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Does Gender Inequality Affect Economic Growth? Empirics from Asian Countries.

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Abstract

Background: Gender inequality is present in our society in different areas of life. Moreover, world organizations acknowledge the importance of gender inequality control and list it as one of the Sustainable Development Goals. Though the standing of gender inequality cannot be denied as a social issue, it is vital to analyze its impact on other areas as well. This study specifically analyzes the impact of gender inequality in education on economic growth and how gender inequality can affect economies' short-run and long-run potential.

Methodology: This study examines the extent and dimensions to which gender inequality affects the economic growth of Asian countries. The study employs an annual dataset from 2003-2018 comprised of 48 Asian countries. World Bank data set is used. Panel data analysis is the basis of the study. The empirical analysis begins with a fixed / random effect. Moreover, sensitivity analysis was also used to check the robustness of initial results.

Results: This study shows that gender inequality at the tertiary level of education affects the economic growth in the selected Asian countries. Since gender inequality at the tertiary level of education is directly associated with the quality of gender mix in the labour market, its impact is reflected in this empirical work. However, gender parity in education at the primary level was found not to be significant in its contribution to GDP growth. Though the impact of gender inequality at the primary level is not found to be statistically significant, reasonably, this inequality will result in a lower potential in the long run. In all the models having population growth, the impact of gender parity was found to be positive.

Conclusion: This study concluded that reducing gender inequality on the tertiary level of education positively affects economic growth. Moreover, the study emphasizes that there is a necessity to increase women's education and lowering gender inequality at different levels of educational attainment to boost long-run and short-run economic potential.

Keywords

Gender Inequality, SDGs, Economic Growth, Women Participation, Education.

Introduction

The concept of gender inequality is widely discussed in the development goals of the United Nations, such as the Millennium Development Goals and Sustainable Development Goals. These goals are settled to target the deprived economies required to maintain the standard of Gender Equality. However, despite the numerous efforts of maintaining equality, the marvels of disparities are still apparent. Furthermore, both developing and developed countries experience gender inequality because such inequalities vary greatly with economic development. The advocation of gender equality is broad in spectrum, considering it is significant as a human right issue and is beneficial in levitating the nation's economic growth. For a long the gender equality is discussed worldwide as a human rights issue; this study aims to emphasize another vital factor due to which gender equality is important, such as more gender equality works as a potential economic booster of a country. Gender inequality exists on a wider horizon in our society, covering almost all fields. Hence, it is important to discuss the predominant gender inequalities considering employment, education, political empowerment, and health. According to the World Bank, these could be approximate measures in gender equality in different regards.

For instance, the education enrollment of women has improved over time. However, the school dropout rate remains an issue because of divergent repercussions precisely in developing countries. Additionally, women's global labour force participation has declined from 51% to 49% during 2000-18. This could be mostly attributed to the lack of quality education for women in developing countries, which detains them from high-paid jobs. Consequently, all these lead to substantial confinement for women's participation in the labour market[1].

Furthermore, regardless of the country's status, approximately all countries experience gender-specific earning gaps. It has been recently anticipated that both men and women receive the same remunerations, then the global wealth would rise by 160 trillion dollars. This has induced 131 economies to introduce 274 reforms in their legal structure, promoting gender equality over the decades.

The map above is taken from the Global Gender Gap report that shows the global gender gap index scores. In this index, 0- 0.2 shows the worst case of gender inequality. Furthermore, 0.8-1 shows relatively more gender equality. The country that shows the highest equality index regarding gender is Iceland (which is a county in Western Europe), with an overall score of 0.858. Also, the country with the highest gender inequality turns out to be Yemen (which is a country in Asia). It has 0.499 scores. Especially in Asia, there is a concentration of countries with high gender inequality. Also, six of the worst ten countries in terms of global gender gap indices are present in Asia.

Sen with his unique work, highlighted the case of missing women, which supports the existence of gender inequality. Controlling the prevalence of gender inequalities is the concern of social experts along with economists. It does not only affect society's well-being, but it also has economic implications[2,3]. Regardless of the basic problems associated with gender inequality, it may also affect the numerous goals of development[2]. Similarly, through numerable channels, it may affect economic growth, such as health, education, and employment, etc.

