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Gender Inequality and Exports Diversification in Pakistan: An Empirical Investigation under Endogeneity

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Abstract

This study empirically investigates the relationship between gender inequalities and exports diversification in Pakistan over the period from 1982 to 2016. Gender equality is critically important for the moral obligation and the economic fundamentals. Gender equality also provides vital support for exports diversification which is very important for the economy to achieve economic transformation and inclusive growth. This study has measured the gender inequality index by using the methodology of World Bank in World Development Report and export diversification is measured by Thiel index. The econometric methodology of instrumental variable generalized method of moment (IV-GMM) regression provides the robust estimates which confirm that the gender inequality, term of trade, gross domestic product per capita, trade openness and demographic factors are the long run determinants of exports diversification in Pakistan. The results are supported with standard diagnostic tests to confirm the significance of the research decision. Previously several studies empirically investigated the relationship between gender discrimination and economic growth but there was only little evidence about the relationship between gender inequalities and export diversification so it would be the productive contribution to the existing literature regarding the issue of gender inequality and diversification in Pakistan. The findings of the study are in line with existing literature on the subject which confirms a negative and significant impact of gender inequality on exports diversification. The study suggests that the gender inequality along with macroeconomic variables like term of trade, real effective exchange rate, trade openness and demographic factors must be considered while designing and implementing policies regarding diversification.

Keywords: Gender Inequality, Exports Diversification, Endogeneity

Introduction

Economic diversification is used to refer to the process of providing with a number of different revenue streams through the process of increasing range of economic products, including the exports products and commodities, are produced by a country (Chauvin and Berthelemy, (2000). Exports diversification is the change in the structure of exports or export diversification widens the range of the products which a country can exports (Dennis and Shephered, 2007). Exports diversification reduces the overreliance on one particular type of products and an increase the extensive and intensive margins that is increases the volume as well as number of accessible markets for the products of a country. According to Samen (2010) the diversification of exports products and market destinations was a great source to meet the challenge of unemployment and lower growth in many developing economies and to avoid the economic and political risks. Howitt (2006) estimated that human capital is the key determinant of economic diversification but it also works for the quality upgrading and stimulates growth. According to IMF (2014b) the structural characteristics and policy decisions especially on education are very critical for economic diversification of an economy. Workforce has strong association not only with diversification but also with export upgrading. Ag-

hion and Howitt (2006) stated that the primary and secondary education is important for imitation of the existing technology and tertiary education for innovation. The gender gaps in education, health and labour market harm the potential of workforce for export diversification therefore, this study explored the impact of gender discrimination on the export diversification while little is known on this relationship.

Gender inequality is very concerning in important dimensions such as income, education, employment or wage and health. Such gender inequality, from a wellbeing and equity perspective, is problematic as they lower wellbeing and justice in the society. Many indicators of wellbeing across the world have large and persistent gender gaps including the gap in control over income resources, education, earning, health, access to job, pay, time use and power in the public and private sphere (UNDP 1995). In assessment of wellbeing, gender can be included on instrumental and intrinsic grounds. The large documents in literature are available which cover the dimension of gender inequality comprises education, health and income and this criteria disfavor women by compromising overall development. The intrinsic approach in gender inequality in the assessment of wellbeing depends upon two factors. On the one hand, the gender differences in important indicators of wellbeing are so large that they must not be excluded. The indicators of wellbeing having large inequality are the education and survival. On the other hand, the other aspect is the sex which supports the case of including gender inequality in overall the assessment of wellbeing. On the basis of sex opportunities availability, the reward and punishment that is the characteristics which is not changeable (Klasen 2007).

