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HOW GENDER INEQUALITIES AFFECT ECONOMIC GROWTH IN PAKISTAN: A COINTEGRATION ANALYSIS

This study examines the impact of gender-related inequalities on economic growth in case of Pakistan on the recent data. We have transformed the conventional Cobb-Douglas production function into a dynamic model, by introducing the TFP, a function of gender inequalities. Total factor productivity is considered to be a dynamic variable by 3 proxy variables: education inequality, health inequality and participation inequality instead of taking it as exogenously given. So this study establishes an inverse relationship between gender inequalities and economic growth. Johansen co-integration test establishes a long-run relationship between gender inequalities and economic growth, followed by error correction model (ECM) for the short-run analysis.

Keywords: *education inequality; health inequality; participation inequality; economic growth.*

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ВПЛИВ ГЕНДЕРНОЇ НЕРІВНОСТІ НА ЕКОНОМІЧНЕ ЗРОСТАННЯ ПАКИСТАНУ: АНАЛІЗ КОІНТЕГРАЦІЇ

У статті оцінено вплив гендерної нерівності на економічне зростання Пакистану на основі останніх даних. Традиційна функція Кобба-Дугласа трансформована в динамічну модель за допомогою введення додаткової функції гендерної нерівності. Сукупна факторна продуктивність представлена як динамічна змінна з 3 складовими: нерівність в освіті, нерівність в охороні здоров'я і нерівна участь на ринку праці. Доведена зворотна залежність між гендерною нерівністю і економічним зростанням. Тест Йохансена на коінтеграцію підтверджує наявність довгострокового зв'язку між гендерною нерівністю і економічним зростанням, модель корекції помилок підтверджує цей зв'язок для короткострокової перспективи.

Ключові слова: *нерівність в освіті; нерівність в охороні здоров'я; нерівна участь на ринку праці; економічне зростання.*

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ВЛИЯНИЕ ГЕНДЕРНОГО НЕРАВЕНСТВА НА ЭКОНОМИЧЕСКИЙ РОСТ ПАКИСТАНА: АНАЛИЗ КОИНТЕГРАЦИИ

В статье оценено влияние гендерного неравенства на экономический рост Пакистана на основе последних данных. Традиционная функция Кобба-Дугласа трансформирована в динамическую модель посредством введения дополнительной функции гендерного неравенства. Совокупная факторная производительность представлена как динамическая переменная с 3 составляющими: неравенство в образовании, неравенство в здравоохранении и неравное участие на рынке труда. Доказана обратная зависимость между гендерным неравенством и экономическим ростом. Тест Йохансена на коинтеграцию подтверждает наличие долгосрочной связи между гендерным неравенством и экономическим ростом, модель коррекции ошибок подтверждает эту связь для краткосрочной перспективы.

Ключевые слова: *неравенство в образовании; неравенство в здравоохранении; неравное участие на рынке труда; экономический рост.*

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Introduction. Economic growth means persistent expansion in productive capacity that results in steady increase of real GDP. Economic development is such a long-run process where real GDP increases accompanied by reduction in inequalities and improvement in the standard of living of all human beings. The novelty of this study is that gender-related inequalities are focused to study their impact on economic growth. Recent empirical data strongly favor the argument that differences in per capita incomes across the countries are mainly due to different disparities which affect TFP in different magnitude. According to Easterly and Levine (2001), TFP is the main determinant of economic growth instead of traditional factors considered responsible for economic growth. Hence these intangible assets like education, health and efficient participation of women in economic affairs are prerequisite for creating knowledge base of the economy, which can shift the production function beyond traditional growth trajectories.

Objective of the study

This article tries to explore the role of gender inequalities on economic growth. We set the following statement for achieving this objective.

Proposition: Reduction in gender inequalities enhances economic growth.

