INTERLINKAGES OF POVERTY, GROWTH AND LABOUR MARKET IN INDIA:

A GENDER PERSPECTIVE

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DECLARATION

This is to certify that the dissertation entitled **"Interlinkages of Poverty, Growth and Labour Market in India: A Gender Perspective"** is based on my original research work under the supervision of Prof. Amaresh Dubey. I hereby submit this dissertation in partial fulfillment of the requirements for the award of the degree of **Master of Philosophy** of this University. This study has not been submitted in part or full for any other diploma or degree of any other University to the best of my knowledge.

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CERTIFICATE

It is hereby recommended that this dissertation may be placed before the examiners for evaluation.

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ABBREVIATIONS

ADF	Augmented Dickey Fueller
CAGR	Compounded Annual Growth Rate
CDS	Current Daily Status
CES	Consumption expenditure Survey
CWS	Current Weekly Status
ECM	Error Correction Model
EFA	Education for all
EUS	Employment Unemployment survey
GDP	Gross Domestic Product
GER	Gross Enrolment Ratio
HDR	Human Development Report
IHDR	India Human Development Report
LFPR	Labour force participation Rate
MDGs	Millenium Development goals
MHRD	Ministry of Human Resource Development.
NSSO	National Sample Survey Organisation
OECD	Organisation for Economic Cooperation and Development
TFP	Total Factor Productivity
UR	Unemployment Rate
VECM	Vector Error Correction Model
WFPR	Workforce Participation Rate

Chapter 1
Introduction

1. Introduction

The theme of this study is to examine the virtuous circle of Economic Growth, Employment and Poverty Reduction and how to sustain this circle in the best possible way. The evolution of economic growth is intricately related to the evolution of employment generation and poverty reduction. In other words, promotion of economic growth fuels the improvement of the living standard of the masses at all levels. Meanwhile, available evidence, particularly in most developing countries, suggests that although economic growth constitutes a necessary condition for employment generation and poverty reduction, it is not a sufficient condition as there are possible trades-offs and conflicts between growth and redistribution of wealth in the country. The overall theme for the 12th plan which aims to achieve "faster, sustainable and more inclusive[1] growth" as set up by the Planning commission (Government of India, 2011) rightly explains the growth debate. Hence, growth has to include the poor, especially women, the vulnerable groups and backward regions as partners in the process. In other words, inclusion needs to be woven well into the growth process.

Further, productive employment and decent standard of living are among the few main objectives of 12th plan. However, according to Amsden (1989), introducing changes in the labour market involve an improvement in the skill and educational levels of the workforce, according to the changing industrial requirements that demand higher labour skills and efficiency. This was clearly witnessed in the case of East Asian economies. Significant achievements by the East Asian countries in education and human development helped these countries' industrial transformation.

[1] "Inclusive development includes both social and financial inclusion and in most cases, the socially excluded are also the financially excluded" according to Economic Survey of India (GOI, 2012-13)

Hence, investing in education[2] and imparting skills for all to help economies achieve inclusive growth with quality jobs is the need of the hour throughout the world for poverty reduction and development.

However, the low standards of education in India raise concern about the means to sustain this growth without developing its human capital. According to World Bank (2001), "as knowledge has become a key factor in economic development, growing enrolments in higher education and rising rates of return on it, tend to make a case for expanding higher education to larger number of people across the world". Although primary and secondary education is usually considered important, it is now believed the quality and size of the higher education is also crucial for development especially in an underdeveloped or marginalised economy.

Further, in the context of employment, according to Economic Survey of India (Government of India, 2012-2013), "the central question is where will the jobs come from even if the masses are educated? Productive jobs are vital for and a good job is the best form of inclusion". According to UNDP, "development can be inclusive and reduce poverty only if all groups of people contribute to creating opportunities, share the benefits of development and participate in decision-making". For an economy to achieve inclusive development, one important element is to create productive and gainful employment along with effective social safety nets to protect those who cannot work.

Achieving a more sustainable world requires income security as well as human security and opportunities for every person to be made available. 'Inclusive Growth' introduced by the Indian Planning Commission raises the obvious question of distribution of benefits of this growth among various population groups and spatially between states and provinces. The concern is more about the nature of the redistributive impact of the growth in the economy and its ability to grow despite the bottlenecks imposed by constraints of a large and growing population, and also

[2] "Education is essential for raising individual productivity and hence wages. General education gives children skills that will be transferable from job to job and the basic tools necessary for further learning. It augments workers ability to perform standard tasks, to process and use information, and to adopt new technologies and production practices." as stated by World Bank (1995).

that the economy is essentially agrarian as even today major proportion of the population is dependent on agriculture. Even as subjects like growth rate, inequality in distribution of income and wealth have remained important concerns in the socio-economic development context, increasing attention is being given to the much debated aspect of poverty and the plausible solutions to curb it in the most efficient way.

Poverty and Education –A mutually reinforcing relationship

Poverty is a multidimensional concept and it is a situation in which a person lacks necessary entitlements and capabilities to satisfy his/her basic needs and aspirations. "Human poverty, which includes education poverty, is an integral part of capability poverty. The features of education poverty include non-participation or low rates of participation of children in schooling, high rates of drop-out and failures, low rates of continuation in schooling, low rates of achievement and exclusion of the poor from education. All these aspects of education poverty are closely related with income poverty.

Poverty of education is a principal factor responsible for income poverty; and income poverty, inturn, doesnot allow the people to overcome poverty of education" education poverty and income poverty mutually reinforce each other" according to Tilak (2005). Hence, education becomes crucial ingredient in poverty reduction strategies and also a tool for development. According to Rahman (2006) "contribution of education to the social and economic development of societies has been established beyond doubt. In addition, the search for strategies for poverty reduction has identified education and literacy as important instruments for improving the conditions of the poor". Moreover, according to UNDP and Government of Botswana (2005) and World Bank (2005), "education helps poverty alleviation through its impact on productivity of labour and through other channels of social benefit and therefore education is an important development goal".

There are several approaches towards explaining education as a concept. Firstly, the "basic needs" approach recognizes education as a basic or a minimum need, fulfilment of which helps in fulfilment of other needs. Secondly, the "human capital" approach emphasizes education as a means of development, while the "human

development" approach recognizes education as an end in itself. The "human capability" approach offers an integrated approach on the role of education as a direct measure of well being and freedom, as an indirect influence on social change, and as an indirect influence on economic production.

According to Chaddha (2004) "in the age of knowledge revolution a worker's intellectual capacities are no less than quality of machines installed or quality of other inputs used for production". Kim and Hagiwara (2010) elaborated the importance of "well-educated labour force as it is considered necessary in the diffusion and adoption of new technology and new methods of production". Hence at this juncture of discussion, it is apt to introduce the concept of Human capital. According to Goode (1959), Schultz (1961) and Khilji (2005), "human capital is a composite concept which consists of education, health, on job trainings, skills, aptitudes and migration to better job, but education serves as the most important ingredients of human capital". Further, according to Rosen (1989), the "stock of skills and productive knowledge embodied in people" constitutes human capital. Ronald Ehrenberg continues, "the knowledge and skills a worker has - which come from education and training - generate a certain stock of productive capital". This productive capital is valued by the amount these skills can earn in the labour market. Also, human capital is not only the means to development but also the ends of development.

Investment in human capital can take many forms such as informal education, on–the –job training, health improvements, learning-by-doing and so on. According to Srivastava (2008) "human capital includes both formal learning (education and training) as well as informal on the job training and learning. However, formal education has been regarded as the most fundamental contribution to human capital accumulation which can be complemented by other forms of human capital and that is why perhaps the empirical growth models too focus on three main levels of education namely: primary, secondary, and tertiary levels. Production-relevant skills are assumed to be embodied in those individuals who have acquired greater quantity and quality of education with a skill hierarchy ranging from primary to tertiary. Thus focussing on education although doesn't fully capture human capital process but it is likely to capture one of the most important components.

Why is post elementary education important?

Government's attention for decades has been on elementary or primary education and higher education always occupied the subordinate position. However, this has suddenly changed in recent years. Higher education contributes to development and has a poverty-alleviating effect. It enhances the earnings of individuals and thereby contributes to economic development. It thus makes a significant contribution to reducing absolute as well as relative poverty. In all, higher education is a very important "human capability" and a "human freedom" of the sort that Amartya Sen proposes, a freedom that helps in attaining other freedoms. While primary education provides the three 'R's (reading, writing and arithmetic skills), it rarely imparts the skills and knowledge necessary for employment in a job that ensures decent wages and living conditions. So, elementary education is not a terminal level of education. Most of the literacy and primary/elementary education programmes in the country do not impart literacy that is sustainable, which means that they do not guarantee that children do not relapse into illiteracy. Further, even if elementary education imparts some valuable attributes in terms of attitudes and skills and is able to take people from below the poverty line to above it, the level of ascent is often not very high. The danger of their falling below the poverty line at any time remains high. However, neither is there any clear resolve of making secondary education universal nor is there any reference to the goal of a 30% enrolment ratio in higher education. On the whole, the approach paper to 12th plan, does not spell out what the government wants to do to improve the public education system, but what it intends to do to facilitate the growth of the private sector. Privatisation seems to be the only mantra for development of education in the Twelfth Plan.

The Concept of Human Capital

Having introduced the concepts of poverty, education and human capital, the concept of human capital is analysed in greater detail. The contributors to the human capital revolution were Becker (1964), Bowen (1964) and Bowman (1966). The originators of human capital theory were early economists from Smith[3] (1776) to Marshall

[3] According to Adam Smith (1723-1790), accumulation of capital could take place only through employment of productive labour and who in turn add to productive assets, thus more a country spends on productive labour, more it adds to generation of GDP. Further, according to J.S Mill (1806-1873), productive labour includes all those efforts, which produce utilities, embodied in material objects and lead to increase in material productivity directly or indirectly.

(1920). It was Schultz (1961) who coined the term human capital and recognised the fact that out of the four factors of production-land, labour, capital and enterprise (the traditional economic thought)- the labour[4] not only supplies physical labour but it applies its knowledge and skill to enhance the production process. However, human capital accumulation got importance by the emergence of endogenous growth theory given by Lucas (1988) and Romer (1989, 1990). Mankiw et al. (1992) was the first to use human capital in production function. The concept of human capital was first proposed by Gary Becker. The model is based on the idea that ,workers embody a set of skills that can be "rented out" to employers. However, the human capital theory is a narrow concept and more neo-liberal approach than human capability approach and has multiple biases against as it talks only of resource production and its accumulation.

Petty (1691) made the first attempt in estimating money value in human beings. Three methods have been used to measure the value: Cost based (cost of production approach), income-based approach (capitalised earnings procedure) and the "education stock approach". The current study is based on the third approach which is based on insights of Adam Smith that creation of specialised labour requires use of scarce inputs, specifically, education/learning. Due to this emphasis on education, the most commonly used measures of "stock of human capital include education-augmented labour input, adult literacy rates, school enrolment ratios, average years of schooling of working-age population". Barro and Lee (1993, 1996, 2003) and Lee and Barro (2001) popularises this approach, measured by "years of schooling".

Moving on from human capital to human capability approach, Amartya Sen (1999) rightly argues that education constitutes a part of human freedom and human capability. Sen (1999) and Jean Dreze (2002) argue that ensuring the capability for functioning constitutes the fundamental aim of development and therefore the fundamental reason for ensuring at least a basic education for all. Wigley and Wigley (2006) also defend Amartya Sen's capability approach and claim that

[4] During 17th century Sir William Petty (1623-1687) considered 'Labour is the father as lands are the mother'. Hence, labour is the source of all the wealth. Similarly, Karl Marx held the same view stating 'A country which ceased to work, would die.' Work is the soul and source of wealth.

education should be evaluated in terms of the capability to achieve valued functioning, rather than mental satisfaction or resources. Thereby going by the human capability approach there is a need to analyse the role of education in capability building and the consequent value functioning.

The Gendered Approach

When discussing about macro concepts like poverty, education and economic development it is important to analyse these topics within the purview of gender. The UN Global Gender Gap data (2011) shows that "women's economic participation and opportunity is worse in India than in 95% of all other countries studied. The UN Gender Inequality Index has ranked India below several sub-Saharan African countries". Gender disparities are even more pronounced in economic participation and women's business conditions in India. Despite India being the second fastest growing economy in the world, gender disparities have remained deep and persistent in India. What explains these huge gender disparities in women's economic participation in India? "Gender equality is not equality of outcomes for men and women, but rather equality in the determinants of these outcomes—that is, equality in opportunities or resources, rights and voice" as stated by World Bank (2001).

Further, according to the World Development Report (World Bank, 2012), "in one third of developing countries, there are more girls in school than boys. Women now make up over 40 percent of the global labour force, gender equality is a core development objective in itself and hence they matter both for development outcomes and policy making. Firstly, gender equality matters because the ability to live the life of one's own choice and be spared from absolute deprivation is a basic human right and should be equal for everyone, independent of whether one is male or female. Secondly, greater gender equality contributes to economic efficiency and the achievement of other key development outcomes. Gender refers to the social, behavioural, and cultural attributes, expectations, and norms associated with being a woman or a man. Gender equality refers to how these aspects determine how women and men relate to each other and to the resulting differences in power between them". Following Amartya Sen, development has been seen as a process of expanding freedoms equally for all people. In this view, gender equality is a core objective to

achieve development. So, just as development means less income poverty or better access to justice, it should also mean reduction of gender gaps.

Capturing the demographic dividend

"India, is on the verge of a demographic revolution with the likelihood of an increase in the working age population (15 years to 59 years) from 58% in 2003 to more than 64% by 2021 adding around 63.5 million new entrants to the working age group between 2011 and 2016 the majority of the proportion will belong to the younger age group (20-35 years)" as stated by Economic Survey of India (GOI, 2012-13). Since, it is one of youngest large nations in the world, Human Development assumes great economic significance for India, as demographic dividend can be reaped only if the labour force is healthy, educated and skilled. The current study also analyses the same and studies how productive labour acts as a catalyst in sustaining the virtuous cycle of economic growth, employment and poverty reduction.

According to Desai (2010) India is unlikely to realise its "demographic dividend" to the fullest extent unless significant strides can be made to increase women's labour force participation through an increase in employment opportunities and a reduction in labour market disadvantages. Desai (2010) further summarizes the various approaches to population growth as follows. According to Cassen (1994), the population "pessimists" have argued that "rapid population growth inhibits development by reducing capital per worker and dampening productivity". According to Kelley and Schmidt (1996); Johnson and Lee (1986), the population "optimists" have argued the opposite, that "rapidly expanding population can increase human and intellectual capital and furnish expanding markets, leading to economic growth". According to Chandrasekhar et al. (2006), in recent years, a third approach has emerged which suggests that "population size is less important than population composition". Having experienced a slower fertility decline, James (2008) claims that "India will have a smaller dependency ratio and will reap the benefits of the demographic dividend, particularly, if the nation chooses to invest in skill development of the youth". Over this period, countries will need to spend less on education and other services for the non-workers, while enjoying the productivity and the savings boost provided by a large proportion of working age population.

The Human Development approach

As per the latest available Human Development Report (UNDP, 2011) which estimates the human development index [HDI] in terms of three basic capabilities: to live a long and healthy life, to be educated and knowledgeable, and to enjoy a decent economic standard of living, the "HDI for India was 0.547 in 2011 with an overall global ranking of 134 (out of 187 countries) compared to 119 (out of 169 countries) in HDR 2010. The growth rate in average annual HDI of India during 2000-2011 is among the highest, a finding also corroborated by the India Human Development Report (IHDR) 2011 brought out by the Institute of Applied Manpower Research and the Planning Commission. According to the IHDR, HDI between 1999-2000 and 2007-08 has increased by 21 per cent, with an improvement of over 28 per cent in education being the main driver. India is ranked 129 in terms of the gender inequality index(GII) which captures the loss in achievement due to gender disparities in the areas of reproductive health, empowerment, and labour force participation, with values ranging from 0 (perfect equality) to 1 (total inequality). A lot more needs to be done as our GII is higher than the global average of 0.492".

The current study presents the inter-linkages of aspects which were presented in various Human Development Reports. The HDR (1993) focussed on people's participation as a central issue and the need for markets, organisations and governance to be reformed inorder to provide access to the benefits for all. The HDR (1995) focussed on gender and human development, emphasising equality of opportunity for all, sustainability of such opportunities from one generation to the next and empowerment such that they participate and benefit from development. The HDR (1996) focussed on economic growth and human development which recognises economic growth as only a means but human development as the end and HDR (1997) focussed on challenge to eradicate poverty from a human development perspective and the fact that human poverty is greater than income poverty as human poverty is the denial of choices and opportunities for a tolerable life.

Having introduced the key concepts, labour market is the ideal starting point. The probability of a household participating in the labour market has direct consequences to the growth of the nation and in turn has a consequence on the probability of a household being in poverty. However, what needs to be analysed is how the virtuous

cycle of Growth, Employment and Poverty reduction can be sustained and how education plays an important role in sustaining this circle. Each objective in the current study have been analysed on gender lines also so that the goal of "inclusive growth" can be justified. Moreover, the Approach Paper to the Twelfth Five-Year Plan suggests that women must be recognised as growth agents in India's political economy across all sectors.

1.1 Literature Review

1.1.1 Education, Employment and Poverty reduction

Speaking about education, the literature shows that there has been an overall neglect of post elementary education and there is a general presumption among many policy makers that secondary and higher education is not necessary for economic growth and development. According to Tilak (2003), secondary and higher education is not included on the poverty reduction agenda of many poor countries and is under emphasised even in the MDGs to be achieved by 2015. In the Indian context also, many empirical evidences and recent research have testified to this overall neglect by government towards the post elementary education. As we know, the poverty alleviating impact of education will vary according to the level of education. Also, productivity enhancing effect of education and prospect of employment/unemployment is likely to differ between primary and secondary education. According to OECD (1997) and World Bank (2006), investment in education beyond the upper secondary level resulted in greater increased earnings and a lack of an upper secondary qualification resulted in decreased earnings. Studies in OECD (1997) states indicate that university-educated women earn 61 per cent more on average in mid-life than those with upper secondary only while those without upper secondary earn 23 per cent less. For men, those without upper secondary education earn between 10 and 38 per cent less than those who have completed upper secondary education only, in most countries while tertiary graduates earn significantly more than upper secondary graduates in all countries.

Raja (2000), argued that "education is the first step in the path of development process. It is a two way process, on one side, it increases the economic growth and on the other side, it reduces the poverty and increases the productivity through its linkages with employment. It plays a very crucial role in building of human capabilities and enhances economic growth through skills and knowledge. Low educational levels of the workforce are the major impediment for more substantial poverty reduction".

Various studies have shown that certain types of employment accentuate poverty. According to the World Bank (1998, 2002) estimates, poverty incidence is highest among casual labour category, especially in agriculture. In contrast, Rahman (2004) states that regular salaried employment can lead to lower poverty. Singh (2003) observes using various rounds of NSSO that lower the level of education, lower is the unemployment rate. Among the non-literates, it is the lowest and the graduate and above category shows the highest incidence of unemployment.

Role of education in enhancing labour productivity and in economic growth has been recognized by the extensive development in New growth theory[5]. The new growth theories emphasised that through education, learning, and skill formation, productivity is enhanced which inturn leads to economic growth [Barro and Sala-I-Martin 1995; Barro 1996]. Many studies like those of Azariadis and Drazen (1990); Barro (1991) and Mankiw et al. (1992) have shown that human capital has been regarded as the primary source of long term economic growth along with physical capital. However, Romer (1989) and Mankiw et.al (1992) state that most of the empirical studies of growth have relied on measures of the accumulation of human capital such as enrolment ratios, or proxies of the stock such as illiteracy rates. Further, Barro and Lee (1993); Nehru et.al. (1993); Dubey and King (1994); Psacharopoulos and Arrigada (1986, 1992); Kyriacou (1991) explain that lack of data on appropriate measures of human capital stock has been the main incentive to estimate the level and distribution of the global stock of human capital across countries.

[5] An economic growth theory that posits humans' desires and unlimited wants foster ever-increasing productivity and economic growth. The new growth theory argues that real GDP per person will perpetually increase because of people's pursuit of profits. As competition lowers the profit in one area, people have to constantly seek better ways to do things or invent new products in order to garner a higher profit. This main idea is one of the central tenets of the theory.

According to Islam (2004), "education can make direct contributions to poverty alleviation through a positive impact on prospects of employment and better type/status of employment". Further, Rahman (2006) explores the linkages between 'Education' and 'Poverty' and the possibility of poverty reduction through better employment opportunities. The empirical evidence suggests high differentials between the poor and non-poor groups, the variations increasing as education levels rise from primary to secondary to SSC completion. An analysis of the state of unemployment and the extent of underemployment among the educated youth from various poverty groups has been carried out. The findings indicate that the level of education is positively associated with the percentage of labour force in salaried employment. Hence, it is important to take initiatives towards job creation and skill development of those who have education below SSC level.

Paul.et.al (2008) attempts to analyse the distribution of education level for age group of 15-34 years and identifies five categories of districts in India. One extreme showing asymmetric distribution reflected by low educational attainment while the other extreme has symmetric distributions with high level of educational attainments. Education seems to be an important quality to participate in the labour market irrespective of the sector of work (organised/unorganised) and of gender. Moav and Neeman (2008) find that human capital and poverty are inversely related. Human capital can be developed through savings and then making investment in health and education sectors. Whereas, less educated people are less concerned about their status so they consume more than their savings and hence they remain in the poverty trap. Hakim et al. (2010) examined the causal relationship of social capital and poverty in Malaysia. The estimated results of Logit model showed that social capital played a significant role in the poverty reduction. Along with social capital, human capital, physical capital, age and gender of the head of household, size of household also play significant role in poverty alleviation. With the development of economic institution and human capital, poverty could be diminished.

1.1.2 Gender wise analysis of Education levels and Poverty

Siddique (1998) explored the gender issues in poverty alleviation in Bangladesh. The study concludes that "alleviation of poverty is not possible without empowering

women. Reduction in women poverty is possible by educating them. There has been a considerable increase in gender inequality in education in low income countries over the last three decades" as observed by World Bank (2001). Gender inequality is now considered as an essential concept for the analysis and alleviation of poverty because of its adverse impacts on a number of valuable development goals. Stromquist (2001) explains that policies adopted by Latin American government were gender blind and the problem of gender access to school and attainment of education was still present. Further, according to Knowles et al. (2002), in developing countries, female education reduces fertility, infant mortality and increases children's education. Okojie (2002) has examined the linkages between gender of household, education and poverty of household in Nigeria and used the data of National Consumer Expenditure Survey (NCES) of 1980, 1985, 1992 and 1996. Results of multivariate analysis showed that poverty in female-headed households was greater than male-headed households, and with high level of education, the probability of households being poor was decreased.

Chaudhary (2007) investigated the impact of gender inequality in education on economic growth in Pakistan. The secondary source of time series data drawn from various issues has been used. In his regression analysis the variables, overall literacy rate, enrolment ratio, ratio of literate female to male have positive and significant impact on economic growth. It was found that gender inequality in initial education reduces economic growth. The results in this study are consistent with those of Klasen (2002). Klasen and Lamanna (2008) explored the impact of gender inequality in education and employment on economic growth. They concluded that gender inequality in education and employment reduced economic growth. On the other hand, Ghulam (2007) explains the causes of the gender inequality of education and analyze how the gender inequality in education impacts the economic growth and development, investment and population growth etc. The findings suggest that the gender inequality in education is as an endogenous variable and show that it can be explained to a considerable extent by "religious preference, regional factors, and civil freedom. For some of these variables, the direction of the effect depends on the particular measure of inequality. The fact that these variables systematically explain gender differentials in education and health suggests that low investment in women's human capital is not simply an efficient

economic choice for developing countries". Authors point out that the available evidence disproves the view that low investment in girls is economically efficient.

1.1.3. Role of Education in promoting Growth

Adam Smith made the first contribution towards the discussion of the relationship between education and economic growth which was, followed by Marshall (1890) who emphasised that "the most valuable of all capital is that invested in human beings". Later, Schultz's (1961) highlighted the "human investment revolution in economic thought". Bowman (1966); Schultz (1961); Becker (1964); Mincer (1972) and many others have placed education as a critical factor in the theories of economic growth.

Mankiw et al. (1992) and Barro (1991) investigated the link between education and economic growth. They examined variations in school enrolment rates, using a single cross-section of both the industrialised and the less-developed countries. Both studies concluded that schooling has a significantly positive impact on the rate of growth of real GDP. The first paper to highlight the weak correlation between growth and increases in educational attainment was Benhabib and Spiegel (1994). Barro and Sala-i-Martin (1995) also investigated the impact of educational expenditures by governments. Their findings showed a strong positive impact.

According to Summers (1994) in those parts of the world where developed human capital is scarce, there is a relatively high return to growth from investment in education, as compared with more developed countries which possess a more abundant human capital as a consequence of a longer education tradition and higher levels of participation. In a study by World Bank (1990), cross-country data comparing long-run (1960–85) growth rates in GDP per worker with estimates of the accumulation of physical capital and of years of schooling of workers have been studied in relation to 63 low- and middle-income countries. This research has indicated a loose link between growth and the number of years of workers' schooling. While there are differences between regions, it was found that education can contribute strongly to aggregate output as measured in GDP. One summary of this research found that education is positively correlated with overall economic growth, with one year of additional schooling of the labour force possibly leading to as much

as a 9 percent increase in GDP for the first three years of schooling and to 4 percent a year for the next three years. However, Pritchett (2001) has argued that poor policies and institutions have hampered growth in many of the least developed economies, directing skilled labour into relatively unproductive activities, hence disrupting the statistical relationship between education and growth in samples that include less-developed economies.

Further, a large number of the studies including Klasen (1999), Dollar and Datti (1999) and King and Mason (2001) confirm that the gender inequality impedes the economic growth. Gender inequality in education has a direct impact on economic growth through lowering the average quality of human capital.

Bils and Klenow (2000) found that greater schooling enrolment in 1960 consistent with one more year of attainment is associated with a faster annual growth over 1960-90. According to them, this conclusion is robust in allowing a positive external benefit from human capital to technology. Their results are consistent with Barro (1995) in which transitional differences in human capital growth rates explain temporary differences in country growth rates. Krueger and Lindahl (2001) show that increases in the stock of schooling do improve short-run economic growth.
Further, Petrakis and Stamatakis (2001) through the empirical findings of the cross-country data sets suggest that the link between growth and education varies as a result of different levels of economic development. They also suggest that the "role of primary and secondary education seems to be more important in LDC nations, while growth in OECD economies depends mainly on higher education". Further, Self and Grabowski (2004) examine the impact of different levels of education on income growth in India for the time period 1966–1996 using time series techniques to determine whether education, for each category, has a causal impact on growth. The results indicate that "primary education has a strong causal impact on growth, with more limited evidence of such an impact for secondary education. Finally, it is found that female education at all levels has potential for generating economic growth. Males, on the other hand, appear to have a causal impact on growth only at primary level and perhaps, weakly, at the secondary level".

Further, Pereira and Aubyn (2004) decompose annual average years of schooling series for Portugal into different schooling levels series. By estimating a number of vector autoregressions, the study shows how measures of aggregate and disaggregate economic growth impacts of different education levels. Increasing education at all levels except tertiary have a significant effect on growth. In yet another study by Mathur and Mamgain (2004) the regression results reveal a strong positive impact of primary, secondary and technically qualified human capital on per capital income. Also, there is a strong negative impact on poverty especially of secondary and higher education. Thirdly, education specific work participation increase with level of education but unemployment also tend to rise for higher levels indicating a decline in utilisation of human capital of higher order. Finally, disparities in human capital endowments are assessed statewise and it is observed that it rises progressively till secondary schooling but lower among general graduates and higher for technical courses.

Another fact is that different schooling levels may have different effects on growth has been addressed in few studies. Papageorgiou (2003) finds that primary education is more important in final goods production, whereas post-primary education is essentially related to technology adoption and innovation. Further, Vandenbussche et al. (2004) present an endogenous growth model where the growth effect of skilled labour is stronger when a country gets closer to the technological frontier. In a sample of 19 developed countries between 1960 and 2000, they find that it is skilled human capital, and not total human capital, that matter for growth.

According to Bergheim (2005), "education which is probably the most important determinant of human capital affects the output through various channels. It increases knowledge which helps to produce more output in relatively smaller time and also it is much likely that an educated person could learn much faster. Increase in the level of education also leads towards better health due to an increase in the awareness of the benefits of healthy living, which in turn increases the output. Moreover, education also enhances the labour force participation in an economy particularly in the case of female participation and output increases further, due to the higher labour force participation rate. Along with education, the role of experience is also very important

in productivity growth. Experience generally reduces the chances of errors and increases the output in a given time period".

Babatunde and Adefabi (2005) argued that education is triggering economic growth through many factors like enhancing the employment opportunities, improving health facilities, reducing fertility and poverty level, improving technological development and source of political stability.

Yet another study by Pradhan (2011) investigate the causality between government expenditure on education and economic growth in India during 1951 to 2001. The empirical analysis has been carried out by Error Correction Modelling and cointegration test. The findings confirmed that there is uni-directional causality between education and economic growth in the Indian economy. And the direction of causality is from economic growth to education but there is absence of reverse causality. The ECM further confirmed that there is a short run dynamics between education and economic growth in India and that has been corrected to bring them into a steady equilibrium position in the long run. Recently, Afzal et.al (2012) confirms bi-directional causality between education and economic growth, between economic growth and poverty and between poverty and education.

1.1.4. Role of women's education in labour market

Klasen (2002) explored that lower female education had a negative impact on economic growth as it lowered the average level of human capital. Further, Dubey et al. (2004) have examined the changes in women work participation rates and role of education in labour force participation. They used a probit model to estimate the likelihood of women being in labour force which is the dependent variable and explanatory variables include education level, marital status, caste, main source of income. The results of the regression support the U-shaped hypothesis of women work participation in developing countries that as economic and educational status of women improves the LFPR declines.

In yet another study by Sebastian (2008) analyses the impact of high enrolment of women in higher education on the gender gap in labour market outcomes of graduates

in terms of work participation and unemployment. The author analyses the role of job preference, gender segregation of occupation and labour force turnover in determining the unemployment level. It was observed that a rise in higher education has led increase in unemployment along with a rise in participation majorly due to inter–labour force mobility. It is observed that women have high preference for teaching and clerical jobs, on the other hand men are employed in various occupations, this skewed job preference have strengthened the gender segregation of labour market.

Further, Rajaram (2009) uses poverty measures that reflect on people's permanent income such as housing condition, wealth index and standard of living index, and argue that these measures could be more informative about the chronic living condition of people than the official measure based on consumption expenditure. Employing probit and logit estimations, the results from the analysis provide evidence that the relationship between female-headed households and poverty depends on the choice of poverty measure. Specifically, poverty measures based on the housing condition and the wealth indices show that female-headed households are less poor than male-headed households. However, based on the standard of living index measure of poverty, female-headed households are marginally poorer than their male-headed counterparts.

Lately, Christopher (2010) says "Education for women is the best way to improve the health, nutrition and economic status of a household that constitute a micro unit of a nation economy. It was observed that rural poverty acts as a push factors for women's education rather than as an obstacle to women's education". The significant influence of urbanization on women's education implied that urbanization had been playing a beneficial role in the attainment of women's education in India. At the same time, the drop-out rate had a negative effect on women's education. It revealed that reduction of girl's drop-out rates is necessary for achieving women's education. The initiatives of the government through investment and infrastructure in developing education in India were examined. With regard to facilities in schools, it had improved significantly, but a lot more need to be done.

Klasen and Pieters (2012) show that recent trends in employment and earnings suggest that at lower levels of education, necessity rather than economic opportunities are the reasons for increased labour force participation. Unit level estimation results confirm that participation of poorly educated women is mainly determined by "economic push factors" and "social status effects". Only at the highest education levels there is evidence of pull factors drawing women into the labour force at attractive employment and pay conditions. This affects only a small minority of India's women. So despite India's economic boom, it appears that for all except the very well educated, labour market conditions for women have not improved. The analysis indicates that the economic performance of the Indian economy is creating attractive labour market opportunities only for highly educated women. On the other hand, the urban labour market for women (and men) with low education does not seem to be improving at all with the economic growth. It always remains debatable whether increased participation in low-paying and informal jobs should be seen as improvements compared to non-participation.

Bhalotra and Aponte (2010) argue, however, that "distress-driven participation in a highly flexible labour market is unlikely to contribute to women's empowerment. Since for Indian women with little education, push factors and household social status are major determinants of participation and that their participation can hardly be considered a sign of emancipation". The authors observe that "female labour force participation rates in developing countries like Asia, move counter-cyclically, i.e., women move from non-employment into paid and self-employment during recessions and that counter-cyclicality is strongest in households with limited alternative sources of insurance against income shocks which in turn proves as an evidence to the insurance mechanism theory".

1.1.5. Female Labour Participation

The basic static labour supply model is a starting point for many models of female labour force participation as observed by Blundell and MaCurdy (1999) where "an increase in the wage rate reduces demand for leisure as its opportunity cost rises, and labour supply will increase. If leisure is a normal good, an increase in a person's or their household members' income will increase the demand for leisure and thus reduce labour supply. These are the well-known substitution and income effects".

The best-known hypothesis in this literature is the feminization U-curve as stated by Goldin (1994); Mammen and Paxson (2000), which suggests that "female labour force participation first declines and then increases as an economy develops. The U-curve is the outcome of a combination of structural change in the economy, income effect, and social stigma against factory work by women. In initial stages of development, education levels rise and employment shifts from agriculture to manufacturing. However, in these initial stages, education increases much more for men than for women".

According to Sunda (1981) the factors influencing the male and female participation rates are not identical and non-economic factors are more important for females than they are for males. Empirical studies also show the female participation rate to be in many cases a dependent variable of the male participation rate. Apart from the wage rate, the factors influencing the female participation rate can be identified as the "family cycle, structural changes in economy, cultural biases and male employment and wage rates".

According to Esteve-Volart (2004); Klasen and Lamanna (2009), effect female participation can have positive impact economic growth, hence, drawing women into the labour force can be a significant source of future growth of the Indian economy and hence higher female participation would be an important component of the so-called demographic dividend. This view is related to the view of "women's labour supply as an insurance mechanism for households" according to Attanasio et al. (2005). However, it has been observed that benefits of India's demographic dividend may be limited, as high economic growth apparently does not translate into higher participation for most of the urban female population.

Participation is further reduced because of social stigma against women working outside of the home, including in manufacturing; these effects are held to be particularly strong for married women. Later on, women's education rises as well, while demand for white-collar workers increases with the expansion of the services sector. Higher wages and socially acceptable types of work, and an erosion of a social stigma against female employment, lead to higher female labour force participation. Though the feminization U is sometimes considered a stylized fact, the empirical

evidence in support of it is mostly based on cross-country analysis, while panel analyses have produced mixed results according to the studies of Çagatay and Özler (1995); Tam (2010); Gaddis and Klasen (2011).

The existence of a U-shape relationship between economic or educational status and women's labour force participation at a given point in time within a country has to be analysed. Among the poorly educated, women are forced to work to survive and can combine farm work with domestic duties, and among the very highly educated, high wages induce women to work and stigmas working against female employment may be less. Between these two groups, women may face barriers to labour force participation related to both the absence of an urgent need of female employment (the income effect), and the presence of social stigmas associated with female employment.

The feminization U hypothesis (at the country or international level) reflects several underlying forces at work which can be summarized in terms of the following hypotheses about determinants of women's labour force participation. The woman's expected market wage positively affects participation. Unearned income, including income from non-labour sources and other household members, has a negative effect on participation; Income and employment insecurity of other household members may induce higher participation. Social stigma, possibly related to (own or husband's) education and the type of work (at home or outside, manual or non-manual work), negatively affect female employment; Large family size and a high household workload have negative effects.

Srivastava and Srivastava (2009) show that for male workers, higher levels of education are associated with higher Workforce Participation Rate (WPR), both in rural and urban areas. But for women, WPR is higher for illiterate women than for women with higher levels of school education – a trend which reverses itself only for women with technical/vocational education or graduates, both in rural and urban areas. Multiple factors such as the "compulsion for men to earn, the greater availability of jobs for men, and the restrictive social norms operating for women, appear to explain this pattern. Workforce participation shows a consistently declining trend with rising economic status for rural women, clearly reflecting on the

economic distress that compels poor women to work. In contrast, for urban women, work participation shows a skewed v-shape, declining as economic status improves, but rises again with the highest consumption decile".

Goldin (1995); Mammen and Paxson (2000) hypothesize that the "U-shape results from a situation in which, at low levels of economic development, women are engaged in large numbers in agriculture and non-farm household enterprise activities. As a country develops, increases in employment opportunities for men as well as increases in earnings lead to a decline in female labour force participation. As the country further develops, the nature of jobs available to women may change; increasing women's education may also make them competitive for white-collar jobs for which they previously did not possess the required educational qualification. Rising incomes also lead to late marriage, childbearing and lower fertility. These factors all bring women back into the labour force. These different impacts of income growth and rising women's wages lead to a U-shaped pattern of female labour force participation across countries".

According to Morrison et al. (2007) numerous empirical studies find that "women's probability of working for pay increases with age (up to the mid 40s, at least in Latin America), urban residence, and increased schooling; it declines with family responsibilities (proxied by the number of children living at home) and family income and wealth" as found in the study of Duryea et al. (2004). These studies point to the importance of fertility and women's reproductive role (and lack of child care) as a factor limiting work for pay. It has also been observed that in countries and regions where women still have lower educational attainment than men, women's labour force participation will be lower than it otherwise would have been.

Another important barrier to women working for pay in many low-income countries is the time burden imposed by domestic tasks, especially the collection of water and firewood. According to UNIFEM (2005), when women are employed, it is frequently claimed that, relative to men, they are more likely to be: i) self-employed rather than work for wages; ii) working in the informal rather than the formal sector; and iii) working as own-account workers, domestic workers and contributing family workers, while men are more likely to work as employers and wage and salaried workers.

