Gender Equality and Economic Growth of Nepal:
A Positive Synergy Hypothesis

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ABSTRACT

Nepal is at a historical period of social, economic and demographic transition. Having multiple transitions at once have provided rooms to explore the experiences that are undergoing on different avenues. This study attempts to explore the relation between gender dynamics and economic growth. Nepal is witnessing historical changes in gender dynamics in the last few decades. These changes are expected to add synergy effect on other socio-economic development. Using time series data for the period of 1990 to 2005, this study investigates to what extent gender equality in life expectancy, education, labour force participation and HDI promote economic growth of Nepal. First, this article calculates the gender equality using the auxiliary of UNDP's HDI calculation methodology in the above mentioned area. In the second stage, this equality index is regressed with lagged differences of GDP per capita growth and the results are analyzed.

Although different studies have shown gender inequality in above-mentioned indicators impede economic growth, this study finds no conclusive relationship in case of Nepal. While the gender equality is increasing considerably, economic growth is not yet supported by the decline. In the last one and half decade female advantages in life expectancy, education attainment and labour force participation are remarkable. The gap between HDI and GDI is decreasing over the years. Within this favourable environment, the economic growth has crippled around 4 percent during the period 1990 to 2005. Gendered economic growth is, therefore, possible when the economic policies are gender visible which can harvest the gender equality dividend in favour of sustained and quality economic growth.

Introduction

Gender equality and economic growth are often two less clearly linked dimensions in Nepal as many other developing countries. The reasons may be that the focus on gender equality has gained momentum fairly recently and economic growth has remained stagnant for over a considerably long period. Macroeconomic attention of gender equality in case of Nepal is considerably new, particularly in empirical analysis. Standing on the arguments that gender equality and economic growth have positive synergy influence on each other (Kabeer, 2003), this paper intends to examine the relationship between gender equality and economic growth considering Nepal as locus of analysis.

Economic growth, in recent discussions, extends beyond then conventionally understood function of labour, technology and investment. Of which, gender equality, which is to decompose the aggregate progress into male and female accounts and maintain converging trends, deserves special attention in contemporary development economics. Concerns to gender equality draw attention from the contemporary global experiences of increasing women participation in labour market and economic activities, educational attainment and health status, which are also prerequisites for economic growth, in countries with economic boom, especially from East Asian Miracle. Macroeconomic analyses agree gender inequality

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limits productivity, output and growth (Ellis, Manuel, & Blackden, 2006). Gender equality (inequality) is of particular concern on human resource development, *a priori* for economic growth.

Explaining economic growth through human resource development has a direct relationship with Sen's capability approach (Sen, 1999). Any reduced achievement for women in these capabilities is intrinsically problematic (Klasen, 2000). Gender, when appears as an institution, has important implication for determining growth that in turn promotes wellbeing having both intrinsic and instrumental significance. The focus of gender in development is, therefore, not because that men and women unequally share development benefits but the more important is the roles are unequally valued. Morrison, Raju and Sinha (2007) suggest gender equality has both short-term and long-term implications in growth which follows several links.

Most of the classical growth models valued growth of labour force, qunatiative input, as an important indicator of economic growth. The quality and composition, especially sex composition, were rarely focused. When the concept of labour force widened to human resoruces attention is increasingly being paid to quality. But the attention in the beginning lacked gender dimension in human resoruce analysis which is still a challenge in many developing countries as it is challegning to establish relationship at macro level. The challenge is compounded in Nepal due to lack of empirical evidences to support the hypothesis.

Many contemporary studies have established the unarguable facts that gender equality in basic human wellbeing has positive contribution to economic growth (Klasen, 1999) while Dollar and Gatti (1999) observed high GNP per capita tends to have low gender inequality. However, later argument is criticized for not always being true. The important is to examine the process how growth represents the gendered determinants of growth. The argument is sustained since the mechanism of growth is not gendered where inequality seems to be pervasive.

Contrasting to argument of positive relationship between gender equality and growth, Seguino (2000a), argued gender inequality in wages in certain economic conditions could yield higher growth. This argument is further confirmed by Seguino (2000b) concluding the economies that disadvantaged women most were the fastest growing ones. However, these conclusions may have quantitative validity, the quality of growth and translation into wellbeing deserve attention to evaluate.