For sustainable and inclusiveness in growth, the economies must have well sequenced and tailored measures to close down the gender gaps of labour force participation rate and to boost productivity and investment (WEO, 2017). The promotion of growth and development because of women has central place in policy debate as gender inequality in terms of access to health, education, income and labour market. A number of constraints including labour and non labour markets are being experienced by women in developing economies. The cultural and social norms are responsible for them because women are expected to do most of the household work and child caring even if they are working women (Richard et.al.,2014). By keeping overall education level fixed, if there is positive externalities in education between male and female, human capital and economic growth can be boosted with more balanced distribution of education between male and female (Amin et al.,2015). According to Morrison et al. (2007) the inefficiency as well as lower growth will have to face if the factors of productions are allocated on the basis of non-economic factors like social norms and customs. If there greater gender equality, the economic growth will boost through allocative efficiency in labour market as well.

Woytek (2013) finds that primary and secondary education is fruitful for imitation while tertiary education can increase innovation. According to Christine Lagarde the gender equality is critically important as it is not only the moral obligation but also the economic game changer (IMF, 2017). Gender inequality is negatively associated with both export quality and diversity, even when controlling for GDP per capita and the importance of manufacturing exports (trade) to the economy. In other words, export diversification and quality is higher in countries which are more gender equality (Actionaid International, 2016). The product diversification can be divided into quality, geographical, intermediate goods, goods to service and vertical diversification. So, if a country exports new product or in a new market, it will be diversification because it raises its marginal incentive. The two country with the same nature of human to natural resources but with different female human resources or education would give the comparative advantage to the nation in manufacturing

sector, with higher education of the female labour force. Female labour force is very important in the production of the goods in the labour intensive manufactured sector. The manufactured exports of the developed countries are more skill intensive than the developing countries while the manufactured exports of developing countries are more labour intensive (Berge, 1994).

On the one side, the gap in gender like gap in opportunity of education will harm the potential pool of human capital and in turn it will limit the diversification and slower technological absorption and innovation. On the other side, the gender gap that is lower female participation rate in labor market will make the talent pool shrink from which employer can choose the better, decreases the number of female entrepreneurs (Kazadjian et al. 2016). The earlier studies used the channel of gender gaps in education, health and labour market to see the impact on different macroeconomic variables but this study explores the impact of these three dimensions of gaps on the critically important issue of export diversification in Pakistan. The gender inequality index is used for this purpose and GII is instrumented with female labour force participation rate and gender ratio while using IV-GMM econometric estimation technique.

Pakistan is facing negative growth in exports from last three years and facing consistent trade deficit of almost 15bn US dollar. Concentration of the products as well as the concentration of markets is the big issue in the economy of Pakistan now a day (Economic Survey of Pakistan 2015-16). From the above discussion we explored that gender equality is very essential in macroeconomic diversification. There is a big scope present to identify more dynamics of diversification of a populous country like Pakistan. This study possibly will be an extensive effort to fulfill the gap in the literature to signify the impact of gender inequality on diversification in Pakistan.

The situation regarding gender gap in opportunities is very alarming because Pakistan is keeping its ranking place at 141 last in the region (UNDP, 2015). The political representation, healthcare, opportunities in education and lowest labor market participation in the region because women have to face mobility restriction, poor transport facility and issue on safety (ADB, 2016). The gender development index (GDI), with three dimension literacy rate, health and income, measured for 160 countries by UNDP in 2015. Pakistan was scored GDI value of 0.742 and for female and male value was 0.452 and 0.610 respectively. The GDI value in South Asia was 0.822 while for India and Bangladesh the GDI value was 0.819 and 0.927 respectively. The following table explains briefly the current situation regarding gender inequality in the country in three dimensions of education, health and labour market.

Table 1. Indicators of Gender Inequality in Pakistan

Indicators	**Female**	**Male**
Literacy rate (%)	43	70
Primary enrollment rate (%)	67	79
Youth literacy rate (% of population ages 15–24)	64	80
Share of Women in parliament	21	79
Life expectancy at birth (years)	68	66
Labor force participation rate (% of population ages 15+)	25	83
Labor force participation rate (% of ages 15–24)	22	67
Employment in agriculture (% of employed ages 15+)	76	35
Employment in industry (% of employed ages 15+)	11	25
Employment in services (% of employed ages 15+)	13	36

Source: World Development Indicators (2018)