There have been a number of theoretical and empirical studies that find that gender inequality in education and employment reduce economic growth. The main arguments of Klasen (1999, 2002) are briefly summarized. Firstly, "gender inequality reduces the average amount of human capital in a society and thus harms economic performance". A second argument relates to externalities of female education. Promoting female education is known to reduce fertility levels, reduce child mortality levels, and promote the education of the next generation. Each factor in turn has a positive impact on economic growth. Thus, gender gaps in education reduce the benefits to society of high female education as also shown in studies of Lagerlöf (1999); Galor and Weil (1996); World Bank (2001). Further, Klasen and Wink (2002); World Bank (2001); Sen (1990) demonstrate that female employment and earnings increase their bargaining power in the home. This not only benefits the women concerned, but their greater bargaining power has been shown to have lead to greater investments in the health and education of their children, thus promoting human capital of the next generation and therefore economic growth, also shown in studies of Thomas (1997); World Bank (2001).

1.3 Objectives

1). To analyse trends of labour force participation rates, unemployment rates and poverty ratios, employment growth and occupational preferences (segregated by gender) over time.

2). To assess the specific pattern of male and female labour-force participation and the reasons for the same.

3). To determine factors affecting probability of labour force participation (segregated by gender) and probability of a household being poor (segregated by region: rural/urban).

4). To assess the causal relationship of levels of education and economic growth and also the causal relationship of education expenditure and economic growth.

5). To examine the virtuous circle of economic growth, employment and poverty reduction.

6). To assess the disparities of education levels at All-India level and across states by gender and track the statewise growth rates of the population according to their education level.

7). To analyse the declining trend of female labour force and reasons for the same.

1.4 Research questions

1) Do the participation rates of labour force (segregated by gender) follow a specific pattern with increase in education status?

Hypothesis: Female labour force participation takes a U-shape with respect to rise in levels of education.

2) Is there any relation between different levels of education (segregated by gender) and economic growth?

Hypothesis: Different levels of education (segregated by gender) contribute to economic growth.

3) What are the posssible factors determining probability of a household being in poverty?

1.5 Methodology

1.5.1 Determinants of probability of Participation in Labour Force

A logistic regression is run separately for each gender where the dependent variable is probability of participating in labour force, explanatory variables are Household type(main source of income of the household) to which the person belongs to, region(rural/urban), levels of education, marital status, age, square of age(to check for the long run effects), Whether the person is poor or not(base on state specific poverty lines), dependency ratio of the household to which the person belongs to, social group of the person, household size, Child-woman ratio of household and Number of infants in the household(factors influencing female labour force participation in specific) to which the person belongs to, whether the person hails from a household with a literate household head. For each model, two separate

regressions are run to analyse the effect of each of the variable when states are included and without inclusion of states.

1.5.2 Determinants of probability of a household being poor

A logistic regression is run separately for both region(urban and rural) on cross section data of All India in 66th, round, NSSO (Employment Unemployment Survey) where the dependent variable is a dichotomous variable showing probability of a household being poor or not. Explanatory variables include age of the household head, square of age of the household head(to see the long run impact), maximum level of education in the household, Whether the household is headed by females, whether the household head is literate or not, social group of the household, dependency ratio of the household, household size and household type.

What is a logistic regression?

"In case of a dichotomous dependent variable, the effect of explanatory factors on the probability of occurrence of an event (Prob. Y = 1) is modeled as

$P(Y=1 \mid X_1, X_2, X_3,\ldots) = f(X_1, X_2, X_3,\ldots)$, where Y is the dependent variable and X is the independent variable.

In case of logistic (or logit) regression, the link function is logit, i.e. $\ln\left[\frac{p}{1-p}\right]$

Thus, $\ln\left[\frac{p}{1-p}\right] = \beta_0 + \beta_1.x_1 + \beta_2.x_2 + \beta_3.x_3 + \ldots$, i.e., the function of p is a linear function of the explanatory variables. This implies that, for given values of explanatory variables $x_1, x_2, x_3,\ldots$

$$p = \frac{\exp(\beta_0 + \beta_1.x_1 + \beta_2.x_2 + \beta_3.x_3 + \ldots)}{[1 + \exp(\beta_0 + \beta_1.x_1 + \beta_2.x_2 + \beta_3.x_3 + \ldots)]}$$

Note that the value of p thus obtained would always be between 0 and 1 as probability should be, but $\ln\left[\frac{p}{1-p}\right]$ varies between - ∞ and + ∞ in instances where the independent variables are categorical, or a mix of continuous and categorical".

Logit is based on a cumulative standard logistic distribution (F). Logit regression is used for qualitative response models when the dependent variable is binary (also

called dummy) which takes values 0 or 1. Logit models estimate the probability of the dependent variable to be 1 (Y=1). This is the probability that some event happens. Binary logistic regression does not assume a linear relationship between the dependent and independent variables. The dependent variable must be dichotomous (2 categories). The independent variables need not be interval, nor normally distributed, nor linearly related, nor of equal variance within each group. The categories (groups) must be mutually exclusive and exhaustive. Larger samples are needed than for linear regression because maximum likelihood coefficients are large sample estimates. A minimum of 50 cases per predictor is recommended. Burns and Burns (2008) explain that the "Logits (log odds) are the b-coefficients (the slope values) of the regression equation. The slope can be interpreted as the change in the average value of Y, from one unit of change in X. Logistic regression calculates changes in the log odds of the dependent, not changes in the dependent value as OLS regression does".

For a dichotomous variable the odds of an event are equal to the probability of success that event happens to the probability of failure of the event happening. The odds ratio presents the extent to which raising the corresponding independent variable by one unit influences the log of odds[6] of the outcome, keeping all other variables constant. If the value exceeds 1 then the odds of an outcome occurring increase; if the value is less than 1, any increase in the predictor leads to a drop in the odds of the outcome occurring.

In the current study, Marginal effects have been used to analyse the effect of explanatory variables on dependent variables rather than analysing the odds ratio. A ME [marginal effect], or partial effect, most often measures the effect on the conditional mean of y of a change in one of the regressors, say Xk. Marginal Effects at the Means (MEMs) are computed by setting the values of X variables at their means, and then seeing how a change in one of the Xk variables changes P(Y = 1). With Average Marginal Effects (AMEs) a marginal effect is computed for each case, and the effects are then averaged. Many prefer AMEs because they think they provide

[6] Odds are probability of success of a variable to its failure.

a better representation of how changes in Xk affect P(Y = 1). In the current study Average Marginal effects have been used.

1.5.3 The Causal Relationship of Education and Economic Growth

Two hypotheses have been formulated under this objective and only uni-directional long-run causality has been tested for. However, in the short run, bi-directional causality, if any, has been tested for.

A) **Different levels of education (segregated by gender) causes economic growth**

First difference of log of Per capita GDP (growth rate of real per capita GDP) which denotes economic growth is used as the dependent variable and different education levels (segregated by gender) (proxied by log of GER) as the explanatory variables in a time series for the period 1960-2010.

B) **Education expenditure (as a percentage of total public expenditure) causes economic growth.** First difference of log of Per capita GDP (i.e., growth rate of real per capita GDP) which denotes economic growth is used as the dependent variable and log of Education expenditure (as a percentage of total public expenditure) is taken as the explanatory variable in a time series for period 1960-2010.

The unit root test is meant to check the stationarity of the variables so, Augmented Dickey Fuller (ADF) test proposed by Dickey and Fuller (1979, 1981); Dickey et al. (2006, 1986); Enders (1995) is applied to investigate the same. Granger causality test has been used to check for short run causation among variables. Johansen Cointegration[7] test has been used to check the long run relationship among the variables. Thereafter, Vector Error Correction Model (VECM) is run for the cointegrated series. All of these techniques have been discussed below:

Order of integration

"A series y_t is said to be integrated of order d (denoted by $y_t \sim I(d)$) if y_t is non-stationary but $\Delta^d y_t$ is stationary; where Δy_t (first difference of y_t) = $y_t - y_{t-1}$ and Δ^2

[7] If there are more than two variables in the model, there is a possibility of having more than one cointegrating vector, hence forming several equilibrium relationships. Thus, if there are n variables, in general, there can be only upto n-1 cointegrating vector, Thus Johansen approach is used for multiple equations as an alternative to Engle Granger approach which can be used only for two variable model.

y_t (second difference) = $\Delta y_t - \Delta y_{t-1}$ and so on. Hence, the order of integration of a series is number of times a (non-stationary[8]) series need to be differenced inorder to become stationary[9] which also implies number of unit roots" as stated in Asteriou and Hall (2011).

Unit root test

To know the order of the series, unit root test is conducted. In the current study, Augmented Dickey Fueller (ADF) test is used. It corrects for the plausible serial correlation (as shown in the equation below), if any, by adding lagged difference terms of the dependent variable extending the Dickey–Fueller model (which assumed errors were white noise process) as error term is unlikely to be a white noise process. Dickey and Fuller (1979, 1981) devised a formal procedure to test for non-stationarity. DF Unit Root Test are based on the following three regression forms:

1. Without Constant and Trend: $\Delta Y_t = \delta Y_{t-1} + \mu_t$
2. With Constant: $\Delta Y_t = \alpha + \delta Y_{t-1} + \mu_t$
3. With Constant and Trend: $\Delta Y_t = \alpha + \beta T + \delta Y_{t-1} + \mu_t$

The hypothesis is:

Ho: $\delta = 0$ then unit root

H1: $\delta \neq 0$

On the other hand, the ADF test can be formulated as follows:

$\Delta Y_t = \alpha + \beta T + \delta Y_{t-1} + \gamma_i \sum \Delta Y_{t-1} - e_t$

Causality Tests

A) Granger Causality (To check short run causality)

The basic definition of causality that is used here is that defined by Granger (1969). Granger defined causality as "testing whether lagged information on a variable X provides any statistically significant information about a variable y in the presence of lagged y". For the lagged variables appearing on the right-hand-side, the number of

[8] A non stationary series has a time varying mean or a time varying variance or both

[9] A stationary series has its mean, variance and autocovariance time invariant.

lags is determined using the Akaike Information Criterion (AIC) and Schwartz Criterion (SC) and the lag that gives the lowest AIC[10] and SC and best fit is chosen. A major part of the analysis depends on the choice of lag length since the results of the causality tests rely heavily on the time lags being imposed.

Granger (1969) developed a relatively simple test that defined causality as follows: a variable y_t is said to granger cause x_t if x_t can be predicted with greater accuracy by using past values of y_t variable rather than not using such past values, all other terms remaining unchanged.

Granger causality test for the case of two stationary variables: y_t and x_t involves estimation of following VAR [11](Vector autoregressive) model.

$$Y_t = a_1 + \sum\beta_i X_{t-i} + \sum\gamma_j y_{t-j} + e_{1t} \quad \text{.....(1)}$$

$$X_t = a_2 + \sum\theta_i X_{t-i} + \sum\delta_j y_{t-j} + e_{2t} \quad \text{.....(2)}$$

In this model there are different cases, firstly, in equation (1) lagged x terms are significant but lagged y terms are insignificant then x_t causes y_t. Secondly, in equation (2) lagged y terms are significant but lagged x terms are insignificant, then y_t causes x_t. Thirdly, Both sets of x and y terms are statistically significant, so there is bi-directional causality. Lastly, both sets of x and y terms are statistically insignificant as stated by Asteriou and Hall (2011).

B) Cointegration Test (To check long run causality)

As stated by Asteriou and Hall (2011) "Time series y_t and x_t are said to be cointegrated[12] of order (d, b) where $d \geq b \geq 0$, if firstly both are integrated of order d,

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[10] With some lags, the AIC and/or the SC may show lower values but the equations may still suffer from serial correlation. Thus, the lags are chosen such as to minimize AIC and SC as well as eliminate serial correlation. Here, we utilize the Q statistics test and LM test to check for serial correlation.

[11] According to Sims (1980), if there is simultaneity among a number of variables, then there should be no distinction between endogenous and exogeneous variables and all are endogenous, i.e., few independent variables are not only independent but also dependent variables to variables that were dependent variables in some other equations. Thus each equation has same set of regressors which led to development of VAR model.

[12] The concept of cointegration was first introduced by Granger (1981) and elaborated further by Phillips (1986, 1987), Engle and Granger (1987), Engle and Yoo (1987), Johansen (1988, 1991, 1995a), stock and Watson (1988).

and secondly, there exists a linear combination of these variables: $u_t = y_t - a_1 - a_2x_t$, which is integrated of order (d-b)". This definition implies, according to Dolado et al. (1999), that cointegration refers to linear combination of nonstationary variables and all variables must be integrated of the same order to be candidates to form a cointegrating relationship. Cointegration is necessary because trended series can create major problems because of spurious regressions which can't be resolved plainly through differencing. To test the co-integration among the variables, the Johansen co-integration test has been used in the current study.

The Johansen Cointegration Test

For n number of variables, only upto n-1 cointegrating vectors can be formed. Thus, for variables n>2, using Engle- Granger- single equation approach is not advisable. From Johansen Approach, estimates for all cointegrating vectors can be obtained.

Asteriou and Hall (2011) explain the cointegration concept as follows: "let x_t, y_t, w_t, all endogeneous variables, and let z_t represent the matrix of these three variables [x_t, y_t,w_t] i.e.,

$Z_t = A_1Z_{t-1} + A_2Z_{t-2} + ...A_kZ_{t-k} + \mu_t$.

This can be reformulated in a VECM:

$\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \ldots\ldots\ldots\ldots\ldots + \Gamma_{k-1} \Delta Z_{t-k-1} + \Pi Z_{t-1} + \mu_t$..... (1)

Where, $\Gamma_i = (I-A_1-A_2...-A_k)$ (i=1, 2.....k-1) and $\pi = -(I-A1-A2.....-Ak)$. Π is a 3*3 matrix because of the assumption of three variables. It contains information on long run relationships. Π can be decompose into $\alpha\beta'$ where α denotes speed of adjustment to equilibrium coefficients while β' will be long run matrix of coefficients. Thus, $\beta' Z_{t-1}$ is equivalent to the error correction term ($u_{t-1} = y_{t-1} - a_1 - a_2 x_{t-1}$) in the single equation case, except that now $\beta' Z_{t-1}$ contains upto (n-1) vectors in a multivariate framework and α denotes the coefficient of the error correction term".

Thus, (1) can also be deduced as:

$\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \ldots\ldots\ldots\ldots\ldots + \Gamma_{k-1} \Delta Z_{t-k-1} + \alpha (\beta' Z_{t-1}) + \mu_t$..... (2)

Further, Given that "Z_t is a vector of non-stationary I(1) variables, then Z_{t-1} are I(0) and ΠZ_{t-1} must also be integrated of order I(0) to obtain a well behaved system.

There are 3 cases for ΠZ_{t-1} to be I(0):

1)When all variables are stationary, in this case simple VAR in levels can to be used as there is no problem of spurious regression, this is case when Π has full rank, (r=n lineary independent relationships)

2) when there is no cointegration, Π matrix is a n*n matrix of zeroes because of no linear relationships among variables in Z_t, in this case, rank of Π matrix is zero and hence no cointegrating relationships.

3)[13]When Π has a reduced rank, (i.e., r</=(n-1) linearly independent columns, thus there are r </= (n-1) cointegrating relationships.

The cointegrating rank of the system is basically the number of cointegrating relationships. According to the Johansen (1988) and Johansen and Juselius (1990), there are two methods for determining the number of cointegrating relations and both involve estimation of matrix Π".

One method is to test the hypothesis that rank[14] = r against the hypothesis that rank is r+1, with null suggesting upto r cointegrating relation and and alternative suggesting r+1 vectors, Test statistics is based on characteristic root (Eigen values).Test consists of ordering Eigen vales in descending order and considering whether they are different from zero. Hence, if rank is zero, all Eigen values are zero, therefore (1- λi) will be1 and since ln (1) = 0, each of expression=0 and if rank of Π is 1, then $0 < \lambda 1 < 1$, so that first expression (1- λi) <0. While all rest will be 0.

Second method is based on Likelihood Ratio test. The trace statistic considers whether trace is increased by adding more Eigen values beyond the r^{th}. Null hypothesis is that number of cointegrating vectors are than or equal to r .When all λi are 0 then trace statistic is also 0. On the other hand, closer the eigen values to unity, more negative is ln (1- λi) term and therefore the larger the trace statistic.

The usual procedure is first, the null hypothesis of r = 0 is tested against $r \geq 1$ to determine if there is at least one cointegrating relationship. If we fail to reject r = 0, then we conclude that there are no cointegrating relationships. In this case, we do not need a VEC model and can simply use a VAR in the differences of the series. If r = 0 is rejected at the initial stage then at least some of the series are cointegrated and thus we proceed to determine the number of cointegrating relationships. Then the second step is to test the null hypothesis that $r \leq 1$ against the alternative $r \geq 2$. If the hypothesis of no more than one cointegrating relation is accepted, then a VEC system

[13] In the current study Case #3 is witnessed.

[14] Number of linearly independent rows or columns in a matrix.

can be estimated with one cointegrating relationship. If the hypothesis that $r \leq 1$ is rejected, then further the hypothesis of $r \leq 2$ is tested against $r \geq 3$, and so on. Thus r is chosen such that it is the smallest value at which we fail to reject the null hypothesis so that there are no additional cointegrating relationships, i.e., is to stop at the value of r associated with a test statistic that exceeds the critical value. These critical values are provided by Johansen and Juselius (1990). If a dynamic system of n variables has r cointegrating relationships, then the rank of the matrix is (n – r). This means that the matrix has r eigenvalues that are zero and (n – r) that are not. The Johansen tests are based on determining the number of nonzero eigenvalues".

C) Vector Error Correction Model (VECM)

Gujarati (2003) explains that "once it is established that the variables are cointegrated, the error term is treated as disequilibrium error term, as in short run there may be disequilibrium, and this error term can be used to tie the short-run behaviour of y_t to its long-run value. The ECM was first used by Sargan (1984) and later popularised by Engle and Granger corrects for disequilibrium. The Granger representation theorem, states that if two variables x and y are stationary then relationship between two can be expressed as an ECM as shown in equation (3). Following Granger and Lin (1995), the conventional granger causality test is not valid, because two integrated series cannot cause each other in long run unless they are co integrated. Thus, long-run causality is tested for variables that have been found to be cointegrated.

However, when variables have unit roots, it is useful to reparametrize the model in the equivalent ECM (Error Correction Model) form as explained by Hendry et al. (1984); Johansen (1988) for single equation case :

$$\Delta Y_t = a_1 + a_2 \Delta x_t + a_3 u_{t-1} + \varepsilon_t \quad \text{.....(3)}$$

where, Δ represents first difference of the respective time series, a_1 represents the constant term, X_t represents the GER for females at each level, Y_t represents the per capita GDP. u_{t-1} is the error term with one period lag [$u_{t-1} = y_{t-1} - a_1 - a_2 x_{t-1}$, error term from cointegrating regression] whereas, ε_t is the random error term of the model.

The ECM equation (3) states that y_t depend on x_t and also on u_{t-1}. Let Δxt be zero and u_{t-1} be positive, implying y_t is above equilibrium value of $(a_1 + a_2 x_{t-1})$. Since a_3 is expected to be negative, the term $a_3 u_{t-1}$ is negative and thus Δyt will be negative to

restore equilibrium, i.e., if y_t is above its equilibrium, it will start falling in the next period to correct the equilibrium, hence the name ECM rightly emerges. The absolute value of a_3 decides how quickly the equilibrium is restored. On the other hand, if u_{t-1} is negative (i.e., y_t is below its equilibrium value) and since a_3 is negative term a_3u_{t-1} is positive and Δy_t will be positive, i.e., y_t will start rising in the next period to restore equilibrium. Here, a_2 is the impact multiplier (the short-run effect) that measures the immediate impact a change in x_t would have in y_t on the other hand, a_3 is the feedback effect or the adjustment effect. Hence, the error term decides the speed of adjustment". When the coefficient of the error term is significant and negative, then there is existence of long–run causality. For multiple equation case, the VECM (equation1) is formulated as already described under the Johansen Test procedure.

1.5.4 Effect of sectoral growth on Poverty Reduction

A multivariate regression (Ordinary least square) is run on poverty(dependent variable) with independent variables (which were decomposed using Shapely Decomposition): output per worker in each sector, share of employed in working age population in each sector, share of working population in total population. All variables were taken as percentage changes.

1.6 Data sources

1) Consumption expenditure survey, NSSO, 61st and 66th round.
2) Employment-Unemployment survey, NSSO, 50th, 55th, 61st, 66th rounds.
3) RBI, Handbook of Statistics on Indian Economy, Macro Economic aggregates (Constant prices) for time series data on GDP (Gross Domestic Product).
4) Ministry of Human Resource Development.

(i) Selected Education Statistics At a Glance, Various issues.
(ii) Statistics of School Education: Various issues.
(iii) Analyses of Budgeted Expenditure on Education, Various issues.

5) Press note on Poverty estimates, Planning Commission, GOI, 2012.
6) State Domestic Product Series for 2004-05 and 2009-10, NAS, CSO.

1.7 Organisation of study

The broad division of the successive chapters are as follows. The 2nd chapter deals with critical analysis of labour force participation in India, analysing the trends related to labour force participation, workforce participation, Unemployment rates, etc. The 3rd chapter analyses the causal impact of different levels of education on education growth, if any. It also analyses the causal impact of education expenditure (as a percentage of total public expenditure) on economic growth. The 4th chapter, analyses the determinants affecting probability of a household of being in poverty and final chapter analyses the interlinkages of economic growth, employment and poverty reduction, followed by conclusion.

Chapter 2

Determinants of Labour Force Participation in India

2.1 Labour force participation in India: An Introduction

The labour market is central in poverty reduction and the so called pro-poor growth; because labour is the major asset the poor possess as stated by the World Bank (1990). The importance of labour markets for poverty reduction has long been recognised in the development theories, which were based on the assumption that industrialization would absorb the surplus labour from the traditional sectors and lead therefore to higher wages and positive effects on welfare as observed in the study of Lewis (1954). However, it has become clear that development and employment generation is much less structured than what the early theories predict. For instance, the service sector has expanded much stronger than manufacturing in many developing countries, including India. As a result, the expansion of the industrial sector did not necessarily lead to reduction in poverty in India as noted by Ravallion and Datt (1996). The productivity and the welfare effects of the employment opportunities that are generated in the course of economic expansion are not always clear.

2.1.1 Why is analysing female labour force participation important?

In the context of labour force participation in India, female labour force participation decision seeks special attention considering the various strong social–cultural norms that rule their decision to participate. The female labour force participation and its contribution to economic development has been addressed in many studies like Esteve-Volart (2004); Klasen and Lamanna (2009) hence, drawing women into the labour force can be an important source of future growth of the Indian economy. Beyond economic benefits, women's participation in the labour force

can be seen as a signal of declining discrimination and increasing empowerment of women as observed by Mammen and Paxson (2000). Women are vital and productive agents in Indian economy, even as studies point towards 'statistical purdah' as stated by World Bank (1991) or 'economic invisibility' as stated by Radha Devi (1990) in a society with strong traits of patriarchal norms where although most women work and contribute to the economy in one form or another, much of their work is not documented or accounted for in official statistics. The influence of development on female labour force participation has been a much debated theme in India in the context of development studies, as also observed in the studies of Sinha (1965); Durand (1975); Agarwal (1985); Mathur (1994); Goldin (1994). Hence, in this chapter an attempt has been made to analyse the U-shaped curve, associated with female labour supply. The initial impact of development on female labour force participation is negative but after a certain stage of development, impact on female labour force participation is positive, thus giving rise to the U-shaped phenomena.

The second puzzling phenomenon with respect to female labour force is that there has been a declining trend in female labour force participation rates since 2004 (as evident from 61st round, NSSO data), hence an attempt has been made to analyse these trends and the reasons for the same. Further, according to Desai et al (2010) the so-called demographic dividend is likely to be much smaller than anticipated unless significant efforts can be made to increase women's labour force participation through an increase in employment opportunities and reduction in labour market disadvantages.

However, in this chapter, the main objective is to analyse the various factors affecting the labour force participation decision in India across gender and what patterns do they depict, and the reasons for the same and to analyse the trends of unemployment, workforce and labour force participation rates over the post reform period and assess the employment growth over this period.

2.1.2 Organisation of the study

Section 2 deals with explaining the definition and concepts. Section 3 analyses the trends which are broadly divided into 2 sub-sections.

A) Statewise trends: Labour force participation rates(all age groups) for 14 major states by gender and sector (50^{th} to 66^{th} round, NSSO); Education- specific Female labour force participation for all ages (66^{th} round, NSSO); Age-specific Labour force participation rates (66^{th} round, NSSO) by gender and sector.

B) All India trends: Employment growth (CAGR) by sector, gender and household type (50^{th} to 66^{th} round, NSSO); Reasons for decline in female labour force participation; Analysis of Education-Specific Occupational (NCO-2004) preferences by gender; Labour force participation Rates, Work force Participation Rates and Unemployment Rates for all ages (50^{th} to 66^{th} round, NSSO) by gender and sector; Education specific –Labour Force Participation Rate and Unemployment Rates for age group 15 years and above (50^{th} to 66^{th} round, NSSO) by gender and sector.

Further, Section 4 explains the Factors affecting Labour force Participation through a logistic regression model for male and female separately. Section 5 discusses the factors determining labour force participation in India through a logistic regression, separately for male and female. Section 6 concludes the chapter.

2.2 Definition and Concepts

A production function[15] is basically a technical relation between input and output and economic growth of the country depends upon increase in goods and services. According to Freeman (2008) Labour Productivity is defined as a ratio of a volume measure of output (gross domestic product or gross value added) to a measure of input use (the total number of hours worked or total employment). Labour productivity is a revealing indicator of several economic indicators as it offers a dynamic measure of economic growth, competitiveness, and living standards within an economy. It is the measure of labour productivity which helps explain the principal economic foundations that are necessary for both economic growth and social development and provides a measure of the efficiency with which inputs are used in an economy to produce goods and services. Hence, labour supply and their productivity are important for economic growth. Productive labour force inturn

[15] Y(output) = f (Labour, Capital, Raw materials, Efficiency parameter and Returns to scale)

depend on efficiency which requires skill building, education, health as the foremost factors.

The various variables and related concepts affecting labour force participation can be explained as follows:

2.2.1 Household type

"The household type, based on the means of livelihood of a household, is decided on the basis of the sources of the household's income during the 365 days preceding the date of survey. For this purpose, only the household's income (net income and not gross income) from economic activities is to be considered; but the incomes of servants and paying guests are not to be taken into account. In **rural** areas, a household will belong to any one of the following five household types: Self-Employed in Non-Agriculture, Agricultural labour, Other Labour, Self-Employed in Agriculture, Others. For **urban** areas, the household types are: Self-Employed, Regular wage earning, Casual Labour, Others. For a household to be classified as 'Agricultural Labour' or 'Self-Employed in Agriculture' its income from that source must be 50% or more of its total income. If there is no such source yielding 50% or more of the household's total income, it will be assigned one of the remaining types, according to the following procedure. To be classified as Self-Employed in Non-Agriculture, the household's income from that source must be greater than its income from rural labour (all wage-paid manual labour) as well as that from all other economic activities put together (a three-way division is to be considered here). A household not assigned one of the types, Self Employed in Non-Agriculture, Agriculture Labour or Self Employed in Agriculture, will be classified as Other Labour if its income from rural labour (all wage-paid manual labour) is greater than that from self-employment as well as that from other economic activities (again a three-way division). All other households will be classified under "Others" (OTH).

For urban areas, on the other hand, the different urban types correspond to four sources of household income, unlike the rural sector where five sources are considered. An urban household will be assigned the type "Self-Employed", "Regular wage salaried", "Casual Labour" or "Other" corresponding to the major source of its income from economic activities during the last 365 days. A household which does not have any income from economic activities will be classified under "Others".

Further, Regular salaried employee consists of persons working in others farm or non-farm enterprises (both household and non-household) and getting in return salary or wages on a regular basis (and not on the basis of daily or periodic renewal of work contract) are the regular salaried employees. The category not only includes persons getting time wage but also persons receiving piece wage or salary and paid apprentices, both full time and part-time. A Casual wage labourer, on the other hand, is a person casually engaged in others farm or non-farm enterprises (both household and non-household) and getting in return wage according to the terms of the daily or periodic work contract is a casual wage labour. Usually, in the rural areas, a type of casual labourers can be seen who normally engage themselves in 'public works' activities" as stated in EUS report, NSSO, 66th round.

2.2.2 Economic Activity

"Human activity mainly falls into two categories: economic activity and non-economic activity. Any activity that results in production of goods and services that adds value to national product is considered as an economic activity. The economic activities have two parts - market activities and non-market activities. Market activities are those that involve remuneration to those who perform it, i.e. activity performed for pay or profit. Such activities include production of all goods and services for market including those of government services, etc. Non-market activities are those involving the production of primary commodities for own consumption and own account production of fixed assets" as stated in EUS report, NSSO, 66th round.

The activity status is determined by the activity situation in which a person is found during a reference period or at a point of time under reference, which occurs with the person's participation in economic and non-economic activities. According to this, a person will be in one or a combination of the following three statuses during a reference period (i) working or being engaged in economic activity (work), (ii) being not engaged in economic activity (work) and either making tangible efforts to seek 'work' or being available for 'work', if the 'work' is available, and (iii) being not engaged in any economic activity (work) and also not available for 'work'. Activity status (i) above is associated with 'employment', (ii) with 'unemployment' and (iii) with 'not being in the labour force'. Activity statuses mentioned in (i) and (ii) above

are associated with 'being in labour force'. The above concepts lead us to define the following three concepts:

1) **LFPR** = $\frac{\text{number of persons employed + number of persons unemployed}}{\text{Total population}}$

2) **Worker Population Ratio (WPR)** = $\frac{\text{number of persons employed}}{\text{Total population}}$

3) **Unemployment Rate (UR)** = $\frac{\text{number of persons unemployed}}{\text{Total labour force}}$

2.2.3 Usual Principal Activity

"The particulars of usual activity are collected with reference to a period of 365 days preceding the date of survey. The broad usual principal activity status is obtained on the basis of a two stage dichotomous classification depending on the major time spent. The persons are first classified as those in the labour force and those not in the labour force depending on in which status, out of these two, the person spent major part of the year. In the second stage, those who are found in the labour force will be further classified into working (i.e., engaged in economic activity or employed) and seeking and/or available for work (i.e., unemployed) based on the major time spent. Thus, we can obtain the broad usual principal status as one of the three viz. employed, unemployed and out of labour force" as stated in EUS report, NSSO, 66th round.

2.2.4 Subsidary Status

"A person whose principal usual status is determined on the basis of the major time criterion may have pursued some economic activity for a relatively shorter time (minor time) during the reference period of 365 days preceding the date of survey. The status in which such economic activity is pursued is the subsidiary economic activity status of the person. In case of multiple subsidiary economic activities, the status of the activity in which relatively longer time has been spent will be considered" as stated in EUS report, NSSO, 66th round.

2.2.5 Current weekly status

"The current weekly activity status of a person is the activity status obtaining for a person during a reference period of 7 days preceding the date of survey. It is decided **on the basis of a certain priority cum major time criterion**. According to the priority criterion, the status of 'working' gets priority over the status of 'not working but seeking or available for work', which in turn gets priority over the status of 'neither working nor available for work'. A person is considered working (or employed)) if he/ she, while pursuing any economic activity, had worked for at least one hour on at least one day during the 7 days preceding the date of survey. Having decided the broad current weekly activity status of a person on the basis of 'priority' criterion, the detailed current weekly activity status is again decided **on the basis of 'major time' criterion if a person is pursuing multiple economic activities"** as stated in EUS report, NSSO, 66th round.

2.2.6 Current Daily Status

"Day-to-day accounting of the available labour time (in terms of 'half-day' units) of persons classified under the categories employed and unemployed (labour force) is done according to the current weekly status concept separately for each of the seven days period of reference. (This was referred to as weekly labour time disposition in the 27th round). The activity pattern of the population, particularly in the unorganised sector, is such that during a week, and sometimes, even during a day, a person can pursue more than one activity. Moreover, many people can even undertake both economic and non-economic activities on the same day of a reference week. The current daily activity status for a person is determined on the basis of his/ her activity status on each day of the reference week **using a priority-cum-major time criterion** (day to day labour time disposition)" as stated in EUS report, NSSO, 66th round.

2.3 Trends

2.3.1 Statewise

2.3.1.1 Labour force participation Rates (all ages) highlighting urban-rural and gender differences (50^{th} to 66^{th} round, NSSO)

In the 66^{th} round, it can be observed from the Table 2.1 that among the 14 major states, the total labour force participation according to Current Weekly Status (CWS) was found to be the highest in Andhra Pradesh which also has the highest female participants especially from rural areas and also has the highest rural labour force participation . Highest male labour force participation and highest urban male labour force participation was in West Bengal. Bihar witnessed the lowest labour force participation rates sector wise and genderwise and overall.

States with total labour force participation below the mean of 14 major states were Haryana, Bihar, Orissa, Punjab, Haryana, and Rajasthan. Highest urban female labour force participation was found in Kerala. Karnataka witnessed the highest urban labour force participation and highest rural male labour force participation. Rural labour force participation was higher in all the states than the urban labour force participation, similarly male have much higher labour force participation than their female counterparts. Highest difference between male and female labour force participation rate was found to be in West Bengal and lowest in Andhra Pradesh. Similarly highest difference between urban and rural labour force participation was in Andhra Pradesh and lowest in Uttar Pradesh. Highest variation across states was found to be among males and lowest among rural females.

Table 2.1: Statewise Labour force participation rate, based on Current Weekly Status, sectorwise and genderwise, NSSO, 66th round.

State	total	Urban male	Urban female	rural male	rural female	Rura	urban	female	male
Andhra	46.66	55.13	18.07	59.85	41.13	50.52	37.09	34.61	58.47
Karnataka	45.14	58.74	17.75	62.47	34.57	48.47	39.14	28.74	61.10
Tamil Nadu	45.13	58.16	19.60	61.00	39.68	49.99	39.13	30.91	59.69
Maharashtra	43.51	59.04	16.05	57.29	35.98	46.88	38.87	27.79	58.04
Gujarat	42.05	57.06	14.56	58.54	30.01	44.95	37.53	24.12	57.95
M.P	39.67	51.32	12.59	55.78	26.14	41.72	32.85	22.99	54.75
Punjab	39.28	59.42	13.09	54.56	24.03	39.83	38.23	20.38	56.29
West Bengal	39.03	60.35	14.46	61.76	14.44	39.32	38.16	14.44	61.42
Kerala	39.01	55.46	21.80	56.58	23.82	39.41	37.86	23.29	56.28
Orissa	38.61	58.91	11.47	58.55	19.51	39.05	35.82	18.44	58.60
Haryana	37.73	56.37	12.90	52.42	21.82	38.28	36.44	19.14	53.62
Rajasthan	37.69	51.17	11.74	50.94	27.21	39.39	32.21	23.58	51.00
U.P	31.18	51.23	7.84	49.03	12.49	31.34	30.55	11.53	49.50
Bihar	28.06	45.53	4.82	48.76	5.56	28.24	26.53	5.48	48.42
mean	39.48	41.24	35.74	21.82	56.08	55.56	14.05	56.25	25.46
Std-dev	5.15	6.53	3.80	7.79	4.13	4.27	4.52	4.56	10.39
cov	13.06	15.83	10.63	35.72	7.37	7.69	32.15	8.11	40.84

Source: computed from unit level of EUS, NSSO, 66th round

From Table (A.1), (A.2) and (A.3), the following observations were made:

Comparing the 50th and 61st round on the current weekly basis, it was found that in 50th round, Andhra Pradesh had the highest labour force participation rate and Bihar had the lowest labour force participation whereas in the 61st round, again Bihar had the lowest labour force participation but Karnataka had the highest labour force participation. In Andhra Pradesh, labour force participation declined by approximately 1% and Karnataka`s labour force participation rose by 3%, since the 50th round.

In 50th round, Andhra Pradesh had highest total labour force participation (as mentioned before), highest rural participation, highest rural male participation, highest male and female participation; Tamil Nadu had highest urban male and urban female participation, highest total urban participation. Gujarat had lowest rural male participation and lowest total male participation. Bihar had lowest urban male and female participation, lowest rural female participation and lowest female participation, lowest rural participation and lowest total participation.

In the 55th round, again Andhra Pradesh had the highest total participation, the highest female participation and highest rural participation rates among the 14 major states. Bihar had the lowest total urban participation. U.P had lowest total participation, lowest male participation, lowest rural male participation, lowest rural participation. Tamil Nadu had the highest total male participation and highest total urban participation. Lastly, West Bengal had the highest urban male participation and lowest rural female and the lowest total female participation rate.

On the other hand, Kerala had the highest urban female participation since 55th round, consistently till 66th round and the reasons could be attributed to "Kerala's high level of female literacy, custom of matrilineal inheritance, political achievement regarding decentralized governance and commitment towards social welfare, high levels of life expectancy, low infant mortality and cohesive social structure promotion of effective interpersonal channels of communication" as observed by Bhatt and Rajan (1990); Kannan (1990); Kumar (1995). Kerala has witnessed impressive performance over the years in the demographic and social development front and has led to the emergence of the so-called 'Kerala-Model' of development. However, it is certainly paradoxical that, in such a society well acknowledged for according higher status and position to women, participation of the women in the labour force has been consistently on a decline. As can be observed from Table 2.1, the total labour force participation has declined by 3% in 66th round, compared to the 61st round, and urban female participation although the highest but has declined to 21.08% in the 66th round which is lower than what it was in 50th round, after rising upto 26% in 61st round.

It is also observed that Bihar having the lowest total labour force participation rate, in all the rounds, especially for urban areas over -time, calls the attention of policy makers to make efforts to generate ample employment opportunities. Low participation rates in Bihar can be attributed to lack of political will to generate jobs, Naxalism also could be a hindering factor for employment growth to flourish, lack of sufficient and quality education and healthcare institutions.

According to Mazumda and Guruswamy (2006) different explanations can be offered for the existence of gender disparity in India. But a significant explanation can be given in terms of cultural practices that vary from region to region. Though it is

a broad generalization, North India tends to be more patriarchal and feudal than South India."Women in northern India have more restrictions placed on their behaviour, thereby restricting their access to work. Southern India tends to be more unrestricted. women have relatively more freedom, and they have a more prominent presence in society" as claimed by Rahman and Rao (2004). Cultural restrictions still are changing, and women are free to participate in the formal economy, though the shortage of jobs throughout the country can be a contributing factor to low female employment.

