

DOES GENDER INEQUALITY IMPEDE ECONOMIC  
GROWTH? A PANEL DATA ANALYSIS WITH GMM  
APPROACH

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We hereby declare that:

- (1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.
- (2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Equal contribution has been made by each group member in completing the research project.
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## **LIST OF ABBREVIATIONS**

EDU	Literacy Rate
GDI	Gender Development Index
GDP	Gross Domestic Product
GDS	Gross Domestic Savings
INF	Inflation
LABOR	Labour Force
MOR	Mortality Rate

## **ABSTRACT**

Gender inequality has gradually attracted public attention and become the major of concern especially the federal of countries since gender inequality tend to hinder the well-being of individuals, the sustainable development of countries, and the evolution of societies, to the downside of both male and female. This study investigates the relationship between gender inequality and economic growth. In this study, we use Generalized Method of Movement (GMM) to estimate the relationship between the Gross Domestic Product (GDP) and Gender Development Index (GDI) and other variables. The data we collected is from 42 countries which covered from period 2010 to 2015. The results of the study indicate that economic growth and gender inequality is negatively correlated.

## **CHAPTER 1: RESEARCH OVERVIEW**

### **1.0 Introduction**

This chapter starts with an introduction about the linkage between gender inequality and economic growth, then followed by the discussion on the existence of gender inequality in education system, labour and economic participation in developing and developed countries. The remaining parts which will be discussed in this chapter are the research background and problem statements, followed by research objectives, research questions, hypotheses and the significances of the research. Lastly, the outlines of each chapter for this research are provided at the end of the chapter.

### **1.1 Overview**

One of the factors that stimulating the economy of a particular country is human capital. If you don't provide women with adequate access to healthcare, education and employment, you lose at least half of your potential. Hence, gender equality and the empowerment of women bring huge economic benefits which tend to circulate in the market.

—Michelle Bachelet, President of Chile (Basantia, 2017)

On 21<sup>st</sup> January 2017, after the inauguration of President Donald Trump, there are approximately more than hundred thousand of female demonstrators gathered in United State (US) Capitol before heading their way toward the White House (Hartocollis & Alcindor, 2017). This demonstration served as a kind of against

inauguration of President Trump, mainly because of the statements that he had made and actions that he had taken which were regarded as a inappropriate manner by generating lack of respectfulness for women and leading to gender discrimination (Stein, Hendrix & Hauslohner, 2017). This peaceful protest movement is known as “2017 Women’s March”. The protesters are varied from different socioeconomic background and religion, women and men, transgender and non-conforming people, young and old, immigrants and indigenous, and disabled people were joined and crowded in cities across the country. These protestations were made in major US cities such as Washington, D.C., Chicago, Los Angeles, New York City, and Seattle. The Women’s March was a powerful single-day protest in the history of US and recorded as one of the largest team in the world history. As stated by the organizers and the founder, Linda Sarsour, the primary concern of this demonstration was due to a limited choice to voice out the consensus stands of society towards any regulation imposed. Linda has illustrated that: “we should stand out against a federal administration that threaten us to believe in every aspect. Hence, it is necessary for us to send a bold message to our new administration on the first day and typically disseminate to the world that women's rights are human rights” (Walters, 2017).

The past trend condition was illustrated that those successful demonstration of Women’s March has made on the front-page of the news in social media and the events have created sensation through social network such as Facebook and Twitter. After one year, the Women’s March is still exercising their on-going practises and the matchers are gathering again across the countries and the world. They have centralized their strength to voice out the rights of female where they should be treated equally especially the equal wage pay and opportunity to voice out in order to eliminate the influential of sexual harassment. This has been concluded and summarized by CARE Rapid Gender Analysis where “One hand alone can't clap, unity is strength”. Hence, the Women’s March has planned to use the political power of diverse women and communities to create a transformative change on society.

These social movements have reflected on the concept of gender are inequitably treated, constrained and positioned in social, economic, and political stratification. There are systematic gender differences in the matter of well-being regardless of one's socioeconomic class (United Nations, 2015). These social anxieties have called up for a deep and ingrained remainder associated with the ongoing pressing economic issues including the gravity of continuing gender disparity across the globe.

According to Charles and Grusky (2004), the extreme of gender inequality has persisted until the current century (2000s) due to different perceptions in their own fundamental capacities, interests and specialized skills. Besides, the widespread of vertical segregation whereby the presumption of men are intrinsically more competent and capable to the committed tasks than women and hence, men have deserved higher positions and more appealing rewards including pay, prestige and authority. This will eventually direct and induce men to be prioritized in rewarding and making any investment which tend to reproduce the issue of gender inequality.

As gender inequality has presently persistent among the societies in the worldwide, women are continually lag behind men especially on the key of rights, opportunities and well-being. According to Yelfign (2001), as female is expected to be less educated, they often get lesser rewards even they are well-performed in the tasks assigned and unlikely to withhold a leading position in workplace as compared to male. The degree of inequality has varied across countries and treated as a common challenge for all nations over the time. Hence, the issue of gender inequality has been growing globally and greatly attracted innumerable researcher to further explore this issue as their thesis study. The issue has captured public awareness, media reports, social network discussions, and major of countries federal attentions. The purpose of this study is to investigate the impact of these mutual factors including gross domestic

saving, labour force, literacy rate, inflation, mortality rate on the growth of economy and the major concern is specialized on gender inequality on economic growth.

## **1.2 Research Background**

### **1.2.1 Gender Equality Definition**

Gender inequality can be expressed by an inequitable treatment of individual based on gender (Mukherjee & Mukhopadhyay, 2013). It arises from the distinctness in socially constructed gender roles as well as biological structure. This kind of inequality is usually considered as one of the portion of tradition ideology, culture, and value which are entrenched greatly in the mind of people. From the perspective of United Nations Children's Fund (UNICEF) (2015), they have stated that "gender equality refers to the fair distribution of treatment between female and male, enjoy the same rights, resources, opportunities and protections. However, it does not require the treatment among female and male to be the same, or that they be treated exactly alike." In a more specific context, gender equality is about human rights and typically women are entitled with the right to live with dignity, freedom in choosing the life they desire and free from any fear.

### **1.2.2 Gender Equality and Economic Growth**

Gender equality plays a significant role towards the economic growth and essential for poverty reduction which has been entitled with the true recognition internationally (Ellis, Cutura, Dione, Gillson, Manuel & Thongori, 2004). Majority of

the government and private sectors strive to achieve gender equality in order to attain with human right and to create business sense or awareness. In such, Madgaykar (2015) has further virtualised that gross domestic product (GDP) could rise by estimated 28 trillion USD by 2025 once there is gender equality in work force. Hence, it would be leading to a condition whereby another China and United States are entering to the world economy with the imposition of substantial effects.

According to Chandra (2015) and Cooper (2017), such incidences could impose a large economic cost as almost half of the population are forcefully to be limited with growth due to the condition where majority of female are unable to unlock their economic possibility. While female is restricted to enter in labour market, economic growth and private sector development will be limited with lesser competition, investment and productivity (Blackden & Bhanu, 1999). According to The Global Gender Gap Report (2017), it is costly to limit female to access to employment opportunities with the evidences shown in the East Asia and the Pacific. They have reported with a substantial loss amounted between USD 42 billion and USD 47 billion annually as a result of limited access to labour market. There is a similar growth restraint being imposed with a sizable cost in the Middle East, North Africa and Sub-Saharan Africa which has been demonstrated by World Bank (World Bank, 2001).

One of the key highlights from The Global Gender Gap Report (2017) has stated that many models and studies have found out that improving gender parity may achieve significant economic dividends, which is significantly depending on the adaptability to confront those challenges. For example, an estimated recovery of USD 250 billion could be improved to the GDP of United Kingdom once it able to achieve gender equality and USD 5.3 trillion would be increased in GDP as among the world by 2025 associated with approximately 25% over the same period from gender parity in economic participation.

Economic growth can be affected by gender inequality through education gap between gender. Several studies have illustrated that the marginal return on education for female has exceeded those for male, in other words, the impact of education for female is greater than male towards the growth of economy (Hill & King, 1995; King, Klasen & Porter, 2008). The restriction imposed towards female to participate in education has caused a lower participation level in formal labour force and skills needed by women entrepreneurs (Ellis et al, 2007). It has subsequently caused a significant decline on the average amount of human capital in the society (Cuberes & Teignier, 2011). Education and more broadly human capital played a key driver in the economic growth as suggested by the augmented Solow model and endogenous growth model.

According to Chandra (2015), the Deputy Division Chief of International Monetary Fund (IMF) has stated on the income inequality and gender inequality are linked simultaneously. A varied earning ability between women and men will directly contribute to income inequality. Income inequality served as the key influential instruments in promoting detrimental effects towards financial market which has indirectly linked to growth of an economy. As stated by Seguino (2000), an unequal income gained by women and men tend to impede the economic growth of a particular country as it has incurred social conflicts, particularly through the unfavourable outcomes of investment and macroeconomics policy. Unfortunately, women tend to receive lower work paid as they are preferable to work in an informal sector which lead to a widening of gender gap earnings and subsequently contributing towards income inequality. For instance, the women whom are crowded into the export industries that are producing price elastic goods tend to receive lower pay due to their restricted bargaining power within the workplace. Hence, the resulting wage differentials may artificially indicate a higher wage for men that tend to serve as a stimulus in export expansion.



Therefore, there is a negative relationship between gender inequality and economic growth. According to Kalsen (2000), gender inequality has a significant and adverse impact on economic growth rate as the findings have proved on the participation of female in the formal sector has a statistically significant and positive correlation with economic growth.

### **1.2.3 Gender Equality Around The World**

Data from Global Gender Gap Report 2017 as shown in table 1 has illustrated on the Sub-Sahara Africa which consists of 46 developing countries displayed a practically range of gender gap incurred within its region. However, there is neither countries from the region able to reach nearly to the range being imposed by both Educational Attained and Health and Survival gender gaps. It refers to the Educational Attained sub index also ranked as the lowest attainment on gender parity globally. However, Western Europe has achieved the highest performance among the region with 75% in achieving the gender parity in 2017. It has sustained under the top 5 countries in the index and whereby there are four countries from the region remained under the top 5 positions in Political Empowerment sub index.