The position of Pakistan in the first report of Global Gender Gap Index (World Economic Forum) regarding gender equality was ranked 112 in 2006 and since then the situation has been deteriorating. In the coming years the situation is worsened as the country was ranked 135th out of 136 in 2013 and 141out of 142 countries. In 2016, Pakistan is ranked in gender equality 143rd out of 144 countries and it shows that the situation for women is being sidelined in the mainstream economic activities. According to the WEF (2016) the labour force participation in male and female is 85 percent and 25 percent respectively. In 2015, Women held 20 percent seats in parliament, 26.5 percent adult women acquired secondary education with 46.5 percent male, 24.3 percent female labour force participation rate as compare to male with 82.2 percent and death rate 0f 178 out of 100,000 women. The value of GII in 2015 was 0.546 with ranking of 130 out of 159 (UNDP,2015).

The long lasting idea of international trade of comparative advantage was given by David Ricardo. This theory emphasized on the specialization of the exports commodity with low opportunity cost that is the concentration of the exports commodity. Most of the developing economies like Pakistan showed the dependence on the few goods with a few trading partners and relied on their factors endowment as it was proposed by Heckcher Ohlin. Pakistan is endowed with high population with low skill sector of agriculture. Pakistan is 6th largest country in the world and second largest in South Asia with 200 million of population size and population growth rate is also very high at 1.8%.

Pakistan is facing the problem of concentration with respect to product and market and almost 60% of products are exported to ten countries like USA, China, UAE, Afghanistan, UK Germany, France, Bangladesh, Italy and Spain. Furthermore, the USA has largest share in export by 17 percent followed by European countries 22 percent, in total exports. Pakistan is being facing trade deficit of 15 bn dollars every year and it is financed with the precious flow of remittances.

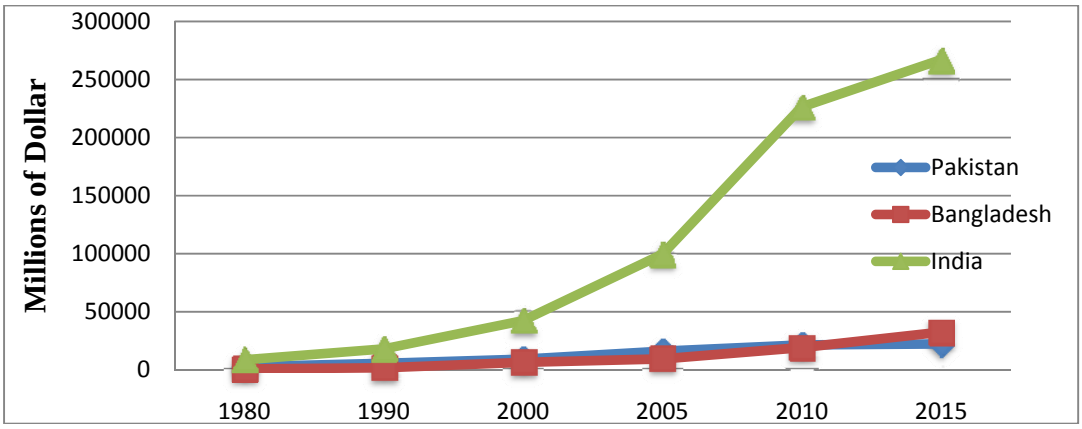

Figure 1. Comparison of Exports of Goods in Region (Millions of Dollars)
Source: Handbook of Statistics UNCTAD, 2018.

The above diagram shows a clear picture of exports growth in the sub- continent and the Pakistan well below from India and the negative growth of exports from last three years is taking Pakistan well below from Bangladesh. The main reason is the concentration of exports with respect of products and market so, there is dead need to diversify exports to avoid trade deficit (SBP, 2016). The paper is organized in a way that the next section reviews the theoretical and empirical literature

while section 3 discuses data, measurement and methodology of estimation. The result of estimated model is discussed in section 4 and the last section shows conclusion with policy recommendations.