The map above is taken from the study of Hennig (2019)[4], i.e. "In focus: Inequalities of gender: education, work, and politics" shows the gender gap in education for the population to 25 and above age and at least have a secondary level education and side by side there is another world map showing the gender gap in the labour market for a population 15 and above age participating in the labour force. The map of these two gender gaps shows more gender inequality in the labour market than education. This gender inequality in terms of both education and employment is highly evident there.

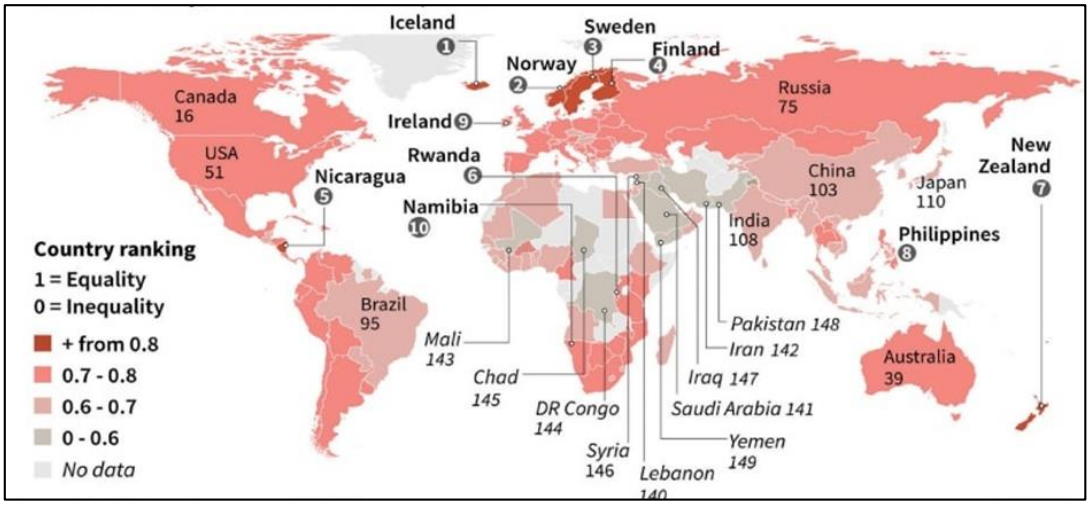

Figure 1: The Gender Parity Index Ranks across Countries

Source: The Global Gender Gap Report 2018 (World Economic Forum)[5]

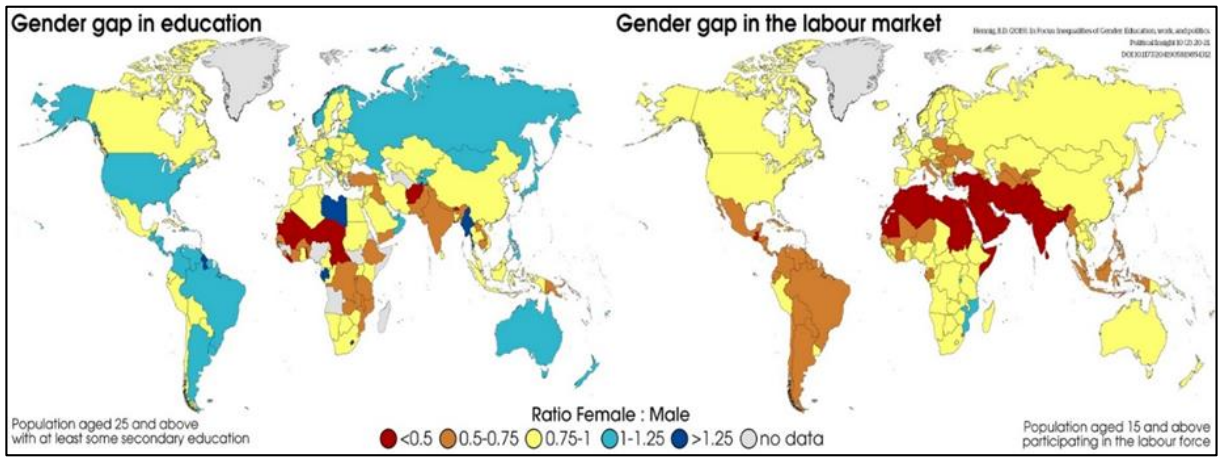

Figure 2: Gender Gap in Education and Labor Market across Countries

Source: Hennig (2019)[4]

As far as the well-being of society is concerned, gender inequality creates vibes of injustice and discomfort among people, which becomes easily contagious due to high connectivity in this modern era. Meanwhile, these views demand the reduction of gender inequality in a different dimension of well-being. Lately, the theoretical and empirical literature has gained intensity by including well-being on different grounds and its impact on the economy and on the welfare of a country. Without contradicting the importance of declining gender inequality on intrinsic grounds, this paper contributes to this latter literature.