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Table 1.1: Gender Parity in 2017 By Region and Distance

Region	Distance from gender parity 2017 (%)
Western Europe	75
North America	72
Eastern Europe and Centre Asia	71
Latin America and the Caribbean	70
East Asia and the Pacific	68
Global Weighted Average	68
Sub-Saharan Africa	68
South Asia	66
Middle East and North Africa	60

Source: Global Gender Gap Index 2017

The Global Gender Gap Report (2017) involved 144 countries and consistently tracked on the progress of those countries over time. Through The Global Gender Gap Report (2017) by World Economic Forum, it takes into consideration for 4 key areas to measure the gender equality gaps between women and men, which are health, education, economy and politics. On average, the gap in health and education attainable over 144 countries are 96% and 95% respectively which are higher as compared to the overall performance of economy and politics. The World Bank Group report also mentioned that there is a significant progress in improving the gender gaps in education and health. This shows that most of the women are expecting to live in good health and on average, the literacy rate of women has closely aligned with the rate being achieved by men.

## DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH? A PANEL DATA WITH GMM APPROACH

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According to Gillard (2017), the Chair of the Global Partner for Education has stated there are still about 130 million of female do not have the chances to be educated with schooling background although 95% of them had involved in education. Early marriage, security and availability are the reasons that keep them out of schooling. Girls will entitle lesser chances to be empowered to make choices for their own standard of living when they are not received education. In some countries, although they have received education and yet still require them to walk a long distance to pursue their schooling which would specially be creating a problem for those with no transportation. Cooper (2017) has further clarified that girls tend to be unsafe while walking to their education institutions. According to Madgavkar (2015), “Smaller differences in educational attainment between men and women are strongly correlated with higher status for female, which helps to reduce the incidence of sex-selective abortions, child marriage, and violence from an intimate partner”. As a results, as female has been continuingly to experience unequal access to education and health, they tend to receive lower income compare to man and indirectly slow down the economic development (Chandra, 2015). Hence, gender inequality in education served as an efficient access to resources able to prevent a reduction in fertility and child mortality as well as to promote a further expansion in education for the next generation (Thomas, 1990; Summers, 1994; Murthi, Guio & Dreze, 1995; Klasen, 2002).

A research by the World Bank based on the sample of a wide range of developing countries has concluded that if female able to complete their education at the same rate similarly to male, this will result in a life time raise in the current girl's cohort of 54% to 68% of the countries' gross domestic product (Chaaban & Cunningham, 2011).

Furthermore, The Global Gender Gap Report (2017) has reported that there is still a big gap showing in economic opportunities for women to be involved. The

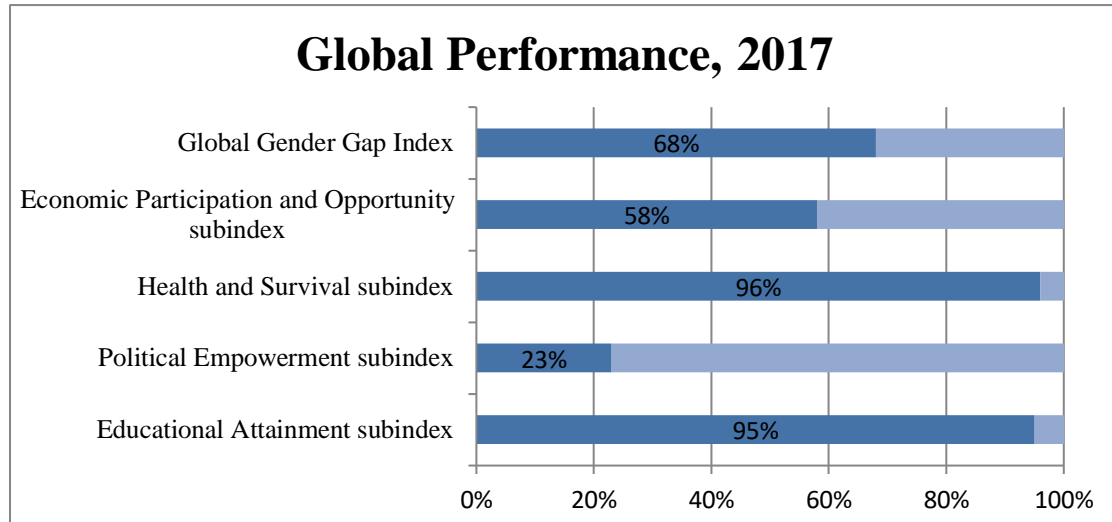
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economic participation gap between male and female has only achieved 58% and political empowerment gap only 23%. Although most of the female entitle the opportunity to enrol in education from primary to tertiary, however only 67% of female participating in workplace and 32% of female holding leadership position. There are 32 countries failed to achieve the world average for the economic participation and opportunity and even 39 countries achieve less than 10% of its gender gap in politics. Women are less likely to work in full time and they earn approximately 10% to 30% lesser than men. According to Charles and Grusky (2004), the widespread of vertical segregation whereby the presumption of men are intrinsically more competent and capable to the committed tasks than women and hence, men will be deserved with higher position and more appealing rewards including pay, prestige and authority. The persistence of gender segregation has created a critical concern and indirectly forward the relative effects towards the economy. Even there is an increase of gender egalitarianism over the last half century, however, the impacts of gender wage differentials and education still served as a strong resistance and remained wildly especially in the workplace (Levanon & Grusky, 2016).

Based on The Global Gender Gap Report (2017), the current rate of changes in gap between women and men in economic participation, it takes another 217 years to get closely to the economic gender parity and minimize the economic gender gap.

Figure 1.2: Global Performance of 2017



Source: Global Gender Gap Index 2017 (Covers all 144 countries featured in the 2017 index.)

### 1.3 Problem Statement / Motivation of study

The ongoing pressing of gender inequality has gradually attracted public attention and become the major concern for the federal of the countries because the persistent of gender inequality tend to hinder the growth of individuals, the evolution of societies and the sustainable development of countries (UNFPA, 2000). During 2000s, there are over 147 leaders over 189 countries have participated the Millennium Summit which was held at United Nations Headquarters in New York (United Nation Development Programme, 2018). They have unanimously adopted United Nation Millennium Declaration, which declared in the statement of values, principles and objectives for the international agenda in the twenty-first century (United Nation Development Programme, 2018). There are eight Millennium Development Goals (MDGs) are derived from this declaration complemented with a particular objectives

and quantifiable benchmarks. The national leaders have contributed unitedly to fight for the global issues in fulfilling eight Millennium Development Goals (MDGs) with a deadline within 2015 (United Nation Development Programme, 2018). Among the MDGs, there are 3 goals reflected on the global attention to the issue of gender inequality and committed to promote gender equality and empowerment of women (United Nation Development Programme, 2018; Khayria & Feki, 2015).

All United Nations members are motivated to put effort in eradicating gender disparity in primary and secondary education preferably at all levels by 2005 (McArthur, 2014). Furthermore, there are various international female rights of organizations such as Womankind Worldwide, International Women's Health Coalition, and International Justice Mission had been formed to advocate the feminists, strive to achieve benefits for women, and support some campaigns in raising awareness on equal rights associated with gender equality (United Nations Children's Fund (UNICEF), 2011; Capraro, 2017). Hence, there is an expected improvement on transformation of gender relation since the beginning of the 20th century.

The Millennium Development Goals Report (2015) stated that despite of extraordinary gain and significant improvement after the massive national tools and policies that have been taken in rising the equality of female in education, employment, economic and political participation, however, the outrageous gender inequalities still persist complemented with an irregular progress been imposed. Among 135 countries, there is only four nations have realized on gender equality, which are Costa Rica, Cuba, Sweden, and Norway (United Nations, 2015). The MDGs able to hold a great promise for women's health and well-being because many of the goals have direct and indirect implications for women's health (Mohindra & Nikiema, 2010). However, the mortality rate of female is growing drastically due to the risks that they need to bear during pregnancy or from childbirth-related

complications in saving their own life (The Millennium Development Goals Report, 2015).

Kassa (2015) has stated on the recent concern on the contribution from women in politics and decision-making across the world. Undoubtedly, women are remainly restricted to fully exploit their talent and potential in the economic and political contribution as they are mostly under-represented in decision-making positions (The Millennium Development Goals Report, 2015; Kassa, 2015). The unfairness cases toward female such as discrimination, harassment, and violence often happen all the time across the world (United Nations, 2015). Hence, there is an ambiguous effect on the growing awareness of gender equality which has been adopted to improve inequality situation. This will lead to a question whether the methods used to settle the gender inequality are time consuming, ineffective, or unsatisfactory?

Forsthuber, Horvath and Motiejunaite (2010) pointed out that gender inequality issues have substantially attracted the social concerns among many countries, but the overall policies in resolving this issue are often neglected. A serious criticism on the findings developed by Kabeer (2015) has been on the role of MDGs which served to minimize the vision and aspiration of a movement into a series of narrow and technically conceived target. Moreover, Mohindra and Nikiema (2010) has announced that the third goal among MDGs has intrinsically lacking objectives to fight for violence against women, economic and political discrimination among female. Meanwhile, the MDG project has only emphasized on the achievement of gender equality in primary and secondary education, nevertheless, the government has ignored the role of higher education which play among women's status, health, economic and political participation (Mohindra & Nikiema, 2010; UN Department of Public Information, 2018). The government has eventually neglected on their initial intention in achieving gender equity and the equal empowerment of women and

diverted their attention outside of the dimensions of women's rights. Due to the uncertain circumstances, the governments might mix up and make the wrong strategic decision in improving women's socioeconomic position as well as in developing a progressive gender-related public policy. The diversion of actions taken by government are mainly due to the ignorance of any specific approaches in measuring the progress and any manners in outlining the suitable interventions. Hence, they might easily evade on the progress of achievement with the politicking consideration on gender equality (Mohindra & Nikiema, 2010).

