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Regional Disparity in Australia : Analysis of Gender Development Index

Saswati Basu* and Parikshit Basu**

Measurement of the level of socio-economic development of a nation is a complex task. However, the socio-economic environment affects overall economic development and business activities. Existence of different types of inequalities such as gender disparities affects the process of development adversely. The UNDP uses two major indicators (HDI and GDI) to measure the achievements of a country's population and gender disparities. These are primarily national level indicators and do not reflect regional differences. Although most of the academic studies in the area of gender inequality are based on developing countries, there are evidences of gender inequalities in developed countries such as Australia. This paper attempted to estimate gender inequalities in the states and territories in Australia using GDI and HDI following the UNDP procedure modified for regional application. The results indicate that, in terms of gender difference, all the states and territories performed well in Australia in the year 2002. The study found existence of gender inequalities in all states and territories in Australia except in the state of NSW. In NSW, women marginally outperformed men. However, the extent of inequalities was very small in all cases. Inter-state differences were also not very significant. In general, women outperformed men in education and health areas. But achievement of women in income earning abilities was less than men in all states and territories.

Key Words: Economic Development. Human development Index, and Gender Development Index

1. Introduction

Poverty is one of the major problems in the world and it is growing, particularly in relative terms. Poverty is increasing despite overall economic growth. Absolute poverty is more abject in the developing world. A large section of population is significantly disadvantaged economically in Asia, Africa and some of the East European countries (UNDP 2003). However, the problem of poverty is not confined within the developing world only. The 'rich-poor gap' seems to have broken the national boundaries and is fast becoming a global issue. The 'core-periphery paradigm' is now interpreted in a modified manner (Burbach, et. al. 1997).

* Affiliated with School of Marketing and Management Charles Sturt University Bathurst, NSW, Australia
** Acting Director- DBA program, Faculty of Commerce , Charles Sturt University Bathurst, NSW, Australia

The traditional 'core' of the major developed countries (the US, Western Europe and Japan) has now being restructured to include 'islands' or 'pockets' of development in NICs and developing countries such as Korea, Taiwan, Mexico, Brazil, India, South Africa etc. On the other hand, the 'periphery' now includes 'pockets' of most developed countries as well. "Cities like New York, Los Angeles, London and Paris now contain large areas where economic and social conditions are similar to those of many Third World countries..." (ibid, pp. 56). According to the Human Development Report, in the US 13.6% of people had daily income of $11 or less and 20.7% of population lacked functional literacy skills in 1994-95 (UNDP 2003). The respective figures for Australia were 17.6% and 17% (ibid)

The nature of poverty has been expressed in multidimensional faces mostly in the levels of education, health, and income. The Human Development Reports (UNDP, 1990 onwards) suggested several other social and economic indicators also to reflect the extent of poverty in individual countries. In addition to overall poverty, the Reports are particularly concerned about the steady increase in differences in the levels of poverty among different segments such as genders, races, regions etc. Poverty levels are different among women and men, among ethnic groups, and among regional and metropolitan areas (UNDP 2003). The number of people below the poverty line is increasing in developing countries along with income inequalities (Jazairy 1991). The income gap between the richest 20% of population in the richest countries and the poorest 20% in the poorest countries in the world is widening very fast. The difference was 30 times in 1960, and it increased to 74 times in 1997 (UNDP 2003).

To measure the level of achievements at national levels, the UNDP has introduced two major indicators in recent years. Human Development Index (HDI) was introduced in 1990 to measure the average progress or achievement of a country's population. Gender Development Index (GDI) was developed in 1995 to consider gender disparity in overall human development of a nation. The difference between HDI and GDI indicates existence of gender inequality in a country. Both HDI and GDI are primarily national level indicators, estimated for the country as a whole. As a result, they do not indicate the differences in achievements in regions within a country. However, regional differences exist in all countries, both in developing and in developed ones, and such differences are most likely to impact on gender inequalities as measured by GDI. The World Bank has recently advising individual countries to estimate the two indicators at regional levels. Several developing countries such as Brazil, Egypt, Namibia and Nepal have been using country-owned process to estimate HD Index or reports at regional levels since 1992 (UNDP 2003). India also started the process since 2001 (GOI 2002). These reports are based on gender, ethnic, age and geographic lines enabling deeper analysis of region-specific inequalities and serious deprivations. South Asian nations are also engaged in estimating regional HDIs in recent years (MUHHDC 2004).

