, the paper tries to construct a simple econometric model for the above data set.

GGWP=a+bGAMPCE+€

It is found that the model shows a bad fit with very low R^2 for both rural and urban areas. Hence the paper answers this question with a sharp disagree that in India though there is positive correlation between the household income and professional gender inequality but this cannot be shown as a case of income effect rather it is the structural transformation in the economy that is mainly causing this relationship.

4. Conclusion

It should be concluded with the above line of analysis though there exists a negative relationship between the household income and female worker population ratio in rural areas and to a little extent in urban areas, this is not sufficient to consider the thing that lower rural female worker participation is attributed to the higher household incomes. Chatterjee, Murgai, Rama (2014) has rightly argued in this context that such a narrow supply-side interpretation is wrong, because it ignores the transformation in the structure of employment at local levels. A salient trait of this period is the collapse in the number of farming jobs without a parallel emergence of non-farm regular jobs and other employment opportunities that considered suitable for women. Therefore, the need is to the provision of the transformation in the structure of employment in India, creation of employment avenues in the growing service sector as well as manufacturing sector of Indian economy guarding the employability and access of women to these sectors from urban as well as rural areas.

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