The Millennium Development Goals Report (2015) has recognized on the ill-matching of achievements and deficiency on the path to achieve gender parity. One of the evidence from the third goal among MDGs refer to the incomplete and yet it should be modified and practiced continuously in the new era development. As a result, the existence of Sustainable Development Goals (SDGs) has emerged to provide guidance for the government to minimize gender inequalities for the next 15 years, from 2015 to 2030. Among the total of 17 goals on sustainable development, there is an indication being visualised to achieve gender equality and a fair empowerment of women with the requirement on the completion of vision set by the Millennium Development Goals (MDGs) (United Nations, 2015).

In the 21<sup>st</sup> century, women tend to get more opportunities in accessing to education as compared to last few centuries across the countries. This is significantly contributed by the increasing opportunity being offered to female in accessing to primary schooling in worldwide which could promote in narrowing down the gender gaps in education (The Millennium Development Goals Report, 2015). Nevertheless, the severe of gender disparities remained persistently among the regions in all levels of education, especially in the marginalized and remote mountainous region (UN Department of Public Information, 2018). In such, these incidences can be viewed continuously by female to face barriers to access to schooling, particularly in



Northern Africa, sub-Saharan Africa and Western Asia (Hakura, Hussain, Newiak, Thakoor & Fan, 2016; United Nation Development Programme, 2018). For instance, there are only 93 females are entitled to enrol in primary schooling for every 100 boys in sub-Saharan Africa which has exhibited the preferential treatment between male and female (United Nation Development Programme, 2018). Moreover, a shortage of education equipment and academic trainer in the remoting region can be viewed as an insoluble challenge in cultivating any potential talents by fairly distributed between male and female (United Nations, 2015).

Furthermore, the gender disparities in secondary and tertiary level education have persisted even associated with a comparative growing in economy. The opportunity offered to female for secondary schooling remained at a downside in Oceania, sub-Saharan Africa and Western Asia, whereas male tend to be positioned at disadvantage in Latin America and the Caribbean (United Nation Development Programme, 2015; United Nations, 2015). Moreover, a serious gender disparity tends to be found in tertiary education for the enrolment of female especially in sub-Saharan Africa and Southern Asia. In fact, majority of female are forced to become ‘a source of income’ in the remote regions as they are required to seek for own financial ways in supporting their obligation towards family and cost of living (United Nations, 2015). As they tend to consider promoting cost of savings in spending on those limited and advance infrastructure facilities, female is sacrificed in spending more time to perform chores. Hence, they will subsequently confront obstacles in pursuing their academic studies and career.

The encouragement of early marriage is considered as one of the forces in hindering girls to pursue for their studies. Due to unwanted pregnancy and rough school atmosphere, the female who committed to these conditions tend to be treated biasedly and threatened which caused them to face difficulties in completing their studies successfully even they are entitled to schooling (Yelfign, 2001; United

Nations, 2015). Khayria (2015) mentioned that gender inequality in education will prevent a reduction in fertility rates, infant mortality rates and drastically bring forward the detrimental effects on to the next generation's opportunities in education and health care.

In contrast, the phenomena of lagging behind in schooling and repetition on years of schooling are more common among male in Europe. The female has usually been obtained with higher academic performance which is essential for the desirability to enter into the university programs. However, in the case of Britain, there is an equal number of gender allocated to the selective schooling even male has performed badly in their academic. This is because male was perceived to have greater potential in possessing leadership position in the future as compared to female (Forsthuber et al, 2010).

According to Mukherjee and Mukhopadhyay (2013), the gender disparity in education will negatively impact on economic development through various ways as education has been considered to be one of the driving forces for a particular country to be strong. This has been supported by a statement where education able to create skilful human capital and the pool of talents could promote the country to be leading among others in term of creation of technology, humanity, rule of law and economy (Yumusak, Bilen & Ates, 2013; Ahang, 2014). Particularly, the encouragement of gender parity in education has a positive multiplier effect on progress across all development areas (Dollar & Gatti, 1999). The misallocation of educational resources among male and female will definitely generate poor quality of human capital which in turn reduce the average literacy rate, capability, efficiency of workforce and research and development in a particular country (Ahang, 2014). Therefore, the overall development of nation will be tremendously influenced under the inefficient market circumstances.

Consequently, those workers who are lack of skills and competencies tend to receive low wages and directly induce them to spend lesser for savings to serve as liquidity funds to meet any emergency. As a result, the amount of money to be circulating in market will reduce and contribute to the situation where demand of goods and services are getting lesser as compared to supply, causing a devastation on economic growth. In brief, the gender bias in education may generate economic problems for policymaker on the progress of realizing economic and social development goals (Dollar & Gatti, 1999; Klasen, 2002; Berik, Rodgers & Seguino, 2009; Klasen & Lamanna, 2009; Fatima, 2010; Mukherjee & Mukhopadhyay, 2013).

According to the findings of Kennedy, Rae, Sheridan and Valadkhani (2017), the construction of gender-based occupational segregation has basically enlarged the existence of gender disparities in employment and wage pay. Nowadays, there is roughly more than 70 percent of working-age male has the opportunity to participate in the labour force, while the remaining proportion has been promoted to female (The Millennium Development Goal Report, 2015).

Furthermore, the proportion of women engaged in employment has continued to grow over the last 25 years, but it remained at a slow pace (United Nations, 2015). Kennedy et al (2017) pointed out that gender wage gap remains existed even though the federal government had applied relevant policies to encounter such inequality more than 40 years. According to the recent case, the editor of BBC China, Carrie Gracie has resigned due to wage discrimination (Furness, 2018). She was surprised to disclose on two of the BBC's international employees where the annual income of male editor entitles with at least 50 percent more than women editors in the same position. The wage paid can be concluded to be based on gender bias rather than working experiences, education levels, skills and capability. Hence, the encouragement of female labour participation does not work to achieve the gender income equality. In addition, gender pay gap results in an increment of risks

complemented with the relative higher poverty level to be faced by female as there are some female are not financially independent. It could create difficulties for them to escape from family violence (NSW Council of Social Service, 2017).

When the actual salary of female is being undervalued than what they have expected, it will directly cause them to be unsatisfied with their job pay and tasks performed. Thus, they might perform negative attitude and laziness in the workplace. This will lead the ineffectiveness and inefficiency on the operation of company whereby the productivity retained at lower level and the company is restricted to produce greater output by using the same level of input with lower costs imposed. Hence, this leads to an ultimate lower Gross Domestic Product (GDP) and poor economic growth of a particular country which has exercised or imposed any activities that promote to gender inequality (Mukherjee & Mukhopadhyay, 2013).

Therefore, this research has emphasized on two key aspects, which are the impact of gender inequality in education and gender inequality in the labour force participation towards economic growth. There are several motivations to conduct this study by focusing on the issue of gender inequality in education and workplace as well as some minor concern on health and rights.

## **1.4 Research Objectives**

### **1.4.1 General Objective**

The general objective of this study is to investigate the influence of gender inequality on economic growth, by using a panel data that consists of 42 countries from 2010 to 2015.

### **1.4.2 Specific Objective**

The specific objective which derived from the general objective is to explore the impact of gender inequality on economic growth.

## **1.5 Research Questions**

Given that our research objectives that are mentioned as above, the following research question to be answer in our study project is why the issue of gender inequality has existed persistently which complemented with any effect on the growth of an economy?

## **1.6 Significance of the Research**

By using panel data techniques, with observations across 42 countries and over the period of 2010 to 2015, we emphasize on the outcomes of the macroeconomic variables including gender development index (GDI) as the proxy for gender inequality, inflation, literacy rate, mortality rate and women labour participation rate, gross savings on economic growth. The major concern will be specified on how gender inequality influence the overall growth of the economy through a panel data analysis. After carrying this research, we discovered that majority of the researchers and journal studies have dedicated to study on how the macroeconomics variables underline and intrigue an economic framework in affecting the economic growth based on the collections of data for each variable. Thus, it promotes us a deep-seated understandings and intensive motivation to complete our research on this study.

Gender inequality act as a significant determinant in deterring a particular country to achieve socially and economically on advancement, stability as well as productive outcomes. There are some important forces have to be understood and taken into account in order to eliminate the accumulating persistency effects of gender inequality on economic growth. The results of the research will provide valuable insights for federal government and non-governmental organization (NGO) to identify, recognize and comprehend the effects of gender inequality towards economy. The eventual objective is to recommend several effective strategies for the government, NGOs, and public in supporting women to entitle with equal rights, privileges, opportunities, and responsibilities as with equal distribution ratio with male.

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In this condition, the relevant involved parties should stand up on their respective rights in voicing out any challenges encountered in achieving the gender parity to be against the circumstance of gender unequal treatment. The information of this study can be used to influence or facilitate government on the basic understandings in tackling the problem of inequality and identifying which channel or mechanism can be applied to minimize gender gap. The government should subsequently apply and implement several precise policies to ameliorate the situation of unbalanced gender disparity. The founding father of the People's Republic of China, Mao Zedong even said that, "women hold up half the sky," admitting the relative abilities imposed by women in the growth of the society towards the economy (Sheppard, 2015). It is a substantial statement that recognizes the capabilities of women who can be aligned similarly as a remarkable performance as what men did. Indeed, the encouragement of gender equality able to increase productivity, stimulate economic growth, and promote better development for the next generation. Moreover, the improvement of women's status will be beneficial for country to achieve its economic development goals whereas the improvement of the public polarized the thinking on the gender in providing a better future for next generation.

Michelle Bachelet said that, "gender equality will only be reached if we are able to empower women". Every party involved should contribute their efforts equally in order to achieve the goal of gender equality in a faster way as the sole contributor by government is difficult to attain development of an economy. Throughout the study, the greater participation from NGOs will be able to increase awareness on gender inequality issue. According to Grosser (2015), there are numerous of NGOs have been working on managing environmental issues, labour and human rights, however, there is a lacking NGOs working on controlling the gender inequality issues. For example, UN Global Compact has revealed to have insufficient participation by women's NGO (Kilgour, 2013). Therefore, NGOs acted

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as a key driver in stimulating the importance of better understanding on gender inequality furthering gender mainstreaming through the country (Rai, 2008).