2.3.1.2 Education-specific Female labour force participation Rates for all age groups (66^{th} round, NSSO) based on CWS

From Table 2.2, it is observed that all 14 states, barring Kerala, show that the maximum proportion of their female labour force participants, in their respective states, are illiterates which implies that sheer poverty and lack of access to educational opportunities drive them to work. Kerala on the other hand had major proportion of its female labour force participants with secondary education. Bihar had the lowest female labour force participation whether illiterates, or with Primary or secondary levels of education. On the other hand, Kerala had the highest female labour force participants with secondary, higher secondary and graduation and above level of education.

Rajasthan and Gujarat saw the lowest female labour force participation with higher education and graduation and above levels of education respectively. Among the illiterate workers, Andhra Pradesh saw maximum participation; Tamil Nadu had the highest participants with primary education level. Kerala had the highest participation of workers with secondary, higher secondary and graduation and above levels of education. The states with illiterate females in labour force who were above the average of 14 states were Gujarat, Rajasthan, Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh. The coefficient of variation was highest among the post secondary education level category and lowest coefficient of variation was found to be in the secondary education category.

Table 2.2: Education-specific Female labour force participation rate (CWS) for all age groups

State	Illiterate	Upto primary	Upto secondary	Upto Higher secondary	Upto graduation and above
Andhra Pradesh	45.55	26.41	21.20	4.93	11.00
Tamil Nadu	41.38	28.39	23.10	4.92	8.87
Karnataka	37.83	19.68	23.46	3.17	4.03
Maharashtra	35.78	24.25	22.76	4.05	5.78
M.P	32.47	14.79	17.42	1.73	2.74
Rajasthan	32.34	11.42	14.98	0.69	3.51
Gujarat	30.91	21.16	17.99	1.86	1.49
Orissa	25.60	12.39	12.57	8.96	5.25
Punjab	23.68	13.47	20.95	3.69	5.26
Haryana	22.98	12.28	20.36	2.59	2.84
West Bengal	16.40	11.79	14.78	2.33	5.70
Uttar Pradesh	15.45	5.37	9.09	1.27	2.78
Kerala	11.92	15.92	24.20	10.55	19.01
Bihar	7.09	3.16	1.73	1.23	6.20
Mean	27.10	15.75	17.47	3.71	6.03
std dev	11.49	7.45	6.39	2.90	4.52
Cov	0.42	0.47	0.37	0.78	0.75

Source: Computed from unit level data of NSSO, 66th round, EUS.

2.3.1.3 Labour force participation rate according to age (statewise analysis, 66th round, NSSO)

Labour force participation rates for age less than 16 years

From Table A.4, it is observed that among the 14 major states, Punjab had the highest urban female labour force participation in this age group. West Bengal had the highest labour force participation and also the highest participation in rural areas especially among the rural male and also highest male labour force participation. While in urban areas, Orissa had the highest urban participation and highest urban male labour force participation. While Kerala witnessed the lowest labour force participation under all categories barring, urban female participation, Gujarat, on the other hand, saw the highest total female especially rural female labour participation among this age group.

Labour force participation rates for age 16 to 59 years

Andhra Pradesh had the highest total labour force participation, also the highest female participation especially rural female participation. Gujarat saw the highest rural male participation. West Bengal witnessed the highest male participation especially urban male participation. Kerala had the highest urban female participation and Tamil Nadu had the highest urban participation among this age group. Bihar saw the lowest participation among all categories except total male participation and rural male participation which was observed to be lowest in Haryana.

Labour force participation rates for age 60 years and above

Bihar had the highest total labour force participation also had the highest urban participation, highest male participation, highest urban male participation. On the other hand, Maharashtra had the highest female participation, highest rural participation and highest rural female labour force participation. U.P had the highest rural male participation.

All India Trends

2.3.2.1 Workforce Participation Rates, Unemployment rates and Labour force participation rates (all ages) over time, across gender and sector

Work force participation

As shown in Table 2.3(a), overall female work force participation has fallen by around 4% (from 50^{th} to 66^{th}) although there was a slight increase in 61^{st} round, whereas for males it has risen by less than 1% during 50^{th} to 66^{th} round and the male-female gap in workforce participation rate has risen by 4% in 66^{th} compared to 50^{th} round. Rural female participation has fallen by 4% whereas among the urban females, the fall was minute in the period 50^{th} to 66^{th} round. Among males, work force participation rose among urban males by 2%, however, WPR among rural males remained constant in the period 50^{th} to 66^{th} round. Table 2.3(b) shows that rural participation rates have fallen as a whole whereas urban participation rose slightly by a percent. The urban-rural gap in WPR has been consistently declining.

Unemployment rates

As Table 2.3(c) shows, unemployment rates in 66th round have fallen for both rural and urban areas compared to 61st round, but rural unemployment rates have risen slightly compared to 50th round, and as Table 2.3(d) shows, for male and females too unemployment rates have fallen in 66th round compared to the 61st round, but compared to the 50th round, unemployment rates for females have risen slightly.

Table 2.3: All India Workforce participation rates, Unemployment rates and Labour force participation rates based on CWS (all ages) over time, across gender and sector.

Table 2.3(a): WFPR genderwise

WFPR	RURAL MALE	URBAN MALE	MALE	RURAL FEMALE	URBAN FEMALE	FEMALE	(GAP)Male-female
50TH	53.07	51.08	52.57	26.73	13.89	23.59	28.98
55TH	51.12	50.91	51.07	25.22	12.77	22.12	28.95
61ST	52.41	53.68	52.74	27.47	15.25	24.41	28.33
66TH	53.05	53.59	53.2	22.26	13.05	19.78	33.42

Source: Various rounds, EUS, NSSO

Table 2.3(b): WFPR sectorwise

WFPR	RURAL	URBAN	TOTAL	Rural -Urban gap
50TH	40.28	33.41	38.57	6.87
55TH	38.46	32.69	37	5.77
61ST	40.18	35.27	38.93	4.91
66TH	38.08	34.28	37.04	3.8

Source: Various rounds, EUS, NSSO

Table 2.3 (c): Unemployment rate regionwise.

UR(%)	RURAL	URBAN	TOTAL
50TH	2.99	5.83	3.62
55TH	3.79	6	4.29
61ST	3.93	6.04	4.43
66TH	3.33	4.25	3.56

Source: Various rounds, EUS, NSSO

Table 2.3 (d): Unemployment rates genderwise

UR (%)	RURAL MALE	URBAN MALE	MALE	RURAL FEMALE	URBAN FEMALE	FEMALE
50TH	2.98	5.17	3.53	3.01	8.42	3.83
55TH	3.85	5.68	4.33	3.67	7.36	4.22
61ST	3.8	5.24	4.18	4.19	8.98	4.97
66TH	3.19	3.56	3.3	3.67	7.23	4.32

Source: Computed from unit level data, various rounds of NSSO, EUS

Labour force participation

From Table 2.4, the male labour force participation has slightly improved over time by around 1 percent. However, the female labour force participation rates have been declining over time. Overall female labour force participation fell by 6% (approx) compared to the 50th round and 61st round. Rural female participation witnessed a comparatively higher fall, around 6% (based on Current weekly Status[16]) than their urban counterpart.

On the other hand, rural males witnesses a meagre rise in participation whereas, urban males witnessed a 2 percent rise in labour force participation. Overall rural participation has witnessed a nearly 2 percent fall whereas overall urban participation is more or less constant compared to the 50th round. Overall labour force participation has fallen by 2 percent in 66th round compared to the 50th round.

[16] Labour force participation rates have also been calculated on usual Status (principal + subsidiary), refer Appendix Table (A.5)

Table 2.4: All India Labour force participation (Current Weekly status) across gender and across sector.

NSSO rounds	Rural Male	Urban Male	Male	Rural Female	Urban Female	Female	Total Rural	Total Urban	Total
50th(1993-94)	54.70	53.86	54.49	27.56	15.17	24.53	41.52	35.48	40.02
55th(1999-2000)	53.17	53.97	53.37	26.18	13.78	23.09	39.97	34.78	38.66
61st(2004-05)	54.48	56.65	55.04	28.67	16.75	25.68	41.83	37.53	40.73
66th(2009-10)	54.80	55.57	55.01	23.11	14.06	20.68	39.39	35.80	38.41

Source: Computed from unit level data of NSSO for various rounds, EUS

2.3.2.2 Employment Growth by gender, sector, household type and occupation type

The overall employment growth (from Table 2.5 below) has fallen slightly during the period 2004-09. During this period, female employment has fallen by around 3%, more prominently for rural females. On the other hand, males over the same period have witnessed a growth rate of 1.2% more so for the urban males which have witnessed a growth of around 2%. Further, rural employment fell by 0.6% and urban rose by 1%. When period 1993-2009 was taken into consideration, the lowest employment growth was for rural females and highest for urban males.

Table 2.5: CAGR (1993-2009) of Employment across sector and gender

Category	CAGR(2004-2009)	CAGR(1999-2004)	CAGR(1993-1999)	CAGR(1993-2009)
Rural Male	0.82	1.78	2.02	1.57
Urban Male	2.48	2.34	3.06	2.65
Male	1.27	1.93	2.28	1.85
Rural Female	-3.80	3.30	2.00	0.55
Urban Female	-0.68	5.21	1.92	2.11
Female	-3.29	3.58	1.99	0.80
Rural	-0.62	2.27	2.01	1.26
Urban	1.86	2.89	2.85	2.55
Total	-0.03	2.41	2.19	1.56

Source: Computed from unit level data, EUS, NSSO (various rounds)

Further, on a segregated basis, the employment growth trend according to household types in rural and urban areas, were as follows:

In rural areas (from Table 2.6), CAGR of self employed in non-agriculture among the male and female was highest during 1999-2004 period, thereafter among the females workers, it has fallen by 5% but for males workers, employment growth was less than a percent during 2004-2009. Overall the self employed in non-agriculture has declined by around 1%.

Table 2.6: Employment growth (CAGR) across household types in Rural areas, (CWS) by gender

	Self employed in non-agriculture			
	CAGR(1993-1999)	**CAGR(1999-2004)**	**CAGR(2004-2009)**	**CAGR(1993-2009)**
Male	3.19	5.64	0.46	3.08
Female	2.67	6.58	-5.12	1.35
Total	3.05	5.89	-0.95	2.65
	agricultural labour			
	CAGR(1993-1999)	**CAGR(1999-2004)**	**CAGR(2004-2009)**	**CAGR(1993-2009)**
Male	3.50	-2.47	1.20	0.89
Female	3.41	-1.31	-1.92	0.24
Total	3.46	-2.03	0.05	0.65
	self employed in agriculture			
	CAGR(1993-1999)	**CAGR(1999-2004)**	**CAGR(2004-2009)**	**CAGR(1993-2009)**
Male	0.00	3.06	-1.60	0.44
Female	0.48	5.71	-6.24	-0.10
Total	0.14	3.90	-3.06	0.28

Source: Various rounds, EUS, NSSO

For agricultural labourers, the fall in 1999-2004 was relatively more for male (by 2.4 %) than females; overall employment fell during this period. In 2004-2009, employment for female fell by 1.9% and for males rose by 1.2%,

For self employed in agriculture, female workers saw a major fall by around 6%, the highest in this period among the three categories of household type, whereas males witnessed a fall in their employment only by 1.6%. Overall, employment fell by 3%.

Overall in the span of 16 years (1993-2009), self employed in agriculture has grown relatively slowly than agriculture labour and self employed in non-agriculture.

In urban areas (from Table 2.7), during 1999-2004, among self employed and regular, female employment growth was much higher than male, however, among the casual category workers, the employment growth declined, more so for males. However, during 2004-2009, female employment declined for regular and self-employed category more so for self employed, and among the casual workers, female employment grew only by 2% whereas male employment grew by 6%.

Table 2.7: Employment growth (CAGR) across household types in Urban areas, (Current weekly Status), by gender

	regular			
	CAGR(1993-1999)	**CAGR(1999-2004)**	**CAGR(2004-2009)**	**CAGR(1993-2009)**
Male	2.21	2.16	2.46	2.27
Female	1.54	6.82	-0.24	2.59
Total	2.09	3.00	1.94	2.33
	casual			
	CAGR(1993-1999)	**CAGR(1999-2004)**	**CAGR(2004-2009)**	**CAGR(1993-2009)**
Male	4.50	-1.35	6.06	3.11
Female	1.85	-0.34	2.89	1.48
Total	3.79	-1.09	5.26	2.69
	self employed			
	CAGR(1993-1999)	**CAGR(1999-2004)**	**CAGR(2004-2009)**	**CAGR(1993-2009)**
Male	3.07	4.30	1.11	2.83
Female	1.96	7.37	-3.10	1.99
Total	2.87	4.85	0.36	2.69

Source: Various rounds, EUS, NSSO

Overall employment growth according to NCO-2004 classification

Table 2.8 describes the employment growth in respective occupation (given by CAGR). Among males, highest growth over the period (1993-2009) was for skilled agriculture and fishery workers and lowest employment growth was for clerks. Among females, elementary occupations saw a major growth whereas plant and machinery operators, saw a decline in employment. With regional specification,

occupation growth in rural areas was highest for elementary and lowest for clerks. On the other hand, in urban areas, highest growth was witnessed for legislators, senior officers, managers and lowest growth for plant and machinery workers.

Table 2.8: CAGR of employment according to NCO (Current Weekly status)-2004.

CAGR(%)(1993-2009)					
Types of occupation	**Male**	**Female**	**Rural**	**Urban**	**Total**
legislators,senior officers,manager	8.37	6.66	8.66	7.74	8.11
professionals	9.87	11.36	9.89	10.26	10.14
technicians and associate professionals	6.33	6.01	5.16	7.15	6.24
clerks	2.84	3.53	2.84	2.99	2.95
service workers,shop and market sale workers	3.14	2.45	2.75	3.31	3.03
skilled agri and fishery workers	14.74	8.39	12.36	6.14	11.99
craft and relate trade workers	4.48	6.13	5.33	4.10	4.79
plant and machineries	3.58	-4.78	2.97	2.35	2.64
elementary occupations	14.14	17.66	18.03	7.63	15.00

Source: Computed from unit level data of various rounds of NSSO, EUS

Reasons for declining female labour force participation

According to Neff et al. (2012) in period 2004-2009, declining rural female labour force participation could be attributed to the following reasons. Firstly, that more women in rural areas are now pursuing higher education and are therefore not available for work (education effect), secondly, that household incomes are rising quickly enough that there is a tendency for women to withdraw from the labour-force to attend to domestic duties (income effect), thirdly, that employment opportunities for women are decreasing, and finally that social and cultural factors may be

interacting with these three factors and amplifying their effects. Their findings suggest that the decline in rural women's LFP could potentially be due to an income effect and partly due to an education effect. They find no evidence of changes in employment opportunities or of social and cultural interaction effects that could explain the decline in rural female LFP.

Similarly, ILO claims that one of the reasons for declining overall female participation could be that more women in India of working age are enrolling in secondary school. Secondly, in terms of declining employment opportunities, occupational segregation appears to play an important role in holding women back. Women in India tend to be grouped in certain industries and occupations, such as basic agriculture, sales and elementary services and handicraft manufacturing. It was also stressed that failure to allow women full access to the labour market is an under-utilization of human resources that holds back productivity and economic growth and that sound labour market information are needed for developing well-informed policies and further work is needed to sharpen the measurement tools used to analyse women's participation in the labour market.

A second line of thought suggests that women's employment in India, as elsewhere, is determined to a large extent by cultural norms that govern women's mobility and labour market prospects. "These norms operate at multiple levels and often mirror the status of women in a particular region, caste, or religion, permeating the household as well as the public sphere" as observed by Kemp (1986); Kapadia (1995); Desai and Jain; (1994). Thus, the "gender stratification system at the macro-level determines women's lower opportunities in the formal labour market, while restrictions within the home affect the kinds of work that women can do. These constraints often push women into non-wage (such as self-employed) and unpaid work, or out of the labour force" according to Raju and Bagchi (1993); Ghosh (1995); Sethuraman (1998); Elson (1999).

A comprehensive analysis undertaken by the National Commission on Self Employed Women and Women in Informal Sector (GOI, 1988) documents that there are few jobs for women in regular salaried or formal jobs – either as office workers or as factory workers - resulting in women's concentration in the informal sector. Since educated men and women often do not want to work in menial jobs as casual

labourers or on family farms, many are unable to find jobs matching their qualification, resulting in their withdrawal from the labour force. Several studies on India have argued that low returns to education for women discourage families from educating their daughters as observed by Kingdon and Unni (1997); Dreze and Gazdar (1996). For instance, Kingdon and Unni (1997) also show that for Indian women, only education beyond post-elementary level enhances wage work participation.

Table 2.9: Employment growth rate (%) NIC -2004 (61st and 66th round, NSSO)

Industrial classification(NIC-2004)	male	female	total
Agriculture	-0.15	-22.12	-8.65
Manufacturing	-0.55	-16.62	-5.23
services	18.48	13.13	17.60

Source: Computed from unit level data, EUS, NSSO.

During the period 2004-2009, from the Table 2.9 above, it is observed that female employment declined mainly in agriculture, followed by manufacturing category of industrial classification. Moreover, the CAGR[17] of employment (according to household types) indicates that the fall in employment was basically in regular and self employed categories in urban areas and for all categories of household type in rural areas.

Changing pattern of employment limited the opportunities for females across all levels of education. On one hand, technological changes restrict the participation among poorly educated females and the creation of jobs in the formal sector is falling behind the rising labour participation of new entrants in the market.

All these changes in employment pattern in the process of development lead to declining participation of females in the labour market.

[17] Refer Table 2.6 and 2.7

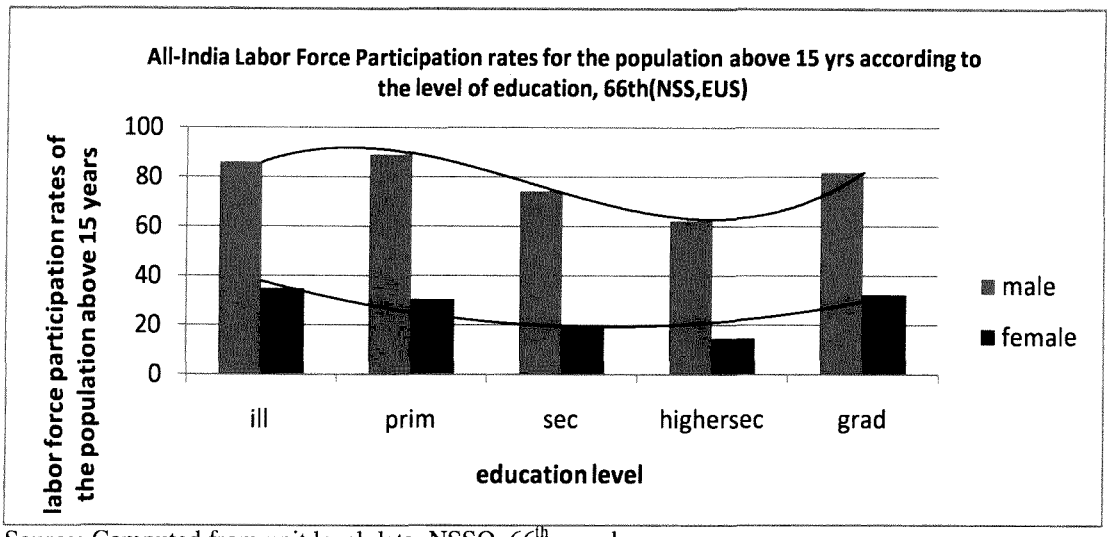
2.3.2.3 Analysis of Education-Specific Occupational preferences (Genderwise), according to NCO-2004

From Table A.6, among males, legislators, senior officials, managers saw maximum proportion of its population as secondary, whereas females had maximum proportion as illiterates in this occupation category in both 50th and 66th rounds of NSSO. Among professionals, major proportion was graduates, for both male and female, in both rounds. For male and female, among technicians and associate professionals, maximum proportion were secondary level educated in 50th round and in 66th round, maximum were graduates among this category. Among clerks, for both male and female, maximum were graduates in both rounds. Among service workers market sale workers, maximum were secondary educated for both male and females in both rounds. Among skilled agriculture and fishery workers, craft and related trades worker maximum were illiterates for both male and female. Among plant and machinery operators, maximum were illiterates for females whereas, upto secondary level educated for males.

2.3.2.4 All India education specific- Labour force participation rate (15 years and above) across gender, 66th round, NSSO.

After analysing (refer Figure 2.1) the All India female labour force participation rates, the hypothesis is confirmed that at initial stages the education specific labour force participation is high, due to sheer need for income earning opportunities but as education level rises the participation is lower but after a certain threshold level of education, which is higher secondary level of education, female workers are found to join back the labour force, hence the U-shaped hypothesis related to female labour supply with respect to education is confirmed whereas for males, the labour force shows a jump at primary and thereafter it falls till higher secondary level and again rises by graduation level of education.

Figure.2.1: Genderwise All India Labour force participation rate (15 years and above) according to the education.



Source: Computed from unit level data, NSSO, 66th round

Education in India appears to be associated with lower rather than higher WPRs as observed by Das and Desai (2003). Part of this may be because educated women are more likely to be married to men with higher incomes, but even controlling for income of the husband and other house-hold members, based on the IHDS documents, a consistent decline in WPRs with education has been observed until past secondary education. "The absence of skilled work preferred by educated women may be partially responsible for this negative relationship. The increase in employment for women with higher secondary and college education, especially in urban areas, suggests that a greater availability of suitable white-collar and salaried employment could lead to increased female labour force participation although at best this seems to counter- balance the initial decline with primary and post-primary education" according to Desai et al. (2010).

Explaining The U-shaped Female labour force participation Hypothesis

Women's LFPR theory shows that there is a U curve relationship between Labour force participation rate and level of development. This pattern arises because for poor, at low levels of income, survival instincts dictate that the women work. As income increases, women generally have less pressure to work and therefore withdraw from the workplace as the income status of the family improves. In India

the withdrawal is also associated with women's labour force withdrawal for family status purposes due to cultural norms that believed in the seclusion of upper caste and class women to maintain high family status. M.N. Srinivas referred to such withdrawal of women from labour as an upward mobility strategy or Sanskritization. Women tend to re-enter the labour force, only for jobs that match with their family status. For instance, service jobs like teaching, nursing, government services such as anganwadi or village health workers, clerical jobs in urban areas are preferred once they quit manual labour.

Morevever, at higher level of education and reaching a higher economic status, attitudes towards women change, and the traditional "care responsibilities" of women also tend to be taken care of due to the high standard of living, which enables them to re–enter the labour force. However, according to Pradhan and Singh (2003) social change is slower than economic change. Hence, with educational development, social reforms with respect to female participation are also expected, which increases participation of females in economic activities. Hence, the "supply side determinants of female participation include informal employment opportunities which decline with development, technological and structural change, conflict between earning income in labour market and housework" according to Pradhan and Singh (2003) .

2.3.2.5 Analysing the Education-specific unemployment rates and labour force participation (15 years and above), over time, across gender and sector

As shown in Table (A.7), (A.8), (A.9) and (A.10), it has been observed that among females, the unemployment rates for illiterates has reduced by less than 1 percent in 66^{th} round compared to 50^{th} round, although it increased in 55^{th} and 61^{st} round.

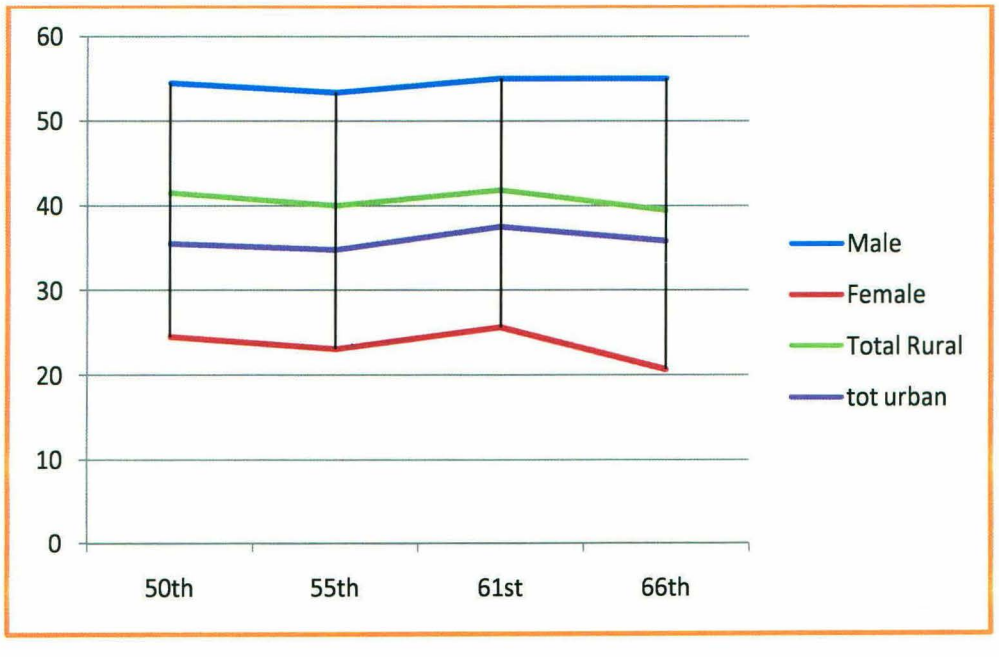
Secondly, for the primary education level workers, the unemployment rates has fallen by mere 0.4% which had shown a slight rise in 61^{st} round. Unemployment rates for secondary level workers has been consistently falling over the years and in the 66^{th} round, it has fallen by around 5% as compared to the 50^{th} round. For the higher secondary level of workers, a fall by 6 percent in 66^{th} round compared to the 50^{th} round and for the graduate and above level of workers, the category that witnesses the highest unemployment rates, has seen the female unemployment rates declining over the period by around 5 percent in 66^{th} round compared to the 50^{th} round.

For males on the other hand, unemployment rates for illiterates and primary level educated workers rose by around 1 percent in 55th and 61st round and slightly lesser in 66th round. For secondary level educated workers the Unemployment rates slightly rose by 55th round but subsequently fell by over 2 percent by the 66th round compared to the 50th round. For the higher secondary level educated workers, it fell by 5 percent and for the graduation and above educated workers, it fell by 2 per cent.

For all rounds, comparing male and female unemployment rates, the female unemployment rates are higher than male and the unemployment rates are much higher at higher secondary and graduation and above level. Among rural and urban male labour participants, highest proportions were primary educated, followed by illiterates and then by graduates. Among rural and urban females, highest proportion was that of graduate and above educated workers, followed by illiterates. Overall among total rural and urban participants, maximum were graduates followed by primary educated.

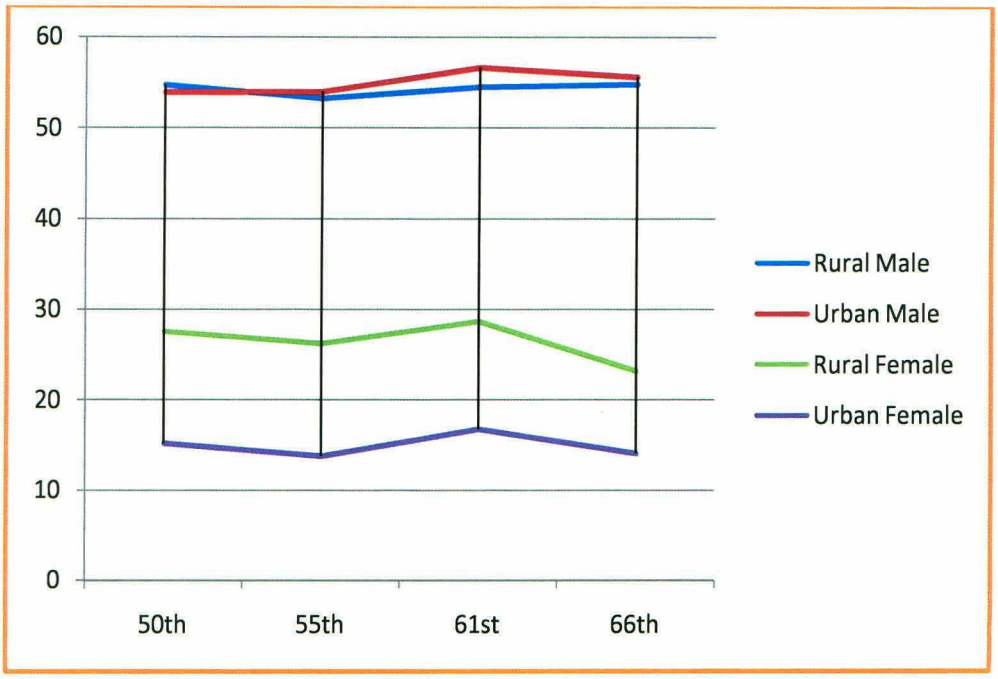
Figure 2.2: Labour force participation rates across gender and sector

Fig 2.2(a): Labour force participation rates across gender and sector



Source: Various rounds, EUS, NSSO

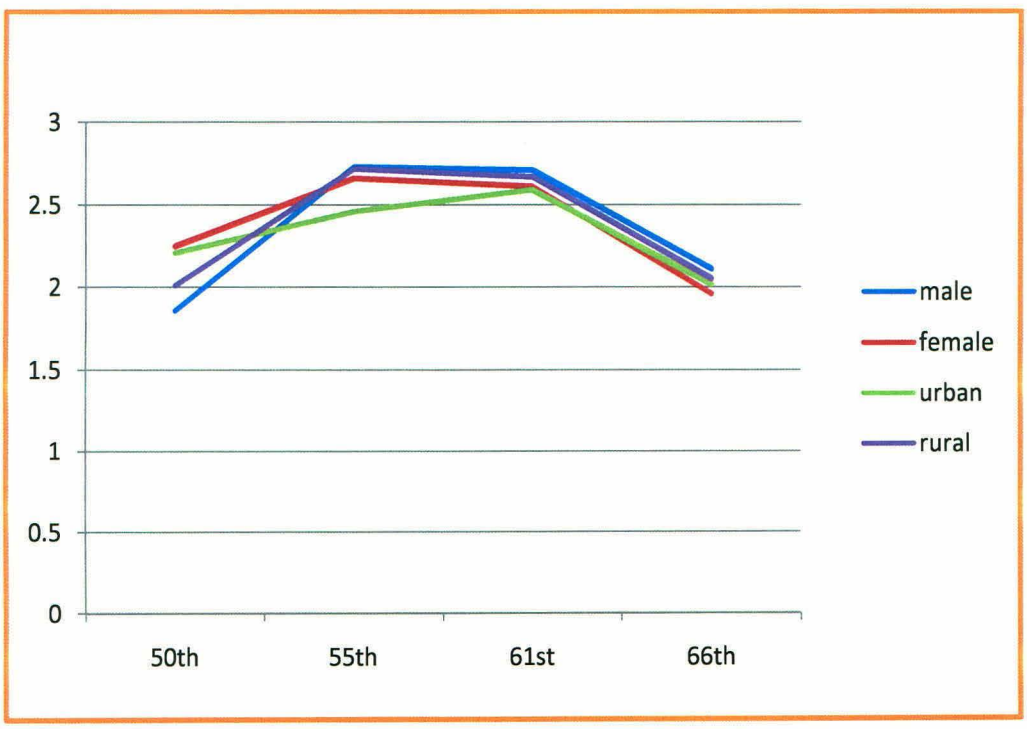
Fig 2.2(b): Labour force participation rates across gender according to the area of residence



Source: Various rounds, EUS, NSSO

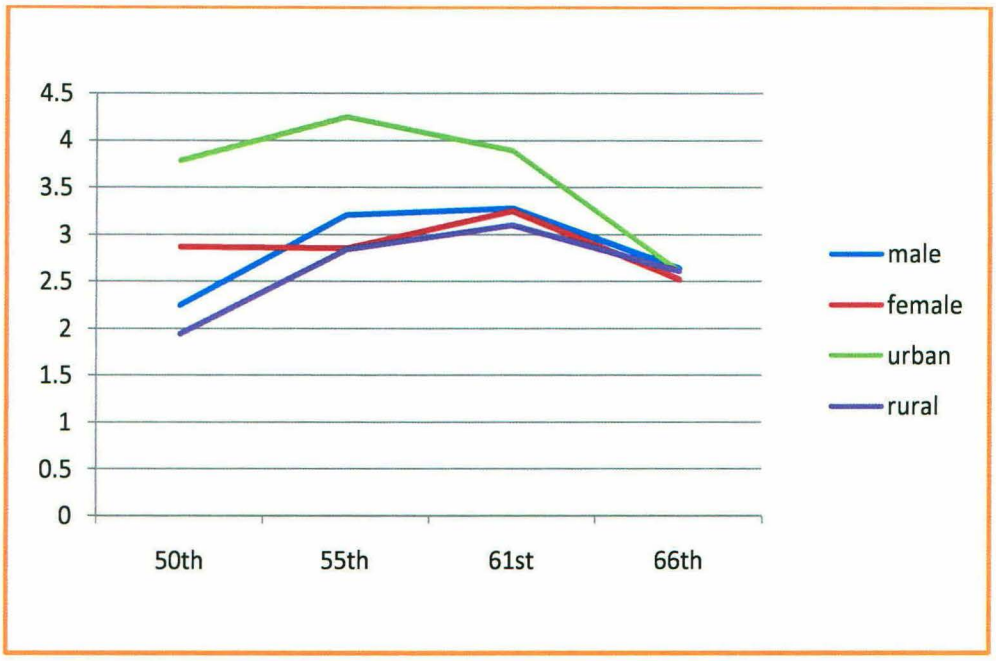
Figure 2.3: Education-specific Unemployment rates (above 15 years) by sector and gender

Fig 2.3(a): Unemployment Rates of Illiterates



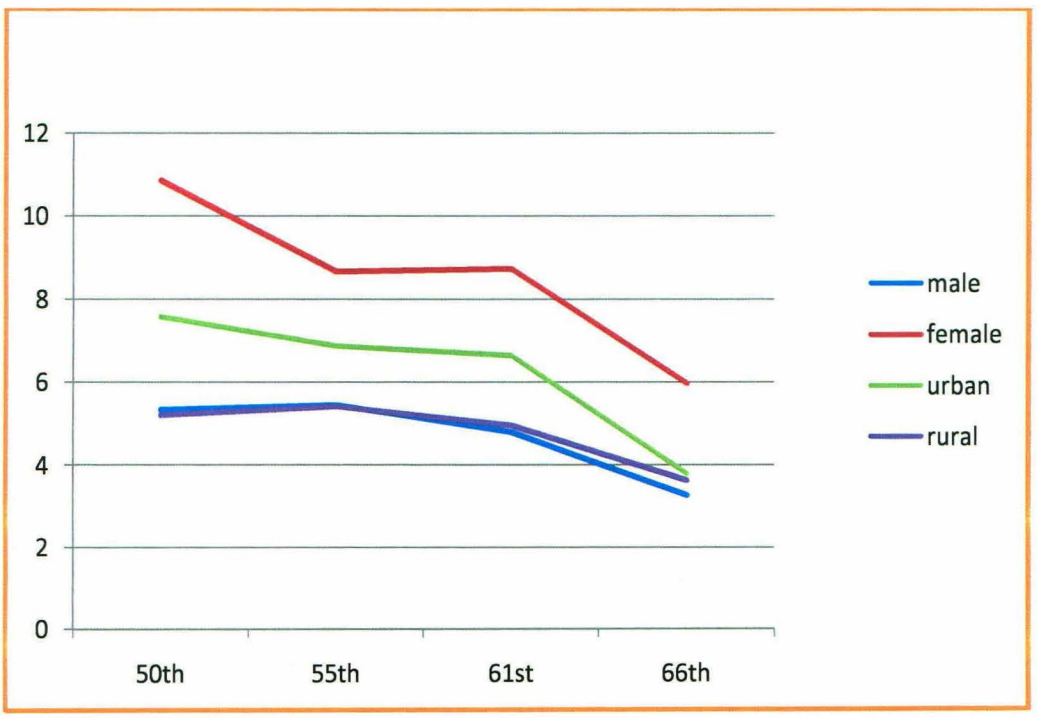
Source: Various rounds, EUS, NSSO

Fig 2.3(b): Unemployment Rates at Primary level



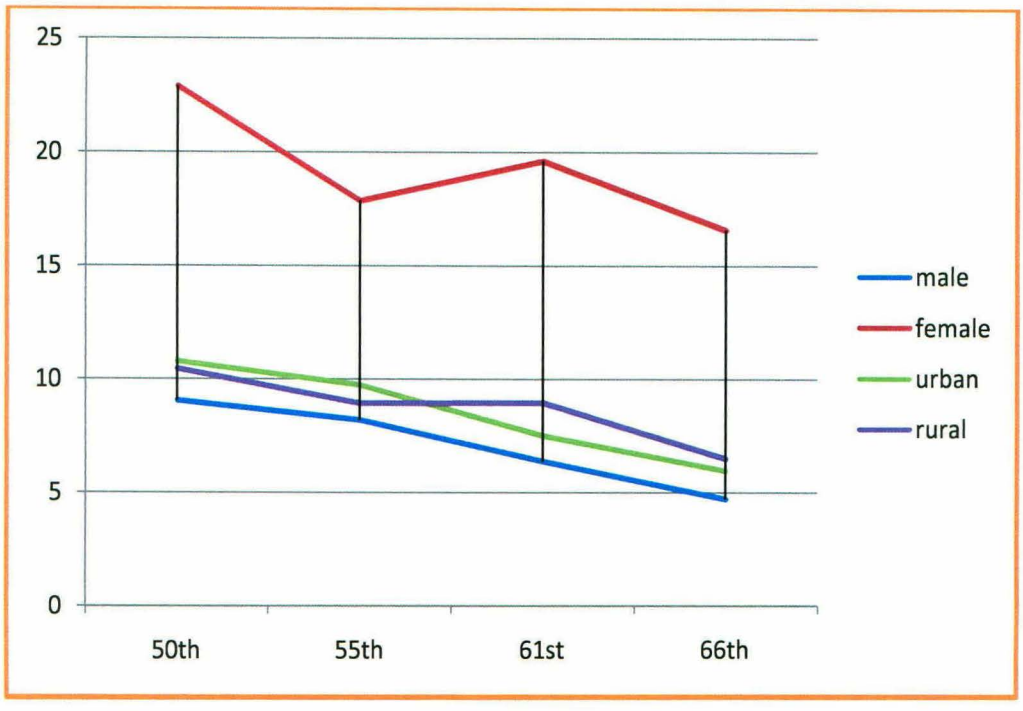
Source: Various rounds, EUS, NSSO

Fig 2.3(c): Unemployment Rates at Secondary level



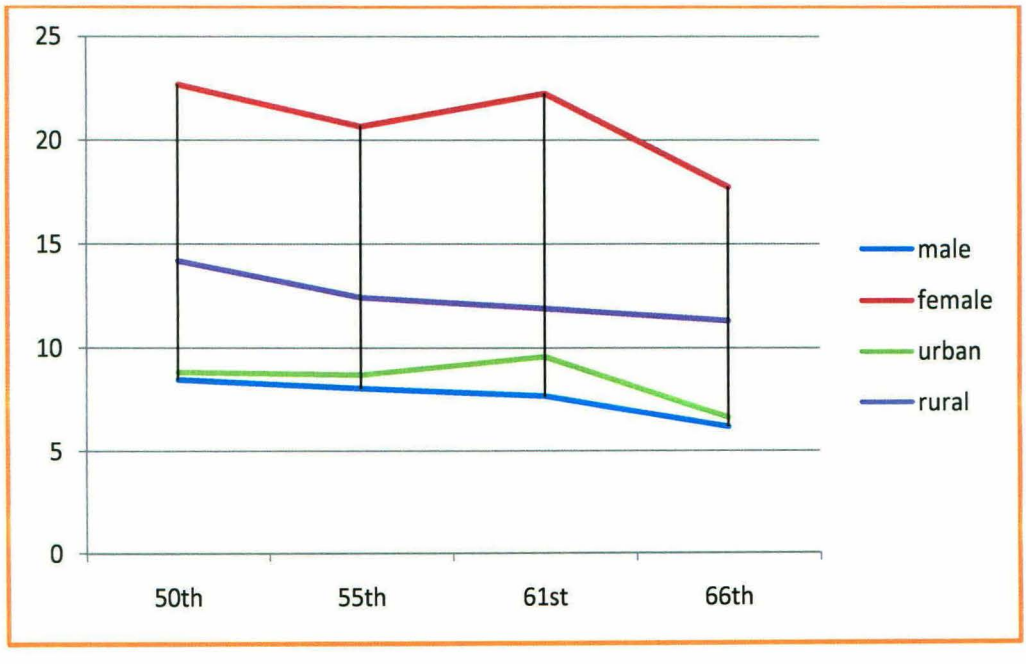
Source: Various rounds, EUS, NSSO

Fig 2.3(d): Unemployment rates at Higher Secondary level



Source: Various rounds, EUS, NSSO

Fig 2.3(e): Unemployment rates at Graduation and above level



Source: Various rounds, EUS, NSSO

For all rounds. while comparing the rural- urban unemployment rates, the urban unemployment rates were found to be higher than rural. for all levels of education upto higher secondary but for graduates and above, rural areas have higher unemployment rate because of job preferences in urban areas .