Studies on gender equality as an input variable for economic growth are particularly lacking in case of Nepal. Most of the studies are concerned with gender equality as an output variable. The differential development performance is duly examined in most of development literatures. They acknowledge gender inequality is pervasive in most of development indicators but empirically unaware of the growth impact of gender inequality as such.

Nepal's economy is poor performing since long. The growth rate has never exceeded 6 percent per annum. There are several possible endogenous and exogenous explanations for low growth performances. Gender as an input variable for explaining economic performance is of great importance in Nepal not only because there is lack of sufficient literatures but also because gender appears as an important institution.

Within the arguments that gender equality is both cause and consequence of economic growth, this study intends to explore the relationship of gender equality with economic growth in Nepal considering the gender equality a *priori* for growth.

Model

Gender equality includes several aspects – inequality in health, opportunity, economy, decision-making, participation, mobility and cultures among others, which may or may not be quantified. This study considers major four parameters that have important roles in economic growth to measure gender equality (inequality) – a) life expectancy as an indicator of health status and government's expenditure on health, b) secondary enrolment rate as an indicator of educational attainment and government's expenditure on education, c) labour force participation as a proxy for share in economic participation and gender inequality index as a difference between UNDP's Human Development Index (HDI) and Gender Development Index (GDI). An index is developed for each three parameters – life expectancy, secondary enrolment and labour force participation and finally, the unadjusted HDI and GDI gap is used to measure the interaction effect. This method has two possible advantages. First, using three parameters separately allows examining the relative importance of each variable. Second, adding adjusted HDI and GDI contributes to interactive explanatory power of gendered development outcomes, although this may nullify the effect of three individual factors included in the model.

Life Expectancy Index (LEI) is constructed in two steps using the auxiliary of UNDP's HDI. In the first step normalized values male and female life expectancy are derived as:

$$NLE_m = \frac{LE_m - 22.5}{82.5 - 22.5} \tag{1}$$

$$NLE_f = \frac{LE_f - 27.5}{87.5 - 27.5} \tag{2}$$

where, *NLE* stands for normalized life expectancy values

       m and *f* are abbreviation for male and female respectively.

The normalized values are converted into LEI by obtaining the ratio of difference between NLE_m and NLE_f to sum of NLE_m and NLE_f, irrespective of positive or negative values as:

$$LEI = \frac{|NLE_m - NLE_f|}{NLE_m + NLE_f} \tag{3}$$

Education Index (EI) is calculated using male and female gross secondary enrolment rate (GSER). Although EI could be calculated including gross primary enrolment rate, studies show primary enrolment rate has little impact on productivity and the other argument is that secondary enrolment is not exclusive to primary enrolment. Therefore, gross secondary enrolment rate is used in this analysis for increasing the explanatory power.

$$EI = \frac{|GE_m - GE_f|}{GE_m + GE_f} \tag{4}$$

where, GE_m and GE_f are gross secondary enrolment rate for male and female respectively.

Labour Force Index (LFI) is used as a proxy measure for male and female share in employment. Labour force is composed of male and female participation in defined economic

activity. For example, if one estimates female participation in labour force, *male participation* can be simply obtained by *100-female share in labour force*. The argument behind this is that male and female share in labour are dependent and incorporating both will not improve the explanatory of power of model. Therefore, only female share in the labour force is considered in this analysis, which is derived as:

$$LFI = \frac{\left|P_f - LF_f\right|}{100} \tag{5}$$

where P_f and LF_f are population share and labour force share for female respectively. P_f and LF_f are obtained as:

$$P_f = \frac{100 - P_m}{100} \tag{6}$$

$$LF_f = \frac{100 - LF_m}{100} \tag{7}$$

where P_m and LF_m are population share and labour force share for male respectively.

Gender Inequality Index (GII) as an adjusted difference between HDI and GDI is derived as:

$$GII = \frac{HDI - GDI}{HDI} \tag{8}$$

The value of GII ranges between 0 and 1, 0 if GDI completely overlaps to HDI indicating no gender inequality and maximum (progressive to 1) if GDI equals 0 indicating complete gender inequality. However, in practice GII has values neither 0 nor 1. Since HDI and GDI are composite indices representing life expectancy, educational attainment and GDP per capita, GII roughly represents all earlier three indicators.