Literature Review

Paasha (1994) deduces that growth in per capita income also results in changing social norms of society. As per capita income increases, preferences of people for education of women changes so female enrollment ratio increases. In labour market as demand for labour increases, it exerts pressure on heavily biased social norms in favor of men and eventually more opportunities open for women and high wage rates for female workers.

Amartya Sen (1995) unveils a very thought-provoking aspect regarding active women participation in economic affairs. According to him, societies must acknowledge women as a vibrant mode of social transformation instead of having sympathetic or helping attitude towards them. As more education and employment opportunities and ownership rights are given to women, it enhances their contribution to economic development.

Nilufer and Korkuk (2004) stated that in most of societies, labour is classified on the basis of gender. All income-generating activities are ascribed to dominant male segment and unpaid household activities are associated with female counterpart. So female have their significance only for reproductive activities and looking after children and family. So a lot of work done by women cannot be materialized due to household nature of work. They deduce in their study, that in developing economies, women have comparatively less opportunities for education, health and more importantly in power structure of the countries.

Bloom and Canning (2003) found that health must be the focal point of any development strategy for Africa. According to them, maximum benefits from schooling cannot be taken from school education unless children of Africa are provided better health conditions.

Easterly and Levine (1997) found that African countries are far low in economic performance due to low ethnic classifications. According to their study, labour is considered to be more heterogeneous due to low enrollment in schools, reduction in labour productivity and eventually staggering economic growth.

Lucas (1988) provided the basis for empirical research on human capital based endogenous growth models. According to him, investment in human capital, constant returns can be avoided.

The Model

The model used in this study is Cobb-Douglas:

$$Y_t = f(K_t, L_t)$$

$$Y_t = A_t K_t^{\alpha} L_t^{\beta} e_t$$

Y_t = GDP

K_t = Gross Domestic Investment used as the proxy variable for capital

L_t = Employment level as the proxy for labor

Following Barro (1991), we have used gross investment rates as the proxy for physical capital, so in this study we have used gross domestic investment rate as the proxy variable for physical capital.

In order to test the significance of human capital for economic growth, we have divided the research into two segments:

Impact of gender inequality on economic growth

To study the impact of gender inequality on economic growth, we take TFP as a function of 3 exogenous variables. Developing countries like Pakistan, despite their desperate efforts, cannot go beyond the traditional growth trajectories due to disparities of women.

Gender inequality has 3 dimensions:

I. Education inequality;

II. Health inequality;

III. Participation inequality.

The issue of women empowerment has got great significance, since MDG's are targeted. In this study we have used 3 proxy variables to measure the extent of inequality in education, health and participation in economic activity.

Education Inequality

Education inequality includes the following parameters used as the proxy for education:

I.   Literacy rate;

II. Enrollment rates in primary and secondary education;

III. Number of employed teachers.

Health Inequality

Health inequality means difference in health related parameters for different segments of the population within the same country. Health inequality includes data the on following variables:

I.   Life expectancy;

II. Crude death rate;

III. Child mortality rate in 1-4 y.o.

Participation Inequality

It would be unjust if we ignore active participation of women in economic affairs

because in Pakistan women constitute more than a half. So this huge liability of women can be transformed into a useful asset due to their involvement in economic activity. Women in Pakistan are unable to fully take part into earning activities. Due to so many social and cultural constraints and orthodox religious beliefs, it is very difficult to mobilize women on the same footing as men are working in different sectors. Pakistani women are mainly involved in rural sector and their activities cannot be materialized as women working in urban sector.