The next section will provide the theoretical underpinnings of the subject, whereas the review of literature is presented in section 3 discusses selected relevant studies on the subject that have been conducted so far. Data and the Methodology are explained in section 4, while section 5 concluded the study along with discussing the directions for further research on this area.

Gender Equality & Economic Growth: Theoretical Building

The researchers are still involved in the intense arguments regarding the type of relationship between economic growth and female status in economic, social, and political setups. Some

scholars follow the critical approach and a more liberal mindset, emphasizing that society's foundation bound the capabilities of women by having equal status. According to them, the capitalist approach triggers such foundations while keeping the growth[6]. It simply suggests that to strengthen women's role, the direct attempt for the change society foundation is needed rather than only focusing on economic growth as a corrective measure[7]. There are two sections in this approach. According to the first one, the rise in growth solely does not manage to improve women's labour force participation or break the bias and discrimination on institutions and society level. Some studies show the surge in the labour market participation of females results in an increased earning of the male segment. It happens due to economic development. This phenomenon restricts the female participant from withdrawing from the labour market and bound them to manage the household chores simultaneously[8]. Often when the female segment of society enters the labour market, they faced bias in the available opportunities. More elaborately, females have only limited professions to look forward to rather than focusing on capabilities, or they often come across with "Glass Ceiling" in a professional setup. Many studies also highlight this mare fact the discriminatory institutional setting in society limits the ability of women to perform to their full potential[9,10]. Youssef found out that in the context of health, the fertility characteristics of women in the Middle East are inclined to gender inequality[9,11]. A report of UNDP pointed out the practices of society and an institution that leads towards gender bias[12]. These contain the laws and reforms that are not succeeding in eliminating the bias practices that the labour market follows, the cultural norm of violence against women, discriminatory property laws, etc[12].

Moreover, in certain beliefs, women's participation in the labour market is not encouraged, which leads to a decline in women's bargaining power in intra-household. Women brought up in such an environment sometimes also support such views, which in turn uplift their worth for marriage in such belies systems[13]. As per the second section, that segment sometimes suggests economic growth itself crumble gender equality[14,15]. Researchers stand for the dependency note that the involvement of males in the more formal labour market results in male segment urban migration. This phenomenon restricts opportunities for females' informal labour market as well as their mobility towards a better social setting due to the extra responsibility of the home, agricultural work, and reproductive pursuits. If any circumstances, can reach the formal labour force, the existing labour market bias practices strengthen the preexisting inequalities. These biases can be a result of cultural practice as well as they can also originate from gender-based division of labour specialization[16]. In opposition to the critical approach, the optimists, recorded principally by neoclassical economists, suggest labour market inequalities decrease with the increase in economic growth because the social cost and economic cost of maintaining discriminatory policies are high. In several cases, giving favours to male employees over females excessively costs the employers[17]. With time because of the increase of labour-saving technologies, women can save time from home and agricultural chores, enabling them to provide labour elsewhere or enhance their skills[18-20]. Nowadays, the households find it useful to educate the females and utilize them as an income-generating part[21,22]. These phenomena lead to the empowerment of females within the family as the level of material contributed by the female increase[23]. Furthermore, they also claim that the post-materialist standard that has developed alongside more educational opportunities and increased awareness triggers the implementation of a social setup that discourages gender discrimination.

The literature on the link between gender inequality in education and economic growth is discussed in the next heading.

Gender Inequality in Education & Economic Growth

There is an ample amount of literature and studies are present addressing gender inequality and how it contributes to the hindrance of economic

growth. While analyzing the association between gender inequality in education and economic growth, the literature mostly suggests whenever there is gender inequality in education, it affects economic growth by directly reducing the potential quantity and quality of labour available in the economy[24-26].