Literature Review

This study is about to check the impact of gender inequality on economic diversification in Pakistan, the evidence from previous literature is very short particularly in Pakistan. For elaborating the gap and dynamics of the study we have made a comprehensive literature review on this issue relating to the impact of gender inequality on economic diversification and other macroeconomic indicators. This part will mainly focus on the literature for previous evidence on the impact of gender inequality on economic diversification.

Akbulut (2007) empirically estimated the link between sectoral changes and the increase in woman's labour force participation rate for the USA economy. From 1950 to 1990, a higher growth rate in the productivity in market services was observed and this time period was the same period of higher female participation rate. Berge et al. (1994) estimated that manufactured exports of the developed countries are more skill intensive than the developing countries while the manufactured exports of developing countries are more labour intensive.

Elhiraika et al., (2014) empirically used the system generalized method of moments (GMM) estimated provide robust evidence that the institutional framework, human capital, infrastructure, public investment and per capita income are the significant determinants of exports diversification. So for the economic transformation and exports diversification, African countries must design and implement the development strategies and the reforms in their institutions.

Amin et al. (2015) found the adverse negative effect of gender inequality in education on the economic growth of a country. Baboo et al. (2011) empirically concluded a strong positive relationship between the share of female in total employment and real exports. Kabeer et al. (2013) empirically claimed that GII also do not include the unpaid labour of the women in their domestic domain that the researchers are in the dark about the growth effect of either direct or indirect, on the unpaid reproductive economy.

Jayaweera (2009) proved empirically the positive association between FDI and exports diversification and the association is reversed for the countries which exports minerals and oil.

Mobeen et al. (2016) empirically estimated that the price sensitivity of exports of Pakistan can make a place in the world market with the devaluation of the currency if the trade policy will act its complementary part. Tadesse et al. (2006) empirically investigated that the existing stock of FDI as well as the stage of diversification changes the results across countries. The further insight also revealed that these results also depend on the economic environment in each country.

Parteka (2011) concluded that the trade restriction and distance are also the strong players of exports diversification. Kazadjian et al.(2016) explored the impact of gender inequality on the economic diversification by using the instrumental variable generalized method of moments (IV-GMM) technique. They concluded that in the low income and developing countries the variation and innovation in the goods produced by an economy decreases because of gender inequality. They also explained, with the help of the data set, the linkage through which this phenomenon happened. On the one side, the gender inequality in opportunities lie lower educational enrollment rates for girls as compare to boys, making the potential pool of human capital limited, harm the diversification. The other channel the gender gap decreases the efficiency of labor force lowers the innovation and generation and development of new ideas. They concluded on the basis of empirical results that the gender friendly policies can help the countries for economic diversification. Alemu (2009) empirically estimated the oil wealth has negative effect on diversification but not all the natural resources

have Dutch Disease effect. The exchange rate and inflation has mixed effect but political instability has adverse effect on the diversification. Rath and Akram (2017) concluded that the exports diversification is essential to increase the total factor productivity growth and to avoid the oscillation in exports growth.

The above reviewed literature shows that gender inequality is very important for is taking vital place in macroeconomic analysis particularly implications on export diversification with especial focus on low income countries. The existing literature focus on the determinants of export diversification other than gender inequality so, the gap exists in the existing literature. This study will be a fruitful effort to fill this gap and possibly an important contribution in the literature on this emerging issue.

Methodology

Gender inequality change has received importance in the recent macroeconomic literature and different studies have determined some theoretical links between Gender inequality and macroeconomic implications. Different economic theorists have developed different models to incorporate Gender inequality into economic analysis. Kazadjian et al., (2016) developed theoretical links between Gender inequality and exports diversification. On the one side, the gender inequality in opportunities lie lower educational enrollment rates for girls as compare to boys, making the potential pool of human capital limited, harm the diversification. The other channel the gender gap decreases the efficiency of labor force lowers the innovation and generation and development of new ideas. They concluded on the basis of empirical results that the gender friendly policies can help the countries for economic diversification. In a nut shell, there are two channels through which Gender inequality makes relationship with exports diversification. One is human capital channel and the other one is resource allocation channel.