Most of the academic studies in the area of gender inequality using GDI and HDI are based on developing countries (UNDP 2003). However, there are evidences of gender inequalities in developed countries such as Australia. Gender inequalities exist in Australia in areas like participation in economic activities and political decision making process, in general and in regional areas (UNDP 2003; ABS 2001). Thus it may be relevant to explore the extent of regional gender disparities in a developed country.

This paper attempts to estimate gender inequalities in the states and territories in Australia using GDI and HDI following the UNDP procedure modified for regional application. Australia's achievement in human development area is one of the best in the world. It ranked 3rd in terms of HDI and 4th in terms of GDI in 2004 in the world indicating very low level of gender inequality at the national level. It may be more revealing to explore the area of regional achievements. Section II of this paper explains the roles of HDI and GDI to judge human and gender development achievements. Section III describes the methodology that has been adopted from the one used by the UNDP with modifications for using at sub-national level. Results of the study are explained in section IV and conclusions are summarised in the final section.

2. Background

Different studies (UNDP, 2002) found existence of unequal development levels within the same country relating to gender, ethnic group and region. The study argued that level of development is lower in remote regions than city and surrounding areas. Again, development level for women is lower than that of men in general everywhere. Rates of development of mainstream people in a country appeared to be higher than its minority groups. It has been realised over the years that improvements in macroeconomic indicators such as per capita income is not sufficient to measure the level of development of a country. It is essential to have a broader indicator that could incorporate economic and social progress. UNDP has introduced the use of HDI in its Human Development Report in 1990 with this objective in mind. HDI measures the average progress or achievement of a country's people. The Human Development Reports argued that people (or human resources) are real wealth of a nation. Thus development of a nation means development of its people and human progress is not just about income expansion and accelerating commodity production but also about expanding human capabilities.

The Human Development Reports defined 'development' as a process of expanding human capabilities or a process of enlarging choices or options. By exercising these choices or options people can develop their power and, in turn, can develop the country. These choices can be of various types, e.g. to be educated, to be creative, to lead a longer and healthy life and so on. The Human Development Reports have selected three specific choices from the viewpoint of poverty and inequality that are essential for human development. These are 'to lead a long and healthy life', 'to acquire knowledge' and 'to have access to resources for a decent standard of living' (UNDP 1990). HDI measures a country's average achievements in these three areas. Accordingly, the selected three indicators to measure human capabilities for HDI are 'life expectancy to measure longevity', 'educational attainment or literacy level to represent level of knowledge', 'an appropriately adjusted real GDP per capita (in PPP $) to ensure a decent standard of living'. The HDI values (measured annually and presented in HDRs) reflect the levels and achievements of individual countries on these three important dimensions of human development. Countries are ranked according to their achievements. The HDRs have provided the maximum and minimum achievable values for these indicators - referred as 'goal post' values (ibid). The HDI indicated how far a country has to travel to achieve these goal post values or to provide the three essential choices to its entire population.

As already indicated, HDI measures average achievements of its entire population as a whole. It does not reflect the difference in the level of achievements that exists between men and women. Literature shows that achievement of men is better than women in almost all areas. Though women biologically live longer than men do, the shorter life expectancy of women in most of the developing countries reflects utmost level of poverty that women suffered from (UNDP 2003; Taylor et al 1983). Women lag behind men in respect of literacy rate and in income earning capacity all over the world, particularly in developing countries (UNDP 1993). Research

shows that women accounts for the larger proportion of people with utmost poverty all over the world (Ward 1988). The measurement of human development or development of a nation remains incomplete if an indicator does not consider the inequality in income and opportunities that exists between men and women.

Researchers (Kottis 1990) attempted to explain reasons behind higher level of poverty among women than men and suggested an inverse relationship between women's labour force participation rate and the pace of economic development. The rapid transformation of the economy through the process of economic development has drastically changed the employment structure of different sectors. This change has negatively affected the employment opportunities available to women in general, and resulted in higher level of poverty among women at the early stage of development. Tisdell (1991) used common access and economic failure theory to explain women's labour in developing countries as a free good with low economic value. Being a free good it has the characteristics of common access and easy availability. Thus the measurement of human development indicator remains incomplete if it does not take into account this gender disparity or inequality. The UNDP introduced Gender development Index (GDI) in 1995 that takes into account gender disparities to measure a nation's average achievements. GDI is a modified HDI adjusted for gender inequality. The difference between HDI and GDI indicates existence of gender inequality in a country. GDI uses the same variables as HDI but explores further into the area of female-male disparity in terms of achievements. GDI imposes penalty for gender disparities. So GDI falls when disparity increases.