A significant concentration of this study has been to analyze the effect of gender inequality in education has on economic growth. There are substantial theoretical contributions that claim the inverse association in economic growth and gender inequality that includes the work of Galor and N.Weil (1996) and Nils-Petter Lagerlof (2003)[27,28]. Their studies highlighted the effect of women's education on fertility and the development of human capital of the upcoming generation, in turn suggesting, and lesser the gender inequality uplift the development level in an economy. The coming section elaborates the main discoveries of the literature. Side by side, the literature with empirical evidence has too examined these associations. Unexpectedly, some results of studies earlier such as Robert Barro and Jong-Wha Lee (1994), claims that gender inequality in education increases the economic growth through the current work in this regard such as has shown the opposite results in this association[29]. The mentioned work not only contradicts the previous studies' outcomes regarding gender inequality and economic growth's relationship, but also these studies explain the reasons for previous work results and explain the better use of econometric, and this use can lead the researcher to desirable outcomes. Moreover, it is worth mentioning that those recent macro-level work's results are also consistent with micro-level analysis findings, i.e. the females have relatively high marginal return to education, which goes even higher if the effect of women's education on fertility and education of the coming generation is also considered[30-32].

In comparison to the work of Barro and Lee (1994), Dollar and Gatti (1999) examined the gender inequality in various four areas for approximately 100 countries for the years 1975-1990[29,33]. They concluded that gender inequality in education with their data affecting economic growth negatively. This outcome is changed from Barro's study since they controlled their model for regions by incorporating a dummy variable for regions involved (Latin America, Sub-Saharan Africa, East Asia and OECD countries).

Hill and King (1995) consider the effect of gender inequality in education and empirically analyze it[31]. They took 152 countries' data with the main proxy of gender inequality in education as the gender gap in education, which was measured by "the female to male enrolment ratio." Their finding shows that countries with more gender inequality in education seem to have lower GDP per capita. In a similar context, Baliamoune-Lutz and McGillivray (2015) scrutinize the relationship between gender inequality and growth of economies in 31 Sub-Saharan African and 10 Arab countries by employing the estimations of the Arellano-Bond[34]. The outcomes of their study suggest that gender inequalities in literacy have a negative impact on growth.

Castello & Domenech (2006), with the help of panel data, observed the inequality of human capital proxied by education and its influence on economic growth[35]. Their study presented how inequality in human capital results in reducing the life expectancy and consequently affects the growth of the economy. Also, the outcomes emphasize the presence of multiple steady states, which are subject to the initial flow of education. Lastly, their work proposed that the mechanism of life expectancy describes a significant component of the link that holds between gender inequality and human capital accumulation.

Ezeh (2020) analyzes the effect of gender inequality in education on economic growth[36]. In his study, he uses the panel data of 40 Sub-Saharan African countries and, as for econometric technique, employed the OLS and Fixed effect model. To conclude, his study shows the negative association between gender inequality in education and economic growth.

This section explains the basic theoretical formation of association gender inequality and how gender inequality exists and affects economic growth. Also, it describes the theoretical base and the literature standpoint for gender inequality in education and its impact on economic growth, without denying the gender inequality's significance as a basic human right. This study aims to observe the impact of gender inequality in education at a different level of education on economic growth, specifically for 47 Asian countries.

The following section provides the basic model that this study follows and the econometric technique it uses.

Methodology

The study employs an annual dataset of 47 Asian countries from 2003 to 2018. The dataset is collected from World Development Indicator (WDI). The inverse Gender parity index at the primary level (GPIPE) and the tertiary level (GPITE) are used as proxies for gender inequality. This paper uses GPIPE and GPITE as given, though, in interpretation, these indices will be defined as inverse; that is, the increase of these indicators is showing the decline in gender inequality. Real GDP per capita growth (GPC) is used as a dependent variable. In contrast, Investment growth (IG) is the annual growth of gross fixed capital formation, Population growth (PG), Trade openness (TO), and Fertility rate (FR) are used as relevant economic and social indicators in the sensitivity analysis. Equation 1 represents the core model to be estimated.

$$GPC_{it} = \alpha_{it} + IG_{it} + GPIPE_{it} + u_{it} \text{ (Equation 1)}$$

All the variables in the model are defined. The model's sensitivity analysis is presented as follows:

$$GPC_{it} = \alpha_{it} + IG_{it} + GPITE_{it} + Z_{it} + uit \text{ (Equation 2)}$$

All variables are already defined except for $Z_{it,}$ which is a vector containing one or more economic and social variables simultaneously.