As the traditional concept of the female advocate inside and male advocate outside have been improved in the recent modern trend. Female have been entitled with more authority to access to education and job opportunity, instead of merely dealing with family affairs. In short, the awareness of gender inequality in society has been seriously taken into account by the public, it will indirectly impose a balanced workforce between male and female by offering equal job enrolment for female to be entitled with leadership position. Therefore, as male and female have reached the same participation in social and political affairs, they will be entitled with identity rights to make a decision and equal chances to influence policy under a fair competition environment. This will eventually make the development system and policy choices to be more effective and inclusive in representing the interest of majority of society which in turn will lead to better development path for a given country without underestimating the intrinsic capabilities owned by female.

In brief, with the consent from both male and female in learning to be respectful and cooperative with each other, this will significantly promote and foster the collaboration between the gender to tolerate in achieving the ultimate goals of gender equality as well as a sustainable development on the overall economic growth.



## **CHAPTER 2: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter mainly discussed about the past empirical studies that related to gender inequality in economic growth. The organization of this chapter as follows: section 2.1 Primeval of gender inequality since 1800s, section 2.1.1 Women suffrage, section 2.1.2 Inequality in workforce and wages, which embark on gender inequality in 1800s. Whereas the following section 2.2, briefly reviews on gender inequality in the view of education in 1900s. Section 2.3 discusses the studies on the gender inequality that investigated by researchers since 2000s, which mainly focuses on issues of gender inequality and economic growth that contain the field of labour market, wages and education in developing countries. The last section 2.4 is a summary to this chapter.

### **2.1 Primeval of Gender Inequality since 1800s**

#### **2.1.1 Women Suffrage**

In the late eighteenth century, an Englishman Jeremy Bentham, a philosopher and a legal reformist have mentioned on the restriction imposed towards women in suffrage and women should be entitled with the right to vote as well as participate in the law making and administrative branches of the government (Williford, 1975).

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After Jeremy Bentham had grabbed the attention on the women's voting right, New Zealand has become the first country to approve women to vote in their national election in the world back in 1893 (Paxton, Hughes & Green, 2006). According to Dilli (2015), a right to vote in suffrage has been realized as one of the major factor for the incurrence of gender equality after a long struggle. During that time, United Kingdom has been confronted with a long story related to the parliamentary rules. Suffrage campaigns had been organised throughout the period and efforts to fight for women's voting rights has been struggled for more than half of a century in United Kingdom. At the end of the World War I, the British Parliament had granted that the voting rights are entitled to the women over the age of 30 if they meet the property criteria. This has exhibited that the right of women has gained attention and being stressed by the public.

Democratic development has been identified as a tool that able to contribute to gender equality. Inglehart, Norris and Welzel (2002) and Beer (2009) have proved a positive correlation between gender equality and democracy throughout their findings. In their studies, Murtin and Wacziarg (2013) found that democratic transition has started to take place in many countries since 1820s. These countries tend to move from the autocratic regimes into democratic regimes which need a total reformation. From having a higher legislative and executive power complemented with limited constraints as well as low political participation, they will need to reform into higher limits on practicing political power and higher level of the political participation. The study in Kenworthy and Malami, (as cited in Paxton, 1997) has investigated that democracies will result in having a more number of women in parliament due to democracies which are more likely to promote its interest in powerless form. In addition, Kenworthy and Malami (1999) mentioned that the level of the democracy is not significant to be one of the factors in determining the percentage of women in the parliament by using Freedom House index as the indicator. The study in Beer (2009) has been published that women prefer dictatorship rather than democratic due to the perception that modernized gender legislation which can be carried out easily

compared to democracies. So, the role of democracy in promoting gender equality is therefore inconclusive.

### **2.1.2 Inequality in Workforce and Wage**

Gender inequality has become a main concern within the international community (Khayria & Feki, 2015). According to World Bank (2001), gender equality has many dimensions instead of a solely homogenous phenomenon. Gender gap can be seen in fields including economic resources, healthcare, and rights in decision making. Dilli (2015) provided a view on gender equality which refers to the responsibilities, opportunities and equal rights between the male and female. Besides, the achievement of gender equality is meant to bring a situation in which the cultural and social environment recognizes the equal value in both women and men.

Prior to World War II, Goldin and Sokoloff (1982) mentioned that it is insignificant to consider women as employed since women are working at home instead of factory. However, they have argued that the innovation of technology in industries such as textile industry has caused women to participate into the workforce and bring impact to non-agricultural trade in the early of 1900. By 1820, they concluded that children and women have built up 30% of labour force in manufacturing, and reached 40% by 1850. Due to the incidences such as embargo in 1807, war in 1812 and industrial revolution, these have been considered as the major factors to increase workforce of children and women in the production sector of all industry. Hence, the participation of children and women employees could contribute to a larger size of factory including their expansion schemes, production and technology equipment to be installed. They mentioned that an increment in wages and

job opportunities are some of the significant elements in boosting up female entrance in the labour market (Goldin & Sokoloff, 1982). According to Denton and Spencer (1997), labour force participation rate is one of the sources to achieve economic growth for every country.

Aside from industrial occupation, education is considered as one of the largest occupation field that had been dominated by the female. In New England colonial era, education in writing and reading is required for the children by Massachusetts law. Women had served as main schoolteacher in 1690s (Perlmann & Margo, 2001). Joel Perlmann and Robert A. Margo also stated in their book namely *Women's Work? American Schoolteachers, 1650-1920* that a large gender gaps in terms of wages between the female and male schoolteachers happened in North-eastern where female schoolteachers were paid at \$6.98, while male schoolteachers were paid at \$13.61 in the mid of 1840s. Besides, the difference of regional such as North and South had generated a large difference in the percentage of female schoolteacher participated in education field. This has resulted in fewer schoolteachers in the North although the South region has a larger population of children and these schoolteachers were less likely to be female, majority in male. Perlmann and Margo (2001) identified Southern and Northern cultural has become a main factor for women in choosing occupation. In the Southern cultural, women were more likely to assist their partner or parents to work on farm, instead of staying in the house. In addition, Southern cultural viewed women as a weak resources and lack of power to control discipline as well as educate their children. Wages is one of the sources that contributed to national GDP directly by throughout the consumption component in GDP function. Hence, it can be concluded that the level of gender gap is affected by a mixture of social and economic factors.

In conclusion, a woman's voting rights in suffrage and democracies development have become the main concern and served at the centre of attention

which allow women to withhold a chance from being treated equally by the society also known as gender equity since 1800. Voting right and democracies development might be perceived to only bring impact to gender equality but it actually affected and contributed to the economic growth. This gender issues have a history back in the 18<sup>th</sup> century and it has successfully grabbed the public's attention. However, this issue remain unsolved due to several factors. Hence, this issue should receive considerable concern from the government and the respective authorities to solve this issue by 2000s once and for all.

## **2.2 Development of Gender Inequality since 1900s**

Most of the researches done around 1990s were mostly for developing and shaping of gender inequality framework. These pioneers such as Foschi (1996) and Foddy and Smithson (1999) continue in investigating gender inequality had constructed several authorized theories such as category-based expectancies theory, theory of status characteristics and expectation states and so on. In modern days, those frameworks are used as base theory for further development that compatible with the environment.

In the western society during 1990s, gender inequality is a continuation issue that has not been eradicated and received gaze and attention in the study of conventional understanding towards differences of gender (Foddy & Smithson, 1999). This can be happened in workplace, family and school. According to Towson, Zanna and MacDonald (1984), they found that males' own mind sets toward women had created a magnifying influence on their judgements. Those men with traditional attitudes toward women would expect greater success and achievement for traditional

women in conventional female occupations and less success for the assertive women in male-dominated work area. Besides, they further stated that prude men believed firmly that women should stay at home and are not a competent employee regardless of their personality and nature of the job.

Cuberes and Teignier (2011) stated that gender inequality is a pervasive issue in many developing countries. The gaps between male and female in achieving outcomes and seizing opportunities occurred in various dimensions that would eventually affect the development of a country. The differences between women and men in employment, wages or poverty are always caused by human capital differentials, which constituted by traditional structures likely to fade away over time. The process can be done by spreading the civilization education among the people.

Other than this, the issue of income generated between male and female in eighteen centuries also has been emphasized in nineteenth century. The persistency and consistency of income difference between genders does not only arise concerns about equality and efficiency, but also induce the tiny hopes of people in creating an ideal democratic society where all people have equal right to engage in something (Chung, 1996). According to Becker (1993), he applied the Human Capital Investment theory that estimates a shaping effect of education expansion. He further states that if a society improve its education and ensure the equity of educational opportunity, income differences between genders might diminish. But, the discovery of situations in western society has proven that no matter how much education had been expanded, there is a barrier to equalize the earnings (Carnoy, Lobo, Toledo & Velloso, 1981). The fundamental reason is that the effect of education on life chance in not equal even if the educational chances can be equalized. However, Hill and King (1995), Tzannatos (1999), Forbes (2000) and Klasen (2002) mentioned that there exists a negative relationship between gender inequality in education and the

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economic growth, yet study of Cuberes and Teignier (as cited in Dollar et al, 1999) do not find a negative effect particularly.

In Hong Kong, there is an overall decreasing trend in gender earnings differentials from 1976 to 1991 by using the attribute quantity and price. Attribute quantity refers to the characteristics of a group that affect its earnings and it can either be endowed or acquired. As for the attribute price, it is a value of the attribute in the labour market. It is mainly the result of market preference for or discrimination against an individual acquiring that attributes (Chung, 1996). The major push behind this diminishing trend is the improvement of attribute quantity in favour of the females, particularly in the human capital variables (Chung, 1996). Nevertheless, the changes in the attribute price throughout the year have brought negative impact to females and luckily, the negative effects of it is offset by the positive effect from the improvement of female attributes. Due to the period of this study was during 1990s, there is not much exploration on the direct measurements to treat the attribute quantity and attribute price in education and employment for females, the government of Hong Kong could only apply indirect measures in education enhancement to reduce the genders earning gap (Chung, 1996).