For all the rounds, unemployment rate was highest among graduates and above educated workers, for each gender and sector. In 66th round, comparing the urban and rural unemployment rates, unemployment rate of rural graduates was around 11%, which was much higher than 6%, among the urban graduates. Among male and female graduates, the unemployment rate among female graduates was around 17%, which was much higher than 6% for males.

Hence, this implies, as people get educated their job preferences also change but the employment opportunities remain the same, hence massive unemployment at higher education levels is witnessed, which has although reduced since the 50th round, but it's still high around 8 %, compared to other levels of education.

2.4 Factors affecting labour force participation rates

(1) Age: Age has been entered as a continuous variable and age (square) term affects the participation in the long run and both age and age (squared) terms have a positive influence on labour force participation for both male and female.

(2)Education levels: As we observe from the graphs and the regression model, female labour force participation shows positive coefficients for graduation and primary levels and negative for secondary and higher secondary levels of education. This confirms the U- shape hypothesis of female labour force participation.

(3) Child-woman ratio: Ratio of average number of children (below age of 5 years) per women in her reproductive age (15-49years) in a household. This variable shows negative coefficient for female labour force participation implying higher the chid-woman ratio in the household lower the labour force participation of female. It doesn't have much explanatory power and have correlation with other demographic variables like dependency ratio and age, etc. Also, the number of infants in a

household has been taken as an explanatory variable for female labour force participation decision.

(3) Dependency ratio: Ratio of number of dependents (less than 15 years of age and those aging more than 60 years) to working population (15-59years) in a household. Dependency ratio is taken as a continuous variable.

(4) Household type: Household size is a continuous variable.

(6) Social group: NSS data records whether the individual is a member of the 'Scheduled Tribes (ST), the Scheduled Caste (SC), or other backward castes (OBC) or falls in the residual category of 'Others' which is mainly the Higher Caste which has been taken as the reference group for the current study.

(7) Household size: The household size variable has a negative influence on the labour force participation of men as well as women especially in the rural areas. In urban areas it has a positive impact on LFPR of men although for women it continues to be negative.

(8) Marital status: The influence of the marital status variable is very different for men and women. For the purpose of estimation, the 'marital status' variable was disaggregated into four categories: unmarried, currently married, widowed, and divorced or separated with the reference group as 'unmarried'.

2.5 Econometric Analysis

The logit model in the current study is of the form:

$$L = \ln\left[\frac{p}{1-p}\right] = \alpha + \sum\beta_i X_i + \sum\gamma_i D_i + \mu$$

Where,

L is the dichotomous dependent variable representing log of odds. It shows the Pi=1 when an individual decides to participate in the labour force and Pi=0 shows no participation.

α is the intercept term.

X_i stands for continuous variables.

D_i dummy variables for binary variables

Where, lithh = binary variable, 1 if the person is the household head is literate, zero otherwise

Married = binary variable, 1 if the person is married, zero otherwise.

Widowed= binary variable, 1 if the person is widowed, zero otherwise.

Divorced= binary variable, 1 if the person is divorced, zero otherwise.

SC= binary variable, 1 if the person is a Scheduled Caste, zero otherwise.

ST= binary variable, 1 if the person is a Scheduled tribe, zero otherwise.

Age = continuous variable, age of the person.

Ag1 = continuous variable, square of the age of the person.

P = binary variable, 1 if person has completed his education upto primary level of education, zero otherwise

Gr = binary variable, 1 if person has completed his education upto graduation and above levels of education, zero otherwise.

hs = binary variable, 1 if person has completed his education upto higher secondary level of education, zero otherwise.

S = binary variable, 1 if person has completed his education upto secondary level of education, zero otherwise.

Dep = dependency ratio of the household, continuous variable

Hh_sz = household size, continuous variable

Sena = binary variable, 1 if person belongs to a rural household where regular employment is the main source of income, zero otherwise.

Sea = binary variable, 1 if person belongs to a rural household where Self employment in agriculture is the main source of income, zero otherwise.

Al = binary variable, 1 if person belongs to a rural household where employment as agricultural labourers is the main source of income, zero otherwise.

Casual = binary variable, 1 if person belongs to a urban household where casual work is the main source of income, zero otherwise

Regular = binary variable, 1 if person belongs to a urban household where regular employment is the main source of income, zero otherwise

Se = binary variable, 1 if person belongs to a urban household where Self-employment is the main source of income, zero otherwise

BPL= binary variable, 1 if person is below poverty line, zero otherwise.

Methodology

A logistic regression is run for 66th round, NSSO, to analyse the determinants of male and female labour force participation and Average Marginal effects are calculated for a cross section of All India states in the age group of 15-65 years, segregated by gender.

Results

For both male and female labour force participation, education levels at primary and graduation have positive signs and secondary and higher secondary have negative signs, confirming the U-shaped hypothesis (in case of female labour force participation).

Female labour force participation[18]

1) Effect of education

The observation is that for female labour force participation decision that the education levels (secondary and higher secondary) have negative coefficients showing as the level of education rises, the labour force participation falls, but after a certain stage, they join back the labour force and hence graduation and above levels of education have positive coefficient. The marginal effects show that a person with graduation and above level of education is 4% more likely to participate in labour force than the person who is illiterate (the reference category for all education levels). Females with primary level of education were 2% more likely to participate in the labour market as compared to the illiterates. On the other hand, females with higher secondary are 17% less likely to participate and females with secondary education are 12% less likely to participate as compared to the illiterates. Further, it was observed that females having literate household head are 6% less likely to participate than the other caste.

2) Effect of Area of residence

Marginal effects for regional dummy shows that female from rural area is 12% much more likely to participate in labour force than female from urban area, which is much higher than that for males.

3) Demographic variables

As household size rises the probability of participating in labour force declines. Both age and age squared (to check effect of age on labour force participation in the long run) variable has a positive coefficient indicating that as age rises labour force participation rises, although the marginal effects are too small. As household size rises, it is 2% less likely for females to participate.

Also, a negative coefficient for the variable "Infant" (number of children whose age is less than 1 in a household) –which shows that as the marital responsibilities and "care burden" rise the labour force participation of females falls. Females with infants in their household are 6% less likely to participate in the labour force .On the other

[18] Refer Appendix Table (A.11)

hand, the child-woman ratio shows a negative sign implying as child –women ratio rises, the female from such a household is 4% less likely to participate in the labour force.

4) Standard of living

Similarly, indicator of standard of living, BPL (based on state-specific poverty line) variable indicates whether the person is poor or not. It can be observed that female who are poor are 1% more likely to participate in labour force than female who are non-poor, however, when state effect are also included in the model, poor females are 4% more likely to participate in the labour market (as poverty lines are state-specific).

5) Caste

STs are 12% more likely to participate than "Other" (reference category) caste; SC females are 3 % more likely to participate than the "Other" caste.

6) Marital status

The currently married status of females has a positive relationship with the labour force participation. However, a married female has only 2% more chance of participating in the labour force than being unmarried (reference category), divorced has 34% more probability of labour force participation than unmarried and widowed have only 6% more probability of participation than unmarried (but higher than married). Hence, marital status plays an important role in female labour participation decision and the state of "being married" for females, restricts the entry into labour force to some extent.

State effects

The explanatory power of the model changes considerably with more or less than same effects in the variables. Only the variable primary education level shows negative sign indicating 3% less likely to participate in the labour force.

The correlation Table for overall female labour force participation (Table A.11(a)) and female labour force participation in rural (Table A.12(a)) and urban area (Table A.13(a)), specifically show positive correlation of labour force with primary and

graduation levels but negative at secondary and higher secondary levels which confirms the U-shaped Hypothesis.

When regression for female labour force participation was run on the basis of area of residence, the following results were found:

Rural female labour force participation[19]

Rural females below poverty line are 7% more likely to participate in labour force than non-poor rural females.

Married rural females are 14% more likely to participate in labour force, divorced are 42% more likely to participate and widowed are 23%, than the reference category (unmarried).

SC and ST rural females are 2% and 14% more likely to participate in labour force than the reference (higher caste).

Dependency ratio, household size etc show a negative relation with the probability of participating in labour force.

Agriculture labourers are 11% more likely to participate in labour force and "other labour" category is 1% less likely to participate in labour force as compared to the reference category ("others"). On the other hand, self employed in agriculture showed a 2% more likely to participate in labour force and self employed in non-agriculture are 8% less likely to participate in labour force as compared to the reference category ("others"). With state effects however, the marginal effects show that self employed in non-agriculture is 4% less likely to participate and self employed in agriculture is 4% more likely to participate than the reference category.

Urban Female Labour force participation[20]

In urban areas, females belonging to Casual and regular household types are 7% and 3%, respectively, more likely to participate whereas self employed household type is 2% less likely to participate.

[19] Refer Appendix Table (A.12)
[20] Refer Appendix Table (A.13)

Male Labour force participation[21]

The variables determining labour force participation were analysed through different models due to the possibility of multicollinearity in including all variables in the same model.

Model 1 show males with primary education are 11% more likely to participate in the labour force compared to the reference category (illiterates) and graduates are 6% more likely to participate, whereas male with secondary level education are 9% less likely to participate and male with higher education are 15% less likely to participate.

Again for males, marginal effects for the marital status "being married" is much more than marginal effects for females which shows that the marital status of a man has not much significant impact on their labour force participation decision, unlike females. Married male is 30% more likely to participate in labour force than unmarried.

This corroborates the hypothesis that marriage is in some sense a watershed phenomenon affecting the labour force entry decision of men and women. For men it is the signal for higher responsibility as the bread winner of the nuclear unit, while for women it emphatically signals the beginnings of new "reproductive responsibilities" and new "norms of behaviour in the marital home" as compared to the 'not married' status. The situation is very different for widowed, divorced and separated women though.

Being in rural area doesn't make much of a difference, it is only 3% more likely for a male from rural area to participate in labour force unlike for females, where probability of labour force participation is much more when the area of residence is rural.

Being a ST male has 3% more likely to participate in labour force and SC male is only 1% more likely to participate in labour force.

The demographic variables all have positive signs, household size, age, dependency ratio. As they increase, the probability of participating in labour force rise. As

[21] Refer Appendix Table (A.14)

dependency ratio rises by one unit, it is 10% (multiplied by a very small proportion, say 0.00002) more likely to increase probability of participation.

Household size and age have very small marginal effects. State effects hardly change the marginal effects or the signs or the significance or the explanatory power of these variables.

A below poverty line (based on state specific poverty lines) male is only 2% more likely to participate than those who are non-poor (reference category). The estimated equations highlight the differences in the significance of factors that determine the labour force participation decisions of men and women. Cultural and demographic factors turn out to be better predictors of women's participation decisions than they are for men. The female equations fare much worse than the male versions in terms of overall explanatory power of the models. This suggests that there are other explanatory factors which have been excluded in these equations and which if included could have increased the explanatory power of the models.

2.6 Conclusion

The study reveals that women workforce and labour force participation has declined in recent years especially for rural females. The rural-urban workforce participation gap has been declining but male-female gap has increased over the years (1993-2009). The highest fall in employment in rural areas was among the self employed in agriculture female workers whereas in urban areas lowest growth in employment was among the female casual workers during 1993-2009 period. The statewise trend also shows that Bihar's labour force participation has remained perennially low. Also, that education–specific female labour force participation confirms the U-shaped hypothesis of female labour supply.

Further, it has been observed that there are various socio-cultural norms of India impacting female and male labour supply differently which propel their decision to participate in the labour market, especially for females, like family traditions and norms, child care responsibilities, decision of the household head, education of the household head, social attitude towards female employment in the family, change in attitude towards women after marriage, where men are generally assumed to be bread

winners and women are the house caretakers. Hence, explanatory power of the logistic regression is generally found to be lower for female labour force participation as many unexplained factors which include social norms cannot be captured empirically.

Marriage plays an intricate role for females and finds it as a barrier for entry to labour market. Further, households like agriculture labourers and self employed in agriculture have shown more likelihood of participating in labour force compared to their counterparts. Also, Child-woman ratio and number of infants in the household is found to restrict the entry.

Government needs to tap the potential of vulnerable categories like ST, SC, illiterates especially in rural areas and females in particular. Graduate and above levels of education have been observed to have a positive relation with probability of labour force participation for both male and female. Thus, promotion and development of higher education and subsequent skill building and the requisite education-specific income earning opportunities is the immediate need. However, the social attitudes towards women education and participation in labour market can be changed only with time and increase in status of women also seems to be a major perceptive factor to increase the labour force participation rate.

It is observed that the expansion of the working-age population and the emergence of new economic opportunities can lead to rise in the LPR and WPR. At the same time, the increase in education can result in a fall in LPR as witnessed by the U-shaped hypothesis.

Poor economic and social development of the region has negative impact on female participation rate. Increasing level of education of younger cohorts will increase the labour force participation in near future when they move to prime working-age. By obtaining more education, they will be exposed to new technologies which further enhances their participation rate.

In the next chapter, the impact of different education levels on economic growth and how they differ for male and female respectively has been analysed.

Chapter 3

The Causal Relationship between Education and Economic growth

Having analysed the determinants of labour force participation and the role of education in labour participation decision specifically, it is important to analyse whether there exists any causal relationship (in the short run) or any evidence of a long–run relationship among education levels and economic growth and if so does Government spending on education expenditure also contribute to economic growth.

This chapter analyses broadly two areas, firstly, it is tested whether different levels of education (proxied by gross enrolment ratios) segregated by gender, have a causal impact on economic growth and secondly whether education expenditure (as a percentage of total public expenditure) has any relationship with economic growth. The first section deals with explaining education as a tool in promoting pro-poor growth, second section gives a brief review on education policy in India. The third section deals with the trends in general education level of population. Further, the fourth section deals with trends for the variables in the study in specific. The fifth section deals with the methodology followed in the current chapter. The sixth section deals with the econometric exercise and the last section concludes the chapter.

3.1 Education as a tool for pro-poor growth

According to the Economic Survey of India (GOI, 2012-13), higher standards of living as well as developmental opportunities for all, coming from greater resources generated by economic growth, are the ultimate aim of development policy which inturn implies that there is an urgent need to bridge regional, social and economic disparities and to empower the poor, marginalised and women in specific. Economic growth is essential, as it allows people to improve their lives but not sufficient to achieve the Millennium Development Goals (MDGs). Hence, Economic Growth is treated as one of the means to curb poverty, provided there is inclusive growth (an aspect which was realised only by the tenth plan of the Indian planning system) in the society.

In recent literature there has been a shift away from trickle down concept to pro-poor growth. Traditional focus in development thinking has been on 'trickle- down' effect of growth, which simply implies "a vertical flow of income from the rich to the poor at a given rate" as stated by Kakwani and Pemia (2000). On the other hand, they define pro-poor growth as "growth that enables the poor to actively participate in, contribute to and significantly benefit from, economic activity". Hence, promoting pro-poor growth requires a strategy that is deliberately biased in favour of those below the poverty line so that they benefit proportionately more than the rich and distribution of the gains from economic activity is fair and equal. Ensuring that growth is pro-poor requires changes in the institutions, law and practices that perpetuate poverty. One such institution is the Educational system.

Hence, Mankiw et al. (1992) and Bergheim (2005) explain that the specific role of human capital needs to be analysed, towards explaining the economic growth, as it increases the output through various known empirically tractable and intractable channels. Human capital enables a worker to produce more output as observed by Bergheim (2005). As human capital increases the productivity of labour, demand for labour and hence employment and output rises. Moreover, human capital is necessary for optimum utilization of physical capital. Increase in the stock of human capital in any economy attracts investment in the physical capital which in turn increases the output as claimed by Abbas (2000, 2001). Existing growth literature accepts education as one of the primary components of human capital since education, other than improving productivity of labour, has certain spillover benefits, implying that over and above benefiting the individuals who receive it, it also benefits society. Hence, this chapter attempts to analyse the contribution of education to economic growth by different levels of education segregated for each gender and also the impact of education expenditure on economic growth.

3.2 Brief review of the Education policy in India

While analysing the Education Policy in India, it has been noted that since independence, education has been in prime focus in India. Efforts to expand access and quality of education have characterised successive Five Year Plans. "In the

period from 1951-52, when the country launched its first five year plan, until 1990, the number of schools increased more than three-fold, outpacing the growth of the school age population" according to Dougherty and Herd (2008). At the tertiary level, the number of universities rose 7-fold, while the number of undergraduate and professional colleges rose 10-fold.

In 1991, India undertook comprehensive economic reforms programme aiming to achieve rapid economic growth by integrating the economy with the global economy. This process created multiple opportunities but it also posed many challenges. Then there was the Jomtien World Declaration (1990) on Education for All (EFA), directing countries to achieve universal access to education within the shortest possible time and the major positive outcome was that elementary education received the somewhat serious attention of government, leading to the passing of the Right of Children to Free and Compulsory Education Act (2009). In 1992, the government revised the National Policy on Education to include several key strategies to achieve the goal of universal access to education and improved school environment. Under this policy, a District Primary Education Programme was launched as a major initiative to expand people's participation in education.

In 2000, the government signed Dakar and UN Millennium declarations and reaffirmed its commitment to Education For All (EFA). Followed by, the national flagship program initiated in 2002, the Sarva Shiksha Abhiyan (SSA), to enrol all 6–14 year-olds in school by 2010. In the same year, free and compulsory education was made a Fundamental Right for all the children in the age-group of 6-14 years through the 86th Amendment of the Constitution. While the focus had been on achieving universal education, sweeping reforms were also introduced to broaden access to higher education which encouraged the functioning of many private institutions and also of distance education programmes and self financing programmes by public institutions. In 2000, "100% FDI was allowed in higher education under the automatic route. As a result, foreign institutions started offering programmes either by themselves or in partnership with Indian institutions. This period also witnessed the growth of the non-university sector. There was rapid expansion of polytechnics and industrial training institutes, largely in the private sector" as claimed by Agarwal (2006). However, despite higher allocations to education by the centre as part of implementing the programme with external assistance the public expenditure on

education as a percentage of GDP rose to just 3.77% (2008-09) from 1.48% (in 1960-61) as per the report on Higher Education (UGC, 2012).

The 11th Plan placed education, particularly vocational and science education, at the centre of development and introduced the "Education Plan (2007-2010)". The government aims to spend Rs 4.13 lakh crore on higher education during the 12th Plan period (2012-17), about four times the amount allocated in the previous plan at Rs 84,943 crore as stated by The Financial Express (May, 2012). According to the Ministry of Human Resource Development (MHRD), majority of the funding would be used to set up new institutions and expanding the existing ones. The list includes state universities, general degree colleges and professional and technical educational institutions.

3.3 Trends of education level of the population in India based on NSSO rounds

3.3.1 Statewise analysis of population according to their education levels, genderwise and regionwise in 2009-10 (66^{th} round, NSSO)

Education level of Total population

Appendix Table (A.15) shows that among the 14 states Punjab, Rajasthan, Uttar Pradesh, Bihar, Orissa, Andhra Pradesh, Karnataka had major proportion of the population as illiterates. Haryana, West Bengal, Madhya Pradesh, Gujarat, Maharashtra, Tamil Nadu and Kerala, on the contrary, had major proportion of its population with secondary education. Bihar had the highest proportion of illiterates; West Bengal had the highest proportion of Primary education level. Kerala had the maximum number of people with secondary level and graduation and above level of education. Haryana had the highest proportion with higher secondary level of education. The highest variation was among the graduation and above category and lowest variation was among the primary education level category which implies that inter –state variation among higher levels of education is skewed which demands immediate attention. Among the 14 states, the coefficient of variation (as observed from Appendix Table A.7) was highest among the graduation and above level of

educated population, followed by higher secondary and secondary level educated population. The least variation among states was for primary educated population.

Education level of Rural population

Table Appendix A.16 shows that, among 14 major states, Punjab, Rajasthan, Uttar Pradesh, Bihar, Orissa, Madhya Pradesh, Gujarat, Andhra Pradesh, Karnataka, had maximum proportion of its population as illiterates. Haryana, West Bengal, Maharashtra, Tamil Nadu had maximum proportion of its population with primary education. Kerala had maximum proportion of its population with secondary education. Bihar had the highest number of illiterates. West Bengal had the maximum number of people with primary education, Kerala had the highest proportion of population with graduation and above level of education in its total population among the 14 major states and Punjab had the highest proportion of population with higher secondary level of education in its total population among the 14 major states.

Education level of Urban population

From Table (A.17), it can be observed that among the 14 major states, Rajasthan had the highest percentage of illiterate Urban population and Kerala had the lowest. West Bengal had the highest percentage of Urban population with primary level of education and Karnataka had the lowest. Kerala had the highest percentage of Urban population with secondary level of education and U.P had the lowest M.P had the highest percentage of Urban population with higher secondary level of education and Orissa had the lowest. Maharashtra had the highest percentage of Urban population with Graduation and above level of education and Bihar had the lowest.

Education level of male population

From Appendix Table (A.18), it can be observed that among 14 major states, Bihar had the highest percentage of illiterate male population and Kerala had the lowest. Kerala had the highest percentage of male population with secondary level of education and Bihar had the lowest. Haryana had the highest percentage of male population with higher secondary level of education. Maharashtra had the highest percentage of male population with graduation and above level of education and Bihar had the lowest.

Education level of female population

From Appendix Table (A.19), it can be observed that among the 14 states, Bihar had the highest percentage of illiterate female population (as a proportion of total population) and Kerala had the lowest. West Bengal had the highest percentage of female population with primary level of education and Karnataka had the lowest. Kerala had the highest percentage of female population with secondary education and Rajasthan had the lowest. Punjab had the highest percentage of female population with higher secondary level of education and Bihar had the lowest. Kerala had the highest percentage of female population with graduation and above level of education and Bihar had the lowest.

3.3.2 Growth rates of population according to education level

Table (A.20) shows the following trends: Among females, comparing 50^{th} and 55^{th} round, Punjab, U.P, Haryana, Rajasthan and M.P showed highest growth among people with higher secondary level of education. Gujarat, Andhra Pradesh, West Bengal, Orissa, showed growth among the secondary education category and Maharashtra, Bihar, Karnataka, Kerala, Tamil Nadu, showed highest growth among the graduate and above category. During this period, highest growth in illiterate female population was in Kerala but a fall in illiterate females was observed in Tamil Nadu. Among Primary educated females, highest growth rate was in Rajasthan and lowest in Tamil Nadu.

During 2004-2009 (61^{st} to 66^{th} round, NSSO) period, all states showed a fall in illiterate population, lowest fall was in Bihar and highest fall in Kerala. However, highest growth rate in graduation and above category was in Bihar and lowest in Punjab.

Among males, during period 1993-99, highest growth in illiterates was in Bihar, highest fall in illiterates was in Haryana. Among graduate and above, highest growth rate was in Andhra Pradesh and lowest in Gujarat. However, during 2004-2009 period, proportion of graduate and above has fallen most in Punjab and risen maximum in Andhra Pradesh. Maximum fall in proportion of illiterates was in Kerala and M.P.

3.3.3 Analysing the distribution of population (All India) according to their Education levels, over time

On observing the trend (from table 3.1 below) of All India Education levels across rounds, it is found that proportion of illiterate males and females in Rural areas were almost double the proportion of illiterate males and females in Urban areas. Comparing male and female education levels, illiterate females were 20% higher than males in the 50th round. Over the years, proportion of illiterate population has declined. As observed, higher secondary and graduation and above educated population are the lowest as a proportion of total population. Comparing with the 50th round, there was a 3% rise in Total graduation and above educated and higher secondary educated population by 66th round. Population with secondary education levels have risen by approximately 8% and primary educated population has risen by 3% and illiterate population has fallen by around 20% which is a positive sign in the context of educational development. In Urban areas, graduation and above educated population rose by 7%, higher secondary educated population have risen by 10%, secondary educated population has risen by 4% but primary educated population has fallen by 4% and illiterates on the other hand, have shown a fall of over 10%.

Total illiterate population has fallen by 20% approximately, whereas primary, higher secondary and graduate and above educated population has risen by around 3% and secondary level of population by 7%.

On comparing male and female All India illiterates, it was found that female illiterates are approximately 20% higher than males and proportion of males with primary education was around 10% more than females in the 50th round, however by the 66th round, the male-female gap has declined to around 3% at primary level of education, however, for illiterates, the male-female gap in 66th round, is lower than the 50th round but still high at 15%.

At the sectoral level there are stark differences especially among females with proportion of Urban females having considerably higher attainment at Higher secondary and graduation and above levels. Sector-wise, Rural sector has considerably lower attainment at all levels and over time the gap has been covered at all levels except graduation and above levels of education attainment which is area of

attention of the policy makers who give emphasis on the primary education and neglect the higher education which plays a major part in poverty reduction and attainment of other developmental goals.

Table 3.1: Percentage distribution of population (All India) according to their Education levels

Rural male	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	45.55	32.34	16.51	2.61	1.64
55th	41.07	32.96	19.43	3.16	2.07
61st	36.43	33.32	20.85	3.51	3.07
66th	29.39	35.14	25.87	5.36	3.64
Urban male	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	24.11	31.89	26.32	7.36	8.97
55th	21.86	29.67	28.72	7.83	10.76
61st	19.47	28.14	28.15	8.27	14.09
66th	16.39	26.84	29.42	10.18	16.6
Total male	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	40.15	32.23	18.98	3.8	3.49
55th	36.12	32.11	21.82	4.37	4.31
61st	32.04	31.98	22.74	4.74	5.93
66th	25.79	32.84	26.85	6.69	7.23
Rural Female	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	67.92	21.99	7.94	0.77	0.35
55th	61.2	25.08	10.81	1.24	0.58
61st	55.05	27	12.74	1.79	1.14
66th	46.7	31.28	16.89	2.92	1.63
Urban Female	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	38.42	29.78	20.49	4.82	5.24
55th	34.22	28.57	23.11	5.94	6.95
61st	30.68	27.51	24.13	6.43	9.34
66th	26.44	26.47	25.57	9.05	11.91

Total Female	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	60.71	23.89	11	1.76	1.54
55th	54.47	25.95	13.88	2.41	2.17
61st	48.95	27.13	15.59	2.95	3.19
66th	41.25	29.99	19.22	4.57	4.39

Total Rural	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	56.41	27.31	12.35	1.72	1.01
55th	50.91	29.11	15.21	2.22	1.34
61st	45.56	30.22	16.88	2.67	2.13
66th	37.81	33.26	21.5	4.18	2.66
Total Urban	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	30.91	30.89	23.56	6.15	7.2
55th	27.76	29.14	26.04	6.93	8.94
61st	24.84	27.84	26.22	7.39	11.82
66th	21.18	26.66	27.58	9.64	14.36
Total	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
50th	50.08	28.2	15.13	2.82	2.55
55th	45.04	29.12	17.96	3.41	3.27
61st	40.28	29.61	19.26	3.87	4.59
66th	33.27	31.46	23.16	5.67	5.85

Source: Computed from unit level data of various NSSO rounds, EUS

3.4 Variables[22] in the study and their trends

Education level (segregated by gender)

The Gross Enrolment Ratios (for the period 1960-2010) at different levels of schooling primary (1st to 5th standard), Middle (6th to 8th standard) Secondary[23] (9th to 12th standard) have been used as a proxy for education levels: The United Nations Educational, Scientific and Cultural Organization (UNESCO), describes 'Gross Enrolment Ratio' as the Total enrolment within a country "in a specific level of

[22] Refer Appendix Table (A.21) for all the variables in the study.

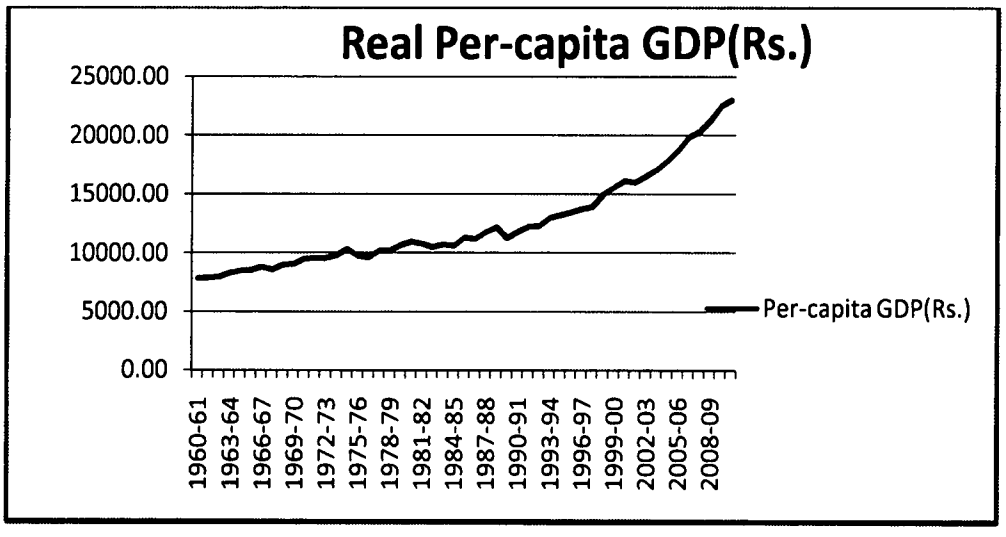
[23] Tertiary level data, segregated by gender, are unavailable for such a long period of time. Hence only three levels have been considered in the study.

education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education." Data for primary, secondary, and tertiary schooling levels are proxies for measures of education. Enrolment ratios are a useful measure of education, though they do have some limitations. Gross enrolment ratios are not limited by age requirements or repeaters, which has been criticized on the grounds of leading to overstatement and could exceed 100% at times. Primary, secondary and tertiary enrolment rates consist often number of individuals enrolled at each level, regardless of their age, as a percent of the Total population of appropriate age, at each level. In the current study log of GER are taken for analysis.

Economic growth: The first difference of log of Real Per capita GDP is used as a proxy for economic growth. The data for Per-capita GDP was taken from National Accounts Statistics (NAS) for the period 1960-2010.

Education Expenditure as a percentage of public expenditure: Education expenditure as a percentage of Total public expenditure is used as a series for testing the Granger causality with Per capita GDP. The data for education expenditure has been taken from MHRD (Ministry of Human Resource Development). In the current study, log of Education expenditure has been taken for analysis for the period 1960-2010.

Figure 3.1: Real Per capita GDP (at factor cost) (base year 2004-05)



Source: RBI, Handbook of statistics on Indian Economy, Macro economic aggregates, Part 1, Annual Series, National Income, Saving And Employment, Table2, Macroeconomic aggregates (at constant prices)

education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education." Data for primary, secondary, and tertiary schooling levels are proxies for measures of education. Enrolment ratios are a useful measure of education, though they do have some limitations. Gross enrolment ratios are not limited by age requirements or repeaters, which has been criticized on the grounds of leading to overstatement and could exceed 100% at times. Primary, secondary and tertiary enrolment rates consist often number of individuals enrolled at each level, regardless of their age, as a percent of the Total population of appropriate age, at each level. In the current study log of GER are taken for analysis.

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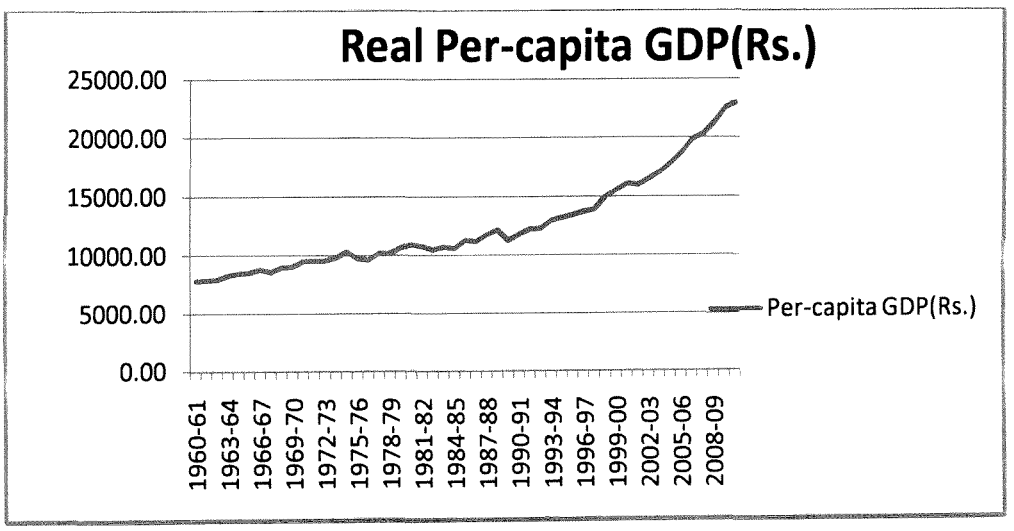
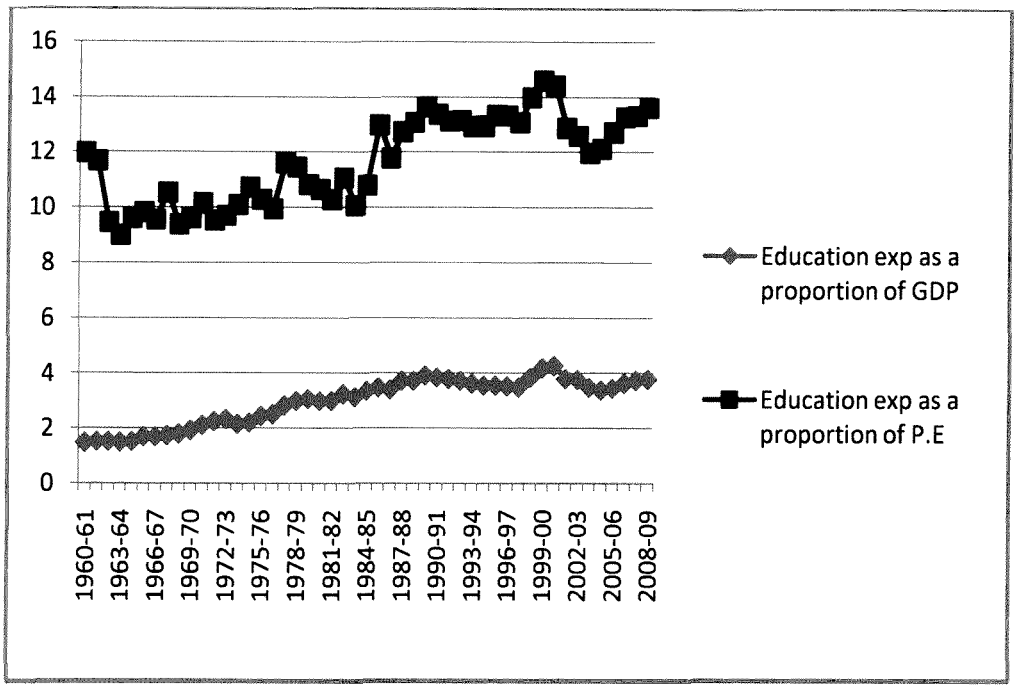
Education Expenditure as a percentage of public expenditure: Education expenditure as a percentage of Total public expenditure is used as a series for testing the Granger causality with Per capita GDP. The data for education expenditure has been taken from MHRD (Ministry of Human Resource Development). In the current study, log of Education expenditure has been taken for analysis for the period 1960-2010.