The time series linear regression model, by following Kazandjian (2016) is specified to find the impact of gender inequality on the exports diversification is

$$y_t = \beta_0 + \beta X'_t + \varepsilon_t$$

Where t= 1, 2……N and y_t represents Theil's Index of exports diversification. B shows the vector of unknown parameters and X'_t represents the vector of variables that affect exports diversification in Pakistan and this vector may contain endogenous variable. X'_t includes variables of Gender inequality, FDI, TOT, GDP per capita, REER, population growth with some endogenous among them.

$$E[\mathcal{E}, Xi] \neq 0$$

The estimates will be biased and inconsistent if we apply OLS to the above model. For the unbiased and consistent regression coefficient, we are to apply specific IV approach such that

$$E[\mathcal{E}, Zi] = 0$$

Where Zi represents the instrumental variables (The IV will be strong if it fulfills three conditions, (a) E(IV, $\mathcal{E}$)=0 (b) E(IV, X) ≠ 0 and (c) No perfect correlation among instruments used in the system) which are orthogonal to the error term that is Zi is correlated with endogenous variable but not with the error term. Our model for the determination of the impact of gender inequality on exports diversification is taken from Kazandjian et al. (2016).

$$EDIV = f(GII, TOT, REER, FDI, W\,PG, LOGPCGDP, GDPGF)$$

In this equation, the list of independent and dependent variables is shown. The detail of the variables and data source is given in Table 2.

Table 2. Variables description

EDIV	Export Diversification	IMF (2017)
GII	Gender Inequality Index	Author's calculation
PCGDP	Logarithm of Per Capita Gross Domestic Product	WDI (2017)
FDI	Foreign Direct Investment	WDI (2017)
PG	Population Growth	WDI (2017)
TOT	Terms of Trade	WDI (2017)
REER	Real Effective Exchange Rate	WDI (2017)
GDPF	Gross Domestic Product Growth Foreign	WDI (2017)

When all the explanatory variables are exogenous, the application of GMM generates worst results. Hausman (1978) established a test of exogeneity by the direct comparison of OLS and GMM output since both techniques give consistent results if all the explanatory variables are exogenous.

In our empirical analysis we will use annual time series data for the period of 1980 to 2015 for Pakistan because of data availability issue. Data sources of the study are World Development Indicators (WDI), International Monetary Fund (IMF) and Economic Survey of Pakistan.

Maloneyet al. (2007), Zandt et al. (2008) all find that lower future growth is associated with sectoral concentration of exports. There are three popular conventional indices to measure diversification like Herfindahl, Gini and Theil indices. This study has used the Theil,s index for the empirical findings of the relationship between the two focused variable. The lower value shows higher export diversification while higher value of the index shows lower diversification of the exports. According to Gonzales et al., (2015b), and Stotsky et al., (2016) GII[i] captures gender inequality across areas of health, empowerment and labor force participation and it is preferable to alternatives such as the GDI (in which one of the main components is not observed and is imputed). The range of the index is between 0 and 1, with higher values indicating higher gender inequality. Other literature on the importance of Gender inequality in macroeconomic performance {Akbulut (2007) Berge et al. (1994) Amin et al. (2015) and Kabeer et al. (2013)} provided similar results, that gender inequality leading toward slow growth, make human capital limited, , lower level of productivity and innovation so, no exports or economic diversification.

Results and Discussion

Instrumental variable regression model with generalized method of moment is estimated which is asymptotically efficient in the presence of heteroskedasticity and endogeneity (Sandeep et al., 2008). GMM is more efficient over IV in the presence of heteroskedasticity and if there is homoskedasticity, the GMM estimator is no worse asymptotically than the IV estimator. Breuch-Pagan and White tests for heteroskedasticity test are used for heteroskedasticity. The implementation of GMM-IV estimator is in the standard IV and 2SLS estimator**.** A useful byproduct of GMM methodology is the GMM over identification test and the J H (Sargan-Hansen test) test is reported as the general test of adequacy. For over identifying restrictions, the J. Hansen test is used with the null hypothesis is that the instruments are not correlated with the residuals. First we run OLS and run the test of endogeneity which is statistically significant. All this shows that there is endogeneity and we cannot run OLS because it will produce biased and inconsistent estimators. From the IV-GMM me-