Economic Growth: Since my concern is to examine the impact of gender equality (inequality) in economic growth, it is measured by GDP per capita growth rate. A lag difference in GDP per capita growth rate is to be considered for examining the change in growth rate considering the base year a zero and calculating the difference for each successive year as:

$$EG = GDP_{x+i}^{pc} - GDP_{x}^{pc} \tag{9}$$

where, EG stands for absolute economic growth measured by GDP per capita growth rate, x is base year and x+i is successive year (i=1………………..n).

For example, if x=1990, the EG for year 1995 is derived as $GDP_{1995}^{pc} - GDP_{1990}^{pc}$ which is applicable for all years to which EG is to be calculated.

Finally, an ordinary least square (OLS) is used to examine the effect of all explanatory variables on explained variable. The regression model follows:

$$EG = \beta_0 + \beta_1 LEI + \beta_2 EI + \beta_3 LFI + \beta_4 GII + \varepsilon_i \tag{10}$$

where, terms have usual and/or earlier described meaning.

For making analysis more analytical, the equation (10) could be decomposed when required.

Data

This study is based on the reference period of 1990 to 2005. Data on life expectancy are obtained from UNDP's Human Development Reports (http://www.undp.org). Secondary enrollment data are obtained from Ministry of Education (MoE) Nepal (*http://www.moe.gov.np)*. Labour force participation and economic growth rates are obtained from the United Nations Statistics Division (http://data.un.org/Default.aspx).

Empirical Findings

Gender Equality in Life Expectancy

Gender equality in life expectancy is, therefore, achieved when female advantage is observed regardless of whether the average life expectancy is high or low. Female advantage in life expectancy is a recent phenomenon in Nepal. Regmi and Dangol (2003) estimated female advantage of about 0.6 years using the census data 2001. Global estimates show that female advantage is observed from the beginning of new millennium in Nepal (Figure 1). During the last one and half decade, female life expectancy observed an increase of 11.5 years compared to 9.5 years increase for male indicating improvements in female survival and thereby decreasing gender inequality.

Figure 1: Male and Female Life Expectancy, 1990-2005, Nepal
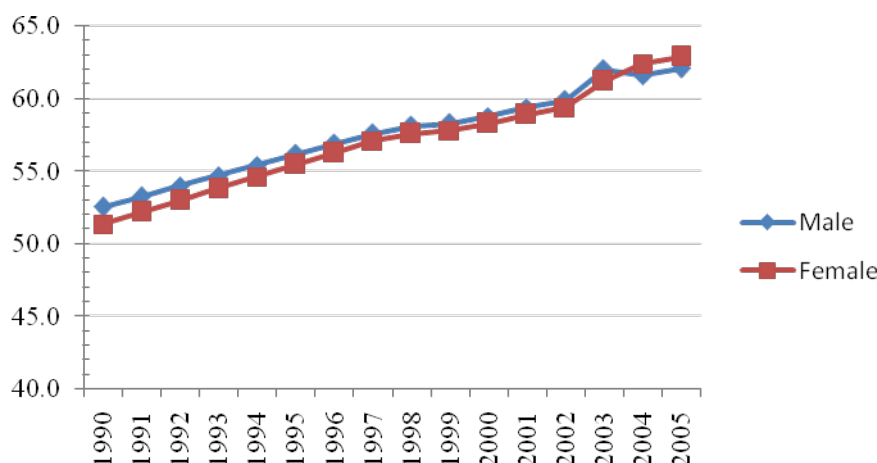
*Source: UNDP's Human Development Reports, 1990-2007/08.*

Life expectancy not only reflects the health improvements, but equally representative of socioeconomic development of the nation. The gender inequality is life expectancy (female disadvantage) reflects women's poor performance in health, education, economic and demographic indicators.

Gender Equality in Educational Attainment

Educational participation of Nepali women has significantly increased after 1990s. Compared to improvement in educational attainment of women, the gender disparities are decreasing only slowly (Acharya, 2003). The gender disparity increases with the increase in the level of education. During the period of 1990 to 2005, the GSER of both male and female has increased steadily, with females growing faster and therefore narrowing the gender gap in enrolment rate. In the 1990, gap between male and female GSER was 23.8 points, which

decreased to 10.2 points by the year 2005. Figure 2 shows increasing gender equality in male and female GSER for the period of 1990 to 2005.