Using the standard form of Cobb-Douglas production and transforming this Cobb-Douglas production function into a linear form we take log on both sides:

$$\ln(Y_t) = \ln(A_t K_t^\alpha L_t^\beta \varepsilon_t)$$

$$\ln(Y_t) = \ln(A_t) + \alpha\{\ln(GDP_t)\} + \beta\{\ln(L_t)\} + \ln(\varepsilon_t)$$

In order to study the impact of gender inequalities, TFP parameter is assumed to be dynamic rather than exogenous to model:

$$\ln(A_t) = \lambda_O + \lambda_1\{\ln(Eduineqt_t)\} + \lambda_2\{\ln(Healthineqt_t)\} + \lambda_3\{\ln(Partiineqt_t)\} + e_t \quad (1)$$

By replacing the TFP parameter into equation **(1)**

Empirical Findings

$$\ln(Y_t) = \lambda_O + \lambda_1\{\ln(Eduineq_t)\} + \lambda_2\{\ln(Healthineq_t)\}$$
$$+ \lambda_3\{\ln(Partiineq_t)\} + \alpha\{\ln(K_t)\} + \beta\{\ln(L_t)\}$$

Most of the times, time serial data often shows the property of non-stationarity at level form. We have tested the stationarity of the data through unit root tests. In this regard, augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are used.

Table 1. **Augmented Dickey-Fuller (ADF) Test Statistics**

Estimated Values		
Variable name	**At level form**	**At first difference**
Y_t	-0.31	-4.25
K_t	1.65	-8.28
L_t	-0.95	-6.14
Edu_ineq$_t$	-0.32	-5.81
Health_ineq$_t$	-1.10	-6.21
Parti_ineq$_t$	0.36	-4.02

At the 5% level of significance critical value is -2.95

The results of the augmented Dickey-Fuller (ADF) test are presented in Table 1. These results reveal that at the level form the estimated values of t-statistics for all the variables are not significantly negative. Therefore, the data is not stationary at level form.

The results of the differenced variables show that estimated values of t-statistics are significantly negative at the 5% level of significance. So, according to ADF all the variables are stationary at the first difference.

Table 2. **Phillips-Perron (PP) Test Statistics**

Estimated Values		
Variable name	At level form	At first difference
Y_t	-0.30	-4.21
K_t	-1.50	-8.78
L_t	0.97	-6.14
Edu_ineq$_t$	1.25	-5.47
Health_ineq$_t$	-0.96	-4.37
Parti_ineq$_t$	1.74	-6.89

At the 5% level of significance critical value is -2.95.

The results of the Phillips-Perron (PP) are presented in Table 2. The above table reveals that at the level form estimated values of t-statistics for all the variables are not significantly negative. Therefore, the data is not stationary at the level form.

The results of the differenced variables show that the estimated values of t-statistics are significantly negative at the 5% level of significance. So, all the variables are said to be integrated of order I (1).

Results of Johansen Cointegration

Cointegration of two or more variables means that there exists a long-run relationship between them. Johansen (1988) and Johansen and Juselius (1990) developed a conintegration technique to test the long-run relationship between variables.

There are two basic criteria of Johansen conintegration results — trace statistics and Eigen value. If trace statistics and Eigen value are greater than critical value at 5%, then there exists a long-run relation between variables. In this study for all the equations results of trace statistics and Eigen values reveal there exists at least one cointegrating vector.

Impact of gender inequalities on economic growth

Johansen cointegration results

The estimated equation is

$$\ln(Y_t) = 50.87 + 0.26\{\ln(Eduineq_t)\} + 0.16\{\ln(Healthineq_t)\}$$
$$+ 2.39\{\ln(Partiineq_t)\} + 0.19\{\ln(K_t)\} + 1.32\{\ln(L_t)\}$$

Table 3. **Long-run analysis of gender inequalities in economic growth**

Impact of gender inequalities on economic growth		
	Short Run	Long Run
Education inequality	0.12 [0.67]	-0.263 [2.788]
Health inequality	0.18 [0.11]	-0.157 [-2.89]
Participation inequality	-0.08 [-0.34]	-2.39 [5.03]

At the 5% level of significance

Table 3 reveals that all 3 types of gender inequalities are inversely related with economic growth. So, there is overall improvement in gender related inequalities but out of these 3, participation inequality is the greatest in magnitude. This reveals that

at education level although inequality is still there but this gap between males and females widens at the time becoming a part of productive labour force. Due to social norms and cultural constraints women are least bothered to work even in urban sectors of Pakistan, even after completion of their formal or professional education. As far as health inequality is concerned, its magnitude is reasonably smaller due to the fact that life expectancy of women is more than of their men counterpart. In 2003 life expectancy for males was 63 and for females 65 years (World Development Indicators, 2005).