Figure 3.1: Real Per capita GDP (at factor cost) (base year 2004-05)



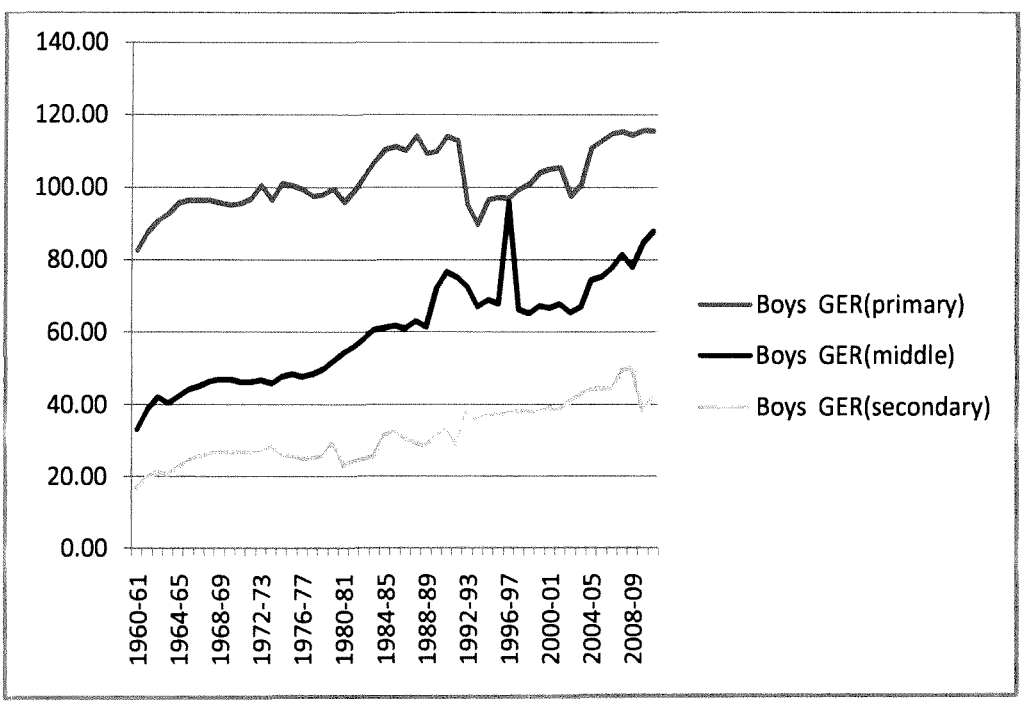
Source: RBI, Handbook of statistics on Indian Economy, Macro economic aggregates, Part 1, Annual Series, National Income, Saving And Employment, Table2, Macroeconomic aggregates (at constant prices)

Figure 3.2: Education expenditure as a percentage of Total public expenditure and Total GDP



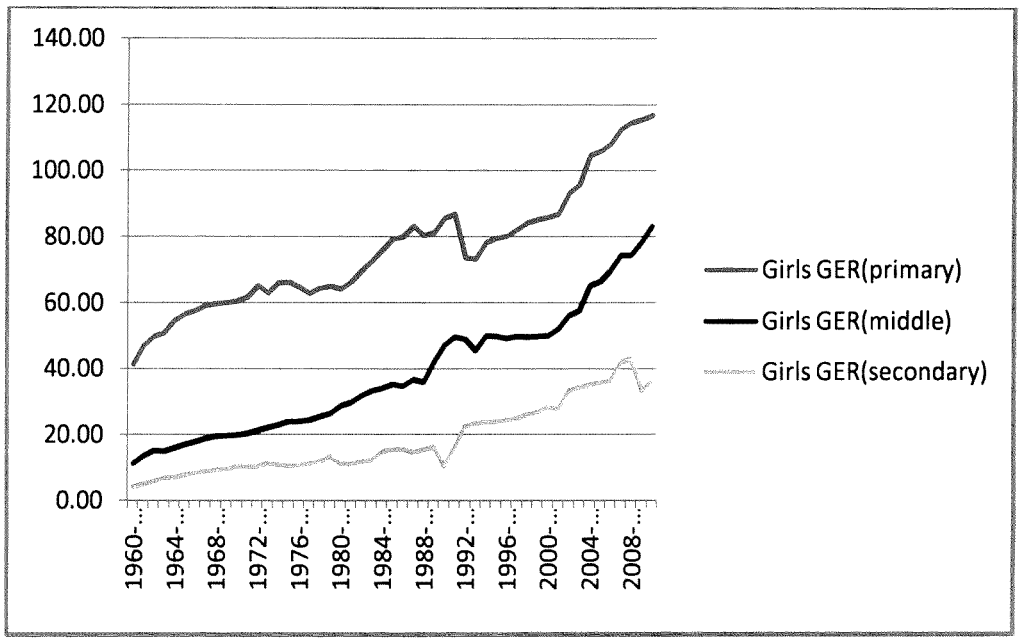
Source: Various issues of Analysis of budgeted expenditure on education, MHRD

Figure 3.3: Boys GER (%) at different education levels



Source: Various issues of Statistics on School Education, MHRD

Figure 3.4 Girls GER (%) at different education levels



Source: Various issues of statistics on school education, MHRD

Trends

It has been observed from the above three Figures (3.1 to 3.4) that per capita GDP has consistently risen (over the period under study 1960-2010). Education expenditure as a percentage of public expenditure rose only slightly over the period, from 11.99% (1960) to about 13.63% (2008-09). The gross enrolment ratios, however, have converged for male and female, more for primary level, followed by middle and least for secondary level of education.

According to Economic survey of India (2012-13), the current trends in GDP growth rate of the Indian economy was 8.6 % and 9.3% respectively for 2009-10 and for 2010-11. However with the change of policy rates due to inflationary pressures in the subsequent years, there was an adverse impact on investment and growth rate slowed down to 6.2% (2011-12) and 5% (2012-13). The reason for the moderation could be attributed to the slow growth of industry which grew at 3.5% and 3.1% respectively in 2011-12 and 2012-13. Service sector on the other hand grew at only 8.2% and 6.6% respectively, in same period. Even agriculture had lower growth rates followed by lower-than normal rainfall in initial phases of south-west monsoon season. The

reason for these low growth rates could be attributed again to the fiscal stimulus provided by the government following the crisis. which increased the average consumption to around 8% which inturn lead to inflationary pressures and use of tight monetary policy which inturn created investment bottlenecks.

3.5 Methodology

The Granger causality testing (for short- run causation) and The Johansen Co-integration test (for any evidence of long run relationship among the variables) has been used for all the variables in the study and if there is any such co-integration among the variables, a Vector Error Correction Model (VECM) is employed .

A time series analysis is conducted to understand firstly, the causal relationship between economic growth and education levels (segregated by gender), for the period 1960-2010 and secondly for education expenditure and economic growth for the period 1960-2008.

Formal technique to check non-stationarity is unit root test. In the current study, ADF test has been used. Having tested for unit root, next test is to analyse short run causality among the variables under the study. Ganger causality assumes the variables, are stationary. Secondly, the validity of the Granger causality results depends much upon the lag chosen; hence the appropriate lag is determined using the VAR lag selection criteria. The pair-wise Granger causality is tested for by rejecting the null hypothesis if p-value of the F-statistic is less than 5%. Once the Granger causality is checked for short run causality among the variables, if any, cointegration test is conducted to check for long-run relationship among the variables.

The co-integration test is conducted to check the long run (equilibrium) relationship among the variables. All the variables in the study must be integrated of the same order to perform the co-integration test. Through the trace statistic and Max-Eigen value statistic, the number of co-integration relation-ship, if any is revealed. The p-value of the respective statistic shows whether it is significant (if p-value is less than 5%) to reject the null hypothesis, alternatively, accept the null hypothesis if p-value of the respective statistic is more than 5%.

For the variables which have been found to be co-integrated, a VECM is employed to ascertain the direction of long-run and short-run[24] causality among the variables found to be co-integrated. The coefficient of the co integrated equation shows the long run causality (if the coefficient is significant and sign is negative). And finally diagnostic tests for the model is conducted wherein the serial correlation test (Breusch serial correlation) are conducted where null hypothesis of no serial correlation can be accepted if p-value less than 5%.

3.6 Econometric Analysis and Interpretation of Results

It is important to test for unit root using standard methods of checking the presence of non- stationarity, if any, hence the ADF test was used. It was observed that all the series under the study are non-stationary except Boys middle and secondary level GER, i.e., they were I (~0) (stationary). The order of integration has to be checked so as to know how many times it must be differenced so as to correct for non-stationarity. In the current study, the Augmented Dickey Fuller (ADF) test for checking unit root (non-stationarity) has been used for the same.

Table 3.2: Unit root test to check non-stationarity

Economic Growth (Real Per-capita GDP)		**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		1.19	-6.43
Test critical values:	1% level	-2.62	-2.62
	5% level	-1.95	-1.95
	10% level	-1.61	-1.61
Boys Primary level	**GER**	**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		-2.45	-6.1
Test critical values:	1% level	-3.57	-3.57

[24] For short run causation in the VECM, the Wald-test can be employed to check whether the independent variables in the model have any effect on the dependent by placing restrictions on the coefficients. However, since granger causality for all the variables (I~0) has already been tested for short run causality, there is no need for Wald test.

	5% level	-2.92	-2.92
	10% level	-2.6	-2.6
Boys middle level GER		**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		-4.38	stationary
Test critical values:	1% level	-4.15	"
	5% level	-3.5	"
	10% level	-3.18	"
Boys Secondary GER		**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		-4.4	stationary
Test critical values:	1% level	-4.15	
	5% level	-3.5	
	10% level	-3.18	
Girls middle level GER		**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		-1.47	-7.12
Test critical values:	1% level	-3.57	-3.57
	5% level	-2.92	-2.92
	10% level	-2.6	-2.6
Girls Secondary level GER		**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		-1.45	-6.5
Test critical values:	1% level	-3.57	-3.57
	5% level	-2.92	-2.92
	10% level	-2.6	-2.6
Education expenditure		**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		-4.08	-7.62
Test critical values:	1% level	-4.16	-4.17

	5% level	-3.51	-3.51
	10% level	-3.18	-3.18
Girls Primary GER		**t-stat(level)**	**t-stat(first diff)**
Augmented Dickey-Fuller test statistic		-1.57	-6.7
Test critical values:	1% level	-3.57	-3.57
	5% level	-2.92	-2.92
	10% level	-2.6	-2.6

The unit root test (as shown in table 3.2) conducted confirmed the presence of unit root[25] for the series of economic growth (proxied by first difference of log of per capita GDP), Boys primary level and all levels of female education. For these series, at level (original form of the series), the observed t – statistic is less than the tau test critical values (by ADF test) hence the null hypothesis that there is unit root is accepted. Further, when test are conducted at first difference, the null hypothesis can be rejected, as the observed t-statistic is greater than the critical values (at 1% or 5% or 10%) and hence the series have no unit root at their first differences. Series are integrated of order one which implies their first differences make the series stationary.

Next, the lag[26] is chosen using the VAR model for lag selection and lag was fixed at 2for all the three models in consideration. The Granger causality finds no evidence of short run causation among the variables except a uni-directional causality which shows economic growth causes male and female education(only at secondary level) as shown in Table 3.3.

[25] Unit root implies non-stationarity in the time series which needs to be differenced (according to the order of integration) to make it stationary.
[26] Refer Appendix Table (A.22)

Table 3.3: Pairwise Granger causality

Null Hypothesis	F-stat	Prob
Economic growth does not Granger Cause boys education at Secondary level	4.17	0.02*
Economic growth does not Granger Cause girls education at Secondary level.	4.96	0.01*

*Reject null hypothesis at 5% level significance.

Further, the Johansen Co-integration (as can be observed from table 3.4, 3.5 and 3.6) tests was performed and it was found that female GER (at all levels) and males (at primary level) and education expenditure, all these three variables have a long run relationship with economic growth. The trace Statistic and max-Eigen value statistic observed for these variables were greater than the critical values hence the null hypohthesis of "no cointegration" equation was rejected which implies atleast one cointegrating equation was present.

Table 3.4: Johansen cointegration test for education expenditure as a percentage of public expenditure and economic growth

Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	Prob.	Trace Statistic	0.05 Critical Value	Prob.
None	15.00	14.26	0.04*	16.71	15.50	0.03*
At most 1	1.85	3.84	0.17	1.85	3.84	0.17

*Reject null hypothesis at 5% level.

Table 3.5: Johansen cointegrated test for male GER (Primary level) and per capita GDP

Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	Prob.	Trace Statistic	0.05 Critical Value	Prob.
None	13.59	14.26	0.06**	16.17	15.49	0.04*
At most 1	2.58	3.84	0.11	2.58	3.84	0.11

** Reject null hypothesis at 10 % level of significance.
*Reject null hypothesis is at 5% leve of significance.

Table 3.6: Cointegration test of per capita GDP and all level of education of females

Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	Prob.	Trace Statistic	0.05 Critical Value	Prob.
None	30.06	27.58	0.02*	48.80	47.86	0.04*
At most 1	10.81	21.13	0.67	18.75	29.80	0.51
At most 2	7.51	14.26	0.43	7.94	15.49	0.47
At most 3	0.42	3.84	0.52	0.42	3.84	0.52

*Reject null hypothesis at 5% level significance.

A VECM model was set up for all the cointegrating equations, and to check the causality running from female secondary education, education expenditure and male education levels causing economic growth, each of the above three equation derived from the VECM is estimated and for all three models, the coefficient of the error term (C1) was found to be significant and negative for all the 3 models thus indicating a long run causal relationship with economic growth. Thus, implying the following:

1) **Male education at Primary level causes Economic growth in the long run:** VECM for this model was formulated as follows and its estimates are presented in Table 3.7 below:

D(DLPCY) = C(1)*(DLPCY(-1)0.097*LB P(-1) +0.43) + C(2)*D(DLPCY(-1)) + C(3)*D(LBP(-1)) + C(4) *D(DLPCY(-2)) + C(5)*D(LBP(-2)) + C(6)

Table 3.7: VECM for Male education and economic growth

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.08	0.31	-3.49	0*
C(2)	-0.12	0.24	-0.48	0.64
C(3)	-0.06	0.12	-0.5	0.62
C(4)	-0.15	0.15	-0.95	0.35
C(5)	-0.03	0.12	-0.27	0.79
C(6)	0	0.01	0.08	0.94
R-squared	0.61	Prob(F-stat)	0	
Adjusted R2	0.56	D-W stat	1.9	

*Significant at 5%

Breusch-Godfrey Serial Correlation LM Test for education expenditure and economic growth

F-statistic	0.10	Prob. F(2,37)	0.90
Obs*R-squared	0.24	Prob. Chi-Square(2)	0.88

2) Female education at all levels cause economic growth in the long run

D(DLPCY) = C(1)*(DLPCY(-1) + 0.016*LGP(-1) - 0.05*LGS(-1) + 0.03*LGM(-1) - 0.06) + C(2)*D(DLPCY(-1)) + C(3)*D(LGP(-1)) + C(4)*D(LGS(-1)) + C(5)*D(LGM(-1)) + C(6)*D(DLPCY(-2)) + C(7)*D(LGP(-2)) + C(8)*D(LGS(-2)) + C(9)*D(LGM(-2)) + C(10)

Table 3.8: VECM for Female education and economic growth

	Coefficient	Std. Error	t-Statistic	Prob
C(1)	-1.87	0.39	-4.77	0*
C(2)	0.48	0.3	1.6	0.12
C(3)	0.12	0.13	0.95	0.35
C(4)	0	0.14	0.03	0.98
C(5)	0	0.04	0.02	0.99
C(6)	0.15	0.18	0.85	0.41
C(7)	0.09	0.13	0.74	0.46
C(8)	0.08	0.14	0.58	0.56
C(9)	0.04	0.04	1.06	0.29
C(10)	-0.01	0.01	-1.43	0.16
R-squared	0.7	Prob(Fstat)	0	
Adjusted R2	0.63	D-W stat	2.12	

*Significant at 5% level

Table 3.8(a): Breusch-Godfrey Serial Correlation LM Test for education and economic growth

F-statistic	3.71	Prob. F(2,37)	0.034*
Obs*R-squared	8.21	Prob. Chi-Square(2)	0.02*

*Reject null hypothesis(No serial correlation) at 5% level

3) **Education expenditure as a proportion of Total public expenditure causes economic growth in the long run.**

D(DLPCY) = C(1)*(DLPCY(-1) - 0.05*LEDU(-1) + 0.11) + C(2)*D(DLPCY(-1)) + C(3)*D(LEDU(-1)) + + C(4) *D(DLPCY(-2)) + C(5)*D(LEDU(-2)) + C(6)

Table 3.9: VECM for Education expenditure and Economic Growth

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.3	0.33	-3.88	0*
C(2)	0.02	0.26	0.06	0.95
C(3)	-0.03	0.08	-0.37	0.71
C(4)	-0.06	0.16	-0.4	0.7
C(5)	-0.13	0.067	-1.93	0.06
C(6)	0	0	0.16	0.87
R-squared	0.66	Prob(F-stat)	0	
Adjusted R2	0.61	D-W stat	1.9	

*Significant at 5% level

Breusch-Godfrey Serial Correlation LM Test for education expenditure and economic growth			
F-statistic	2.36	Prob. F(2,37)	0.11
Obs*R-squared	5.10	Prob. Chi-Square(2)	0.08

C(1) in the above three models, refers to the coefficient of error term as derived in chapter[27] two. The result of VECM for education (both male and female) and economic growth is similar to results of Self and Grabowski (2004) that female education at all levels cause growth, however, in this study it happens only in long-run and also their study finds all its variables stationary unlike the current study where all the variables are not of the same order and uses the data period (1960-2010).

[27] Refer equation (2) under The Johansen Cointegration Test (chapter 1, section 1.5.3), the term $\alpha(\beta' Z_{t-1})$ shows that α is the coefficient of the error correction term $(\beta' Z_{t-1})$.

Further, the study of Sachs and Warner (1995) find a positive, but still insignificant impact of primary (Total GER, not segregated by gender) level education on growth. On the other hand, Barro and Lee (1997) in their study also conclude that primary and tertiary education have negative and insignificant impacts on growth. Results of VECM for education expenditure and economic growth are similar to results of Barro and Sala-i-Martin (1995) whose findings showed a strong positive impact of government education expenditure on economic growth. Recently, the study of Afzal et.al (2012) confirms bi-directional causality between education and economic growth, between economic growth and poverty and between poverty and education.

Breusch test for the residual of the above VECM model was performed where no serial correlation was found as the null hypothesis of "no serial correlation" was accepted as p–values were not significant (not less than 5%) to reject the null hypothesis for 2 models, namely relationship between economic growth and education expenditure and relationship between economic growth and male education (primary level). However, for VECM of girls education (at all levels) and economic growth, serial correlation among the error terms was found, which is not desirable.

3.7 Conclusion

The study shows that female education at all levels is found to cause Economic growth (proxied by per capita GDP) in the long run. On the other hand, male level education at only at primary level was found to cause economic growth. Lastly, Education expenditure was also found to cause Economic growth in the long-run.

It is specifically observed that female education at all levels causes economic growth (proxied by per capita GDP). Female education is a preferred policy strategy to promote development as observed by Summers (1994); Schultz (2002); Herz and Sperling (2004) as it has been observed that increase in female education improves human development outcomes such as child survival, health and schooling according to World Bank (2001), Schultz (2002); Strauss and Thomas (1995); King and Hill (1993); World Bank (2007). Hence, immediate attention towards promoting education of women is required.

Also, Granger causality showed a short run causality running from Economic growth to Secondary level of education for both the genders. Implying that education causes economic growth (as observed by the long run relationship) which inturn promotes education (although at post elementary level and only in short run) through productive epmloyment. Hence promotion of education especially among females is an immediate area of concern and also job availability corresponding to such level of education so that people may be encouraged to study although the benefit would be reaped in future.

Also there is an urgent need for increase in spending on education, which in-turn leads to an increase in the propensity for young people to undertake education and skill development and improve the Total factor productivity and thus contributing to growth.

Chapter 4

Analysis of Determinants of Poverty in India

Having analysed the determinants of probability of labour force participation of an individual and the contribution of education to economic growth, it is now to be analysed what are the determinants affecting the probability of a household being poor and specifically what is the role of education in this context.

4.1 Introduction

According to the World Bank (2000), "poverty is pronounced deprivation in well-being". The broadest approach to well-being (and poverty) is the one articulated by Amartya Sen (1987), who argues that well-being comes from a "capability" to function in society. Thus, poverty arises when people lack key capabilities, in the form of inadequate income or education, or poor health, or insecurity, or low self confidence, or a sense of powerlessness, or the absence of rights such as freedom of speech. Viewed in this way, poverty is a multi-dimensional phenomenon, and has no simple way out. Hence, according to Sen (1981, 1985), poverty needs to be tackled by providing opportunities, creating entitlements and building capabilities. In the current study, analysis of determinants of probability of a household of being in poverty has been analysed with regional categorisation into urban and rural. Also the impact of education and employment on poverty reduction has been analysed.

Organisation of the study

In Section 2 concepts and definitions have been explained. Section 3 explains the factors affecting the probability of a household to be in poverty. Section 4 explains the trends related to poverty ratios. Section 5 analyses the determinants of probability of a household being in poverty through logistic regression. Section 6 concludes the chapter.

4.2. Concepts and definitions

4.2.1 Household Monthly Per–capita Expenditure (MPCE): As stated in NSSO report, EUS, 66th round, Household consumer expenditure is measured as the "expenditure incurred by a household on domestic account during a specified period, called reference period. It also includes the imputed values of goods and services, which are not purchased but procured otherwise for consumption. In other words, it is the sum total of monetary values of all the items (i.e. goods and services) consumed by the household on domestic account during the reference period. The imputed rent of owner-occupied houses is excluded from consumption expenditure. Any expenditure incurred towards the productive enterprises of the households is also excluded from the household consumer expenditure.

The NSS concept of MPCE is defined first at the household level (household monthly consumer expenditure ÷ household size). This measure serves as the indicator of the household's level of living. One needs to assign a value that indicates level of living to each individual, or at least to each household, in a population in order to know the level of inequality in living standards of the population, or the proportion living in poverty. For studies of poverty and inequality within populations, however, average income or average expenditure is not enough". There are two ways of measuring household MPCE:

Uniform Reference Period MPCE: "Uniform Reference Period MPCE is the measure of MPCE obtained by the NSS consumer expenditure survey (CES) when household consumer expenditure on each item is recorded for a reference period of last 30 days (preceding the date of survey)" as stated in NSSO report, EUS, 66th round.

Mixed Reference Period MPCE: "Mixed Reference Period MPCE is the measure of MPCE obtained by the CES when household consumer expenditure on items of clothing and bedding, footwear, education, institutional medical care, and durable goods is recorded for a reference period of last 365 days, and expenditure on all other items is recorded with a reference period of last 30 days" as stated in NSSO report, EUS, 66th round.

Modified Mixed Reference Period MPCE: "Modified Mixed Reference Period MPCE is the measure of MPCE obtained by the CES when household consumer expenditure on edible oil, egg, fish and meat, vegetables, fruits, spices, beverages, refreshments, processed food, pan, tobacco and intoxicants is recorded for a reference period of "last 7 days", and for all other items, the reference periods used are the same as in case of Mixed Reference Period MPCE" as stated in NSSO report, EUS, 66th round.

4.2.2 Concepts of poverty

Dessallien (1999) explains the various concepts as follows:

1) **Absolute and Relative Poverty**

Absolute poverty refers to "subsistence below minimum, socially acceptable living conditions, usually established based on nutritional requirements and other essential goods". It refers to living below a set standard which is the same in all countries and which does not change over time. Relative poverty compares the lowest segments of a population with upper segments, usually measured in income quintiles or deciles. It refers to a standard which is defined in terms of the society in which an individual lives and which therefore differs between countries and over time.

2). Objective and Subjective perspectives

Poverty can be approached from objective or subjective perspectives. "The objective perspective (sometimes referred to as the welfare approach) involves normative judgements as to what constitutes poverty and what is required to move people out of their impoverished state. The subjective approach places a premium on people's preferences, on how much they value goods and services (hence the emphasis on individual utility). Although poverty and vulnerability are often related, they are not synonymous. Some groups may be at risk of becoming poor because of inherent vulnerabilities (i.e., different types of discrimination based on class, gender, ethnicity, or factors such as disability, region of residence and family con-figuration".

3) Physiological and Sociological deprivations

Several poverty concepts are derived from perceived causes of poverty. They can be divided into two types of deprivations: physiological and socio-logical. Physiological deprivation concept says that "people are poor because they lack income, food, clothing and shelter". Both the income and basic needs concepts of poverty stem from physiological deprivations (although some advocates of the basic needs concept set the parameters beyond physiological needs). Strategies to reduce poverty emerging from these approaches focus on increasing the income / consumption of the poor and their attainment of "satisfiers" of basic needs, such as health and education. The concepts of poverty emerging from the perspective of sociological deprivations are rooted in underlying structural inequities and inherent disadvantages. They are based on observations that even when resources are flowing into sectors dominated by the poor, the latter may not be able to take full advantage of them because of structural impediments.

These constraints hamper access by the poor to "external" assets, such as credit, land, infrastructure and common property (i.e., the natural environment), and "internal" assets, such as health, nutrition and education.

4) Human Capability concept

Human Capability concept of poverty focuses on expanding people's opportunities and spans both the physiological and sociological realms of deprivation. Accordingly, "poverty is not merely in the impoverished state in which the person actually lives, but also in the lack of real opportunity - due to social constraints as well as personal circumstances - to lead valuable and valued lives". Emphasis on empowering the poor, facilitating their participation in society and enabling them to move upward on the socioeconomic ladder, are central to the human capability approach to poverty reduction.

5) Poverty line

The poverty estimates published by the Planning Commission count the number of people who are living in households whose monthly per capita total expenditure is less than a poverty line for the sector and state in which they live. These poverty lines are updated over time using the Indian system of state by state price indexes, which are estimated separately for rural (the consumer price index for agricultural labourers,

CPIAL) and urban (the consumer price index for industrial workers, CPIIW) households. There is no predetermined All India poverty line, either for urban or rural. Instead, poverty counts are made for each state, within each sector, and added-up to get urban and rural totals. A poverty line such as this one that largely accounts for only calories and does not include the other basic needs of life is unacceptable. While defining poverty, all basic and fundamental human needs such as proper nutrition (and not just nutrition based on calories), drinking water, shelter, hygiene, clothing, education, etc, need to be accounted for.

The Tendulkar Committee for the first time recommended use of implicit prices derived from quantity and value data collected in household consumer expenditure surveys for computing and updating the poverty lines. Implicit price indices (Fisher Price Index) have been computed from the 66th Round NSS (2009-10) data on Household Consumer Expenditure Survey. Tendulkar Committee developed a methodology using implicit prices for estimating state wise poverty lines for the year 2004-05. Using these poverty lines and distribution of monthly per capita consumption expenditure based on mixed reference period (MRP), the Tendulkar Committee estimated poverty ratios for the year 2004-05.

(6) Poverty Measurement tools

Historically, the Indian statistical system led the world in the measurement of poverty. The sample surveys that were pioneered by Mahalanobis at the Indian Statistical Institute in Calcutta in the 1940s and 1950s are now known as the National Sample Survey Organization (NSSO), a part of government statistical system, whose household surveys are the basis for the regular publications on poverty by the Planning Commission. And because of the initiative started by Mahalanobis, today most countries have a recent household income or expenditure survey from which it is possible to make a direct assessment of the living standards of the population.

The **headcount index (HCI),** the proportion of the total population considered to be poor, is defined as the "fraction of the population whose standard of living (income or expenditure) is below the poverty line". It is quite useful in addressing overall changes in poverty. The weakness of this measure is that it only measures changes of income that cross the poverty line and ignores shifts below the poverty line. If a poor person becomes poorer, this is not reflected in the headcount index.

The **poverty gap index (PGI)** alleviates some of this problem by measuring the aggregate amount of poverty relative to the poverty line. The poverty gap represents the "transfer of income to the poor that would be necessary to eliminate poverty, assuming an absolute poverty line. The poverty gap index is simply the average poverty gap across the entire population".

The **Foster-Greer-Thorbecke** measure is sensitive to the problem of extreme poverty. It is defined as the square of the poverty gap, divided by the population. By using the square of the poverty gap, the FGT gives heavier weight than the PGI to the poverty of the very poor, because all income gaps are squared.

4.3. Factors affecting the probability of a household being poor

4.3.1 Household size

"The size of the sample household, i.e., the total number of persons normally residing together (i.e., under the same roof) and taking food from the same kitchen (including temporary stay-aways and excluding temporary visitors) will be recorded against this item" as stated in NSSO report, EUS, 66th round.

4.3.2 Household head gender

Whether or not women face a higher risk of poverty than men, is difficult to answer for two reasons. First, it is possible that female poverty is due to intra-household discrimination, which is hard to measure. Second, "female headed households and widows usually live in smaller households" as observed by Visaria (1980); Dreze and Srinivasan (1997). It has often been argued that, "women are a deprived and discriminated lot, with limited access to resources" as stated by World Bank (1991). Studies Barros et al. (1997); Buvinic and Gupta (1997) have shown that, both in developing and developed countries, female headed households (FHHs) have different socioeconomic and demographic characteristics as compared to the male headed households (MHHs). In the current study, Gender of the household head is taken as a categorical variable. Here male headed household is taken as reference category.

4.3.3 Literate status of household head

Whether the household head is literate or not, has been taken as a dummy variable.

4.3.4 Demographic variables

Age of the household head, Age of the household head (squared), Dependency ratio of the household is taken as a continuous variable.

4.3.5 Maximum **education level** of the household has been taken as a continuous variable.

4.3.6 Social group

Social group is an important factor determining the poverty levels of the household where "other caste is taken as the reference category" and each of the remaining social group namely SC, ST, and OBC is analysed for.

4.3.7 Household type

In rural areas, it is divided into self employed in agriculture, self employed in non-agriculture, agriculture labour, other labour and in urban areas, regular, casual, and self employed. In each of the sector "others" are taken as the reference category.

4.4 Trends

4.4.1 All India

As observed from the Table 4.1 poverty ratios in rural area has fallen considerably (approximately 10%) by both MRP and URP basis over the decade 1993-2004, similarly in urban areas it has fallen by around 7%. Further, the NSSO report for 2009-10, shows that the All-India HCR has declined by 7.3 percentage points from 37.2% in 2004-05 to 29.8% in 2009-10, with rural poverty declining by 8.0 percentage and urban poverty by 4.8 percentage points from 25.7% to 20.9% over the same period. Further, from Table 4.2, it is observed that 66^{th} round estimates (based on EUS) which are based on Tendulkar methodology (hence cannot be compared to other rounds) show 28% overall poverty. The other two rounds also show that rural poverty has reduced more than urban poverty.

Table 4.3 shows that the proportion of BPL population falls as the maximum level of education attainment in a household rises. Table 4.4 shows that BPL (as a proportion of total in each category) with female headed households is slightly less than BPL population with male headed households. Also, among households with no literate household head around 50% were below poverty line and only 30% were below poverty line among those households with a literate household head. BPL on the basis of household types (as shown in Table 4.5 and Table 4.6 below) shows that in rural areas, highest proportion of BPL population was among agriculture labour category and in urban areas BPL population was highest for casual workers. Further on the basis of social group categorisation (as shown in Table 4.7) highest proportion of BPL was found among the STs, followed by SCs.

Table 4.1: Poverty ratios on MRP and URP basis, CES.

	Rural		Urban		Percentage Poverty Reduction(50^{th}-61^{st})		
NSSO	**URP**	**MRP**	**URP**	**MRP**	**Rural**	**URP**	9
50th	37.3	31.6	32.4	27.9		**MRP**	9.8
55th	NA	27.1	NA	23.6	**Urban**	**URP**	6.7
61st	28.3	21.8	25.7	21.7		**MRP**	6.2

Source: Derived from Himanshu (2008)[28]

Table 4.2: Poverty Ratios (MRP)

NSSO Round	Rural	Urban
66	32.11	18.57
61	24.9	25
55	34	28.9

Source: computed from unit level data of NSSO, EUS (various rounds)

[28] Himanshu (2008) "Growth, Employment and Poverty Reduction: Post-Reform Indian Experience", Asia Research Centre, Working Paper. 23.

Table 4.3: Percentage of population below poverty line according to maximum level of education in the household

BPL	illiterate	primary	secondary	higher secondary	graduate and above
among each category of education	47.39	53.33	36.41	22.7	11.43

Source: computed from unit level data of NSSO, 66th round, EUS

Table 4.4: Percentage of population below poverty line according to gender and literacy status of the household head

BPL	not literate household hea	literate head
Among each category	49.5	27.04
BPL	**male headed**	**female headed**
Among each category	34.82	33.78

Source: computed from unit level data of NSSO, 66th round, EUS.

Table 4.5: BPL population among rural household type

BPL	sena	Al	ol	sea	others
Among each category	33.12	55.05	44.68	30.96	22.77

Source: computed from unit level data of NSSO, 66th round, EUS.

Table 4.6: BPL population among urban household type, 66th round, NSSO

BPL	Self employed	regular	casual	others
Among each category	25.88	14.97	55.35	15.34

Source: computed from unit level data of NSSO, 66th round, EUS.

Table 4.7: BPL population among different social groups, 66th round, NSSO

BPL	ST	SC	OBC	Others
Among each category	53.74	45.09	34.96	21.95

Source: computed from unit level data of NSSO, 66th round, EUS.

Statewise

Table 4.8, shows that in 66th round, Tamil Nadu, Orissa, M.P, U.P, Bihar had poverty ratio above the All India poverty ratio in rural areas whereas in urban areas the same states and West Bengal had poverty ratio higher than the All India poverty ratio. A higher variation in poverty ratios was observed for rural areas across 14 major states. These estimates are based on Tendulkar estimates. So it cannot be compared to other rounds. However, in 61st round[29], U.P, Bihar, Orissa, Maharashtra, Tamil Nadu had poverty ratios above the All India poverty ratio.

[29] Refer Appendix Table (A.23)

Table 4.8: Percentage of people below poverty line across states (66th round, NSSO) on MRP basis

State	Rural	Urban	Total
Kerala	11.98	12.06	12
Punjab	14.6	18.04	15.81
Haryana	18.55	23	19.88
Maharastra	29.51	7.9	20.51
Andhra Pradesh	22.69	17.67	21.28
Gujarat	26.63	17.66	23.22
Karnataka	26.14	19.53	23.83
Rajasthan	26.37	19.93	24.81
West Bengal	28.79	21.93	27.13
Tamil Nadu	34.89	31.72	34.25
Orissa	39.2	25.92	37.3
M.P	41.98	22.88	37.33
U.P	39.35	31.67	37.8
Bihar	55.32	39.35	53.7
All India	33.81	20.88	30.31
Mean	29.71	22.09	27.78
Stdev	11.66	8.17	11.06
c.v	0.39	0.37	0.4

Source: Computed from unit level data, CES, NSSO, 66th round

4.5 **Econometric Analysis**

Logistic regression is run for both urban and rural areas for a cross section of All India states, NSS 66th round, to analyse the factors affecting probability of household being in poverty. Hence, the dependent variable, i.e, probability of a household being in Poverty and the following results were obtained through the method of **Average Marginal Effect, AME**.

The logit model in the current study is of the form:

$$L = \ln\left[\frac{p}{1-p}\right] = \alpha + \sum \beta_i X_i + \sum \gamma_i D_i + \mu$$

Where, L is the dichotomous dependent variable representing log of odds. It shows the Pi=1 when an individual decides to participate in the labour force and Pi=0 shows no participation.

α is the intercept term.

X_i stands for continuous variables.

D_i dummy variables for binary variables

Where, lithh = binary variable, 1 if the household head is literate, zero otherwise

SC= binary variable, 1 if caste of the household is Scheduled Caste, zero otherwise.

ST= binary variable, 1 if caste of the household is a Scheduled tribe, zero otherwise.

Agh = Age of the household head, continuous variable

Aghl =. Square of age of household head, continuous variable

Femhhh= binary variable, 1 if the female headed household, zero otherwise.

levedu =Maximum level of education in the household, continuous variable

Dependency Ratio (Dep) = dependency ratio of the household, continuous variable

Household size (hh_sz) = household size, continuous variable

Sena = binary variable, 1 if the main source of income of the rural household is from Self- employment in non-agriculture, zero otherwise.

Sea = binary variable, 1 if the main source of income of the rural household is from Self employment in agriculture.

Al = binary variable, 1 if the main source of income of the rural household is from employment as agriculture labourers, zero otherwise.

Regular = binary variable, 1 if the main source of income of the urban household is from regular employment, zero otherwise.

Casual = binary variable, 1 if the main source of income of the urban household is from casual employment, zero otherwise.

Se = binary variable, 1 if the main source of income of the urban household is from Self employment, zero otherwise.

Land owned = Land owned (hectares), continuous variable for rural areas only.

Methodology

Logistic regression was run on 66^{th} round (NSSO) data on a cross-section of All India states to determine the factors affecting the probability of a household being in household in both rural and urban areas separately.