**Figure 2: Male-Female Difference in Gross Secondary Enrolment Rate, Nepal, 1990-2005.**
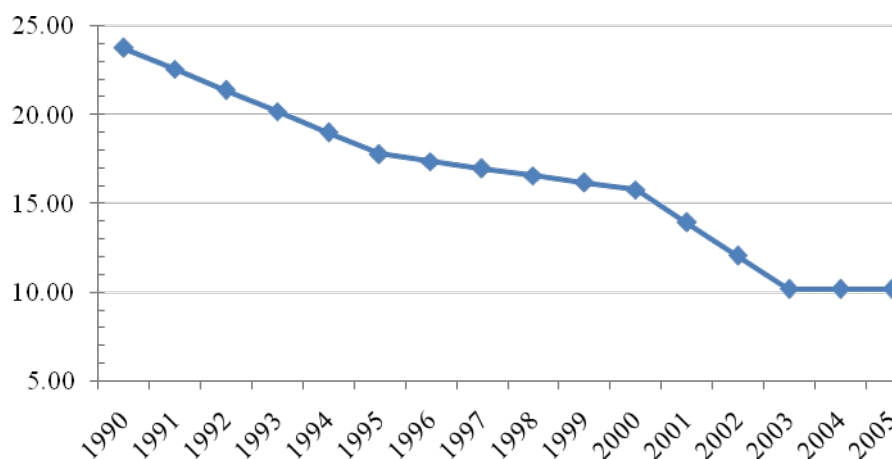
Source: Ministry of Education, Government of Nepal, available at http://www.moe.gov.np, accessed on 20 January 2009.

In 1990, the GSER was 29.5, which reached to 48.13 in 2005. The female GSER was as low as 17.1 in 1990 and reached to 49.1 in 2005, an increase of 32.0 points. However, for males it was as high as 40.9 in 1990 and an increase of 18.4 points was observed during the same period. The increasing gender equality in education attainment has multiplier effect on other socioeconomic indicators. Therefore, education has both instrumental and intrinsic significance.

Gender Equality in Labour Force Participation

Inclusion criteria in labour force in Nepal are changing over the censuses. The latest Census of 2001 used a combined concept of labour force and gainful approach. It considered those who worked for any length of time during the 12 months preceding the census date as economically active. Additionally, people involved in extended works were included in economically active population (Shrestha, 2003). In this study, labour force is defined as the proportion of population (male and female separately) in economically active age group engaged in some form of economic activity as defined by system of national account. Male and female participation in labour force has remained more or less constant over the years. For example, male participation in labour force was 80.4 percent in 1990, which declined to 78.3 percent in 2005 whereas for female it was 48.1 percent in 1990 and slightly increased to 49.9 percent in 2005. A slight decline in the gap of male and female participation in labour force is observed until 2003 and a slight increase thereafter (Figure 3). The increase is particularly due to decrease in female participation.

Figure 3: Male and Female Difference in Labour Force Participation, Nepal, 1995-2005.
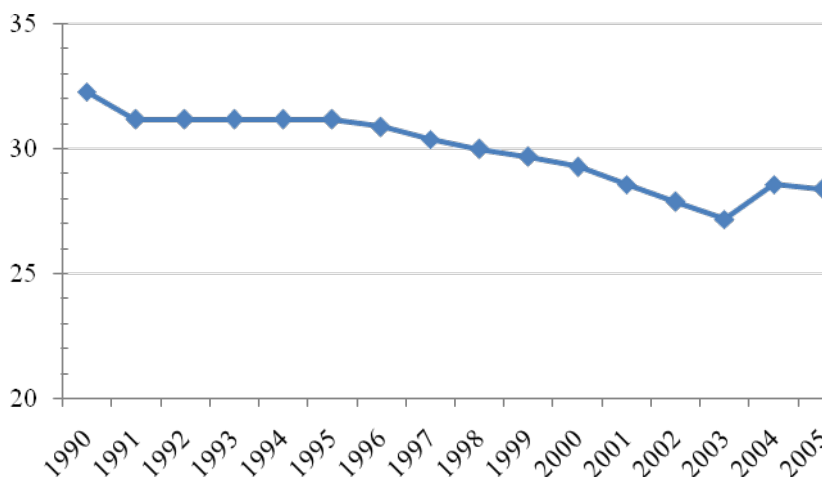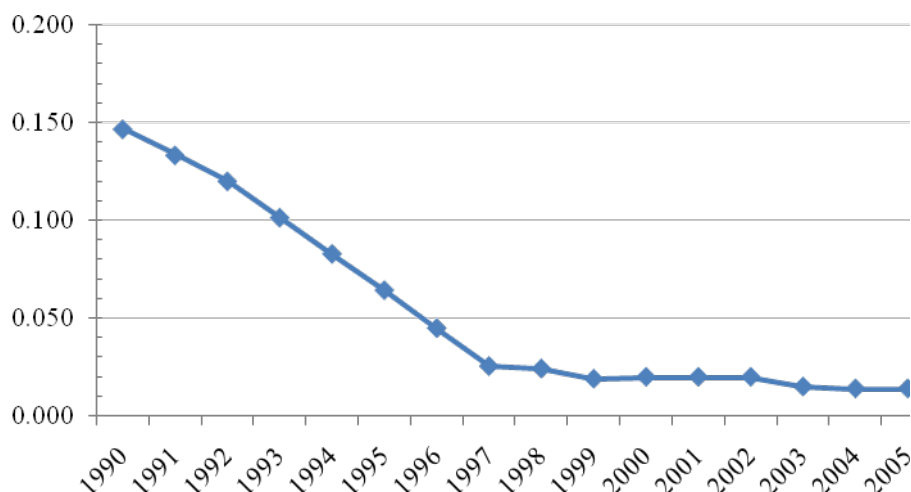