Like HDI, GDI is also developed primarily as a national level indicator. It indicates the average achievements only. GDI at national level can not reflect picture of gender disparities at regional areas within a nation. The Human Development Reports also accepted that the national level index reflects only a partial picture (UNDP 2003) and of its inadequacy in collecting proper data for estimating GDI (UNDP 1995). Shiva Kumar (1996) argued that national level GDI does not reflect regional disparities on its entirety since the Index depends on average data. So he estimated GDI for 16 Indian states separately for 1991-92 and compared them with 130 countries of the world. His results showed amazing differences that existed within regions in India. He took the percentage reduction of the GDI from the HDI [(HDI-GDI)/HDI] as one of the indicators of gender inequalities in regional states. Using the method he has shown that the national indicators reflect little of the extent of gender inequalities that exists at regional levels. Tisdell (2002) confirmed UNDP's view that GDI at national level provides an incomplete picture. Dijkstra (2002) identified several methodological and practical limitations of GDI and suggested an alternative measure 'Standardised Index of Gender Equality'. SIGE is an assessment of relative female power and relative female access to assets. UNDP's HDI and GDI measurement techniques are commonly used tools to estimate average development achievement of a country. However, the techniques have mostly been used in the context of developing countries. Studies for developed countries are very rare. In this paper we have attempted to apply the measurement technique in Australia where no such study was undertaken so far.

It is argued that developed countries do contain 'pockets' or 'sections' where development rate is much lower than the national level for various reasons (UNDP, 2002; Burbach et. al. 1997). Unequal development rate between genders has foremost adverse impacts on future progress rate as it may impede sustainable development. The current study has focused on state level only and opens up opportunities for future research to cover district and local levels. The practice of using HDI and GDI measurement techniques to estimate the degree of overall development is becoming popular in developing countries (UNDP, 2002; Haq et al, 2004; Government of India, 2002). The present study argues that it is appropriate to investigate development rate in less developed pockets exists in developed countries as well. So, the current paper has great policy implications to, review and modify the current gender related policies and adopt suitable one for sake of sustainable development.

3. Methodology

The UNDP procedure of estimation of the GDI and HDI is followed in this paper (UNDP 2003). Few modifications have been made to apply the same at sub-national level. The paper examines the difference between the two indices (HDI *less* GDI) to judge the extent of gender differences (Siva Kumar 1996). Thus, the performances of men and women are equal when the difference is zero. A positive value indicates that men are doing better than women and vice versa.

As mentioned earlier, GDI is an adjusted HDI. It adjusts the average achievement to reflect the inequalities between men and women in three dimensions or indicators:

- A long and healthy life, as measured by life expectancy at birth;
- Acquired knowledge as measured by the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio; and
- A decent standard of living as measured by estimated earned income (PPP $).

The estimation of GDI involves three steps.
First step is to estimate male and female development indices. Female and male achievement indices in each area estimated according to the general formula:

Dimension (indicator) Index = (Actual value – minimum value) / (maximum value – minimum value)

Minimum and maximum values are set in the UNDP reports as common 'goalposts' for all countries.

As there are three indicators we need to estimate six development indices:

- Male education development Index
- Male health development Index;
- Male income development Index;
- Female education development Index;
- Female health development Index; and
- Female income development Index.

For example, in a country, life expectancy at birth for women and men were 83 years and 79 years respectively. The goalpost maximum values were specified by UNDP as 85 years for women and 82 years for men and the minimum values were at 27 and 25 years for women and men respectively. The health development index for women would be (83-27)/(85-27)=0.965. The health development index for men, using the same formula would be 0.947. Health and education indices can also be worked out for women and men using the same procedure.

The second step for estimation of GDI involves combining female-male indices in each indicator/dimension in a way that penalises differences in achievements. The resulting index is called Equally Distributed Index:

Equally distributed index =
{[female population share (female index$^{1-\varepsilon}$)] + [male population (male index$^{1-\varepsilon}$)}$^{1/1-\varepsilon}$

where, ε measures the aversion to inequality, and $\varepsilon = 2$ as specified by the UNDP in HDRs. Thus the general equation becomes

Equally distributed index =
{[female population share (female index^{-1})] + [male population (male index^{-1})}$^{-1}$

This is the harmonic mean of the male and female values. For gender sensitive adjustments UNDP used the weighting formula that expresses a moderate aversion or disliking to inequality, setting the weighting parameter ε as 2. The Report suggests that each society can select a specific value for its aversion to gender inequality (ε) depending upon its initial position and the time bound goal it set for itself. If there is no aversion to inequality, ε should be set as zero, and there should not be any difference between HDI and GDI and thus, no gender inequality. The higher the aversion to gender inequality the larger should be the value of ε. The Reports recommends the use of a moderate value $\varepsilon = 2$.