Table 4.9: Logistic regression on Determinants of Rural poverty

Table 4.9 (a): Correlation table

Variables	bpl	sc	st	obc	hh_size	sena	sea	al	ol	agr1	manuf1	tert	agh1	femhhh	lithhh_ne	agh_new	levedu_n	dep	land owne
bpl	1																		
sc	0.09	1.00																	
st	0.12	-0.19	1.00																
obc	-0.03	-0.46	-0.30	1.00															
hh_size	0.23	-0.04	-0.01	0.03	1.00														
sena	-0.05	-0.03	-0.09	0.05	0.02	1.00													
sea	-0.12	-0.20	0.04	0.04	0.17	-0.34	1.00												
al	0.19	0.15	0.06	-0.06	-0.13	-0.25	-0.43	1.00											
ol	0.05	0.13	-0.02	-0.03	-0.04	-0.18	-0.31	-0.23	1.00										
agr1	0.08	-0.06	0.12	-0.01	0.38	-0.32	0.40	0.19	-0.27	1.00									
manuf1	0.04	0.07	-0.02	0.00	0.10	0.14	-0.25	-0.15	0.42	-0.30	1.00								
tert	-0.09	-0.03	-0.07	0.02	0.12	0.42	-0.23	-0.21	-0.02	-0.29	-0.10	1.00							
agh1	-0.08	-0.08	-0.07	0.02	0.26	-0.03	0.14	-0.11	-0.08	0.21	0.02	0.09	1.00						
femhhh	-0.01	0.00	0.00	0.02	-0.13	-0.05	-0.06	0.02	-0.02	-0.07	-0.03	-0.02	0.06	1.00					
lithhh_new	-0.18	-0.10	-0.07	0.01	-0.05	0.09	0.05	-0.15	-0.05	-0.11	-0.05	0.11	-0.16	-0.19	1.00				
agh_new	-0.08	-0.08	-0.07	0.02	0.28	-0.03	0.14	-0.11	-0.08	0.23	0.03	0.09	0.99	0.06	-0.16	1.00			
levedu_new	-0.23	-0.12	-0.09	0.01	0.23	0.05	0.13	-0.22	-0.10	0.04	-0.03	0.22	0.19	-0.05	0.38	0.21	1.00		
dep	0.21	0.00	-0.01	0.03	0.22	0.00	0.01	-0.04	0.00	-0.11	-0.06	-0.08	0.04	0.03	-0.06	-0.01	-0.21	1.00	
land owned	-0.12	-0.15	0.03	0.02	0.22	-0.12	0.41	-0.20	-0.15	0.30	-0.12	-0.07	0.15	-0.06	0.06	0.15	0.17	-0.01	1.00

Table 4.9 (b): Model 1

No. of obs (sample)	**56176**	**Prob > chi2**	0	
Log pseudolikelihood	-3.89E+08	**Pseudo R2**	0.18	
Variables	**dy/dx**	**Std.Err**	**Z**	**p-value**
household size	0.06	0	7050.8	0
Sea	-0.03	0	-591.7	0
Sena	-0.03	0	-589.14	0
Al	0.13	0	2837.89	0
female household head	-0.01	0	-145.06	0
literate household head	-0.06	0	-1649.49	0
age of household head	0	0	-2524.54	0
max level of education in household	-0.08	0	-3858.55	0
Dep	0.22	0	2934.7	0
Sc	0.1	0	1931.11	0
St	0.19	0	3334.11	0
Obc	0.06	0	1337.2	0
land owned	0	0	-1902.29	0

Table 4.9 (c): Model 2

No. of obs (sample)	56176	Prob > chi2	0	
Log pseudolikelihood	-3.72E+08	Pseudo R2	0.20	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Sc	0.1	0	2066.76	0
St	0.19	0	3049.07	0
Obc	0.06	0	1250.98	0
land owned	0	0	-1667.02	0
household size	0.06	0	6396.21	0
Sea	-0.05	0	-1042.98	0
Al	0.1	0	2042.82	0
Sena	-0.05	0	-1023.53	0
female household head	0.01	0	207.29	0
literate household head	-0.06	0	-1640.13	0
age of household head	0	0	-2051.07	0
max level of education in household	-0.07	0	-3379.31	0
Dependency	0.22	0	2870.72	0
PONDICHERRY	-0.38	0	-213.51	0
TAMIL NADU	0.06	0	271.79	0
LASHWADWEEP	-0.2	0	-64.08	0
GOA	-0.07	0	-105.37	0
KARNATAKA	0.07	0	344.03	0
ANDHRA PRADESH	0.03	0	159.33	0
MAHARASHTRA	0.14	0	691.04	0
D and N HAVELI	0.19	0	186.09	0
DAMAN & DUI	0.04	0	32.44	0
GUJARAT	0	0	3.41	0
MADHYA PRADESH	0.16	0	776.04	0
CHATTISGARH	0.25	0	1137.34	0
ORISSA	0.12	0	607.17	0
JHARKHAND	0.15	0	688.25	0
WEST BENGAL	0.12	0	627.95	0
ASSAM	0.17	0	824.54	0
MEGHALAYA	-0.24	0	-568.85	0
TRIPURA	-0.1	0	-272.85	0
MIZORAM	0.01	0	11.81	0
MANIPUR	0.27	0	671.73	0
NAGALAND	0.03	0	60.53	0
ARUNACHAL PRADESH	0.14	0	260.46	0
SIKKIM	0.01	0	20.35	0
BIHAR	0.22	0	1141.45	0
U.P	0.09	0	458.72	0
RAJASTHAN	-0.02	0	-80.19	0
HARYANA	-0.04	0	-196.26	0
UTTARANCHAL	0.01	0	25.13	0

PUNJAB	-0.06	0	-279.57	0
HIMACHAL PRADESH	-0.05	0	-169.7	0

Table 4.9 (d): Model 3

No. of obs (sample)	56176	Prob > chi2	0	
Log pseudolikelihood	-4.05E+08	Pseudo R2	0.17	
variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Sea	-0.08	0.00	-1747.81	0.00
Al	0.13	0.00	2938.29	0.00
Sena	-0.03	0.00	-599.80	0.00
Dep	0.25	0.00	3276.78	0.00
Sc	0.06	0.00	1584.90	0.00
St	0.15	0.00	3024.72	0.00
Femhhh	-0.01	0.00	-110.71	0.00
lithhh_new	-0.07	0.00	-1833.96	0.00
levedu_new	-0.08	0.00	-4293.51	0.00
agh1	0.00	0.00	-2859.54	0.00
hh_size	0.06	0.00	6961.67	0.00

Table 4.10: Logistic regression on Determinants of Urban Poverty

Table 4.10(a): Correlation table

Variables	bpl	sc	st	obc	hh_size	cas	reg	se	agh1	femhhh	lithhh_ne	agh_new	levedu_n	dep	tert	manuf1
bpl	1.00															
sc	0.13	1.00														
st	0.04	-0.07	1.00													
obc	0.08	-0.33	-0.14	1.00												
hh_size	0.31	0.01	-0.02	0.03	1.00											
cas	0.28	0.14	0.04	0.08	0.01	1.00										
reg	-0.19	0.01	0.01	-0.09	-0.10	-0.32	1.00									
se	0.01	-0.10	-0.05	0.04	0.19	-0.34	-0.66	1.00								
agh1	-0.02	-0.06	-0.03	-0.03	0.30	-0.08	-0.06	0.07	1.00							
femhhh	0.01	0.01	0.02	0.00	-0.06	0.02	-0.02	-0.09	0.13	1.00						
lithhh_new	-0.30	-0.13	-0.03	-0.05	-0.15	-0.23	0.17	-0.02	-0.12	-0.20	1.00					
agh_new	-0.02	-0.05	-0.03	-0.03	0.32	-0.08	-0.06	0.08	0.99	0.12	-0.12	1.00				
levedu_new	-0.37	-0.16	-0.03	-0.12	0.02	-0.32	0.24	-0.03	0.20	-0.04	0.41	0.21	1.00			
dep	0.21	0.01	-0.01	0.03	0.21	0.06	-0.12	0.03	0.08	-0.02	-0.07	0.04	-0.22	1.00		
tert	-0.04	-0.01	-0.02	-0.06	0.33	-0.21	0.05	0.20	0.20	-0.03	0.03	0.22	0.17	-0.13	1.00	
manuf1	0.18	0.05	-0.01	0.05	0.23	0.22	-0.05	-0.04	0.01	-0.03	-0.17	0.02	-0.17	-0.05	-0.35	1.00

Table 4.10(b): Model 1

No. of obs (sample)	31576		Prob > chi2	0
Log pseudolikelihood	-1.15E+08		Pseudo R2	0.27
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
household size	0.05	0	4057.51	0
Casual	0.12	0	1030.07	0
Regular	-0.04	0	-335.95	0
Se	-0.01	0	-83.09	0
female household head	0.01	0	124.77	0
literate household head	-0.07	0	-1279.97	0
age of household head	0	0	-946.78	0
max level of education in household	-0.08	0	-3528.6	0
Dep	0.14	0	1341.69	0
Sc	0.09	0	1344.68	0
St	0.11	0	921.53	0
Obc	0.05	0	986.15	0

Table 4.10(c): Model 2

No. of obs (sample)	31576	Prob > chi2	0	
Log pseudolikelihood	-1.15E+08	Pseudo R2	0.27	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Casual	0.13	0.00	2273.06	0.00
Regular	-0.03	0.00	-609.89	0.00
Dependency	0.15	0.00	1436.78	0.00
SC	0.06	0.00	997.22	0.00
ST	0.08	0.00	699.00	0.00
Female household head	0.01	0.00	162.30	0.00
Literate household head	-0.08	0.00	-1310.03	0.00
Maximum level of education	-0.08	0.00	-3651.13	0.00
Square of age of household head	0.00	0.00	-1047.41	0.00
Household size	0.05	0.00	4284.36	0.00

Table 4.10(d): Model 3

No. of obs (sample)	31576	**Prob > chi2**		**0**
Log pseudolikelihood	-1.12E+08	Pseudo R2		**0.29**
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Sc	0.09	0	1430.81	0
St	0.11	0	823.71	0
Obc	0.06	0	1188.23	0
household size	0.04	0	3626.83	0
Se	0	0	12.75	0
Casual	0.14	0	1224.37	0
Regular	-0.02	0	-192.63	0
female household head	0.01	0	152.23	0
literate household head	-0.07	0	-1193.56	0
age of household head	0	0	-812.42	0
max level of education in household	-0.08	0	-3465.36	0
Dependency	0.14	0	1380.12	0
PONDICHERRY	-0.15	0	-227.01	0
TAMIL NADU	-0.05	0	-171.9	0
KERALA	-0.04	0	-110.22	0
LASHWADWEEP	-0.31	0	-97.21	0
GOA	-0.01	0	-13.67	0
KARNATAKA	0.04	0	119	0

ANDHRA PRADESH	0	0	14.49	0
MAHARASHTRA	0.06	0	209.56	0
D & N HAVELI	-0.08	0	-43.06	0
DAMAN & DUI	0.02	0	16.19	0
GUJARAT	-0.02	0	-72.02	0
MADHYA PRADESH	0.09	0	289.48	0
CHATTISGARH	0.07	0	196.48	0
ORISSA	0.04	0	136.54	0
JHARKHAND	0.06	0	200.66	0
WEST BENGAL	0.08	0	275.81	0
ASSAM	0.12	0	342.89	0
MEGHALAYA	0.01	0	22.76	0
TRIPURA	-0.07	0	-120.62	0
MIZORAM	-0.07	0	-102.4	0
MANIPUR	0.24	0	494.91	0
NAGALAND	0.09	0	135.69	0
ARUNACHAL	0.1	0	132.02	0
SIKKIM	-0.04	0	-19.7	0
BIHAR	0.07	0	241.54	0
U.P	0.07	0	244.4	0
RAJASTHAN	-0.04	0	-146.78	0
DELHI	-0.03	0	-104.63	0
HARYANA	0.01	0	21.54	0
UTTARANCHAL	0.08	0	214.37	0
CHANDIGARH	0.02	0	39.71	0
PUNJAB	0	0	15.27	0
HIMACHAL PRADESH	-0.02	0	-33.45	0

Without taking the states into consideration, a clear picture of the marginal effects cannot be obtained for all the variables as the poverty lines are state specific and region specific. Hence, both regressions, with and without states have been run.

Determinants of Rural poverty

From table (4.9), it can be observed that in rural areas, the probability of a household headed by female falling into poverty is 1 % less[30] likely than male headed household (reference category). This result is similar to the result of Ramprasad (2009) poverty measures based on the housing condition and the wealth indices also show that female-headed households are less poor than male-headed households whereas based

[30]Rural Female headed households are 1% more likely to be in poverty, when state effect is taken into consideration, as observed in model 2: Table 4.9(c).

on the standard of living index measure of poverty, female-headed households are marginally poorer than their male-headed counterparts .

However, as age[31] of the household head rises, the probability of the household being in poverty is less likely in the short run[32], but the marginal effects of this variable are very less (0.0002approx).

Higher the maximum level of education in the household, lower is the probability of a household in falling into poverty. Similarly, higher the household size, dependency ratio higher is the probability of a household of being in poverty. Further, household with a literate household head is 6% less likely of being in poverty as compared to a illiterate household head.

Among the different household type, the agriculture labour is 13 % more likely to fall into poverty than the reference category "others". However, the self employed in agriculture household and self-employed in non-agriculture is 3% less likely of being in poverty. Similar results were found in other studies. It was found that poverty incidence is highest among casual labour category, especially in agriculture as observed by World Bank (1998, 2002). In contrast, regular salaried employment can lead to lower poverty as observed by Rahman (2004).

Comparing the marginal effects of household belonging to social groups of SC and ST with respect to the reference category (Other caste), a ST person has higher probability (19% more likely than the reference) of falling into poverty followed by SCs (10% more likely to fall into poverty), when each of these categories are compared with the "other" caste.

With state effects the results remain more or less the same, but the sign of the variable female household head does change the explanatory power of the model also rises.

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[31] Square of the household head (agh1) is dealt with in a separate model 3: Table 4.9(d) (to avoid multicollinearity), inorder to check the long run effect of age. However, the marginal effect and the sign remain same as that of the variable age.

[32] In the long run, the effect of age(age squared) too is expected to show a negative relation implying that as age of the household head rises , probability for a household of being in poverty is less likely but by a very minute proportion.but because of high multicollinearity with age(short run), this variable was dropped.

Determinants of Urban Poverty

From Table 4.10, it can be observed that in urban areas, on the other hand, female headed household are more likely to fall into poverty by 1% as compared to male headed household unlike in rural areas. Demographic variables household size, dependency ratio, again has similar marginal effects like in rural areas, showing a positive relationship with probability of the household falling into poverty. Dependency ratio has a lesser (14%) impact on increasing the probability of household being in poverty compared to rural areas. Age[33] of the household has similar effect as in rural areas, i.e., as age of the household rises, the probability of household is less likely to fall in poverty but by a very minute proportion.

Self employed household is 1% less likely of being in poverty, followed by regular workers, who are 4% less likely of being in poverty and then the casual workers who are 12% more likely of being in poverty compared to the reference category ("others")

Like in rural areas, an urban household with a literate household-head is 7% less likely of being in poverty and higher the level of education in the household.

Unlike, in rural areas, the marginal effects of social group SC and ST does not have major difference between them. SC household are 9% more likely of being in poverty. STs are 11% more likely of being in poverty and OBC are 5% more likely of being in poverty as compared to the reference category (other caste).

The results of the current study are similar to several studies like Hakim, Razak and Ismail (2010) showed that social capital, human capital, physical capital, age and gender of the head of household, size of household also play significant role in poverty alleviation. With the development of economic institution and human capital, poverty could be diminished. Chaudhary (2009) concluded that alleviation of poverty is possible by lowering the household size and dependency ratio, improving education, increasing female labour participation. Further, Okojie (2002) has showed that poverty in female-headed households was greater than male-headed households,

[33] Square of the household head (agh1) is dealt with in a separate model 2: Table 4.10(c) (to avoid multicollinearity), inorder to check the long run effect of age. However, the marginal effect and the sign remain same as that of the variable age.

and with high level of education, the probability of households being poor was decreased.

4.6 Conclusion

The importance of both labour market and education is especially highlighted in the model. It has been concluded that higher the education attainment of any member of the household, greater are the chances of not falling into poverty Further, there is least likelihood of a household being in poverty was found among the self employed followed by regular workers, however, casual workers were found to be more likely of being in poverty. In rural areas on the other hand, agricultural labourers were found to be more likely to be in poverty compared to their counterparts. Therefore, efforts should be made to provide the kind of education that would help reduce unemployment (or raise the scope for employment) and provide more 'regular jobs'.

Also, the demographic variables especially a higher dependency ratio implies the need for working population to be more skilled and productive and more work opportunities to be provided for in order to sustain the dependent population through their better earning capacity and a better job. Higher dependency ratios and large household size implies a greater probability of a household being in poverty. Further, among the social groups, both SC and ST are more vulnerable to poverty compared to the other caste.

Having analysed the determinants of poverty reduction, the inter-linkages of poverty, growth and labour market has been analysed in the final chapter followed by conclusions and policy implications.

Chapter 5

Conclusion

Before summing up the previous chapters and drawing the final conclusion, it is necessary to critically analyse the interlinkages of Employment, Economic growth and Poverty.

5.1 Interlinkages of Poverty, Employment and Economic Growth

Employment with rising productivity is the critical link in the growth-employment-poverty nexus. Rising economic growth results in poverty reduction, when the productivity of poor workers increases, either in their current occupation, or in new jobs or opportunities for self-employment.

The World Development Report by World Bank (2013) define " Jobs" as what we earn, what we do, and even who we are and that claim jobs to be the drivers of development with the following three dimensions:

Living standards: Poverty falls as people work their way out of hardship, especially in countries where scope for redistribution is limited.

Productivity: Efficiency rises as they get better at what they do , when more productive jobs appear, and less productive ones disappear.

Social cohesion: when societies flourish as a result of job creation and bring together people from different cultural and social backgrounds and instil a sense of job opportunity.

Further, economic growth is typically thought of as the way to reduce poverty, however, its effectiveness in achieving this depends on the pattern of growth, essentially how particular sectors of the economy and workers benefit from growth. A high rate of economic growth, associated with a high degree of employment intensity, is a necessary condition for the reduction of poverty, but

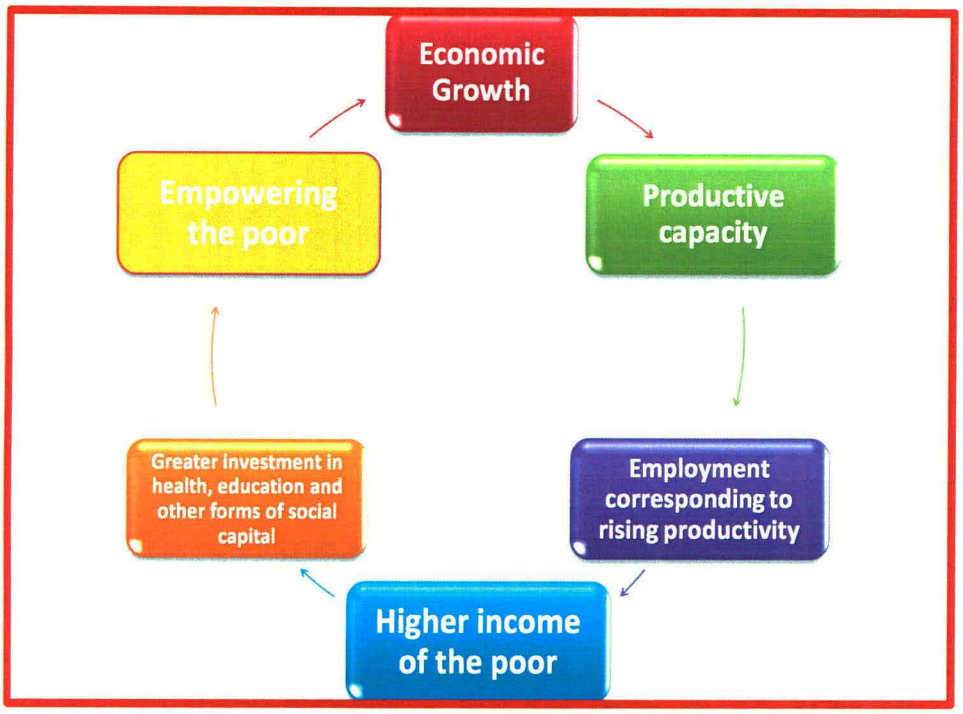
may not be sufficient. For poverty to be reduced, productivity and earnings must increase sufficiently to increase the incomes of the poor. The link between economic growth, employment and poverty reduction is thus a process in which output growth induces an increase in productive and remunerative employment, which, in turn, leads to an increase in the incomes of the poor and a reduction in poverty. The increase in incomes also finances investments in health and education that increase the productive capacity of the workforce, which improves sustainability. Success, however, will depend on the rate of economic growth, the output elasticity of demand for labour, and the ability of poor members of the labour force to respond to increasing demand for labour. One of the important strategies ensuring that growth is pro-poor is high employment-intensity of growth and a rise in productivity which also depend on institutions, policies, laws and practices that positively affect the functioning of labour markets. A well-functioning institutional environment can support the virtuous circle and, in the process, facilitate pro-poor growth. The most effective means of participating, contributing and benefiting is through decent and productive employment. Thus policies are needed to ensure that the pace and pattern of economic growth leads to employment opportunities, and that the poor are sufficiently empowered.

5.2 Explaining the Interlinkages

According to Islam (2004), there is an evident link between economic growth, employment and poverty reduction, which forms a virtuous circle, as Fig. 5.1 illustrates. The stronger the links in the virtuous circle, the more likely it is that growth will be pro-poor. Although the circle does not have a defined beginning or end, the sequence can be chosen to run from sustained rates of economic growth, leading to sustained increases in productive capacity and generate employment opportunities, for waged and self-employed workers, irrespective of their sex, religion, ethnic or social group, or political opinion. The author highlights the need to integrate unemployed or underemployed workers into higher productive activities, so that they may obtain higher incomes.

This income will allow families, businesses and society to invest in education and skill formation (for themselves or their children, thus for the future generation), as well as health, safety and other forms of social protection. These investments empower the poor, thereby creating the necessary conditions for further investment, consumption, higher productivity and growth in the second round, and the completion of the virtuous circle of pro-poor growth .

Fig 5.1: Virtuous circle of growth, employment and poverty reduction



Adaptation from Islam (2004)

5.3 Effect of sectoral growth (decomposed into productivity and employment profiles) on poverty

A similar exercise as followed by Gutierrez et al. (2007) has been shown in table (A.24) where percentage changes in poverty ratios, (ω=Y /E)output per worker , (e=E/A) share of the working age population that is employed ,(a=A/N) the share of the population that is of working age where Y is value added, E is employment, A is the population of working age and N is the total Population ,

calculated for 30 states over two rounds of NSS (61st and 66th) and the following equation was estimated.

$$\frac{Y}{N} = \left(\sum \frac{Y_i}{E_i} \frac{E_i}{A} \right) \frac{A}{N}$$

Equivalently,

$$y = \left(\sum \omega_i * e_i \right) * a$$

Here, growth (changes in value added per capita) is explained through growth in each of its components, that is, through changes in ω, e, and a; and changes in the vectors of sectoral labour productivities (ω1,ω2,...,ωs) and employment (e1, e2, ...,es). The methodology used here is called the Shapley Decomposition Approach.

Shapley Decomposition have the advantage of being additive. In other words, if percentage change in 'w', 'e', and 'a' are the marginal contribution of each component to the observed change in per capita value added, obtained through the Shapley decomposition, then change in growth can be described as addition of individual marginal contribution of components which together contribute to change in growth, denoted as follows:

$$\bar{\omega} + \bar{e} + \bar{a} = \frac{\Delta y}{y}.$$

Then, changes in poverty ratios due to changes in growth can be expressed in terms of the following equation:

$$\frac{\Delta P}{P} = \beta_0 + \sum_i \beta_i \bar{x}_i \quad \text{.....(1)}$$

Gutierrez et al. (2007) explain that "if movements out of non-employment and into employment reduce poverty then the coefficient of 'e' is expected to be significantly and negatively correlated with changes in headcount poverty 'P'. On the other hand, if the income of the poor rises because they change from low productivity jobs to high productivity jobs, or because their earnings are positively correlated with TFP or the capital/labour ratio, then the coefficient of

'w' should be significantly and negatively correlated with changes in poverty. If increases in the fraction of the working population reduce poverty, then the coefficient of 'a' should be significant and negative".

Table 5.1: Multivariate regression (OLS) on selected variables affecting poverty reduction

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-125.24	30.26	-4.14	0
INPROD	-0.05	0.03	-1.96	0.06**
TERPROD	-0.15	0.07	-2.12	0.05*
APROD	0	0.01	0.01	0.99
INEPWP	-0.15	0.03	-4.4	0.00*
AGEPWP	-1.46	0.33	-4.46	0.00*
TEREPWP	-0.25	0.12	-2.06	0.05*
WRKPOPSH	-1.26	0.61	-2.05	0.05*
R-squared	0.71	D-W stat		2.29
Adjusted R-squared	0.61	Prob(F-stat)		0

*Significant at 5% level

** Significant at 10% level

Table (5.1) shows estimated equation (1) using data for 30 states for 61st and 66th round of NSS. A multivariate OLS regression was run and the following results were found where dependent variable is percentage change in poverty and percentage changes in sectoral components of growth are treated as independent variables. The movements into employment in agriculture and industrial sector has a poverty reducing effect (with highly significant p-values) and productivity of labour in tertiary sector (at 5% level of significance) has shown to reduce poverty. Also, the share of working age population (indicating role of demographic factor) and movements into employment in tertiary sector (at 5% level of significance) play an important role in reducing poverty. Productivity of labour in industrial sector too contributes to poverty reduction (at 10% level of significance). However, the coefficient of productivity of labour in agriculture was found to be highly insignificant so as to further interpret results.

Therefore important conclusions arise. Firstly, labour intensity is important for reducing poverty, and it matters in which sector the intensity takes place.

Secondly, increasing productivity in manufacturing sector and primary sector, in which half of the population in India is still employed but due to low productivity still the problem of poverty persists. Thirdly, increasing employment opportunities in Tertiary sector is necessary.

According to Economic Survey of India (Government of India, 2012-13), "productive jobs are vital for growth. And a good job is the best form of inclusion. More than half our population depends on agriculture, but the experience of other countries suggests that the number of people dependent on agriculture will have to shrink if per capita incomes in agriculture are to go up substantially. While industry is creating jobs, too many such jobs are low-productivity non-contractual jobs in the unorganized sector, offering low incomes, little protection, and no benefits". Service jobs are relatively high productivity [as was also observed from Table (5.1)], but employment growth in services has been slow in recent years. However, it has been recognised that productive jobs in secondary sector has a poverty reducing effect, hence efforts should be made to improve the productivity. India's challenge is to create the conditions for faster growth of productive jobs outside of agriculture, especially in organized manufacturing and in services, even while improving productivity in agriculture.

Further, speaking about the demographic aspect, more working age people will mean more workers, especially in the productive age groups, more incomes, more savings, more capital per worker, and more growth. Also, according to Bailey (2006), since demographic change is associated with fertility declines, the transition period may be accompanied by greater female participation in the labour force. So the need of the hour is more productive jobs and skill development in which education plays a major role.

Further, analysis in Table (5.1) also point out the sources of growth as stated by Economic Survey of India (GOI, 2012): "It has been found that growth in per capita income is driven by growth in labour productivity (what the average worker produces), growth in working age population (fewer the people who are in the dependent age group in the population, greater the output), growth in the fraction of those who can work that actually look for work (labour force participation rate), and growth in those looking for work who actually find it (employment rate). However,

the increase in the share of working age population (WAP) seems to add only a little to growth because the increase in the fraction of people working is probably not the main consequence of the demographic dividend. Instead, the effects of the demographic dividend are channelled through the increase in labour productivity, which comes from more physical capital employed per worker (in turn resulting from greater saving and investment), more human capital per worker (which comes from more education as smaller families lead to greater spending on education per child), and greater total factor productivity (TFP)". Hence, skill development and education of the future workforce are important determinants of growth.

As claimed by Islam (2004) "the macro-level, the linkages between growth and poverty can be conceptualised in terms of the average productivity of the employed workforce, which gets reflected in the level of real wage or earning in self-employment. A low average productivity can be due to the deficiency in capital relative to labour and the use of outdated technology". Islam (2004) further explains the virtuous circle claiming that when high rates of economic growth lead to sustained enhancement in the productive capacity, there are possibilities of generation of employment opportunities with rising productivity. The higher employment will lead to a higher investment in health or education, which would enhance further productive capacity and finally economic growth. Thus, the relationship between poverty and unemployment could be a vicious one in the absence of growth.

5.4 Conclusion

All the chapters show the evident interdependencies between economic growth, employment and poverty reduction. From chapter 2, it has been observed that higher unemployment has been witnessed among the higher educated class due to specific job preferences. The study reveals that women workforce and labour force participation has declined in recent years especially for rural females. The rural-urban workforce participation gap has been declining but male-female participation gap has increased over the years (1993-2009). The highest fall in employment in rural areas was among the self employed in agriculture female workers whereas in urban areas lowest growth in employment was among the female casual workers during 1993-

2009 period. The state-wise trend shows that Bihar's labour force participation has remained perennially low. Also, that education–specific female labour force participation confirms the U-shaped hypothesis of female labour supply.

Further, it was observed that there are various social- cultural norms of India impacting female and male labour supply differently which propel their decision to participate in the labour market, especially for females. Marriage plays an intricate role for females and finds it as a barrier for entry to labour market. Further, households like agriculture labourers and self employed in agriculture have shown more likelihood of participating in labour force compared to their counterparts. Also, Child-woman ratio and number of infants in the household is found to restrict the entry.

Government needs to tap the potential of vulnerable categories like ST, SC, illiterates especially in rural areas and females in particular. Graduate and above levels of education have been observed to have a positive relation with probability of labour force participation for both male and female. Thus, promotion and development of higher education and subsequent skill building and the requisite income earning opportunities is the immediate need. However, the social attitudes towards women education and participation in labour market can be changed only with time and increase in status of women also seems to be a major perceptive factor to increase the labour force participation rate. Hence, a closer look towards social-cultural and economic factors pulling females away from work participation needs to be analysed.

The study in 3rd chapter shows that female education at all levels is found to cause Economic growth in the long run. On the other hand, male level education at only primary level causes economic growth in the long-run. Hence, immediate attention towards promoting education of women is required. Also, there is a short run causality running from Economic growth to Secondary level of education for both the genders, implying that on one hand, education causes economic growth and on the other hand, economic growth promotes education through productive employment. Hence, promotion of education and productive employment, especially among females, is an immediate area of concern.Thus, there is an urgent need for increase in spending on education, which in-turn leads to an increase in the propensity for young

people to undertake education and skill development and improve the total factor productivity and thus contributing to growth.

From the 4th chapter, it is observed that higher the attainment of education of any member of the household, greater are the chances of not falling into poverty. Further, there is least likelihood of a urban household being in poverty was found among the self employed followed by regular workers, however, casual workers were found to be most likely of being in poverty. In rural areas on the other hand, agricultural labourers were found to be more likely to be in poverty compared to their counterparts. Therefore, efforts should be made to provide the kind of education that would help reduce unemployment (or raise the scope for employment) and provide more 'regular jobs'. Further, higher dependency ratios and large household size implies a greater probability of a household being in poverty. Further, among the social groups, both SC and ST are more vulnerable to poverty compared to the other caste.

The final chapter shows the interlinkages of growth, employment and poverty through a decomposition of growth and its effect on poverty and it was revealed that productivity in tertiary sector and employment into agriculture and industrial sector contributes to poverty reduction. Growth is the critical link between poverty and unemployment to make it virtuous circle, however, to make it pro-poor, investment in education and other social capital is necessary and as already observed education plays an important role in promoting long-run economic growth. Hence, education acts as catalyst in sustaining the virtuous circle of economic growth, employment and poverty reduction. Hence, efforts towards improving the quality and availability of education and training for women and men is required which fuels the innovation, investment, technological change, enterprise development, economic diversification and competitiveness. Also, strengthening the gender perspective in developmental planning through sustained review, monitoring and evaluation is required. Improvement is not possible without more frequent and better quality gender-disaggregated data on employment, skill and education.

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APPENDIX

Table (A.1): Labour Force Participation rates across states (CWS)

State	Rural male	urban male	Total male	Rural female	Urban female	Total female	Total Rural	Total urban	Total
Andhra Pradesh	61.62	55.30	59.94	45.13	18.28	38.27	53.32	37.21	49.12
Bihar	51.48	46.48	50.86	14.22	6.94	13.37	33.82	28.50	33.18
Haryana	57.28	54.66	56.42	34.17	13.57	27.50	46.17	35.05	42.56
Gujarat	46.22	52.67	47.92	21.25	13.46	19.29	34.44	34.82	34.54
Karnataka	59.43	55.23	58.21	36.73	17.33	31.25	48.13	36.75	44.87
Kerala	55.76	58.41	56.42	22.67	21.92	22.49	38.45	39.71	38.76
M.P	55.59	48.99	54.02	32.19	13.27	27.85	44.36	32.24	41.52
Maharashtra	54.09	54.49	54.24	40.61	15.87	31.61	47.45	36.16	43.24
Orissa	55.94	53.92	55.67	22.58	13.65	21.49	39.36	34.95	38.80
Punjab	55.12	56.99	55.66	20.18	9.65	17.14	38.57	34.62	37.42
Rajasthan	53.07	49.56	52.26	38.81	14.42	33.30	46.22	32.98	43.19
Tamil Nadu	59.45	59.61	59.51	42.18	23.23	35.54	50.74	41.39	47.45
U. P	51.24	49.45	50.88	17.89	9.66	16.29	35.41	30.87	34.52
West Bengal	55.52	58.62	56.27	15.02	16.40	15.33	35.72	39.15	36.52

Source: Computed from NSSO, 50th round, EUS

Table (A.2): Labour force participation rate (CWS), across state by sex and sector

State	Rural Male	Urban Male	Total Male	Rural Female	Urban Female	Total Female	Total Rural	Total Urban	Total
A.P	60.05	53.19	58.02	42.93	17.08	35.45	51.55	35.52	46.86
Bihar	50.02	46.56	49.56	15.48	8.29	14.59	33.36	28.83	32.77
Gujarat	57.95	55.10	57.01	35.77	12.53	28.49	46.98	34.80	43.07
Haryana	47.90	52.38	49.14	17.43	11.53	15.83	33.57	33.41	33.53
Karnataka	59.86	56.30	58.86	35.23	17.99	30.55	47.59	37.61	44.84
Kerala	56.29	56.53	56.35	22.51	22.42	22.48	38.55	38.79	38.62
M.P	52.62	50.45	52.13	31.08	12.41	26.90	42.28	32.31	40.04
Maharashtra	53.36	55.88	54.35	38.67	14.01	29.36	46.19	36.08	42.30
Orissa	54.62	49.84	53.79	23.84	12.77	22.08	39.11	32.12	37.95
Punjab	54.12	56.23	54.81	27.52	10.52	22.26	41.30	35.29	39.37
Rajasthan	49.86	49.32	49.73	32.71	11.23	28.06	41.50	31.51	39.27
Tamil Nadu	59.83	58.13	59.22	38.85	21.55	32.77	49.40	40.25	46.15
U.P	47.52	50.68	48.17	16.74	8.71	15.15	32.58	30.91	32.24
West Bengal	54.68	61.02	56.07	14.00	12.50	13.68	34.72	37.65	35.36

Source: Computed from unit level data, NSSO, 55th round, EUS

Table (A.3): Labour force participation rate (CWS), across states by sex and sector.

State	Rural Male	Rural Female	Total Rural	Urban Male	Urban Female	Total Urban	Total Male	Total Female	Total
Karnataka	61.79	41.56	51.79	58.51	18.45	39.19	60.76	34.50	47.87
Andhra Pradesh	60.23	43.78	52.00	57.61	22.29	39.95	59.55	38.23	48.88
Tamil Nadu	59.98	44.64	52.20	60.69	24.92	42.93	60.26	37.09	48.61
Gujarat	59.22	39.44	49.66	58.85	14.89	38.21	59.10	31.43	45.85
West Bengal	58.01	15.88	37.25	62.58	16.47	40.55	59.18	16.02	38.08
Orissa	57.84	25.09	41.31	53.85	16.11	35.85	57.27	23.93	40.57
Kerala	56.78	28.55	41.97	56.04	26.04	40.82	56.60	27.97	41.70
Maharashtra	56.38	42.31	49.52	57.82	18.68	39.26	56.97	32.97	45.40
Punjab	56.37	33.30	45.34	58.88	15.34	38.34	57.18	27.63	43.11
M.P	53.57	28.88	41.79	53.58	13.44	34.38	53.57	25.28	40.07
Haryana	53.39	28.27	41.38	52.79	13.65	34.99	53.22	24.48	39.66
Rajasthan	50.82	34.45	42.77	51.83	16.51	34.61	51.06	30.24	40.85
U.P	48.60	19.89	34.58	53.80	11.06	33.51	49.65	18.18	34.37
Bihar	48.33	11.84	30.93	48.32	6.40	28.77	48.33	11.35	30.73

Source: Computed from unit level data of NSSO, 61st round, EUS

Table (A.4): Age-specific Labour force participation rates (CWS) across state, by sex and sector.