As for econometric techniques, the unobserved effects which exist region to region can be accounted for through panel fixed and random effect model; the empirical analysis begins with testing whether fixed or random effect model is appropriate in the present case. This is done through the Hausman test, which takes the null hypothesis that the country effects are uncorrelated with other regressors in the model[37]. In case if the null hypothesis is rejected, the fixed-effect model is appropriate, whereas in case if the evidence is insufficient to reject the null hypothesis, the result of the random-effect model is considered to be appropriate.

The model estimation, along with discussion, is explained in the next section.

Results

The random effect model is estimated, and the results are presented in table 1.

Table 1: Random effect model (Panel least square).

Variable	Coefficient	Std. Error	t-Stats	Prob.
IG	0.030	0.016	1.811	0.071
GPIPE	-17.310	9.336	-1.854	0.064
Constant	20.482	9.217	2.222	0.027
Effects specification				
Adj R^2	0.139	**Prob. (F-statistic)**	0.000	

Dependent variable: GPC
Source: Authors' estimation
IG- Investment growth; GPIPE-Gender parity index at the primary level

The results of the random effect model in table 1 above show that investment growth and gender parity are statistically significant. However, the coefficient of gender parity has an unexpected sign and a magnitude that is far beyond meaningful interpretation.

Table 2: Correlated Random Effects - Hausman Test.

Test Summary			**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random			8.550	2	0.014
Cross-section random effects test comparisons:					
Variable		**Fixed**	**Random**	**Var (Diff.)**	**Prob.**
IG		0.029	0.0367	0.000	0.003
GPIPE		-17.309	-12.653	42.759	0.476
Effects specification					
Adj R^2	0.139	**Prob. (F-statistic)**		0.000	

Source: Authors' estimation

IG- Investment growth; GPIPE-Gender parity index at the primary level

Particularly in table 1 above, though the model is overall statistically significant, the Hausman test results (which is presented in table 2) show that there are significant cross-country differences in the sample countries. Consequently, the appropriate model in this study is a fixed-effect model. The results of the fixed effect model are presented in table 3.

Table 3: Fixed effect model.

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
IG	0.061	0.008	7.622	0.000
GPIPE	-2.410	2.960	-0.814	0.416
Constant	5.550	2.924	1.898	0.058
Effects specification				
Adj. R^2	0.562	**Prob (F-statistic)**		0.000

Dependent variable: GPC

Source: Authors' estimation

IG- Investment growth; GPIPE-Gender parity index at the primary level

The results of the fixed effect model in table 3 above show that investment growth association with economic growth is direct and significant. The gender parity coefficient (parity in gross enrolment at the primary level) is found to be statistically insignificant, which needs further investigation. The sign of gender parity is negative, which also needs careful interpretation. The result seems to imply that an increase in gender parity (at primary education) would negatively affect the GDP growth of the selected Asian countries. To understand the possible reasons for the results and finds whether the estimated coefficient is consistent or not, sensitivity analysis (inclusion of variable/s approach) is employed. The results of sensitivity analysis are reported in table 4.

Table 4: Sensitivity Analysis.

Model	**GP proxy**	**Additional variable/s**	**Coefficient of GPI**	**t-stats**	**Prob.**	**Adj. R^2**	**Prob. (F-stats)**
Core	GPIPE	---	-2.410	-0.814	0.416	0.562	0.000