The girls' right to education has always a pivot of academic and policy attention in the remote settings in some rural China's villages (Hannum, Kong & Chang, 2009). Those villagers had embedded themselves with traditional attitudes about educating women in terms of expected returns to the family as compared with educating men is disadvantaged. Furthermore, they believed that girls are less worthy and capable than boys. As the saying goes, "married daughter is just like water that has been spilled" indicated that she doesn't belong to her parents any more. This had result in more girls are neglected in receiving education and remain illiterate. The socialization decisions made by parents are tainted by cultural viewpoints on obligatory abilities, rights and responsibilities of men and women. These cultural

perspectives become concrete in educational opportunities that made accessible to boys and girls (Hannum et al, 2009). According to Wilson, Peterson and Wilson (1993), gender inequality in investments towards children emphasized not only on the parents' beliefs about the values and capabilities of girls, but those decisions made are affected by the different labour market treatment in girls and boys. This implies that a gender-based division of labour frames parental socialization and investments for children from an early age, with the consequence of poorer educational and occupational trajectories for girls (Wilson et al, 1993).

Poor countries always have a monopoly on gender inequality. Stereotype thinking of men earn more than women in essentially all societies. However, disparities in health, education, and bargaining power within marriage tend to be larger in underdeveloped countries (Jayachandran, 2014). As compared to developed and civilized societies, the degree of discrimination against women is weakened by the development of education, tradition, economic growth, modernization and the effort of women's organizations (Zaidi, 1996). In underdeveloped countries, the weight of women is incomparable with their sisters' in developed countries and they do not receive much respects. Higher morbidity and mortality rates, low levels of education and literacy, and few employment opportunities, are some of those factors which deny the achievement and development of the potential of women (Zaidi, 1996).

In brief, the level of argument for gender inequality from various aspects such as workplace, economic power, capabilities and education had been heated up since 19<sup>th</sup> centuries. This is mainly due to the rise of the feminist consciousness as the world is moving towards civilization. Even in third world countries such as Haiti, Comoros and Ethiopia had begun to strike for women education rights, they intend to improve themselves from poor countries label by increasing the literacy rate of the people including women (Dormekpor, 2015).



## **2.3 Gender Inequality and Economic Growth since 2000s**

According to Kennedy et al (2017), a gender wage pays disparities remain negatively related to economic development due to the failure to take into account on country-specific factors especially equal pay legislation among gender as well as the flexibility of work distribution. This has further consensus with the efficiency wage hypothesis that revealed a linkage of individual's effort to their real wage rate which resulted in an unequal distribution of income among genders. In such, this has subsequently demotivated the lower paid gender especially female from incentivizing to exhibit maximum effort and contribution. Consequently, a widening of gender income differential reduces labour force participation that limit the female labour market supply which in turn inducing real GDP per capita to decline substantially in long run.

Moreover, an occupational segregation among gender especially male whom often dominating particularly for more than 80% in Australia's mining and construction sectors which has enlarged wage disparity according to the traditional gender orientated industries. In other words, an access or owning of different level of education and work experiences will discrepant gender wage pay according to their own educational qualification and career opportunities. As a result, a finding from developed countries including Australia resulted an improved or additional investment in female education can improve human capital and ultimately minimize gender wage differentials which could consistently address increment of GDP per capita in long run.

Furthermore, most of the European countries including Germany, United Kingdom, Slovenia, Ireland and Poland have experienced increasing economic inequalities due to the spreading impact from financial sector of United States in 2007.

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Even with the facts that the young generation of women tend to be more educated than men in many countries, however, there is a significant difference persist in the labour market whereby lesser opportunities are being offered to women in term of job participation sector, wages as well as the chances of pursuing higher education level (Castellano & Rocca, 2016). During recession, women tend to engage more towards temporarily contracts due to the reduction in their employability and obsolescent in comparative skills as they were more responsive and vulnerable to an unusual change in labour market condition. In brief, these symptoms have clearly illustrated the influences and stereotypes of various attitudes or behaviours preserved by human in responding to the labour force participation being offered to gender especially women. Therefore, women might be suffered in the unfair treatment from the labour market since childhood due to the illegitimate behaviours of prejudice and the intrinsic disadvantages on the capabilities of women workforce. From time to time, the gender differences especially in labor market has obviously been amplified which are dominated by the lesser opportunity being offered to women than men to participate in professional career sectors (Fernandez & Forli, 2009).

According to Hippe and Perrin (2017), a research on the relationship between human capital and gender parity index reveals positive impacts across European regions. However, the historical evidences have exhibited the prevalent placement of large efforts on the education of male rather than female which could subsequently influence the literacy levels of gender that might variate according to the opportunity offered.

Murphy and Oesch (2016) has stated on the employment shares which occupied by female has been growing accumulatively in the higher professionalism level of occupation including health care, law, medical and human resources. Through the designation of study on Britain, Germany and Switzerland, due to the prevailing perception on economics over 2000s, the differences in wage disparities

across the occupations of male and female varied in terms of their productivity including gender norms, human capital, management on time investment, job-specific knowledge and skills. At the same time, it has been further analysed on the factors being imposed towards gender segregation which are due to gender devaluation besides of solely on wage disparities. As stated by Kamberidou (2011), gender devaluation could be referring to the contributions by female are gradually minimized or undervalued in term of academic performance whereby male are tending to dominate the job professions especially their adaptive skills in the rapid changing environment. Based on neoclassical economics, a cultural devaluation varies from job productivity denominated by female and male, differential time investment into skills acquisition as well as the perceptions on the differential gender status in deserving the rational basis of wages had eventually lead to a conflictual relation in terms of workloads, remunerations and power (Murphy & Oesch, 2016). Hence, the countries involved has stressed on the collective organization with specific skills adapted into the job enrolment and wage bargaining across gender that could subsequently affect their economy through its competition across labour market.

In addition, under the developing countries including in the central Africa, Latin America, and parts of the southern India, there is a widespread of matrilineal system where men have the authority in controlling over the land whereas women only get the rights to access the land use through their own father (Razavi, 2007). According to Bould (2006), some of the developing countries tend to lean on international community in fund their respective development scheme in order to address for the gender poverty and inequality issues over the past two decades. However, Dormekpor (2015) has clarified on the current twenty centuries; those developing countries relied on the local laws and customs in redefining the issues of gender poverty and inequality. As the gender inequality in education has not been eliminated or even minimized up to certain extents, South Asia countries and China have considerably suffered from a high rate of mortality among female than male. As a result, the gender inequality in education and income would empirically reduce the

economic growth in developing countries and eventually resulted in poverty trap which dominated through the effects of demographic (Klasen, 2002).

## 2.4 Summary

This section provides the summary of the research which discuss on the evolution of gender inequality towards economic growth and the components that could lead to a variation in the gender inequality in the developed and developing countries. The relevant factors discussed as above are education, income and labour force.

The issue of gender inequality has brought to an attention in 1800s started from an Englishman, Jeremy Bentham. He brought the attention in women suffrage to public and strived to obtain voting rights especially for female (Williford, 1975). In several studies, there is a positive correlation between gender equality and democracy (Inglehart et al, 2002; Beer, 2009). Prior to the World War II, women participants in the labour market was insignificant in major ways in America. Goldin and Sokoloff (1982) mentioned that it is insignificant to consider women as employed since the fundamental tasks for women are working at home for their family instead of participants in the industry as partially contributed to the society. In New England colonial era, there was a large difference of wages between the female and male in the North-eastern. This gender inequality issues have a history back in the 1800s and it has successfully grabbed the public's attention but remain unsolved.

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In 1900s, gender inequality is considered as a persuasive issue in many developing countries (Cuberes et al, 2011). Becker (1993) had estimated a shaping effect on the education expansion by using Human Capital Investment theory. He mentioned that income inequality between male and female might diminish throughout the effect of equity in education opportunity. However, there was a barrier to equalize the earnings in western society (Carnoy et al, 1981). In Hong Kong, there was a decreasing trend in gender earning differentials from 1976 to 1991 (Chung, 1996). A girl's right to education always serve as a pivot for academic purpose and policy attention in the remote settings in some rural villages of China (Hannum et al, 2009).

In 2000s, researchers included Kennedy et al (2017) mentioned that a gender wage pay disparity remain negatively related to economic development due to gender income differential that limit the female labour market supply. Consequently, a real GDP per capita will be resulted in a declining situation in long run. Many European countries experienced increasing economic inequality in the incidence of financial crisis during 2008. There are some findings have summarised on the research on job opportunities, wages and higher education opportunities which are lesser to be offered to women than men (Fernandez & Fogli, 2009; Castellano & Rocca, 2016). Apart from that, the relationship between human capital and gender parity index reveals positive impacts across European regions (Hippe & Perrin, 2017). South Asia countries and China suffered from a high rate of mortality among female and male due to inequality in education. This could be explained by the issue of gender inequality happened along 200 years ago since 1800s and was considered a persistent gap that are hard to be achieved equally. Nevertheless, gender inequality in education and income would reduce the economic growth in developing countries and resulted in poverty trap which has been dominated through the effect of demographic (Klasen, 2002). In conclusion, gender inequality brought negative impact to economic growth in major countries. In order to achieve a sustainable economic growth, gender

inequalities in major area have to be minimized or even eliminated with the requisite of cooperation from various parties.

## **2.5 Literature gaps**

There are some literature gaps have been found from the literature review above. First of all, the limitation of the research for gender inequality on economic growth in the past study has considered as one of the literature gaps. The availability of volume evidence related to GMM model and GDI data usage for gender inequality and economic growth in the past study is limited. The main reason is due to the limitation of database and technology not well developed in the past decades. Hence, the obstructions imposed on researchers tend to narrow down the scope of their research. Since the research on this issue is limited, this study has the relative potential to be served as one of the researches that cope to this literature gap.