The final step averages the three equally distributed indices in an unweighted manner to obtain the value of GDI:

GDI = 1/3 (the equally distributed index of income) + 1/3 (the equally distributed index of educational attainment) + 1/3 (the equally distributed index of life expectancy)

Thus, computation of GDI involves estimations of 'the equally distributed index of income', 'the equally distributed index of educational attainment' and 'the equally distributed index of life expectancy'. The GDI is the average of these three equally distributed indices and has a value ranging from 0 to 1. GDI of one (GDI = 1) indicates that a country has reached its goal in its way to development, as set in the UNDP Reports.

HDI does not consider gender differences in achievement values separately in its estimation. It considers average achievements of all people together. If the values of three dimension indices are estimated for a particular country, HDI can be estimated by averaging them:

HDI = 1/3 (income index) + 1/3 (education index) + 1/3 (life expectancy index)

Data Requirements

For Income Index:
- **Real GDP (PPP $)**
- **Female labour force participation rate**
- **Female-male wage ratio**
- **Female share in total wage bill**
- **Total labour force participation rate**

For Life Expectancy Index:
- **Total life expectancy at birth**
- **Male life expectancy at birth**
- **Female life expectancy at birth**

For Education Index:

- Adult literacy rate (over 15 years)
- Combined gross enrolment ratio of primary, secondary & tertiary levels of female
- Combined gross enrolment ratio of primary, secondary & tertiary levels of male
- Combined total gross enrolment ratio

Primary source of information for this study was ABS published data. Data on gross enrolment rate was collected from 'Eighty20' source (www.eighty20.com). Information on national GDP (PPP $) was collected from the World Bank source (World Bank 2003). State-level GDP (PPP $) was estimated by applying the national proportions (Shiva Kumar 1996). We have considered adult literacy ratio as 100% primarily due to non-availability of more specific data. Under the Australian education system there is no official age limit for enrolment in any course after primary and secondary school level. So, we have selected the age band 4-24 and estimated the gross enrolment ratio using total enrolment to total population in this age band.

4. Analysis of Results

Estimated values of GDI and HDI in Australia and its 8 states and territories for the year 2002 are presented in Table 1 and 2 respectively. The national level values for Australia are very high at 0.927 and 0.929 for GDI and HDI respectively. These are slightly different from the ones estimated by the UNDP for the same year as the methodology has been adjusted to accommodate regions. Table 3 presented the difference between these two indices. The difference between HDI and GDI indicates the difference in men and women's achievements in human development (Shiva Kumar 1996). Positive difference (HDI higher than GDI) indicates existence of gender inequality (men are achieving better than women) and vice versa. As evident from Table 3, differences between HDI and GDI were positive for Australia at national and regional levels except in case of NSW state. NSW was the only state in Australia where women outperformed men. However, the differences were very small in all cases indicating little gender disparities.

Achievements of states and territories in different components of GDI and HDI are explained in Tables 4 and 5. The result shows that the achievements of women were the highest in ACT and NT in all three dimensions. So differences between male and female achievements were low in the two territories. The income levels of ACT women were higher. Higher proportion of women workers was engaged in high skill occupation and earned higher income as compared to other states and territories in Australia (ABS 2003). Lesser proportion of women workers did part time jobs where wage rate was lower and women labour force participation rate in ACT (66.3%) was also higher than the national average (55.3%). ACT also fared best in achieving higher literacy rate. About 82.5% of its population in the 4-24 age group were enrolled in primary, secondary or tertiary sectors against the national average of 73%. About 90% of total population in ACT lived in city areas.

In case of NT, female–male ratio in total population was lower at 0.47:0.53 than the national average of 0.503:0.496. Moreover, highest labour participation rate of 68% in NT helped it to achieve best results in income earning abilities for women. Men's performances were lower than the national average and women performed similar to the average women in the country. So the

difference between achievements of men and women was less. The study also reveals that the overall achievement of NT was lower than the national level as reflected in its lower HDI of 0.917 (0.929 for Australia). It indicates low level of income earning abilities, poor health and poor literacy rates of NT people than an average Australian.

It is interesting to note that on income earning areas, women in NSW fared poorer than all other states. The NSW women earned less per capita GDP (PPP$ 25,111) than an average Australian women did (PPP$ 27,640). Higher pressure of population might be considered as one of the factors responsible for this lower per capita GDP in NSW where about one-third of total women population of Australia lives. As a result, the income index for women in NSW is lowest among all states.