Model 2	GPIPE	PG	-2.358	-0.830	0.407	0.624	0.000
Model 3	GPIPE	TO	-4.879	-1.545	0.123	0.570	0.000
Model 4	GPIPE	FR	1.791	0.529	0.597	0.545	0.000
Model 5	GPIPE	PG TO	-4.954	-1.651	0.100	0.639	0.000
Model 6	GPIPE	PG FR	8.488	2.642	0.009	0.715	0.000
Model 7	GPIPE	FR TO	0.093	0.025	0.980	0.549	0.000
Model 8	GPIPE	PG TO FR	8.432	2.531	0.012	0.624	0.000
Model 9	GPITE	---	0.119	0.233	0.816	0.592	0.000
Model 10	GPITE	PG	0.999	2.404	0.017	0.714	0.000
Model 11	GPITE	TO	0.046	0.090	0.929	0.605	0.000
Model 12	GPITE	FR	-0.530	-0.875	0.382	0.589	0.000
Model 13	GPITE	PG TO	0.917	1.977	0.049	0.843	0.000
Model 14	GPITE	PG FR	1.138	2.736	0.007	0.746	0.000
Model 15	GPITE	FR TO	-0.943	-1.726	0.085	0.618	0.000
Model 16	GPITE	PG TO FR	1.116	2.054	0.041	0.785	0.000

Dependent variable: GPC
Source: Authors' estimation
GPIPE-Gender parity index at the primary level; PG-Population growth; TO-Trade openness; FR-Fertility rate

The sensitivity analysis is presented in table 4 above and shows that the coefficient of gender parity is negative though statistically insignificant in most of the models that proxy gender parity through school enrollment at the primary level. However, adding relevant social and economic variables improved the statistical significance, and in model 08, where all additional variables are included in the model simultaneously, the effect turned out to be positive and significant. In the models having gender parity at the tertiary level of education as a proxy for gender parity, most of the coefficients are found to be positive and significant[31,36]. The results imply that an increase in gender parity positively affects economic growth. To put it differently, a decrease in gender disparity at the tertiary level of education increases economic growth. The research question of this study that is "Does Gender Inequality Affect Economic Growth?" is found to be in the affirmative though the result heavily depends on the inclusion of relevant variables in the model. In general, it means that gender parity at the tertiary level is more important in terms of its contribution to the GDP growth of the selected Asian countries. In all the models having population growth, the impact of gender parity is found to be positive.

Discussion

The result of the basic model emphasizes that it is important to include the relevant variables in the model to get persistent and reliable results. Also, it can be seen through results that it is important to classify the type of gender equality when addressing the impact on economic growth[36]. For instance, while considering gender inequality in education, gender inequality at the tertiary level turn out to be more significant than gender inequality at the primary level[36].

Existing studies in this regard support the same results though in these studies region under analysis is different[31,36]. It is important to also mention that throughout the Asian countries, the quality of education and the gender inequality phenomena are different. Since most of the countries are developing nations, they have a relatively low quality of education and more gender inequality. Also, it has been said that gender inequality refrains countries from realizing their full potential and, as a result limiting the growth potential of a country[31,36]. The results show that primary education inequality seems to affect

less on economic growth. Additionally, with real-world implications, it is quite justifiable that primary schooling does not provide labour skills. It is also found that the inclusion of relevant variables increases the explanatory power of the model.

Lastly, gender equality in tertiary education seems to increase economic growth, implying a surge in qualified labour force helps the economy to realize its full potential. Since the labour markets consist of all genders, a decrease in gender inequality at the tertiary level of education increases the number of qualified ready to enter labour in the job market hence increases economic growth. Thus Asian countries should consider providing more gender-equal education opportunities at tertiary level education as their short-term and medium-term program. And for long-term planning of sustainable growth, primary education gender equality should be their main goal.

Conclusion

The study uses gender parity in primary and tertiary education enrollment levels to test the impact of gender disparity in the economic growth of Asian countries. It is found, in general, that gender parity/ disparity is almost ineffective in determining economic growth if it is used as a proxy through parity in primary level education. It is a bit unusual because it seems that gender parity should positively contribute to GDP growth. This implies that the linkage between primary education and the labour market is quite weak. Moreover, though statistically insignificant, the negative coefficient of gender parity is also unusual, which needs careful interpretation and further investigation regarding the linkage between educational disparities in different levels and the disparities that exist in the labour market. The link between gender parity and GDP growth becomes statistically significant and positive when parity in the tertiary education level is used in the model. This also supports the idea that the parity in enrollment at the tertiary level is more connected with the labour market. Therefore, increasing parity at the tertiary level would increase economic growth.

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