Moreover, the discussion on the relationship between gender inequality in education and economic growth remains unclear and results in an ambiguous finding. There are numerical empirical evidences including Hill and King (1995), Tzannatos (1999), Forbes (2000) and Klasen (2002) claimed that there is a negative effect for gender inequality in the education towards economic growth. However, the study by Cuberes and Teignier (as cited in Dollar et al, 1999) has declared that the relationship between gender inequality in education on economic growth is not negatively related. One of the reasons imposed on these conflicts are mainly due to the time period included for the conduction of research analysis on the effect of gender inequality in education towards economic growth. For instance, the research done by Dollar et al (1999) used a longer time range which is 1960-1990 instead of 1975-1990. Hence, the

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omission of at least 15 years of data observation tend to influence the results to be realistic or violated complement with positive or negative effect.

In addition, the different measure of human capital in serving as a proxy in stimulating the economic growth tend to be varied and resulted in different level of effects with either substantially or slightly influenced. For example, the research conducted on this study has used the total year of schooling of the adult population instead of the share of adult population with at least secondary education level as the indicator of human capital. Hence, the effect of human capital measured by the shares of adult population are ambiguous since different proxy used tend to result in different modelling results towards the economic growth.

Furthermore, the literature gap tends to be identified in the realisation on methodological aspects. The earlier findings in 1800s are mostly limited in the database availability and using less-sophisticated methods in the study of gender inequality on economic growth. Regarding to this issue, the latest updated database of Gender Development Index (GDI) as the proxy of gender inequality instead of directly measure it with limited responses generated and the adoption of Generalized Method of Movement (GMM) with a panel data could overcome this issue. Therefore, this study had applied the GMM model and GDI data for estimating gender inequality and economic growth. However, there might be other well-suited approach can be used to outline the impact of gender inequality towards economic growth in a clearer dimension.

## **CHAPTER 3: METHODOLOGY**

### **3.0 Introduction**

This chapter introduced the data and methods used to conduct the project. Section 3.1 introduced the theoretical framework that linked gender inequality and economic growth. It further discussed about the relationship between double standard theory and economic growth. Section 3.2 had discussed the data used and ways to collect it. Next, section 3.3 showed the econometric framework by explaining the natural of ordinary least squares (OLS) model and difference generalized method of moments (GMM) in sub section 3.3.1 and 3.3.2. Sub section 3.3.3 discussed the difference GMM and its expected signs while section 3.4 is the diagnostic checking for the model.

### **3.1 Theoretical Framework**

“Double standard” theory that proposed by Foschi (2000) mentioned that there are differing standards applied on different individuals depending on who they are in various situations even though they also provide the same proof regarding the quality being evaluated. The main focus in Foschi's theory is that under explicit conditions, a status characteristic which distinguishes the people into two classes (for example, gender) trigger the use of a double standard (Foschi, Lai & Sigerson, 1994). Double standard not only applied in the workplace capabilities determination but also related



to the infant mortality rate because most of the families which adopted traditional mindset prefer male infants and tend to show less concerns towards female infants. This had subsequently result in high female infant mortality rate and it happened frequently in India since establishment (Robitaille, 2013).

To some extent, women are often assigned with easier tasks that required low level of ability than men, Foschi (2000) had claimed that gender is treated as cue to competence in society. He conducted experiment on double standard for competency and concluded that there is different benchmark for competence that evaluated according to gender where women always try harder and not allowed to have more mistakes than men for the attribution of same level of capability. Moreover, failure of completing task is viewed as a consistent result for a woman but not for a man. Ultimately, this result will be interpreted as lack of capability more strongly in the woman than male (Foschi, 1996).

Based on this theory, we formulated our model which related to the economic growth by endogenizing gender inequality, women participate rate in the labour market and women mortality rate. Moreover, we tend to provide more evidences to prove the significant relationship between those mentioned variables by referencing the past studies. From the research of Cuberes and Teignier (2011), there is positive effect of economic growth on gender equality when there is increment in women labour rate and according to the theory mentioned, women always being assumed to have low productivity and capabilities compare to men which is contradict to it. Aside from that, a diminish in gender inequalities had improved the women relative wages and lower the mortality rate as they have more income to support the living cost. Eventually, it had increase the children's literacy level which is positively impact the economy growth (Cuberes & Teignier, 2011). This statement had justified the theory claims on mortality rate.

## 3.2 Data

Due to limited resources, it is impossible for us to conduct the study for the whole world and the important variables in the model such as GDI do not contain sufficient information that could be used on every country. Moreover, the data for both variables are also restricted to certain years and unavailable to obtain for some underdeveloped countries as they are complicated to be measured. So, we are forced to exclude those countries that do not have enough information on the selected variables. At the end, we selected GDI as our gender inequality variable because it can provide higher sample size which is 42 countries that met the requirement of our study which covered from period of 2010 to 2015. For some of the variables such as mortality rate and women labour participation rate, it had been presented in logarithm because the number is large to interpret and express. A tabular presentation of the data and variables are as shown below.

Table 3.1: Definition and Sources of Variables

Variables	Description	Data source
<b>GDI</b>	<b>Gender Development Index</b>  Measures gaps in human development disparities between genders in three basic aspect of human development; health, knowledge and living standards	United Nations Development Program
<b>INF</b>	<b>Inflation</b>  A continuous increment in the general price levels which resulting in the loss of	WDI

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currency value

<b>EDU</b>	<b>Literacy Rate</b>	WDI
	Total number of literate persons which is expressed as a percentage of the total population	
<b>MOR</b>	<b>Mortality Rate</b>	WDI
	Number of deaths during a period among a particular type or group of people	
<b>LABOR</b>	<b>Women labour participation rate</b>	WDI
	Measure the percentage of a country's female working age population that involve actively in the labour market, either by working or by looking for employment (Verick, 2014)	
<b>GDS</b>	<b>Gross Domestic Saving</b>	WDI
	The amount of money that a person deducts from his disposable income to put in a bank as asset	

### **3.3 Econometric Framework**

#### **3.3.1 Ordinary Least Squares (OLS) Model**

Ordinary Least Square (OLS) regression is a form of statistical method of analysis that provide a visual demonstration in estimating the relationship between an endogenous variable and one or more exogenous variables. By gathering a sample of dataset which served as a representative in lining the relationship between independent and dependent variables, it will be configured as a best fit of straight line. Meanwhile, an OLS method can be adopted to minimize the sum of the squares of the errors generated from the associated results between the differences in the actual value and anticipated value for squared residuals based on the model (Gale, 2008). In such, all the assumptions underlying on the OLS regression must be fulfilled in order to determine and cater for the best model without any inconclusive results. For example, the conditional mean should be zero which reflected on the relationship between error terms and exogenous variables are independent. At the same time, OLS assumed there is a constant variance between error terms and exogenous variables to provide a correct model estimates. However, there are some limitations in adopting OLS regression especially in analysing the repeated measures of data which could lead to misleading or even inconclusive conclusion (Albert, 2016). Therefore, the adoption of Difference Generalized Method of Moments (GMM) approach will be more applicable and appropriate to computerize repeating dataset measures.

### **3.3.2 Difference Generalized Method of Moments (GMM)**

In general, the GMM framework served as a key instrument in estimating a set of population moment conditions which are ratiocinated from the assumptions of an econometrics model (Hall, 2005). Meanwhile, GMM approach provide a computationally method in performing the model inference and estimation on the parameter from a statistic set without the specification to illustrate the likelihood function. However, in term of GMM context, it may construct an efficient estimates of panel data model even though the existing instrumental variables did not exploit the entire information which are available in the sample chosen (Baum, 2013). By analysing the dynamic relationship on the propositions of the model (3.1), the aim to conduct such model is to observe any lasting impact on a given variable on another variable.

As proposed by Arellano and Bond (1991) in adopting the difference GMM approach as the model estimation, there are some advantages incurred as a dynamic panel data estimator which has been designed to deal with any unobservable heterogeneity or individual effect. According to Baum (2013), it allows for a partial adjustment on the model by undertaking first differences as in the one-way fixed effects model to perform demeaning transformation. Hence, the estimator serves as a prevention driver in dealing with dynamic panel bias whereby in avoiding the independent variables to be correlated with the lagged dependent variable up to certain degree (Wei & Chiang, 2004). The OLS estimator could be biased when the exogenous variables and error terms are correlated. Meanwhile, it could be viewed as an alternative in overcoming the limitation of OLS in term of capturing effect of endogeneity and heteroscedasticity problems. As stated by Hall (2005), it can be concluded that GMM approach served as the method of Instrumental Variables (IV) estimation.

Moreover, GMM estimator considered as asymptotically normal distributed as it follows from getting a mean-value of moment conditions surrounding the true parameter of the model which is similar to Taylor's theorem (Sheppard, 2015). Even though the covariance depends on the estimation of parameter, however, a true specification of the model with the sample moments that are adequately close to zero will be crucial for an identical normality of covariance matrix. In addition, it would be tremendously useful for the conduct of individual coefficients and significance impact on model to verify any imbalance panels and accommodate the potential effects on multiple endogenous variables. Therefore, GMM framework provide the flexibility in examining any econometrics problem faced by OLS estimator and resulting an efficient estimator associated with unbiased and consistent estimates.

### 3.3.3 The Difference GMM Model

The estimated dynamic GMM model is shown as below:

$$\begin{aligned} GDP_{i,t} = & \beta_0 GDP_{i,t-1} + \beta_1 GDI_{i,t} + \beta_2 INF_{i,t} + \beta_3 EDU_{i,t} + \beta_4 MOR_{i,t} + \beta_5 LABOR_{i,t} \\ & + \beta_6 GDS_{i,t} + \mu_{i,t} \end{aligned} \quad (3.1)$$

Where  $\beta_0$  indicates the coefficient of gross domestic product (GDP) of the countries in last year;  $\beta_1$  represents the coefficient of gender development index (GDI);  $\beta_2$  represents the coefficient of inflation rate;  $\beta_3$  represents the coefficient of literacy rate;  $\beta_4$  represents the coefficient of mortality rate;  $\beta_5$  represents the coefficient of women labour participation rate;  $\beta_6$  represents the coefficient of gross domestic saving;  $\mu_{i,t}$  refers to the error terms in the regression model. The  $i$  and  $t$  indicate the index of cross-sectional countries and time periods respectively, whereas  $t-1$  represents the lag of one-time period. According to the model estimation, inflation, women labour participation rate and gender development index are revealed to have a

negative relationship towards the GDP. Meanwhile, the gross savings, literacy rate and mortality rate are estimated to possess a positive relationship with GDP in the sampled countries.