Source: United Nations Statistics Division, available at http://www.data.un.org/Default.aspx, accessed on 20 January 2009.

Gender Inequality in Development

This study uses the gap between UNDP's Human Development Index (HDI) and Gender Development Index (GDI) as a proxy for measuring gender inequality in development. GDI is gender adjusted HDI and in the absence of gender inequality three indicators of HDI, the values of these to indices should be identical. Therefore, the difference between these two is the contribution of gender inequality. UNDP has made revision in the methodology of calculating HDI in 1997. The revised method yields higher HDI values than the conventional method. The higher values from the revised method are used in this study. The HDI of Nepal has increased by 0.119 during the last 16 years whereas the GDI has increased by more than double of the growth of HDI and thereby reducing the gap between GDI and HDI. The gap between HDI and GDI is consistently decreasing which signifies an improvement in gender equality. In 1990, the gap was 0.147, which reduced by 90 percent during 1990 to 2005. The decline was faster until 1997 (Figure 4) and will be much slower in the future years when the values of the both indices increase.

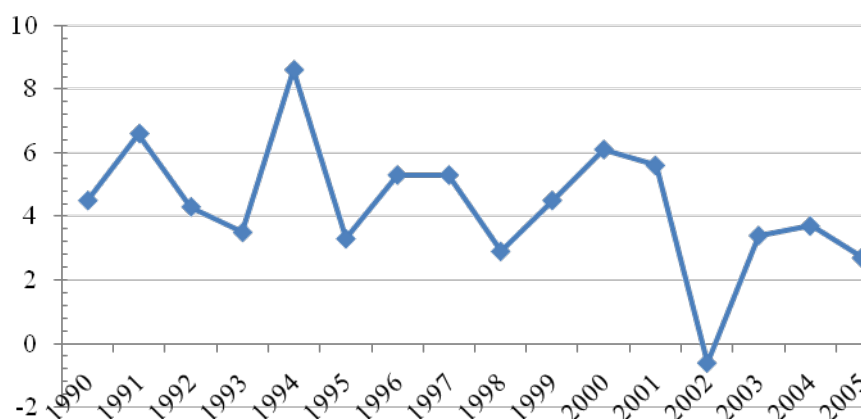**Figure 4: HDI and GDI Difference, Nepal, 1990-2005.**

Economic Growth

This study uses growth rate in GDP per capita to measure economic growth. Nepal's economic growth is not uniformly increasing over the year. Nepal observed satisfactory economic growth in early 1990s due to massive economic liberalization and reforms (Khatiwada & Sharma, 2002). During the last 16 years, Nepal's GDP per capital grew by an average of 4.36 percent. Figure 5 shows the trend of GDP per capita growth rate.

Figure 5: GDP Per Capita Growth Rate, Nepal, 1990-2005.