thodology, we obtain estimated coefficients which are corrected for endogeneity, heteroskedasticity and autocorrelation. Hansen's J test is used to examine the validity of IV where the null hypothesis is that the instruments as a group are exogenous. For orthogonality condition, we can use Hansen–Sargan–Basmann C tests or DWH endogeneity since in IV context there is no difference in "endogeneity test" and a test of "exogeneity" or "orthogonality". The results shows the rejection of null hypothesis, so we concluded that the all the explanatory variables are not exogenous. The relevance test is used to test either the instruments being used are correlated with the endogenous variable and if they are statistically insignificant, we cannot use them as instruments. But here they are statistically significant if p- value is less than 5 percent.

Table 3. Results for exports diversification using instrumental variable regression (IV-GMM rob)

Independent Variable	Coefficient	Robust (Std. Err)	P-Values
GII	2.141***	.3481046	0.000
LOGPCGDP	.5208***	.1119246	0.000
GDPGF	-.00548	.0077096	0.477
PG	.1941*	.1119513	0.083
FDI	.04634**	.0185467	0.012
REER	-.00336***	.0009571	0.000
TOT	.00501***	.0010651	0.000
C0nstant	-2.195***	1.11857	0.005
All the coefficients are significant at 5% level of significance while structural component like population is significant at 10 % level of significance.			

Instrumented: GII= FLFPR, GR

After empirical analysis of all the models, detailed diagnostics are given in Table 4 for the authentication of study findings.

Table 4. Diagnostics on the IV-GMM Mode

Tests and Null Hypothesis	P-Value
1. Hansen- J Test (Overidentifying Restrictions) Ho: Instruments as a group are not endogenous	0.1550
2. Endogeneity Test (Orthogonality conditions) Ho: All the explanatory variables (IV) are not exogenous	0.0467
3. F-test (Relevance Test) Ho: Instruments are insignificant	0.000

Conclusion

The study strongly underpins the negative impact of gender inequality on the export diversification in Pakistan by employing IV- GMM econometric technique for the period of 1982-2016. The literature has identified different determinants of export diversification including term of trade, real exchange rate, world GDP, domestic GDP and FDI. Recent literature has identified that countries experiencing inequality in opportunity in labour market, health and education have important implications for macroeconomic indicators like growth, trade, and unemployment and human devel-

opment [Kabeer et al., (2013), Edward, (2010)] The recent literature has clearly explained that gender inequality is one of the key determinants of export diversification (Kazadjian et al.,(2016). The findings of the study show that the equality in income, health and labour market is very prominent in the exports diversification. In case of Pakistan, a large number of studies have been conducted on different aspects of export diversification however; no previous study has directly investigated its impact of gender inequality on export diversification. In this regard, all related diagnostic tests were performed to ensure the validity of results and fulfillment of the assumption of instrumental variable. The gender inequality index is used for the inequality of opportunity and for export diversification Thrill's index is used which covers extensive as well as intensive diversification. The estimated coefficient of GII carries positive sign which is according to literature. The results show that GII, FDI, PCGDP, TOT, REER are significantly affecting export diversification. From the findings of the study the following policy which are very straightforward are recommended. First, to increase the potential of labour market and in turn to increase the diversification of exports through female labour force participation rate, the awareness in the society will be very helpful. That is to make the women independent to take part in the economic activities. Second, the health facilities with the rise in expenditure on health sector can raise the health of economic factors which will increase the capabilities of theirs. Third, the education sector which is very prominent in terms of imitation of the existing technology and innovation, equality will be fruitful. The limitations of the study are the absence of appropriate time series instruments of gender discrimination due to data unavailability and single country analysis. In future it can be extended to the different regions by making a cross sectional panel.

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