The expected sign for  $\beta_1$  is negative with an increase in gender inequality could limit the educational and employment opportunity offered to female causing a decline on economic growth (Seguino, 2000; Khayria & Feki, 2015; Ali, 2015). In addition, the expected sign for  $\beta_2$  is negative by referring to the theoretical expectation whereby a high level of economic growth will be resulted with a low inflation. This has been further clarified by Khan and Ssnhadji (2001) and Mallik and Chowdhury (2001) whereby an inflation lead to an uncertain profitability of investment generated in future especially where high inflation often come with increased price variability and induced the real investment to shrink in economy. However, the considerable influence of inflation which below the relative threshold rate is expected to have a positive influence on economic growth with an achievement on stability (Hasanov, 2011; Aydin, Esen & Bayrak, 2016). The expected sign for  $\beta_3$  is positive with the influence of considerably high level of literacy possessed by the labour force would promote greater long term economic growth on the nation through total factor productivity as well as the direct factor in production function (Gylfason, 2001; Babatunde & Adefabi, 2005; Babalola, 2011; Hanif & Arshed, 2016).

Furthermore, the expected sign for  $\beta_4$  is positive which indicate an increased mortality rate will occasionally lead to a rapid economic growth over a short-term period, normally within few months (Brenner, 2005). From time to time, an increasing mortality rate could surge up the rate of unemployment to population ratio which has directly refer a negative relationship between economic development over a medium-to-long term. A decline in the exogenous of mortality rate could promote an enhancement on economic growth through the transfer of allocation of funds on

precautionary demand for children to the investment on children's education and daily supplies (Kalemli-Ozcan, 2002; Lleras-Muney, 2005; Preston, 2007).

The expected sign for  $\beta_5$  is negative which indicate a redundant portion of labour participation could result in an unskilful and unproductive outcome, which will subsequently slow down the growth on economy and eventually be replaced by the fixed capital formation (Jong & Tsiachristas, 2008; Shahid, 2014). This has been further clarified by Kargi (2014) on the high participation of labour force in market might be occupied by unemployed person with the consequences of incurring current account deficit and indebtedness that are detrimental to economic growth (Kargi, 2014; Chen, Hsu, & Lai, 2014). Meanwhile, the expected sign for  $\beta_6$  is positive which has indicated a varying savings behaviour could contribute to an investment and eventually promote growth towards the economy (Bacha, 1990; Jappelli and Pagano, 1994; Mohan, 2006; Kaldor, 2010). The cornerstone of savings is referring to an increase in savings will accelerate growth through a higher investment management (Anoruo & Ahmad, 2001; Misztal, 2011).

After obtaining the relative information and details for the difference GMM estimators, we will be conducting a diagnostic checking in order to examine for validity of the underlying model. Hence, the Sargan-Hansen test has been implemented to verify the instrumental variables used which are unemployment and income distributions. It will be essentially useful to detect any explanatory variables that are correlated with the error term in the model with a hope to obtain a consistent parameter estimates (Baum, 2009).

Therefore, we have adopted panel data as our micro data collection whereby the cross-sectional dimension (N) is large while the time-series dimension tends to be lesser as to ensure the asymptotic approximations capture a constant number of



observations over a ranging of time-series. At the same time, the collection of panel data could give raise to the degree of freedom and simultaneously reduce the collinearity among explanatory variables. It will be crucial to address and capture the impact of adopting economic variables as well as the high variability of dataset which failed to be analysed by cross-sectional or time-series dimensions (Podesta, 2000; Hurlin, 2010).

### **3.3.4 The Rationale of Variable Choices**

#### **3.3.4.1 Gross Domestic Product (GDP)**

According to Brussels (2007), Gross Domestic Product (GDP) served as the key indicator of economic development which comprised in measuring the total market value of all goods and services produced in a nation. Meanwhile, GDP as a proxy in determining human development and well-being internationally through the comparison between the countries in the worldwide. In such, economic growth could be explained by an obtainable level of performance to the desirable or targeted attainment associated with the technological advancement over the time. As stated by Oluwatayo and Ojo (2018), the economic performance of Africa with respect to the adoption of Millennium Development Goals are measured by GDP, in which by accessing to their poverty and education provision towards the productive growth of an economy of a nation. Moreover, a sustainable economic growth has persistently served as a predominant concern for most of the countries regardless of resulting from external debt, savings, availability of workforce and financial crisis (Alfredsson & Malmaeus, 2017; Senadza, Fiagbe & Quartey, 2017; Aydin, Alrajhi & Jouini, 2018).

#### **3.3.4.2 Gender Development Index (GDI)**

UNDP introduced a new measure on gender equality, which is the Gender Development Index (GDI). It is a variable that measures the development of states according to the standard of living in a country (Stewart, 2014). The GDI highlighted gender gap in achievement in three basic dimensions of human development including health (life expectancy), education (years of schooling) and income level (gross national income per capita). As mentioned in Stachura and Śleszyński (2016), the various aspects included in GDI had helped improve the data sensitivity towards robustness of the model and this could bring out more meaningful interpretations. We are able to see the combined effects of the mentioned dimensions on economic growth which seldom be the focus of the other past studies. So, we formulated our model with this variable to contemplate its effects on economic growth and intended to show its usefulness in explaining different situations when mixed with other indicators.

#### **3.3.4.3 Inflation (INF)**

Inflation has plunged countries into long periods of instability and it is the rate of prices increment over a period of time (Oner, 2010). Inflation is normally a wide measure, for instance the general increment in the cost of living in a nation. However, it can also be more narrowly explained for specific goods, for examples, foods and services that we consumed daily. Whatever the situations, inflation indicates how much more costs needed for a relevant set of goods or services has become over a certain period. From the study, we use inflation to observe its effects on the economic growth in term of prices. It is vital to be included in the study because it has

significant relationship between economic growth as mentioned in Baharumshah, Slesman and Wohar (2016) and Mohsen and Jouzaryan (2016). Both studies stated the negative effect of inflation on growth is felt only at excessively high levels of inflation. So, we intended to test whether the inflation during the study period is affectable to the growth of those selected countries.

#### **3.3.4.4 Literacy Rate (EDU)**

Literacy rate can be defined as the ability of human capital to read and write. In other words, literacy rate is derived from the total number of literate persons out of total population. There are several studies of literature are related with many other issues including women labour force participation, gender equity and women's political which explain the relationship or impact towards economic development (Sundaram & Vanneman, 2007; Beer, 2009; & Bandiera & Natraj, 2013; Yao & You, 2018). In the research of Bandiera and Natraj (2013), the statistic results has demonstrated that literacy rate and economic growth were represented in a significant and positive relationship. This can be explained by an increasing in the literacy rate leads to further development in an economy of a nation, which both is moving in the same direction. Besides, education of female is especially important to the future growth of an economy for most of the nation (World Bank, 2001; Klasen, 2002). With the reason stated above, literacy rate is encouraged to serve as an indicator in our model for the estimation.

#### **3.3.4.5 Mortality Rate (MOR)**

The definition for mortality rate can be described as a percentage of people do not live for ever among a particular type or group of people. One of the ways to reduce gender inequality is to reduce the level of mortality among the female society. The reason is due to lower mortality rate able to boost up economic development as more human capital is useful for enhancing the gross domestic product (Klasen & Lamanna, 2009). There are several research including Kalemi-Ozean (2002), Robeyns (2003) and Klasen and Lamanna (2009) have used the mortality rate as an indicator in their model estimation in order to test for the relationship between mortality rate and economic development. The most likely explanation in their results is an increasing in the rate of mortality lead to a decreasing in economic development. In contrast, a decreasing in mortality rate is more favourable for the economic development. Hence, we have encouraged to place mortality rate as one of the indicator in our model for investigation.

#### **3.3.4.6 Women Labour Participation Rate (LABOR)**

Labour force can be explained as the population in the working age of 16 to 64 in an economy who either are employed or are seeking employment (Kargi, 2014). For instance, the full time students, housewives, and pensioners are not included in the labour force participation rate. Labour force is a critical indicator for a given nation because it can facilitate to analyze the persistent of unemployment rate as well as the health of labour market in a country. The labour force participation rate generally would drop when a country is in the phrase of recession where people tend to be more difficult to find jobs. Chen, Hsu and Lai (2014) mentioned that an increase in unemployment compensation would enlarge the labour force and enhance

employment which would eventually drive up economic growth. However, an increase in cost of hiring and bargaining power of workers tend to decrease the labour force because this has increased their burden. For our study, we put in the women labour participation rate to detect the effect on economic growth as the closer the gender labour participation rate gap, the higher the chance to boost the economy growth since the women able to produce high quality works with the same capabilities with men (Lahoti & Swaminathan, 2016).

#### **3.3.4.7 Gross Domestic Saving (GDS)**

Gross Domestic Saving is defined as the savings of household, private corporate sector and public sector after they are deducting their final consumption expenditure. Rasimidatta (2011) and Najarzadeh, Reed, and Tazan (2014) pointed out that saving rate is one of the main forces that drive the economic growth. The rising of aggregate savings contributes to higher investment opportunity and finally lead to the higher GDP growth for a particular country. It indicates that the higher saving rate lead to lesser consumption, which could enhance a larger amount of capital investment and also result in a higher rate of economic growth. Furthermore, countries which have sufficient high rate of domestic saving are not mainly depend on foreign direct investment or external saving which create the chances of risk from unstable currency. Hence, we inserted gross domestic saving into our model estimation to determine the impact on economic growth. Besides, the importance of saving rate to GDP can be proved by several past studies such as Bosworth (1993), Edwards (1995), and Andrei and Huidumac-Petrescu (2013). Those studies concluded that saving rate is positively related to economic growth and this relationship holds true even for low-middle income countries as well as high-income nations.