Table (A.4a): Upto 15 years

State	Rural Male	Urban Male	Total Male	Rural Female	Urban Female	Total Female	Total Rural	Total Urban	Total
Punjab	2.92	3.87	3.22	0.91	1.47	1.09	2.07	2.86	2.33
Haryana	1.38	2.70	1.76	0.68	0.51	0.62	1.07	1.66	1.25
Rajasthan	2.45	2.66	2.49	2.96	0.58	2.48	3.07	1.69	2.79
U.P	3.46	3.46	3.46	1.50	0.98	1.41	2.62	2.35	2.57
Bihar	2.29	0.93	2.15	0.46	0.23	0.44	1.44	0.69	1.37
West Bengal	5.65	1.81	4.89	1.71	1.20	1.61	4.04	1.62	3.56
Orissa	3.49	5.68	3.76	1.84	1.06	1.74	2.73	3.46	2.82
M.P	3.47	2.17	3.21	1.18	0.73	1.09	2.43	1.54	2.26
Gujarat	3.54	2.17	3.03	5.09	1.46	3.91	4.24	1.88	3.41
Maharashtra	1.89	1.64	1.79	1.55	0.29	1.07	1.73	1.02	1.46
Andhra Pradesh	2.76	1.26	2.33	3.10	0.58	2.37	2.96	1.05	2.41
Karnataka	2.88	1.30	2.36	3.21	0.16	2.19	3.23	0.92	2.46
Kerala	0.23	0.09	0.19	0.00	0.14	0.04	0.12	0.11	0.12
Tamil Nadu	0.40	0.42	0.41	1.16	0.03	0.67	0.78	0.24	0.54

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.4b): 16 to 59 Years

State	Rural Male	Urban Male	Total Male	Rural Female	Urban Female	Total Female	Total Rural	Total Urban	Total
Punjab	85.67	86.37	85.94	34.87	18.73	29.37	59.77	55.23	58.12
Haryana	82.08	83.58	82.57	33.58	20.35	29.56	59.16	55.3	57.95
Rajasthan	84.82	78.77	83.22	44.1	18.35	37.6	64.76	49.93	60.93
U.P	85.14	80.15	83.93	20.65	11.66	18.6	52.9	47.21	51.57
Bihar	85.63	77.84	84.74	9.26	8.08	9.13	48.42	45.05	48.04
West Bengal	90.42	87.21	89.61	21.09	20.32	20.89	57.08	54.47	56.41
Orissa	90.32	85.25	89.54	29.19	16.65	27.47	58.49	51.86	57.53
M.P	89.92	78.83	87.18	41.92	18.29	36.09	66.73	49.58	62.5
Gujarat	91.43	86.84	89.52	45.69	21.3	35.77	69.49	55.97	63.93
Maharashtra	84.91	84.22	84.59	52.09	23.21	39.65	68.71	55.89	62.99
Andhra Pradesh	86.99	81.95	85.47	58.86	26.36	49.54	72.8	54.91	67.53
Karnataka	91.2	83.52	88.21	49.15	25.82	40.78	69.83	56.11	64.69
Kerala	84.36	81.59	83.61	34.74	32.89	34.25	57.58	55.92	57.14
Tamil Nadu	86.81	85.67	86.28	54.74	28.11	43.05	70.02	56.75	64.06

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.4c): 60 years and above

State	Rural Male	Urban Male	Total Male	Rural Female	Urban Female	Total Female	Total Rural	Total Urban	Total
Punjab	50.35	36.88	46.41	17.24	5.45	13.59	34.27	20.97	30.27
Haryana	47.02	35.15	44.61	13.06	4.01	11.16	30.70	19.88	28.47
Rajasthan	64.88	29.41	56.79	20.76	4.95	16.56	42.86	15.98	36.21
U.P	69.85	43.39	65.26	13.19	7.25	12.05	43.62	25.59	40.34
Bihar	74.74	48.20	71.89	9.01	3.08	8.19	46.65	25.82	44.14
West Bengal	62.62	30.21	51.16	4.85	5.19	4.97	32.72	17.34	27.31
Orissa	56.03	30.75	53.36	8.80	5.32	8.36	34.24	17.67	32.32
M.P	67.77	32.15	58.64	24.24	10.15	19.87	47.91	20.64	40.21
Gujarat	61.74	31.30	49.88	15.54	2.41	10.43	35.78	15.06	27.71
Maharashtra	64.04	29.30	51.67	34.58	7.47	24.77	48.51	17.66	37.44
Andhra Pradesh	57.84	24.25	49.76	27.66	8.96	23.10	41.54	15.93	35.34
Karnataka	63.30	32.51	53.14	27.08	6.53	20.90	44.16	19.67	36.45
Kerala	50.38	39.04	47.63	14.08	6.70	12.18	31.19	21.36	28.73
Tamil Nadu	57.72	34.36	46.93	32.98	9.62	22.91	44.39	21.81	34.33

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.5): All India Labour force Participation rates, over time, Usual status

NSSO rounds	Rural Male	Urban Male	Male	Rural Female	Urban Female	Female	Total Rural	Total Urban	Total
50th(1993-94)	56.09	54.30	55.64	33.04	16.50	29.00	44.90	36.34	42.77
55th(1999-2000)	54.04	54.31	54.11	30.03	14.73	26.21	42.30	35.41	40.55
61st(2004-05)	55.51	57.03	55.90	33.30	17.82	29.43	44.62	38.25	43.00
66th(2009-2010)	55.60	55.87	55.68	26.49	14.61	23.30	41.45	36.22	40.02

Source: Computed from unit level data of NSSO (various rounds), EUS

Table (A.6): Distribution of populatin according to education specific-occupational preferences, genderwise

50th						66th					
MALE	illiterate	primary	secondary	higher secondary	Graduate	MALE	illiterate	primary	secondary	higher secondary	Graduate
legislators senoir officials managers	10.3%	19.7%	32.7%	9.9%	26.4%	legislators senoir officials managers	8.1%	15.5%	38.3%	12.3%	25.8%
professionals	2.7%	3.0%	18.0%	11.0%	64.9%	professionals	3.7%	8.6%	21.7%	10.4%	55.5%
technicians associate professionals	4.8%	7.5%	38.8%	22.5%	25.9%	technicians associate professionals	1.7%	4.4%	19.1%	15.7%	59.1%
clerks	1.3%	4.7%	33.7%	19.7%	40.3%	clerks	1.1%	2.3%	27.2%	19.0%	50.5%
service workers market sale workers	17.8%	28.9%	38.2%	7.9%	5.8%	service workers market sale workers	10.8%	20.8%	43.0%	13.9%	11.5%
skilled agriculture and fishery workers	49.3%	28.1%	18.1%	1.8%	1.4%	skilled agriculture and fishery workers	27.3%	26.4%	34.4%	7.7%	4.2%
craft and related trades workers	26.3%	32.3%	33.1%	4.9%	2.0%	craft and related trades workers	19.8%	30.4%	38.1%	5.3%	6.4%
plant and machine operators	20.7%	35.7%	36.1%	3.9%	2.0%	plant and machine operators	10.3%	22.8%	49.5%	8.6%	8.8%

elementary occupation	48.1%	30.8%	17.7%	1.5%	.6%	elementary occupation	37.2%	31.9%	26.8%	3.1%	1.0%
FEMALE	illiterate	primary	secondary	higher secondary	Graduate	FEMALE	illiterate	primary	secondary	higher secondary	Graduate
legislators senoir officials managers	44.9%	27.5%	14.3%	4.9%	7.4%	legislators senoir officials managers	33.6%	21.9%	28.1%	6.1%	10.2%
professionals	9.2%	3.9%	14.9%	8.8%	63.1%	professionals	8.2%	5.4%	11.4%	7.4%	67.6%
technicians associate professionals	4.0%	4.3%	45.4%	20.8%	25.2%	technicians associate professionals	2.6%	2.2%	20.7%	13.5%	61.0%
clerks	4.0%	.9%	23.9%	21.5%	49.7%	clerks	2.2%	1.9%	15.2%	21.4%	59.3%
service workers market sale workers	57.6%	25.0%	13.8%	1.4%	1.2%	service workers market sale workers	30.7%	23.6%	31.0%	6.4%	8.2%
skilled agriculture and fishery workers	73.3%	16.2%	8.7%	.6%	.3%	skilled agriculture and fishery workers	58.9%	21.8%	16.3%	2.2%	.8%
craft and related trades workers	56.0%	21.3%	18.8%	1.8%	.9%	craft and related trades workers	37.8%	32.3%	25.0%	3.4%	1.5%

plant and machine operators	52.3%	32.4%	13.3%	1.0%	.3%	plant and machine operators	34.0%	29.0%	30.7%	3.6%	2.7%
elementary occupation	80.4%	12.4%	6.0%	.1%	.1%	elementary occupation	64.0%	23.4%	11.7%	.7%	.2%
TOTAL	illiterate	primary	secondary	higher secondary	Graduate	TOTAL	illiterate	primary	secondary	higher secondary	Graduate
legislators senoir officials managers	16.3%	21.1%	29.5%	9.0%	23.1%	legislators senoir officials managers	11.6%	16.4%	36.9%	11.5%	23.7%
professionals	3.8%	3.1%	17.5%	10.6%	64.6%	professionals	4.6%	8.0%	19.7%	9.9%	57.8%
technicians associate professionals	4.5%	6.5%	40.8%	22.0%	25.7%	technicians associate professionals	2.0%	3.7%	19.6%	15.0%	59.7%
clerks	1.7%	4.1%	32.2%	19.9%	41.7%	clerks	1.3%	2.2%	25.3%	19.3%	51.9%
service workers market sale workers	24.2%	28.3%	34.3%	6.9%	5.1%	service workers market sale workers	13.7%	21.2%	41.3%	12.8%	11.0%
skilled agriculture and fishery workers	62.0%	21.8%	13.1%	1.2%	.8%	skilled agriculture and fishery workers	37.4%	24.9%	28.6%	5.9%	3.2%

craft and related trades workers	31.5%	30.4%	30.6%	4.3%	1.8%	craft and related trades workers	23.6%	30.8%	35.3%	4.9%	5.4%
plant and machine operators	26.8%	35.1%	31.7%	3.4%	1.6%	plant and machine operators	11.6%	23.1%	48.5%	8.3%	8.5%
elementary occupation	54.8%	27.0%	15.2%	1.2%	.5%	elementary occupation	45.2%	29.3%	22.4%	2.4%	.8%

Source: Computed from unit level data of 50th and 66th round, NSSO, EUS

Table (A.7): All- India Education-specific Labour force participation rates and Unemployment rates for the age group 15 years and above, 50th round

Rural Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	1.81	1.85	4.75	9.04	12.26
	lfpr	90.1	89.72	75.59	71.89	91.69
Urban Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.2	3.54	6.48	9.06	6.27
	lfpr	86.78	86.49	73.44	65.13	86.28
Total Male		Illiterate	Primary	Secondary	Higher secondary	Graduation and above
	ur	1.86	2.24	5.34	9.05	8.46
	lfpr	89.69	88.95	74.84	68.6	88.18
Rural Female		Illiterate	Primary	Secondary	Higher secondary	Graduation and above
	ur	2.25	2.33	8.37	24.16	31.98
	lfpr	44.79	34.87	24.6	26.74	49.35
Urban Female		Illiterate	Primary	Secondary	Higher secondary	Graduation and above
	ur	2.23	5.1	15.98	21.87	20.12
	lfpr	27.08	18.91	14.02	17.1	36.66
Total Female		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.25	2.87	10.85	22.87	22.68
	lfpr	42.17	29.95	19.76	20.29	38.81
Total Rural		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.01	1.94	5.2	10.45	14.17
	lfpr	61.72	69.55	60.17	62.03	84.57
Total Urban		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.21	3.78	7.58	10.78	8.81
	lfpr	46.77	55.66	49.33	47.27	69.12
Total		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.03	2.35	6.01	10.61	10.64
	lfpr	59.64	65.88	55.98	54.03	73.73

Source: Computed from unit level data of NSSO, 50th round, EUS

Table (A.8): All India Education- specific labour force participation rates and unemployment rates for age group 15 years and above, 55th round.

Rural Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.70	2.88	5.03	8.00	9.93
	lfpr	88.26	87.30	76.52	73.48	90.43
Urban Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.91	4.37	6.31	8.44	6.93
	lfpr	84.09	84.68	73.49	65.60	85.35
Total Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.73	3.21	5.45	8.19	8.04
	lfpr	87.71	86.70	75.50	69.83	87.16
Rural Female		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.75	2.71	7.66	17.38	32.07
	lfpr	44.47	34.70	25.31	21.99	42.33
Urban Female		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	1.72	3.59	11.42	18.32	16.78
	lfpr	25.07	16.54	12.86	14.27	31.44
Total Female		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.66	2.85	8.67	17.86	20.67
	lfpr	41.57	29.53	20.07	17.24	33.64
Total Rural		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.72	2.84	5.41	8.94	12.42
	lfpr	60.53	66.39	59.29	59.47	80.19
Total Urban		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.46	4.25	6.88	9.73	8.69
	lfpr	44.71	52.54	48.14	44.59	65.34
Total		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.69	3.14	5.88	9.29	10.00
	lfpr	58.27	62.91	55.17	51.81	69.89

Source: Computed from unit level data of NSSO, 55th round, EUS

Table (A.9): All India Education-specific unemployment and labour force participation rates of persons of age group 15 years and above, 61st round.

Rural Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.7	3.14	4.35	6.81	8.54
	lfpr	87.92	88.98	77.81	72.52	89.68
Urban Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.72	3.74	5.79	5.74	7.07
	lfpr	82.85	86.62	74.61	63.32	84.48
Total Male		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.71	3.28	4.8	6.37	7.66
	lfpr	87.27	88.45	76.78	68.36	86.48
Rural Female		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.63	2.98	7.65	20.48	28.86
	lfpr	47.5	39.48	31.24	27.62	49.84
Urban Female		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.41	4.53	12.25	18.22	19
	lfpr	28.4	22.44	14.84	14.57	36.87
Total Female		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.61	3.25	8.73	19.61	22.26
	lfpr	44.69	34.91	24.82	20.5	40.34
Total Rural		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.67	3.1	4.96	8.97	11.9
	lfpr	61.85	68.35	60.92	57.73	79.21
Total Urban		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.59	3.89	6.64	7.5	9.58
	lfpr	45.79	56.29	48.68	43	66.45
Total		Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
	ur	2.66	3.27	5.47	8.36	10.47
	lfpr	59.59	65.41	56.64	50.56	70.85

Source: Computed from unit level data of NSSO, 61st round, EUS

Table (A.10): All India Education-specific unemployment and labour force participation rates of persons of age group 15 years and above, 66th round.

Rural Male		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	2.1	2.64	3.37	4.58	8.27
	LFPR	86.74	89.99	75.04	64.03	82.94
Rural Female		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	1.98	2.52	5.04	18.43	26.72
	LFPR	37.33	34.03	24.26	19.92	38.47
Total Rural		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	2.05	2.61	3.64	6.49	11.31
	LFPR	54.53	64.41	55.94	49.01	69.68
Urban Male		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	2.16	2.63	3.07	4.91	4.96
	LFPR	81.57	85.32	72.52	59.83	81.56
Urban Female		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	1.77	2.52	9.06	13.44	13.51
	LFPR	22.19	20.06	12.74	10.33	30.29
Total Urban		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	2.02	2.61	3.79	5.95	6.62
	LFPR	41.23	52.86	46.26	37.7	61.32
Total Male		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	2.11	2.64	3.28	4.71	6.17
	LFPR	86	89.01	74.27	62.26	82.06
Total Female		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	1.96	2.52	5.97	16.58	17.75
	LFPR	34.93	30.71	20.07	14.81	32.5
Total		Illiteracy	Primary	Secondary	Higher Secondary	Graduation and above
	UR	2.04	2.61	3.68	6.28	8.3
	LFPR	52.49	61.84	52.76	43.76	64.08

Source: Computed from unit level data of NSSO, 61st round, EUS

Table (A.11): Logistic regression for Female labour force participation (above 15 years), 66th round, NSSO.

Table A.11 (a): Correlation Table

	cws_l	hh_sz	dep	cw	infant	lithhh	age	married_f	widowed	divorced	st	sc	bpl	p	s	hs	gr	agl	rural
cws_l	1.00																		
hh_sz	-0.08	1.00																	
dep	0.00	0.32	1.00																
cw	-0.04	0.19	0.44	1.00															
infant	-0.03	0.24	0.14	0.39	1.00														
lithhh	-0.11	-0.09	-0.07	-0.04	-0.04	1.00													
age	0.09	0.01	0.09	-0.03	-0.03	-0.02	1.00												
married_f	0.03	0.02	0.19	0.21	0.08	0.03	0.26	1.00											
widowed	0.09	-0.08	0.04	-0.01	-0.01	-0.07	0.39	-0.46	1.00										
divorced	0.06	-0.04	0.00	-0.02	-0.01	-0.03	0.02	-0.12	-0.02	1.00									
st	0.11	0.00	0.00	0.02	-0.01	-0.09	-0.01	0.00	0.01	0.00	1.00								
sc	0.03	-0.03	0.01	0.03	0.01	-0.12	-0.02	0.00	0.01	0.02	-0.15	1.00							
bpl	0.03	0.24	0.23	0.18	0.08	-0.23	-0.01	0.01	0.03	0.00	0.12	0.11	1.00						
p	0.02	-0.02	0.01	0.00	0.00	0.12	-0.03	0.06	-0.03	0.01	0.01	0.00	0.02	1.00					
s	-0.12	-0.01	-0.08	-0.07	-0.02	0.19	-0.27	-0.15	-0.11	-0.01	-0.05	-0.05	-0.12	-0.30	1.00				
hs	-0.09	-0.02	-0.09	-0.05	-0.01	0.13	-0.15	-0.13	-0.06	-0.01	-0.04	-0.06	-0.12	-0.14	-0.16	1.00			
gr	0.02	-0.06	-0.07	-0.04	-0.01	0.16	-0.05	-0.04	-0.05	0.00	-0.05	-0.07	-0.15	-0.14	-0.16	-0.07	1.00		
agl	0.05	0.03	0.08	-0.03	-0.02	-0.03	0.98	0.15	0.42	0.01	-0.02	-0.02	-0.01	-0.04	-0.24	-0.14	-0.07	1.00	
rural	0.14	0.06	0.11	0.07	0.01	-0.21	0.01	0.06	0.00	0.00	0.13	0.08	0.12	0.07	-0.09	-0.15	-0.26	0.01	1.00

Table A.11 (b): Model 1

No. of obs (sample)		152000		Prob > chi2		0
Log pseudolikelihood		-2.01E+08		Pseudo R2		0.004
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**	**[95%**	**Conf.Interval]**
Dependency	0.01	0.00	54.84	0.00	0.01	0.01
No. Of Infants in the household	-0.06	0.00	-564.68	0.00	-0.06	-0.06
Married	0.02	0.00	409.79	0.00	0.02	0.02
Divorced	0.34	0.00	1014.68	0.00	0.34	0.34
Primary	0.02	0.00	310.73	0.00	0.02	0.02
Graduation and above	0.04	0.00	351.32	0.00	0.04	0.04

Table A.11(c): Model 2

No. of obs (sample)	151365	Prob > chi2	0	
Log pseudolikelihood	-1.96E+08	Pseudo R2	0.03	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Age	0.00	0.00	326.07	0.00
SC	0.05	0.00	837.93	0.00
ST	0.17	0.00	2037.43	0.00
Bpl	0.01	0.00	163.83	0.00
Married	0.10	0.00	1149.27	0.00
Widowed	0.21	0.00	1607.19	0.00
Divorced	0.40	0.00	1193.24	0.00

Table A.11(d): Model 3

No. of obs (sample)	151898	Prob > chi2	0	
Log pseudolikelihood	-1.96E+08	Pseudo R2	0.03	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
agl	2.7E-05	2.2E-08	1.2E+03	0.0E+00
SC	6.2E-02	6.3E-05	9.9E+02	0.0E+00
ST	1.8E-01	8.2E-05	2.1E+03	0.0E+00
Married	9.2E-03	5.7E-05	1.6E+02	0.0E+00
Graduation and above	5.8E-02	1.0E-04	5.7E+02	0.0E+00

Table A.11 (e): Model 4

No. of obs (sample)	143773	Prob > chi2	0	
Log pseudolikelihood	-1.78E+08	Pseudo R2	0.06	
variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Higher Secondary	-0.17	0.00	-1418.69	0.00
secondary	-0.12	0.00	-1981.96	0.00
SC	0.03	0.00	397.85	0.00
ST	0.12	0.00	1498.10	0.00
Rural	0.12	0.00	1968.91	0.00
Divorced	0.31	0.00	908.69	0.00
widowed	0.09	0.00	1009.22	0.00
household size	-0.02	0.00	-1331.15	0.00
Child-woman ratio	-0.04	0.00	-765.90	0.00
Dependency	0.04	0.00	323.62	0.00

Table A.11 (f): Model 5

No. of obs (sample)	143773	Prob > chi2	0	
Log pseudolikelihood	-1.67E+08	Pseudo R2	0.12	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Higher secondary	-0.19	0.00	-1626.72	0.00
Secondary	-0.14	0.00	-2443.60	0.00
SC	0.03	0.00	562.27	0.00
ST	0.10	0.00	1161.13	0.00
Rural	0.15	0.00	2495.98	0.00
Divorced	0.24	0.00	713.48	0.00
Widowed	0.07	0.00	716.91	0.00
household size	-0.01	0.00	-901.75	0.00
Child-woman ratio	-0.03	0.00	-667.43	0.00
Dependency	0.08	0.00	612.94	0.00
A & N ISLANDS	0.04	0.00	33.79	0.00
PONDICHERRY	0.08	0.00	103.20	0.00
TAMIL NADU	0.09	0.00	348.19	0.00
KERALA	0.04	0.00	126.69	0.00
LASHWADWEEP	-0.01	0.00	-2.03	0.04
GOA	-0.15	0.00	-202.87	0.00
KARNATAKA	0.07	0.00	241.72	0.00
ANDHRA PRADESH	0.10	0.00	374.95	0.00
MAHARASHTRA	0.07	0.00	273.91	0.00
D & N HAVELI	-0.45	0.00	-156.25	0.00
DAMAN & DUI	-0.10	0.00	-49.35	0.00
GUJARAT	0.03	0.00	94.41	0.00
M.P	-0.02	0.00	-59.50	0.00
CHATTISGARH	0.05	0.00	170.58	0.00
ORISSA	-0.11	0.00	-373.79	0.00
JHARKHAND	-0.17	0.00	-547.71	0.00
WEST BENGAL	-0.15	0.00	-569.01	0.00
ASSAM	-0.14	0.00	-478.45	0.00
MEGHALAYA	0.05	0.00	103.48	0.00
TRIPURA	-0.13	0.00	-250.76	0.00
MIZORAM	0.11	0.00	124.13	0.00
MANIPUR	-0.04	0.00	-64.95	0.00
NAGALAND	-0.01	0.00	-9.92	0.00
ARUNACHAL PRADESH	-0.01	0.00	-6.73	0.00
SIKKIM	0.03	0.00	30.02	0.00
BIHAR	-0.34	0.00	-1172.04	0.00
U.P	-0.16	0.00	-600.18	0.00
RAJASTHAN	0.00	0.00	12.77	0.00
DELHI	-0.17	0.00	-406.66	0.00
HARYANA	-0.02	0.00	-77.51	0.00
UTTARANCHAL	0.09	0.00	259.14	0.00
CHANDIGARH	-0.03	0.00	-30.38	0.00
PUNJAB	-0.02	0.00	-65.76	0.00
HIMACHAL PRADESH	0.19	0.00	509.87	0.00

Table (A.12): Logistic regression for Rural Female Labour Force Participation, 66th round, NSSO

Table A.12 (a): Correlation Table

Variables	cws_l	sena	sea	al	ol	hh_sz	dep	cw	infant	lithhh	age	married_r	widowed	divorced	st	sc	bpl	p	s	hs	gr	agl
cws_l	1.00																					
sena	-0.08	1.00																				
sea	0.01	-0.33	1.00																			
al	0.14	-0.25	-0.42	1.00																		
ol	-0.03	-0.18	-0.31	-0.23	1.00																	
hh_sz	-0.09	0.01	0.18	-0.14	-0.05	1.00																
dep	-0.01	0.01	0.04	-0.05	0.01	0.33	1.00															
cw	-0.04	-0.01	0.00	0.00	0.02	0.19	0.43	1.00														
infant	-0.03	0.00	0.04	-0.04	0.00	0.23	0.14	0.39	1.00													
lithhh	-0.08	0.10	0.05	-0.16	-0.05	-0.06	-0.04	-0.02	-0.03	1.00												
age	0.10	-0.01	0.03	-0.02	-0.03	0.00	0.08	-0.03	-0.03	-0.02	1.00											
married_r	0.04	0.01	0.03	-0.02	0.01	0.02	0.16	0.20	0.08	0.04	0.24	1.00										
widowed	0.08	-0.01	-0.04	0.05	0.00	-0.09	0.04	-0.01	-0.02	-0.07	0.38	-0.48	1.00									
divorced	0.06	0.00	-0.03	0.03	0.01	-0.05	0.00	-0.02	-0.01	-0.02	0.01	-0.12	-0.02	1.00								
st	0.10	-0.09	0.04	0.06	-0.02	-0.01	-0.01	0.02	-0.01	-0.08	-0.02	-0.01	0.01	0.00	1.00							
sc	0.01	-0.03	-0.19	0.15	0.13	-0.04	0.00	0.02	0.01	-0.10	-0.03	0.00	0.01	0.02	-0.18	1.00						
bpl	0.01	-0.06	-0.10	0.19	0.04	0.22	0.23	0.18	0.07	-0.18	-0.01	0.00	0.02	0.00	0.12	0.10	1.00					
p	0.01	0.02	-0.01	0.02	0.00	-0.04	-0.02	-0.01	-0.01	0.17	-0.07	0.05	-0.06	0.01	0.00	-0.02	-0.01	1.00				
s	-0.11	0.04	0.03	-0.09	-0.02	0.00	-0.08	-0.07	-0.02	0.19	-0.31	-0.18	-0.11	-0.01	-0.05	-0.05	-0.13	-0.30	1.00			
hs	-0.07	0.02	0.03	-0.08	-0.04	0.01	-0.07	-0.04	0.00	0.10	-0.15	-0.12	-0.06	-0.01	-0.03	-0.05	-0.10	-0.12	-0.12	1.00		
gr	0.02	0.01	-0.01	-0.08	-0.03	-0.01	-0.04	-0.02	0.00	0.10	-0.07	-0.05	-0.04	0.00	-0.03	-0.04	-0.09	-0.09	-0.09	-0.04	1.00	
agl	0.07	-0.01	0.04	-0.02	-0.03	0.03	0.07	-0.03	-0.02	-0.03	0.98	0.13	0.42	0.01	-0.02	-0.03	-0.01	-0.08	-0.28	-0.14	-0.08	1.00

Table A.12 (b): Model 1

No. of obs (sample)	91575	Prob > chi2	0	
Log pseudolikelihood	-1.46E+08	Pseudo R2	0.04	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Dependency	-0.03	0.00	-207.02	0.00
household size	-0.02	0.00	-1188.70	0.00
Sc	0.02	0.00	221.56	0.00
St	0.14	0.00	1497.05	0.00
Primary	0.02	0.00	302.49	0.00
Literate household head	-0.07	0.00	-1145.52	0.00
Married	0.14	0.00	1539.37	0.00
Divorced	0.42	0.00	989.26	0.00
Widowed	0.23	0.00	1813.97	0.00

Table A.12 (c): Model 2

No.of obs (sample)	91025	Prob>chi2	0	
Log pseudolikelihood	-1.34E+08	Pseudo R2	0.11	
variables	**dy/dx**	**Std.Err**	**z**	**P>z**
household size	-0.01	0.00	-794.20	0.00
bpl	0.04	0.00	595.51	0.00
Graduate and above	0.09	0.00	460.02	0.00
SC	0.03	0.00	359.38	0.00
ST	0.10	0.00	1050.78	0.00
widowed	0.21	0.00	1686.43	0.00
divorced	0.35	0.00	818.80	0.00
married	0.15	0.00	1718.14	0.00
Literate household head	-0.07	0.00	-1171.84	0.00
A & N ISLANDS	-0.02	0.00	-14.18	0.00
PONDICHERRY	0.08	0.00	66.76	0.00
TAMIL NADU	0.12	0.00	372.93	0.00
KERALA	-0.02	0.00	-56.74	0.00
LASHWADWEEP	-0.10	0.00	-21.93	0.00
GOA	-0.18	0.00	-199.36	0.00
KARNATAKA	0.06	0.00	200.90	0.00
ANDHRA PRADESH	0.12	0.00	392.04	0.00
MAHARASHTRA	0.10	0.00	330.75	0.00
D & N HAVELI	-0.47	0.00	-142.86	0.00
DAMAN & DUI	-0.13	0.00	-55.03	0.00
GUJARAT	0.04	0.00	110.85	0.00
M.P	0.00	0.00	-3.32	0.00
CHATTISGARH	0.06	0.00	177.12	0.00
ORISSA	-0.11	0.00	-334.85	0.00
JHARKHAND	-0.19	0.00	-536.95	0.00
WEST BENGAL	-0.20	0.00	-619.96	0.00
ASSAM	-0.15	0.00	-438.26	0.00
MEGHALAYA	0.08	0.00	144.71	0.00
TRIPURA	-0.14	0.00	-254.15	0.00
MIZORAM	0.09	0.00	74.21	0.00
MANIPUR	-0.09	0.00	-132.75	0.00
NAGALAND	0.02	0.00	21.49	0.00
ARUNACHAL PRADESH	-0.01	0.00	-6.59	0.00
SIKKIM	0.07	0.00	61.89	0.00
BIHAR	-0.37	0.00	-1115.79	0.00
U.P	-0.17	0.00	-544.77	0.00
RAJASTHAN	0.03	0.00	84.88	0.00
DELHI	-0.45	0.00	-263.10	0.00
HARYANA	-0.03	0.00	-96.54	0.00
UTTARANCHAL	0.13	0.00	335.42	0.00
CHANDIGARH	-0.09	0.00	-45.75	0.00
PUNJAB	-0.02	0.00	-63.33	0.00
HIMACHAL PRADESH	0.20	0.00	491.08	0.00

Table A.12 (d): Model 3

No.of obs (sample)	91575	Prob>chi2	0	
Log pseudolikelihood	-1.45E+08	Pseudo R2	0.04	
Variables	**dy/dx**	**Std.Err**	**Z**	**P>z**
Dependency	-0.03	0.00	-212.00	0.00
household size	-0.02	0.00	-1152.44	0.00
SC	0.02	0.00	222.98	0.00
ST	0.14	0.00	1489.51	0.00
Graduation and above	0.11	0.00	574.04	0.00
Married	0.15	0.00	1603.48	0.00
Divorced	0.43	0.00	1001.01	0.00
Widowed	0.24	0.00	1853.43	0.00
Literate household head	-0.07	0.00	-1138.19	0.00

Table A.12 (e): Model 4

No. of obs (sample)	86791	Prob > chi2	0	
Log pseudolikelihood	-1.35E+08	Pseudo R2	0.05	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Child-woman ratio	-0.04	0.00	-666.67	0.00
household size	-0.01	0.00	-874.50	0.00
SC	0.00	0.00	-3.17	0.00
ST	0.13	0.00	1333.38	0.00
Graduation and above	0.10	0.00	516.05	0.00
Higher secondary	-0.09	0.00	-518.28	0.00
Secondary	-0.07	0.00	-713.66	0.00
age	0.00	0.00	241.32	0.00
al	0.11	0.00	1506.74	0.00
ol	-0.01	0.00	-89.79	0.00
married	0.11	0.00	977.53	0.00
widowed	0.17	0.00	971.94	0.00
divorced	0.41	0.00	896.51	0.00
Literate household head	-0.04	0.00	-504.33	0.00

Table A.12 (f): Model 5

No. Of obs (sample)	86791	Prob>chi2	0	
Log pseudolikelihood	-1.35E+08	Pseudo R2	0.05	
variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Child-woman ratio	-0.04	0.00	-649.59	0.00
household size	-0.02	0.00	-1060.93	0.00
SC	0.02	0.00	207.78	0.00
ST	0.13	0.00	1363.14	0.00
Graduation and above	0.08	0.00	404.13	0.00
Higher Secondary	-0.11	0.00	-619.45	0.00
Secondary	-0.08	0.00	-819.90	0.00
age	0.00	0.00	138.41	0.00
sea	0.02	0.00	239.12	0.00
sena	-0.08	0.00	-818.07	0.00
married	0.11	0.00	978.41	0.00
widowed	0.18	0.00	1023.63	0.00
divorced	0.42	0.00	923.61	0.00
Literate household head	-0.04	0.00	-618.29	0.00

Table A.12 (g): Model 6

No. of obs (sample)	86791	Prob > chi2	0	
Log pseudolikelihood	-1.24E+08	Pseudo R2	0.12	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Child-woman ratio	-0.03	0.00	-592.13	0.00
household size	-0.01	0.00	-731.71	0.00
SC	0.03	0.00	402.09	0.00
ST	0.09	0.00	966.51	0.00
Higher Secondary	-0.18	0.00	-1050.40	0.00
Secondary	-0.14	0.00	-1493.50	0.00
Age	0.00	0.00	-295.56	0.00
Sea	0.04	0.00	544.58	0.00
Sena	-0.04	0.00	-446.66	0.00
Married	0.11	0.00	1010.34	0.00
Widowed	0.16	0.00	936.85	0.00
Divorced	0.34	0.00	755.77	0.00
Literate household head	-0.04	0.00	-544.38	0.00
PONDICHERRY	-0.02	0.00	-19.57	0.00
KERALA	-0.08	0.00	-453.15	0.00
LASHWADWEEP	-0.16	0.00	-35.96	0.00
GOA	-0.26	0.00	-308.14	0.00
KARNATAKA	-0.04	0.00	-232.05	0.00
ANDHRA PRADESH	0.01	0.00	85.02	0.00
MAHARASHTRA	-0.01	0.00	-62.21	0.00
D & N HAVELI	-0.59	0.00	-180.52	0.00
DAMAN & DUI	-0.19	0.00	-78.73	0.00
GUJARAT	-0.08	0.00	-461.13	0.00
M.P	-0.13	0.00	-837.60	0.00
CHATTISGARH	-0.04	0.00	-195.97	0.00
ORISSA	-0.22	0.00	-1250.12	0.00
JHARKHAND	-0.31	0.00	-1385.13	0.00
WEST BENGAL	-0.30	0.00	-1914.64	0.00
ASSAM	-0.25	0.00	-1205.75	0.00
MEGHALAYA	-0.02	0.00	-44.78	0.00
TRIPURA	-0.25	0.00	-477.63	0.00
MIZORAM	-0.01	0.00	-9.33	0.00
MANIPUR	-0.16	0.00	-250.69	0.00
NAGALAND	-0.08	0.00	-99.52	0.00
ARUNACHAL PRADESH	-0.12	0.00	-144.52	0.00
SIKKIM	-0.05	0.00	-44.39	0.00
BIHAR	-0.48	0.00	-2628.21	0.00
U.P	-0.29	0.00	-2212.48	0.00
RAJASTHAN	-0.11	0.00	-717.11	0.00
DELHI	-0.58	0.00	-354.65	0.00
HARYANA	-0.14	0.00	-640.43	0.00
UTTARANCHAL	0.03	0.00	83.77	0.00
CHANDIGARH	-0.19	0.00	-100.59	0.00
PUNJAB	-0.13	0.00	-570.60	0.00
HIMACHAL PRADESH	0.11	0.00	337.28	0.00

Table A.12 (h): Model 7

No. of obs (sample)	91025	Prob > chi2	0	
Log pseudolikelihood	4.4E+07-	Pseudo R2	0.06	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Bpl	0.07	0.00	623.30	0.00
Dependency	-0.03	0.00	-191.70	0.00
household size	-0.02	0.00	-855.31	0.00
SC	0.06	0.00	535.24	0.00
ST	0.07	0.00	332.26	0.00
Graduate and above	0.16	0.00	1610.93	0.00
married	0.01	0.00	105.65	0.00
divorced	0.25	0.00	580.92	0.00
widowed	0.12	0.00	817.24	0.00
Literate household head	-0.10	0.00	-928.18	0.00

Table (A.13): Logistic Regression for Female Urban Labour Force Participation.