Another interesting finding is the role of female-male wage ratio in achieving higher level of income index if other factors such as female labour participation rate are of lower value. In case of Tasmania female labour participation rate was one of the lowest at 50.2%, but the female-male wage ratio was the highest (1.0). The income index of Tasmania was better than that of NSW.

5. Conclusions

Level of poverty is not uniform among all sections of population in the world. Some specific gender or groups are always found to be less privileged than the others. One of the most widely discussed areas in recent years is gender related economic disparities. Indicators like GDI provide quantitative estimates of gender differences. However, most of the studies focussed on disparities at the national level and on developing countries. Since gender disparities exist in developed countries and at regional levels it is interesting to investigate the issue further. This paper dealt with regional gender differences in Australia. The results indicate that, in terms of gender difference, all the states and territories performed well in Australia in the year 2002. The study found existence of gender inequalities in all states and territories in Australia except in the state of NSW. In NSW, women marginally outperformed men. However, the extent of inequalities was very small in all cases. Inter-state differences were also not very significant. In general, women outperformed men in education and health areas. But achievement of women in income earning abilities was less than men in all states and territories. Female-male wage ratio was 0.89 at the national level indicating women's wage rate was 89% of men's wage rate. In total wage income women's share was only 40% whereas 55% of total women labour force was economically active. In case of NSW, gender difference was found to be relatively higher where women were achieving better than men. Except income earning abilities, NSW women performed consistently better in all areas.Performance of women is satisfactory in all states and territories in Australia. However, still there is scope of improvement, particularly in the area of income earning opportunities for women. In recent years, women's participations in tertiary education and professional activities are growing steadily. Economic opportunities should grow accordingly to maintain a sustainable balance. Government policies can provide and protect such opportunities to enhance balanced economic development further.

Appendix

Table 1

Estimated GDI : 2002
States and Territories in Australia

	GDI	Rank
Australia	0.9279	
NSW	0.9269	5
Victoria	0.9277	4
Queensland	0.9250	6
South Australia	0.9315	3
Western Australia	0.9431	2
Tasmania	0.9184	7
Northern Territory	0.9171	8
ACT	0.9747	1

Table 2
Estimated HDI : 2002
States and Territories in Australia

	HDI	Rank
Australia	0.9294	
NSW	0.9266	6
Victoria	0.9292	4
Queensland	0.9264	5
South Australia	0.9329	3
Western Australia	0.9447	2
Tasmania	0.9193	7
Northern Territory	0.9176	8
ACT	0.9756	1

Table 3
Estimated Gender Differences : 2002
States and Territories in Australia

	HDI	GDI	% Difference	Rank
Australia	0.9294	0.9279	0.16	
NSW	0.9266	0.9269	- 0.03	
Victoria	0.9292	0.9277	0.17	5
Queensland	0.9264	0.9250	0.15	4
South Australia	0.9329	0.9315	0.15	4
Western Australia	0.9447	0.9431	0.17	5
Tasmania	0.9193	0.9184	0.10	3
Northern Territory	0.9176	0.9171	0.001	1
ACT	0.9756	0.9747	0.001	1

Table 4
Components of GDI : 2002

States and Territories in Australia

	Income		Life Expectancy		Education	
	Index	Rank	Index	Rank	Index	Rank
NSW	0.920	7	0.913	5	0.947	2
Victoria	0.921	6	0.918	2	0.943	3
Queensland	0.940	3	0.910	6	0.924	7
South Australia	0.939	4	0.912	4	0.942	4
Western Australia	0.979	2	0.917	3	0.932	6
Tasmania	0.929	5	0.893	7	0.933	5
Northern Territory	1.02	8	0.810	8	0.916	8
ACT	1.029	1	0.928	1	0.966	1

Table 5
Components of HDI : 2002
States and Territories in Australia

	Income		Life Expectancy		Education	
	Index	Rank	Index	Rank	Index	Rank
NSW	0.922	8	0.911	5	0.912	3
Victoria	0.926	7	0.918	2	0.912	2
Queensland	0.944	4	0.910	6	0.895	7
South Australia	0.943	5	0.912	4	0.903	5
Western Australia	0.984	3	0.917	3	0.912	4
Tasmania	0.931	6	0.893	7	0.901	6
Northern Territory	1.025	2	0.810	8	0.863	8
ACT	1.031	1	0.928	1	0.937	1

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