The effect of each explanatory factors discussed earlier is tested using OLS as modelled in equation (10). In the four models used in this analysis, one new explanatory variable is added in each successive steps. The findings shown in Table 1 claim no statistically significant relationship of gender equality (inequality) explained by the indicators – life expectancy, educational attainment, labour force participation and gender inequality in development- in economic growth. These factors also do not have satisfactory explanatory power for economic growth, in case of Nepal, since the adjusted R^2 value is ominously small. Considering the interaction effect within the independent variables, bivariate regression models are fitted to observe the effect of each individual indicator. Nevertheless, except LFI, none produced statistically significant result. LFI shows a significant influence on economic

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growth when regressed independently. But the influence vanishes when it interacts with other variables.

Table 1: Gender Equality and Economic Growth in Nepal (Dependent Variable Absolute Economic Growth)

Model		β	Std. Error	t	Sig.
1	(Constant)	-3.734	2.464	-1.515	.152
	LEI	41.850	28.150	1.487	.159
	Adjusted R square	0.075			
2	(Constant)	.238	4.909	.048	.962
	LEI	-49.510	101.558	-.488	.634
	EI	16.491	17.607	.937	.366
	Adjusted R square	0.066			
3	(Constant)	-.905	5.111	-.177	.862
	LEI	-29.690	104.734	-.283	.782
	EI	7.527	20.387	.369	.718
	LFI	269.088	301.253	.893	.389
	Adjusted R square	0.052			
4	(Constant)	.516	5.690	.091	.929
	LEI	-96.230	149.349	-.644	.533
	EI	43.190	59.420	.727	.482
	LFI	-48.828	584.195	-.084	.935
	GII	-41.490	64.709	-.641	.535
	Adjusted R square	0.003			

Although, the values are not significant, negative signs are observed for all indicators except Education Index. The negative signs are expected while the positive sign in Education Index leads to confusion and further discussion on the model, data and theoretical explanation. The unexpected positive sign for Education Index may be due to the data used in the analysis. It is argued that enrolment rate only do not capture the educational attainment well. The pass-out rate (completion rate) could be an appropriate alternative, which could not be included in this study owing to data limitation. The factors – Life Expectancy Index, Labour Force Index and Gender Inequality Index turn to negative when all four factors included in the model together showing an interaction effect within the independent variables. The negative relationship explains that with the increase in the gender inequality there is possible negative impact on economic growth. The another important point to note is the continuous decline in the value of adjusted R Square when each independent variable is added in the model. This decline seriously warns in the model fit and methodological issues.

Discussion and Conclusion

Revisiting the endogenous growth model where importance of human capital is largely acknowledged for economic growth, experiences from East Asian Miracle confirms the importance of gender equality in education and labour force participation for accelerating economic growth. Life expectancy explains the achievement in health, which is essential for human resource development. However, there are controversial arguments on the role of gender equality in life expectancy and economic growth. Role of female education is appreciated for improving women's wellbeing (Sen, 1999) and productivity. Participation of female in economic market is another important factor to influence national economic performance. However, Systems of National Account (SNA) restrict the measurement of female participation in labour force. Women's works are invisible and unpaid and largely

confined in care economy. Gender inequality in development indicator is summary of earlier mentioned three indicators, which is supposed to have a negative influence in economic growth.

Gender equality in Nepal is increasing over years in all indicators used in this analysis. Female advantage in life expectancy is observed in recent years. The male and female gap in education attainment is decreasing. Female participation in labour force is increasing and the difference between HDI and GDI is decreasing. These all indicators converge to encouraging conclusion for elimination of gender disparity in social and economic dimensions. However, the gender equality dividend is still not harvested by the economic polices for an encouraging economic growth of Nepal. The main reasons may be that economic growth of Nepal has not taken any defined shape yet. It is assumed to be determined by socio-political system rather than other indicators. Nepal made many encouraging achievements in minimizing gender inequality in social and political dimensions in the last one and half decade. However, this improvement could not support the economic growth as expected largely due to unfavourable politico-economy.

Although, the empirical evidences in this study do not show any statistically significant relationship between gender inequality and economic growth until now, a significant relationship can be expected in the future once the economic growth takes a defined shape and the gender equality dividend starts functioning. The increasing gender equality is helpful to prepare social and human capital required for economic growth. An appropriate economic policy that utilizes the dividends of gender equality along with other social indicators is required to harvest the positive synergy benefits from gender equality and economic growth.

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