Table 4. **Short-run dynamics**

Impact of gender inequalities on economic growth	
Education inequality	-0.263[2.788]
Health inequality	-0.157[-2.89]
Participation inequality	-2.39[-5.03]

At the 5% level of significance.

In the short-run analysis of the impact of gender inequalities, ECM value is -0.18 which means in the short run education and inequalities are positively affecting economic growth. But this short-run deviation will converge towards the long-equilibrium path of inverse relationship between education and health inequality with economic growth, whereas participation inequality is inversely proportional even in the short run following the same long-run behavior.

Conclusions and Recommendations

Conclusions. In Pakistan gender inequalities are inversely related to economic growth. Participation inequality is the largest in magnitude adversely affecting economic growth. Due to cultural constraints women are least bothered to work even in urban sectors of Pakistan, even after completion of their formal or professional education. Despite, health conditions are biased in favor of male dominant society but not at alarming stage. The data on gender-related inequalities depict a there is sharp decline in the last decade, Gen. Parvaiz Musharraf era due to his policies to empower women.

Recommendations. More opportunities and civic freedom must be provided for efficient involvement of women in economic activity, raising the literacy rate of women as education facilitates them to learn skills.

Besides conventional education, training in fields of agriculture, health care and handicrafts will make women more forward-looking. Investment in women's human capital must be focused by creating more education and skill opportunities for women, in order to transform them into an efficient player in economic activity. Policy measures must be taken to bound girls from professional institutions like medical and engineering universities to work for their country as they preclude the opportunities for male students to get enrolled in professional institutions and then under the pressure of several social constraints, they deny to become the part of workforce. This will also reduce participation inequality.

References:

Ahmad, N. and Bukhari, S. (2007). Gender Inequality and Trade Liberalization: A case study of Pakistan. Research Report No. 67. Karachi, Pakistan: Social Policy and Development Center.

Amartya Sen. (1995). Gender Inequality and Theories of Justice, Women, Culture, and Development: A Study of Women Capabilities, World Institute for Developing Economic Research.

Barro, R. J. (1991). Human Capital and Growth, American Economic Review, Papers and Proceedings, Vol 91, No 2: 12-17

Easterly, W. and Levine, R. (2001). It's Not Factor Accumulation: Stylized Facts and Growth Models, World Bank Economic Review, Vol 15: 177-219.

Gujarati, D. N. (2005). Basic Econometrics, International Edition. 4th edition, McGraw-Hill, New York.

Hafiz, A. P. (1994). Cost Effectiveness in Primary Education: A Study of Pakistan, Pakistan Development Review, Vol 33(4), Part 2, Winter, 1167-78.

Lucas, R. E. Jr. (1988). On the Mechanics of Economic Development, Journal of Monetary Economics, Vol.22, 3-42

Lucas, R. E. Jr. (1990). Why doesn't Capital Flow from Rich to Poor Countries? American Economic Review, Vol.80, No.1: 92-96

Nilufer, C. and Korkuk, E. (2004). Gender and Globalization a Macroeconomic Perspective, Working Paper No. 19, Policy Integration Department World Commission on the Social Dimension of Globalization.

Romer, P. (1990). Endogenous Technological Change, Journal of Political Economy, Vol.98 (5), 71-102

Romer, P. (1990a). Human Capital and Growth: Theory and Evidence, Carnegie-Rochester Conference Series on Public Policy: Unit Roots, Investment Measures and Other Essays, Vol.32, 251-285.

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