Table A.13 (a): Correlation Table

	cws_l	casual	regular	se	hh_sz	dep	cw	infant	lithhh	age	married_r	widowed	divorced	st	sc	bpl	p	s	hs	gr	ag1
cws_l	1.00																				
casual	0.08	1.00																			
regular	0.02	-0.32	1.00																		
se	-0.04	-0.33	-0.68	1.00																	
hh_sz	-0.09	0.00	-0.10	0.17	1.00																
dep	-0.01	0.05	-0.08	0.05	0.29	1.00															
cw	-0.07	0.04	-0.04	0.04	0.19	0.44	1.00														
infant	-0.05	0.02	-0.05	0.04	0.28	0.13	0.37	1.00													
lithhh	-0.10	-0.22	0.16	-0.02	-0.15	-0.06	-0.04	-0.05	1.00												
age	0.04	-0.02	0.01	0.02	0.02	0.11	-0.02	-0.03	0.00	1.00											
married_r	-0.05	0.01	0.00	0.05	0.02	0.25	0.23	0.09	0.06	0.31	1.00										
widowed	0.10	0.03	0.01	-0.04	-0.05	0.03	-0.01	-0.01	-0.10	0.39	-0.41	1.00									
divorced	0.07	0.03	-0.01	-0.02	-0.02	0.01	-0.02	0.00	-0.03	0.02	-0.11	-0.02	1.00								
st	0.03	0.05	0.01	-0.05	-0.02	-0.01	-0.01	-0.02	-0.03	-0.01	-0.02	0.02	0.02	1.00							
sc	0.07	0.15	0.02	-0.11	0.00	0.01	0.02	0.03	-0.14	-0.02	-0.01	0.03	0.01	-0.07	1.00						
bpl	0.05	0.28	-0.18	0.01	0.28	0.21	0.15	0.10	-0.30	-0.03	-0.01	0.04	0.01	0.04	0.13	1.00					
p	0.02	0.08	-0.06	0.03	0.02	0.05	0.02	0.01	0.02	0.08	0.09	0.03	0.01	0.00	0.05	0.09	1.00				
s	-0.11	-0.04	0.02	0.01	-0.01	-0.04	-0.04	-0.02	0.12	-0.17	-0.05	-0.09	-0.01	0.00	-0.03	-0.07	-0.31	1.00			
hs	-0.09	-0.10	0.04	-0.01	-0.05	-0.10	-0.06	-0.03	0.12	-0.16	-0.12	-0.08	-0.01	-0.01	-0.05	-0.13	-0.17	-0.27	1.00		
gr	0.13	-0.15	0.15	-0.05	-0.09	-0.05	-0.02	-0.01	0.17	-0.05	0.00	-0.08	-0.01	-0.03	-0.09	-0.21	-0.20	-0.31	-0.17	1.00	
ag1	0.01	-0.03	0.00	0.02	0.04	0.10	-0.03	-0.02	-0.01	0.98	0.21	0.42	0.02	-0.01	-0.02	-0.02	0.07	-0.15	-0.15	-0.07	1.00

Table A.13 (b): Model 1

No. of obs (sample)	60305	Prob > chi2	0	
Log pseudolikelihood	-4.5E+07	Pseudo R2	0.03	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Age	0.00	0.00	682.93	0.00
Se	-0.02	0.00	-218.00	0.00
Married	-0.06	0.00	-653.98	0.00
Dependency	-0.05	0.00	-251.03	0.00
Graduate and above	0.15	0.00	1460.59	0.00
Primary	0.05	0.00	443.89	0.00
Bpl	0.08	0.00	779.70	0.00

Table A.13 (c): Model 2

No. of obs (sample)	60290	Prob > chi2	0	
Log pseudolikelihood	-4.1E+07	Pseudo R2	0.07	
variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Dependency	0.07	0.00	326.33	0.00
Child-woman ratio	-0.06	0.00	-676.74	0.00
household size	-0.02	0.00	-785.10	0.00
SC	0.05	0.00	453.10	0.00
ST	0.07	0.00	301.46	0.00
Graduation and above	0.10	0.00	741.66	0.00
Primary	0.00	0.00	22.13	0.00
Higher secondary	-0.11	0.00	-616.43	0.00
secondary	-0.07	0.00	-604.86	0.00
casual	0.07	0.00	570.62	0.00
regular	0.03	0.00	331.08	0.00
Literate hosehold head	-0.09	0.00	-781.16	0.00

Table A.13 (d): Model 3

No. of obs (sample)	60290	Prob > chi2	0	
Log pseudolikelihood	-4E+07	Pseudo R2	0.09	
variables	**dy/dx**	**Std.Err**	**z**	**P>z**
casual	0.04	0.00	336.55	0.00
regular	0.03	0.00	288.98	0.00
dependency	0.05	0.00	261.43	0.00
Hosehold size	-0.02	0.00	-700.78	0.00
Child-woman ratio	-0.06	0.00	-672.71	0.00
Literate hosehold	-0.09	0.00	-797.84	0.00
higher secondary	-0.11	0.00	-645.31	0.00
secondary	-0.09	0.00	-738.63	0.00
Graduate and above	0.09	0.00	696.62	0.00
Below Poverty Line	0.06	0.00	541.50	0.00
A & N ISLANDS	0.09	0.00	59.73	0.00
PONDICHERRY	0.05	0.00	60.71	0.00
TAMIL NADU	0.04	0.00	91.61	0.00
KERALA	0.11	0.00	205.76	0.00
LAKSHWADWEEP	0.13	0.00	38.28	0.00
GOA	-0.06	0.00	-46.22	0.00
KARNATAKA	0.03	0.00	65.08	0.00
ANDHRA PRADESH	0.02	0.00	45.63	0.00
MAHARASHTRA	0.02	0.00	49.47	0.00
D & N HAVELI	-0.31	0.01	-44.86	0.00
DAMAN & DIU	-0.09	0.00	-30.51	0.00
GUJARAT	0.01	0.00	20.79	0.00
MADHYA PRADESH	-0.03	0.00	-63.83	0.00
CHATTISGARH	0.01	0.00	17.92	0.00
ORISSA	-0.06	0.00	-106.26	0.00
JHARKHAND	-0.08	0.00	-137.55	0.00
WEST BENGAL	-0.02	0.00	-35.81	0.00
ASSAM	-0.06	0.00	-97.46	0.00
MEGHALAYA	0.14	0.00	144.68	0.00
TRIPURA	0.05	0.00	50.77	0.00
MIZORAM	0.22	0.00	211.26	0.00
MANIPUR	0.04	0.00	36.26	0.00
NAGALAND	0.02	0.00	12.40	0.00
ARUNACHAL PRADESH	0.04	0.00	28.95	0.00
SIKKIM	0.06	0.00	21.82	0.00
BIHAR	-0.18	0.00	-295.37	0.00
UTTAR PRADESH	-0.11	0.00	-224.56	0.00
RAJASTHAN	-0.03	0.00	-49.94	0.00
DELHI	-0.13	0.00	-229.88	0.00
HARYANA	-0.01	0.00	-15.00	0.00
UTTARANCHAL	-0.06	0.00	-88.84	0.00
CHANDIGARH	-0.02	0.00	-23.45	0.00
PUNJAB	-0.03	0.00	-50.37	0.00
HIMACHAL PRADESH	0.05	0.00	50.13	0.00

Table (A.14): Logistic Regression on determinants of Male Labour Force Participation (15-65 years), 66th round, NSSO

Table A.14 (a): Correlation Table

	cws_l	hh_sz	dep	lithhh	age	married_r	st	sc	bpl	p	s	hs	gr	ag1	rural
cws_l	1.00														
hh_sz	0.00	1.00													
dep	0.13	0.32	1.00												
lithhh	-0.06	-0.11	-0.08	1.00											
age	0.31	-0.05	0.18	0.01	1.00										
married_r	0.48	0.03	0.28	0.02	0.61	1.00									
st	0.03	0.00	0.01	-0.10	-0.01	0.02	1.00								
sc	0.02	-0.02	0.02	-0.13	-0.03	0.00	-0.15	1.00							
bpl	0.05	0.28	0.24	-0.22	-0.04	0.04	0.12	0.10	1.00						
p	0.13	0.00	0.04	0.13	0.05	0.08	0.02	0.05	0.10	1.00					
s	-0.13	0.04	-0.05	0.22	-0.22	-0.15	-0.04	-0.04	-0.07	-0.40	1.00				
hs	-0.17	-0.01	-0.09	0.14	-0.12	-0.12	-0.03	-0.05	-0.11	-0.18	-0.26	1.00			
gr	0.02	-0.05	-0.05	0.20	0.03	0.01	-0.06	-0.09	-0.17	-0.18	-0.26	-0.12	1.00		
ag1	0.22	-0.04	0.15	-0.01	0.98	0.52	-0.01	-0.03	-0.04	0.04	-0.20	-0.12	0.01	1.00	
rural	0.06	0.08	0.12	-0.22	0.01	0.04	0.13	0.08	0.12	0.10	-0.01	-0.09	-0.25	0.02	1.00

Source: computed from unit level data, NSSO, 66th round, EUS

Table A.14 (b): Model 1

No. of obs (sample)	156212	Pseudo R2	0.26	
Prob > chi2	0	Log pseudolikelihood	-1.19E+08	
variables	**dy/dx**	**Std.Err**	**Z**	**P>z**
gr	0.05	0.00	834.87	0.00
sc	0.01	0.00	239.62	0.00
st	0.03	0.00	375.51	0.00
p	0.11	0.00	2066.95	0.00
married_new	0.29	0.00	6627.55	0.00
age	0.00	0.00	328.60	0.00
Rural	0.03	0.00	680.10	0.00
bpl	0.02	0.00	524.79	0.00
hh_sz	0.00	0.00	-426.45	0.00

Source: computed from unit level data, NSSO, 66th round, EUS

Table A.14(c): Model 2

No. of obs (sample)	156212	Prob > chi2	0	
Log pseudolikelihood	-1.37E+08	Pseudo R2	0.15	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Higher secondary	-0.16	0.00	-3083.76	0.00
Secondary	-0.09	0.00	-2184.76	0.00
SC	0.01	0.00	294.52	0.00
ST	0.04	0.00	519.37	0.00
household size	0.00	0.00	-104.87	0.00
Age	0.01	0.00	3404.41	0.00
Dependency	0.10	0.00	980.67	0.00

Source: computed from unit level data, NSSO, 66th round, EUS

Table A.14(d): Model 3

No. of obs (sample)	156212	Prob > chi2	0	
Log pseudolikelihood	-1.36E+08	Pseudo R2	0.16	
Variables	**dy/dx**	**Std.Err**	**z**	**P>z**
Higher secondary	-0.15	0.00	-3001.79	0.00
Secondary	-0.09	0.00	-2169.42	0.00
SC	0.01	0.00	285.47	0.00
ST	0.04	0.00	499.79	0.00
household size	0.00	0.00	-32.78	0.00
Age	0.01	0.00	3399.85	0.00
Dependency	0.10	0.00	1017.77	0.00
A & N ISLANDS	0.06	0.00	61.20	0.00
PONDICHERRY	0.00	0.00	1.95	0.05
TAMIL NADU	0.04	0.00	198.24	0.00
KERALA	0.00	0.00	10.82	0.00
LASHWADWEEP	-0.03	0.00	-14.59	0.00
GOA	-0.02	0.00	-39.34	0.00
KARNATAKA	0.06	0.00	330.40	0.00
ANDHRA PRADESH	0.02	0.00	103.70	0.00
MAHARASHTRA	0.04	0.00	212.82	0.00
D & N HAVELI	0.17	0.00	102.18	0.00
DAMAN & DUI	0.05	0.00	40.32	0.00
GUJARAT	0.07	0.00	369.05	0.00
M.P	0.04	0.00	236.41	0.00
CHATTISGARH	-0.02	0.00	-107.14	0.00
ORISSA	0.05	0.00	234.30	0.00
JHARKHAND	0.01	0.00	71.00	0.00
WEST BENGAL	0.06	0.00	337.26	0.00
ASSAM	0.06	0.00	283.89	0.00
MEGHALAYA	0.00	0.00	5.97	0.00
TRIPURA	0.05	0.00	140.78	0.00
MIZORAM	0.04	0.00	59.23	0.00
MANIPUR	0.01	0.00	24.02	0.00
NAGALAND	-0.05	0.00	-111.12	0.00
ARUNACHAL PRADESH	-0.05	0.00	-95.21	0.00
SIKKIM	0.03	0.00	44.47	0.00
BIHAR	0.02	0.00	95.44	0.00
U.P	0.02	0.00	100.21	0.00
RAJASTHAN	0.01	0.00	53.43	0.00
DELHI	0.02	0.00	80.41	0.00
HARYANA	0.02	0.00	78.01	0.00
UTTARANCHAL	-0.03	0.00	-127.59	0.00
CHANDIGARH	0.02	0.00	28.21	0.00
PUNJAB	0.03	0.00	151.04	0.00
HIMACHAL PRADESH	0.03	0.00	113.57	0.00

Source: computed from unit level data, NSSO, 66th round, EUS

Table A.14(e): Model 4

No. of obs (sample)(		156166		Prob > chi2	0	
Log pseudolikelihood		-1.18E+08		Pseudo R2	0.27	
variables	**dy/dx**	**Std.Err**	**z**	**P>z**	**[95%**	**Conf.Interval]**
Primary	0.11	0.00	2035.19	0.00	0.11	0.11
Graduation and above	0.06	0.00	858.41	0.00	0.06	0.06
Sc	0.01	0.00	243.20	0.00	0.01	0.01
St	0.03	0.00	405.47	0.00	0.03	0.03
Rural	0.03	0.00	740.04	0.00	0.03	0.03
married	0.30	0.00	11000.00	0.00	0.30	0.30
Bpl	0.02	0.00	477.93	0.00	0.02	0.02
A & N ISLANDS	0.06	0.00	58.84	0.00	0.06	0.06
PONDICHERRY	0.02	0.00	24.50	0.00	0.01	0.02
TAMIL NADU	0.03	0.00	137.32	0.00	0.03	0.03
KERALA	0.00	0.00	3.52	0.00	0.00	0.00
LASHWADWEEP	-0.03	0.00	-11.88	0.00	-0.03	-0.02
GOA	-0.01	0.00	-21.91	0.00	-0.01	-0.01
KARNATAKA	0.06	0.00	301.90	0.00	0.06	0.06
ANDHRA PRADESH	0.00	0.00	3.20	0.00	0.00	0.00
MAHARASHTRA	0.02	0.00	112.22	0.00	0.02	0.02
D & N HAVELI	0.14	0.00	93.62	0.00	0.14	0.14
DAMAN & DUI	0.00	0.00	0.55	0.58	0.00	0.00
GUJARAT	0.05	0.00	250.24	0.00	0.05	0.05
M.P	0.01	0.00	60.78	0.00	0.01	0.01
CHATTISGARH	-0.07	0.00	-329.06	0.00	-0.07	-0.07
ORISSA	0.03	0.00	168.67	0.00	0.03	0.03
JHARKHAND	0.00	0.00	-21.02	0.00	0.00	0.00
WEST BENGAL	0.04	0.00	212.91	0.00	0.04	0.04
ASSAM	0.05	0.00	229.01	0.00	0.05	0.05
MEGHALAYA	0.00	0.00	-8.07	0.00	0.00	0.00
TRIPURA	0.03	0.00	90.88	0.00	0.03	0.04
MIZORAM	0.05	0.00	68.65	0.00	0.04	0.05
MANIPUR	-0.01	0.00	-20.51	0.00	-0.01	-0.01
NAGALAND	-0.05	0.00	-94.74	0.00	-0.05	-0.04
ARUNACHAL PRADESH	-0.05	0.00	-106.66	0.00	-0.05	-0.05
SIKKIM	0.03	0.00	45.24	0.00	0.03	0.03
BIHAR	-0.02	0.00	-100.79	0.00	-0.02	-0.02
U.P	0.01	0.00	40.08	0.00	0.01	0.01
RAJASTHAN	-0.03	0.00	-136.26	0.00	-0.03	-0.02
DELHI	0.01	0.00	26.86	0.00	0.01	0.01
HARYANA	-0.02	0.00	-111.93	0.00	-0.02	-0.02
UTTARANCHAL	-0.04	0.00	-175.94	0.00	-0.04	-0.04
CHANDIGARH	0.01	0.00	26.85	0.00	0.01	0.02
PUNJAB	0.02	0.00	99.10	0.00	0.02	0.02
HIMACHAL PRADESH	0.01	0.00	23.74	0.00	0.01	0.01

Source: computed from unit level data, NSSO, 66th round, EUS

Table (A.15): Education-specific Percentage distribution of the Total population, across states, 66th round, NSSO.

STATE	ILLITERATE	PRIMARY	SECONDARY	HIGHER SECONDARY	GRAD & ABOVE
Punjab	29.75	29.68	25.46	8.16	6.16
Haryana	30.93	31.56	22.06	8.23	6.78
Rajasthan	41.91	31.59	16.84	4.37	4.46
U.P	41.01	30.59	18	5.02	4.65
Bihar	45.3	30.55	16.95	3.61	2.39
West Bengal	28.66	40.64	20.37	4.22	4.81
Orissa	34.33	31.7	25.59	3.81	4.28
M.P	35.3	35.46	18.47	5.3	4.6
Gujarat	30.65	31.09	25.88	5.35	6.62
Maharashtra	23.72	27.38	31.27	7.54	9.5
Andhra Pradesh	38.76	27.11	21.93	5.31	6.37
Karnataka	32.32	25.61	28.59	6.17	7.18
Kerala	13.05	29.7	39.29	6.99	10.53
Tamil Nadu	23.91	32.38	28.25	7.29	7.83
mean	32.11	31.07	24.21	5.81	6.15
stdev	8.46	3.69	6.34	1.59	2.18
cov	26.34	11.87	26.18	27.36	35.46

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.16): Education-specific percentage distribution of Rural population

STATE	Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
Punjab	33.75	31.04	24.53	7.27	2.57
Haryana	33.14	33.19	22.13	7.14	4.10
Rajasthan	46.43	32.63	15.16	3.13	1.84
U.P	43.95	31.70	17.39	3.90	2.47
Bihar	47.43	30.54	16.25	3.16	1.54
West Bengal	32.33	43.15	18.97	2.44	1.67
Orissa	36.17	32.63	24.89	3.33	2.67
M.P	39.53	37.39	17.29	3.32	1.64
Gujarat	37.51	33.51	23.04	3.36	2.22
Maharashtra	29.78	30.23	29.77	5.64	4.01
Andhra Pradesh	44.72	28.23	19.76	3.88	2.87
Karnataka	38.47	27.94	26.48	4.43	2.58
Kerala	13.42	31.31	39.13	6.50	9.15
Tamil Nadu	28.83	35.29	25.90	5.99	3.66

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.17): Education-specific percentage distribution of Urban population

STATE	Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
Kerala	13.05	29.70	39.29	6.99	10.53
Maharashtra	23.72	27.38	31.27	7.54	9.50
Tamil Nadu	23.91	32.38	28.25	7.29	7.83
West Bengal	28.66	40.64	20.37	4.22	4.81
Punjab	29.75	29.68	25.46	8.16	6.16
Gujarat	30.65	31.09	25.88	5.35	6.62
Haryana	30.93	31.56	22.06	8.23	6.78
Karnataka	32.32	25.61	28.59	6.17	7.18
Orissa	34.33	31.70	25.59	3.81	4.28
M.P	35.30	35.46	18.47	5.30	4.60
Andhra Pradesh	38.76	27.11	21.93	5.31	6.37
U.P	41.01	30.59	18.00	5.02	4.65
Rajasthan	41.91	31.59	16.84	4.37	4.46
Bihar	45.30	30.55	16.95	3.61	2.39

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.18): Education-specific percentage distribution of Male population

STATE	illiterate	primary	secondary	higher secondary	graduation and above
Punjab	25.09	31.60	28.32	8.02	6.01
Haryana	22.53	33.11	25.43	10.41	8.10
Rajasthan	30.55	34.56	22.03	6.04	5.92
U.P	32.02	32.94	22.57	6.05	5.62
Bihar	34.87	33.53	21.81	4.91	3.57
West Bengal	23.32	41.95	22.69	4.81	6.05
Orissa	27.30	32.70	29.24	4.52	5.78
M.P	27.34	36.77	22.61	6.41	5.96
Gujarat	22.94	33.11	29.98	5.84	7.73
Maharashtra	17.59	27.06	34.53	8.73	11.47
Andhra Pradesh	30.77	28.25	25.44	6.42	8.65
Karnataka	24.99	26.47	31.78	7.21	9.45
Kerala	11.75	29.71	40.77	6.58	10.78
Tamil Nadu	17.56	33.09	31.23	8.16	9.57

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.19): Education-specific percentage distribution of Female population

STATE	Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
Punjab	34.93	27.55	22.29	8.32	6.33
Haryana	40.75	29.74	18.11	5.68	5.25
Rajasthan	53.96	28.45	11.33	2.60	2.91
U.P	50.64	28.08	13.10	3.92	3.60
Bihar	56.86	27.24	11.55	2.17	1.07
West Bengal	34.53	39.19	17.81	3.56	3.44
Orissa	41.42	30.68	21.90	3.09	2.76
M.P	44.11	34.00	13.89	4.08	3.09
Gujarat	39.36	28.82	21.26	4.79	5.36
Maharashtra	30.36	27.73	27.73	6.26	7.38
Andhra Pradesh	46.90	25.95	18.34	4.17	4.04
Karnataka	39.85	24.73	25.32	5.11	4.84
Kerala	14.24	29.69	37.94	7.36	10.31
Tamil Nadu	30.10	31.69	25.34	6.44	6.12

Source: Computed from unit level data of NSSO, 66th round, EUS

Table (A.20): Growth rates of population according to the education levels over various NSSO rounds, genderiwse.

Table (A.20a): Growth rates for males

Male(55th&61st)	Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
Punjab	-5.67	6.20	10.71	21.87	86.26
Haryana	4.76	9.87	6.93	36.98	108.03
Rajasthan	13.79	12.27	27.99	23.49	52.33
U.P	-5.01	-0.65	6.94	5.90	14.58
Bihar	-30.97	-8.73	-15.09	-3.68	-23.59
West Bengal	-4.07	18.73	8.40	38.18	24.21
Orissa	-5.64	-0.32	20.80	15.02	67.32
M.P	-28.46	-21.09	-14.71	-21.19	15.16
Gujarat	-2.82	3.97	14.96	19.93	65.82
Maharashtra	-6.92	-10.30	8.57	18.25	70.32
Andhra Pradesh	-11.13	-10.58	9.52	1.12	35.22
Karnataka	-14.25	8.11	3.84	14.68	36.28
Kerala	12.98	2.52	4.35	9.40	167.06
Tamil Nadu	-19.16	-1.51	-8.59	-2.79	68.08

Table (A.20b): Growth rates for females

Fem(61&66th)	Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
Punjab	-6.87	-9.00	10.29	30.47	6.92
Haryana	-12.71	8.98	32.45	28.01	14.98
Rajasthan	-7.44	31.55	50.38	62.68	89.89
U.P	-12.23	23.52	32.91	57.55	81.70
Bihar	-1.13	45.09	45.78	159.31	160.33
West Bengal	-22.76	0.11	6.41	42.61	5.25
Orissa	-21.13	20.36	24.03	66.81	40.06
M.P	-17.29	32.43	70.57	96.30	32.40
Gujarat	-3.57	15.02	18.29	47.03	48.00
Maharashtra	-16.09	4.61	15.41	73.10	39.25
Andhra Pradesh	-12.36	9.94	31.00	84.49	63.38
Karnataka	-9.74	4.16	27.98	60.57	50.92
Kerala	-22.84	3.71	4.15	45.11	25.38
Tamil Nadu	-8.07	9.79	46.66	54.66	63.12
Female(50th &55th)	**Illiterate**	**Primary**	**Secondary**	**Higher Secondary**	**Graduation and above**
Punjab	0.00	0.28	0.27	0.66	0.50
Haryana	-0.06	0.24	0.56	0.76	0.63
Rajasthan	0.05	0.71	0.53	0.72	0.65
U.P	0.10	0.55	0.58	0.80	0.62
Bihar	0.23	0.50	0.59	0.45	0.71
West Bengal	0.02	0.09	0.48	0.36	0.31
Orissa	-0.04	0.25	0.54	0.48	0.53
M.p	0.06	0.49	0.64	0.77	0.44
Gujarat	0.02	0.20	0.66	0.16	0.62
Maharashtra	0.03	0.34	0.53	0.61	0.63
Andhra Pradesh	0.02	0.28	0.80	1.24	1.53
Karnataka	0.05	0.20	0.50	0.77	0.80
Kerala	0.29	0.01	0.19	0.60	0.78
Tamil nadu	-0.14	0.00	0.34	0.51	1.13

Source: Computed from unit level data , EUS, NSSO (various rounds)

Female(55th & 61st)	Illiterate	Primary	Secondary	Higher secondary	Graduation and above
Punjab	-6.06	2.98	22.55	67.11	103.90
Haryana	7.85	9.00	11.77	98.24	137.33
Rajasthan	12.39	37.69	67.24	28.29	43.65
U.P	-4.99	7.16	24.65	21.85	24.15
Bihar	-30.00	0.50	-7.42	-22.53	-56.69
West Bengal	-7.28	30.43	18.49	42.04	49.95
Orissa	-6.49	6.65	43.61	48.44	84.04
M.P	-26.96	-18.27	1.25	-31.20	33.46
Gujarat	-1.77	-0.13	14.45	53.25	63.97
Maharashtra	-8.85	-5.97	18.89	33.16	82.30
Andhra Pradesh	-8.08	0.15	17.92	14.40	20.92
Karnataka	-12.08	1.63	13.56	35.03	52.22
Kerala	4.25	-1.75	7.66	18.77	157.22
Tamil Nadu	-11.56	2.06	3.43	24.82	36.81

Source: Computed from unit level data, EUS, NSSO (various rounds)

Table (A.20c): Growth rates for total population

Tot(61st and 66th)	Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
Punjab	-9.56	-5.61	12.02	32.18	2.30
Haryana	-14.21	6.69	20.82	64.69	22.79
Rajasthan	-8.83	22.15	42.05	65.09	57.80
U.P	-13.45	18.80	27.52	42.97	44.08
Bihar	-5.08	39.93	43.70	76.58	35.46
West Bengal	-21.60	2.89	6.84	16.59	4.69
Orissa	-22.09	12.63	25.04	56.52	27.93
M.P	-17.78	18.65	66.56	64.51	28.85
Gujarat	-1.67	15.67	17.67	37.58	37.96
Maharashtra	-18.22	1.65	13.18	58.85	35.68
Andhra Pradesh	-14.25	8.65	27.71	71.68	51.57
Karnataka	-13.04	-1.57	26.00	55.54	58.24
Kerala	-21.21	-0.58	3.86	47.75	21.50
Tamil Nadu	-9.37	4.28	41.41	64.79	43.33

Source: Computed from unit level data , EUS, NSSO (various rounds)

Total(50th & 55th)	Illiterate	Primary	Secondary	Higher Secondary	Graduation and above
Punjab	0.00	0.25	0.25	0.61	0.35
Haryana	-0.07	0.17	0.40	0.59	0.32
Rajasthan	0.02	0.43	0.43	0.42	0.45
U.P	0.08	0.36	0.40	0.45	0.50
Bihar	0.25	0.35	0.31	0.21	0.55
West Bengal	0.00	0.07	0.38	0.22	0.30
Orissa	-0.05	0.17	0.31	0.45	0.46
M.p	0.05	0.35	0.49	0.29	0.56
Gujarat	0.00	0.09	0.58	0.30	0.32
Maharashtra	0.04	0.28	0.44	0.55	0.54
Andhra Pradesh	0.04	0.25	0.53	0.68	0.98
Karnataka	0.07	0.12	0.46	0.41	0.55
Kerala	0.25	0.02	0.21	0.52	0.47
Tamil Nadu	-0.11	-0.03	0.31	0.38	0.54

Total(55th, 61st)	Illiterate	Primary	Secondary	Higher Secondary	graduation and above
Punjab	-5.88	4.71	15.40	40.46	94.08
Haryana	6.58	9.50	8.55	56.81	118.30
Rajasthan	12.93	21.36	37.98	24.86	49.95
U.P	-5.00	2.53	12.31	10.87	17.27
Bihar	-30.42	-5.18	-12.78	-8.02	-29.56
West Bengal	-5.97	23.98	12.40	39.43	31.90
Orissa	-6.15	2.71	29.64	25.75	71.90
M.P	-27.58	-19.96	-9.74	-24.55	20.28
Gujarat	-2.18	2.13	14.76	31.18	65.16
Maharashtra	-8.08	-8.30	12.66	23.30	74.49
Andhra Pradesh	-9.37	-5.86	12.76	5.55	30.72
Karnataka	-12.99	5.09	7.81	21.95	41.45
Kerala	7.72	0.33	5.99	14.47	162.08
Tamil Nadu	-14.55	0.14	-3.69	8.66	55.70

Source: Computed from unit level data , EUS, NSSO (various rounds)

Table (A.21): Time series data on Per capita GDP, education expenditure as a proportion of public expenditure, GER (%) for Male and Female at Primary, middle and Secondary level of schooling

Year	Per-capita GDP(Rs.)	Boys GER(primary)(%)	Boys GER(middle)(%)	Boys GER(secondary)(%)	Girls GER(primary)(%)	Girls GER(middle)(%)	Girls GER(secondary)(%)	Education exp as a proportion of GDP(%)	Education exp as a proportion of Public expenditure(%)	Growth rate of GDP per capita{first difference of log(Per capita GDP)(%)}
1960-61	7788.42	82.6	33.2	16.7	41.4	11.3	4.1	1.48	11.99	-
1961-62	7839.53	87.4	38.7	19.6	47	13.5	5	1.52	11.7	0.01
1962-63	7909.87	90.8	42.1	21.2	49.8	15.2	5.8	1.52	9.47	0.01
1963-64	8236.97	92.6	40.4	20.7	50.8	14.9	6.7	1.5	9	0.04
1964-65	8430.78	95.7	42.3	22.7	54.7	16.1	7	1.51	9.6	0.02
1965-66	8492.9	96.3	44.2	24.3	56.5	17	7.7	1.69	9.82	0.01
1966-67	8797.06	96.3	45.1	25.5	57.6	17.9	8.3	1.68	9.56	0.04
1967-68	8520.87	96.3	46.5	26.2	59.2	18.8	8.8	1.73	10.55	-0.03
1968-69	8969.68	95.6	47	26.9	59.6	19.4	9.3	1.8	9.38	0.05
1969-70	8994	95.1	47	26.7	60	19.6	9.5	1.92	9.61	0
1970-71	9453.96	95.5	46.3	26.8	60.5	19.9	10.2	2.11	10.16	0.05
1971-72	9527.35	96.7	46.3	26.7	61.7	20.4	10.2	2.25	9.53	0.01
1972-73	9514.22	100.4	46.8	26.7	65.1	21.4	10.3	2.33	9.7	0
1973-74	9780.49	96.3	45.9	28.5	62.9	22.1	11.3	2.15	10.1	0.03
1974-75	10300.41	101	47.7	26.2	65.9	23	10.9	2.2	10.74	0.05
1975-76	9698.91	100.4	48.6	25.6	66.1	23.9	10.5	2.44	10.3	-0.06
1976-77	9600.15	99.3	47.8	25.1	64.7	24	10.7	2.51	9.96	-0.01
1977-78	10154.93	97.4	48.6	25.2	62.6	24.4	11	2.83	11.61	0.06
1978-79	10178.74	97.9	49.9	25.6	64.3	25.5	11.6	3	11.46	0
1979-80	10616.54	99.3	52	29.9	65	26.4	13.3	3.07	10.83	0.04
1980-81	10901.75	95.8	54.3	23.1	64.1	28.6	11.1	2.98	10.67	0.03
1981-82	10753.27	98.9	56	24.1	66.2	29.7	11.1	3	10.3	-0.01
1982-83	10473.22	103	58.3	25.1	69.6	31.8	11.6	3.25	11.07	-0.03
1983-84	10704.67	106.9	60.6	25.4	72.6	33.2	12.1	3.14	10.07	0.02

1984-85	10591.15	110.3	61.3	31.7	76	34	14.7	3.35	10.8	-0.01
1985-86	11279.14	111.1	61.8	32.7	79.2	35.3	15.4	3.49	12.99	0.06
1986-87	11180.62	110	61	30.8	79.8	34.7	15.5	3.41	11.78	-0.01
1987-88	11750.02	114	63.1	29.4	83.2	36.6	14.5	3.73	12.75	0.05
1988-89	12129.02	109.2	61.4	28.4	80.3	35.8	15.3	3.72	13.08	0.03
1989-90	11221.24	109.7	72	31.2	81.3	42.1	16.3	3.93	13.64	-0.08
1990-91	11759.8	113.9	76.6	33.9	85.5	47	10.3	3.84	13.37	0.05
1991-92	12188.49	112.8	75.1	28.6	86.9	49.6	15.7	3.8	13.14	0.04
1992-93	12260.66	95	72.5	38.2	73.5	48.9	22.3	3.72	13.15	0.01
1993-94	12949.73	89.6	67.1	35.8	73.1	45.4	23.4	3.62	12.94	0.05
1994-95	13171.09	96.6	68.9	37.2	78.2	50	23.8	3.56	12.95	0.02
1995-96	13429.12	97.1	67.8	37.1	79.4	49.8	23.9	3.56	13.34	0.02
1996-97	13717.86	97	95.8	37.6	80.1	49.2	24.4	3.53	13.33	0.02
1997-98	13895.78	99.3	66.3	38.3	82.2	49.7	24.9	3.49	13.09	0.01
1998-99	14984.55	100.9	65.1	38	84.1	49.5	26	3.85	14	0.08
1999-00	15574.51	104.1	67.2	38.1	85.2	49.7	26.8	4.19	14.6	0.04
2000-01	16065.18	104.9	66.7	39	85.9	49.9	28.4	4.28	14.42	0.03
2001-02	15971.13	105.3	67.8	38.23	86.9	52.1	27.7	3.8	12.89	-0.01
2002-03	16519.85	97.5	65.3	41.29	93.1	56.2	33.2	3.77	12.6	0.03
2003-04	17066.99	100.6	66.8	42.94	95.6	57.6	34.3	3.49	11.98	0.03
2004-05	17799	110.7	74.3	44.26	104.7	65.1	35.1	3.39	12.13	0.04
2005-06	18725.16	112.8	75.2	44.58	105.8	66.4	35.8	3.45	12.73	0.05
2006-07	19834.07	114.6	77.6	44.42	108	69.6	36.4	3.64	13.29	0.06
2007-08	20300.79	115.3	81.48	49.4	112.6	74.36	41.9	3.74	13.33	0.02
2008-09	21238.88	114.3	77.9	50.56	114.4	74.4	43.1	3.78	13.63	0.05
2009-10	22440.87	115.6	84.5	38.31	115.4	78.3	33.3	3.9	13.42	0.06
2010-11	22991.24	115.4	87.7	42.2	116.7	83.1	36.1	3.8	14.16	0.02

Source:

1. Data on Per-capita GDP from NAS, Central Statistical Organisation.
2. Data on education expenditure as a percentage of Total public expenditure from MHRD: Analysis of budgeted expenditure on education,
3. Data on gross enrolment ratio for Male and Female: MHRD(various issues)

Table (A.22): VAR model lag length criteria.

Education expenditure and Economic growth						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	126.85	NA	1.03e-05	-5.81	-5.73	-5.78
1	137.87	20.50	7.44e-06	-6.13	-5.89	-6.04
2	147.94	17.81*	5.62e-06*	-6.42*	-6.01*	-6.26*
3	148.82	1.46	6.52e-06	-6.27	-5.70	-6.06
4	151.63	4.44	6.94e-06	-6.22	-5.48	-5.94
Economic growth and levels of education(Male)						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	188.12	NA	3.28e-09	-8.18	-8.02	-8.12
1	262.89	132.91	2.42e-10	-10.80	-9.99*	-10.50*
2	283.11	32.36*	2.04e-10*	-10.98*	-9.54	-10.44
3	291.90	12.48	2.95e-10	-10.66	-8.57	-9.88
4	308.14	20.23	3.19e-10	-10.67	-7.94	-9.66
Economic growth and levels of education(Female)						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	274.77	NA	6.98e-11	-12.03	-11.87*	-11.97
1	292.06	30.74	6.61e-11	-12.09	-11.29	-11.80
2	322.14	48.13*	3.60e-11*	-12.72*	-11.27	-12.18*
3	332.73	15.06	4.80e-11	-12.48	-10.39	-11.70
4	343.25	13.09	6.69e-11	-12.23	-9.50	-11.22

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table (A.23): Percentage of people below poverty line sectorwise (61st round), MRP basis

State	Rural	Urban	Total
Punjab	5.88	3.08	4.98
haryana	9.05	11.58	9.73
Andhra Pradesh	7.37	21.6	11.01
Kerala	9.63	16.48	11.24
M.P	11.6	23.92	14.75
Karnataka	11.64	26.91	16.34
Rajasthan	13.99	28.57	17.23
Gujarat	**17**	**21.28**	**18.09**
west bengal	24.25	10.8	20.96
Tamil Nadu	21.99	36.38	24.82
Maharashtra	22.2	29.27	25.05
U.P	25.31	26.37	25.51
Bihar	33.66	30.38	33.36
Orissa	39.97	40.84	40.09
All India	22	21.9	21.97
mean	18.11	23.39	19.51
stddev	10.24	10.27	9.61
c.v	0.57	0.44	0.49

Source: Computed from unit level data, 66th round, NSSO, CES

Table (A.24): Percentage changes in Poverty, GDP per worker (sectorwise), worker per working population (sector wise) and share of working population in Total population (using 61st and 66th rounds, NSSO).

State	pov	Agri(e/a)	Industry (e/a)	Service(e/a)	Agri(y/e)	Industry(y/e)	Service(y/e)	Working Pop(a/n)
Jammu & Kashmir	-3.80	-87.08	-6.37	15.60	-10.75	5.40	1.42	4.28
Himachal Pradesh	-13.40	-86.92	9.43	7.79	6.94	50.87	48.36	0.10
Punjab	-5.00	-88.99	7.75	-7.56	37.97	61.94	56.91	2.49
Uttaranchal	-14.70	-92.73	39.44	-8.57	11.91	51.43	99.15	3.99
Haryana	-4.00	-89.94	21.22	-3.04	42.54	9.20	78.77	3.20
Delhi	1.10	-97.47	1.49	-4.22	624.15	32.18	80.85	2.10
Rajasthan	-9.60	-88.41	6.76	-0.79	24.58	23.70	36.51	4.09
U.P	-3.20	-90.86	7.17	-10.22	33.15	26.80	58.66	2.77
Bihar	-0.90	-95.56	39.95	2.57	22.36	21.14	27.41	2.45
Sikkim	-18.00	-93.01	50.54	5.34	32.29	186.17	47.39	1.72
Arunachal Pradesh	-5.20	-96.29	7.91	12.24	16.12	-5.64	26.74	3.29
Nagaland	11.90	-97.27	-18.34	-29.39	15.30	46.60	43.23	7.99
Manipur	9.10	-93.92	27.47	14.46	87.31	2.31	13.72	-2.81
Mizoram	5.80	-97.13	86.99	4.10	53.79	-12.72	41.33	-0.68
Tripura	-23.20	-94.40	180.89	-21.84	95.70	-47.68	81.84	1.34
Meghalaya	1.00	-95.34	22.96	15.83	30.10	6.19	1.42	5.25
Assam	3.50	-96.17	16.04	1.16	16.82	-12.80	31.55	2.29
West Bengal	-7.60	-87.46	12.28	-1.89	25.39	16.43	59.49	3.71
Jharkhand	-6.20	-90.24	23.50	7.22	94.57	-23.47	54.29	-0.68
Orrisa	-20.20	-89.33	10.21	-4.18	31.75	34.74	69.39	1.52
Chattisgarh	-0.70	-90.88	-8.32	-11.62	33.65	56.83	70.34	2.95
M.P	-11.90	-90.44	0.33	-20.36	17.84	42.15	64.16	4.10
Gujarat	-8.80	-87.65	-8.72	10.48	33.81	76.04	34.30	0.51
Maharashtra	-13.60	-88.99	-6.23	1.83	26.94	65.12	48.93	3.05
A.P	-8.80	-88.51	17.47	-8.85	40.55	25.76	65.27	2.24
Karnataka	-9.80	-91.11	19.30	8.42	47.31	16.62	38.95	0.15
Goa	-16.30	-87.79	56.83	-34.06	-33.25	-38.86	61.31	6.50
Kerala	-7.70	-87.92	13.01	9.57	18.78	20.90	53.50	-0.10
Tamil Nadu	-11.80	-83.06	-1.49	-9.01	26.91	38.39	59.16	1.82
Pondicherry	-12.90	-88.67	7.97	36.78	66.75	21.75	16.11	1.13

Source: Press note on Poverty estimates, Planning Commission, GOI, 2009-10; Various issues of State domestic Product, NAS, CSO.