### **3.4 Diagnostic Checking**

There are two important tests to be conducted in order to verify for the specification and GMM model which are Sargan-Hansen Test and Arellano-Bond (AB) Serial Correlation Test.

#### **3.4.1 Sargan-Hansen Test**

The cornerstone of applying Sargan-Hansen test in our regression model analysis is to determine the validity on the estimates generated respective to the instrumental variables. As proposed by Sargan (1958) and Hansen (1982), this statistical test will be essential to test for any over-identifying restrictions as well as its validity. The hypothesis testing of this test will be concerned on whether the instrumental variables are correlated or uncorrelated to some residuals set. The hypothesis statements for Sargan-Hansen Test are illustrated as follow:

$H_0$ : The instruments are valid (The instruments are uncorrelated with error term).

$H_1$ : The instruments are invalid (The instruments are correlated with error term).

Hence, as for the rejection decision making, if the null hypothesis is rejected, it can be concluded that the instruments are invalid. Meanwhile, if the null hypothesis is not rejected, the instruments are concluded to be valid. Hence, this has resulted that the instrumental variables are excluded from the correlation between its regressor and the residuals in the model.

### **3.4.2 Arellano-Bond (AB) Serial Correlation Test**

As proposed by Arellano and Bond (1991) on the specification of AB Serial Correlation test, it has been adopted as a testimonial in studying the practical performance with resulting any presence of serial correlation with error term that could affect the validity of instrumental variables in the model. The hypothesis statements for AB Serial Correlation Test are exhibited as below:

$H_0$ : There is no serial correlation (The instruments are valid).

$H_1$ : There is serial correlation (The instruments are invalid).

Therefore, as for the rejection decision making, if the null hypothesis is rejected, it means that the instrumental variables are valid. Meanwhile, if the null hypothesis is not rejected, it can be concluded that the instrumental variables are invalid. In order to test for the presence of serial correlation, we tend to examine by using different level order of differences instead of in the level form. For instance, we adopted second order of differences in order to test for the presence of serial correlation in first order difference.

## **CHAPTER 4: DATA ANALYSIS**

### **4.0 Introduction**

This chapter revealed the respective results and relationship between the independent and dependent variables. The structure of the chapter is as follows including section 4.1 introduced the descriptive statistics of each exogenous and endogenous variables. Under section 4.2, it showed the introduction of difference GMM approach, the comparison between OLS and GMM estimator method as well as the results estimation on each variable included. Section 4.3 discussed on the diagnostic checking to verify the validity of the model and followed by section 4.4 on the summary of the overall data analysis.

### **4.1 Descriptive Statistics**

Descriptive statistics was constructed by E-Views which are one dependent variable GDP and six different independent variables that are gender development index (GDI), inflation rate (INF), literacy rate (EDU), mortality rate (MOR), women labour participation rate (LABOR) and gross domestic saving (GDS) between the year 2010 and 2015 which were 6 years. Descriptive statistics help to summarize the data in measuring the central tendency and the variability within a given set of data which collected randomly from population as our sample data. The statistics that we have used to interpret are mean, median, maximum, minimum and standard deviation.



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Table 4.1: Descriptive Statistics for total countries

Variables	Mean	Median	Maximum	Minimum	Standard Deviation
<b>GDP</b>	4.06196	4.06127	14.43474	-6.60868	3.08284
<b>GDI</b>	0.92301	0.95100	1.01000	0.58000	0.08302
<b>INF</b>	5.27370	3.76675	34.34074	-17.58773	5.82422
<b>EDU</b>	0.98158	0.99800	1.11091	0.62951	0.07372
<b>MOR</b>	4.72714	4.78691	6.42462	3.53422	0.63527
<b>LABOR</b>	3.65829	3.72476	4.00501	2.75023	0.27497
<b>GDS</b>	17.15153	16.31801	67.56291	-33.14760	18.76123

Mean refers to the average value among the number, also known as expected value which resulted from the sum of all sample data and divided by the sample size. Based on the table 4.1.1 above, mean of GDP is 4.06196, GDI is 0. 92301, INF is 5.27370, EDU is 0.98158, MOR is 4.72714, LABOR is 3.65829 and GDS is 17.15153. Median represents the midpoint value in the set of data collected. In the other words, it is derived from the middle of the lowest value to highest value. The median value for GDP, GDI, INF, EDU, MOR, LABOR and GDS are 4.06127, 0.95100, 3.76675, 0.99800, 4.78691, 3.72476, and 16.31801 respectively. The maximum and minimum value for GDP can be reached to 14.43474 and -6.60868. Whereas EDU shows a maximum value 1.11091 and a minimum value 0.62951. The maximum value of GDS, INF, MOR and LABOR are 67.56291, 34.34074, 6.42462 and 4.00501 accordingly. The minimum value for these four variables GDS, INF MOR and LABOR are -33.14760, -17.58773, 3.53422 and 2.75023. However, the GDI achieved the lowest maximum value among the variables which is 1.01000 and the minimum value is 0.58000. Obviously, the maximum and minimum value for

GDS has the largest gap as compared to other variables. In various independent variables, the EDU has the lowest standard deviation 0.07372 whereas GDS results the highest standard deviation 18.76123. Furthermore, standard deviation for GDP, INF, MOR, LABOR and GDI are 3.08284, 5.82422, 0.63527, 0.27497 and 0.08302 accordingly. Based on the result stated above, we can observe that the EDU, MOR, LABOR and GDI have shown a quite similar value of standard deviation.

## 4.2 Difference GMM Approach

Table 4.2.1 represents the results of difference GMM estimation for the GDP in all countries. The macroeconomic indicators are Gross Domestic Savings (GDS), Inflation (INF), Literacy Rate (EDU), Mortality Rate (MOR), Women Labour Participation Rate (LABOR) and Gender Development Index (GDI). Generally, Table 4.2.1 shows the estimated model by using Ordinary Least Square (OLS) method and Generalized Methods of Moments (GMM) which show the effects of the dependent variable on  $GDPT_{-1}$  respectively. OLS and GMM apply 42 countries in the estimation which consist of 252 observations in OLS method whereas 168 observations in GMM method due to different year applied in these two estimations. There are 6 years data included in OLS estimation which from 2010 to 2015 whereas only 4 years data which from 2012 to 2015 included in GMM estimation since GMM estimation will adjust the time period automatically.

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### 4.2.1 Estimation Results

Table 4.2: Dynamic panel GMM estimations in total countries

**Dependent Variable: Gross Domestic Product (GDP)**

Variables	Difference GMM (Dependent: GDP)	
	OLS	GMM
GDP <sub>t-1</sub>	-	-0.12582 (0.0000)***
Gender Development Index	0.58251 (0.9155)	-57.18090 (0.0210)**
Inflation	-0.01514 (0.6400)	-0.01688 (0.3722)
Literacy Rate	-8.21846 (0.0460)**	47.52593 (0.0000)***
Mortality Rate	2.01881 (0.0000)***	10.61426 (0.0122)**
Women Labour Participation Rate	1.14416 (0.3252)	-60.60842 (0.0000)***
Gross Domestic Savings	0.05319 (0.0000)***	0.08943 (0.0228)**
No. of Observations	252	168
No. of Countries	42	42
Sargan Test	-	31.49625 (0.638016)
AR(1)	-	-2.22603 (0.0260)**
AR(2)	-	-1.01999 (0.3077)

Notes: -\*\*\*, \*\*, and \* represent significant level at 1%, 5%, and 10% respectively.

- Figures in parentheses are p-values.

#### **4.2.2 OLS vs Difference GMM**

From the table above, there is a vast difference between OLS and GMM. For gross domestic savings, both approaches show positive relationship with the dependent variable, GDP, which is 0.05319 and 0.089433 respectively. As for the inflation rate, both approaches also show similar result which is negative relationship with the GDP. The OLS displays -0.015143 while GMM displays -0.016883. On the other hand, for the literacy rate, OLS estimator and GMM had showed different results. OLS estimator indicates a negative relationship between literacy rate and GDP which is -0.015143. Meanwhile, GMM had showed a positive relationship for the stated variables which is 47.52593. Both OLS and GMM estimators had explicated positive correlation between mortality rate and GDP which is 2.018808 and 10.61426 correspondingly. For the women labour participation rate and GDI, the estimators had exhibited contrast result as OLS showed positive relationship for both variables with the GDP where 1.144161 for labour force and 0.582514 for GDI while GMM showed the two variables have negative relationship with the endogenous variable where -60.60842 for labour force and -57.1809 for GDI.

In overall, GMM approach is chosen over the OLS because GMM able to capture the extension of the fixed-effects model and internal transformation process of the data for over a time period (Ullah, Akhtar & Zaefarian, 2017). They also explained that GMM included the lagged values of the dependent variable are also an important instrument to capture for dynamic endogeneity which OLS has failed to consider such effect. Besides, the nature of the panel data used by the study and the dynamic nature of the GDP imply that GMM model able to provide more efficient and consistent estimates for the variables as compared with basic OLS model (Ullah et al, 2017).

### **4.2.3 Interpretation of Regression Estimation**

From the result of OLS estimation in table 4.2.1, as 1 percent increase in GDS, the GDP will raise 0.05319 percent, on average, holding other variables constant. This means that GDS and GDP has exhibited positive relationship and statistically significant at the significance level 1 percent with the p-value of 0.0000. However, INF results a negative and insignificantly to GDP with the coefficient 0.015143 and p-value of 0.6400 respectively due to the p-value exceed the level of significant. EDU shows a significant negative sign associated with GDP. For 1 percent increase in EDU, the GDP will drop 8.218459 percent, on average, holding other variables constant; and significant at level 5 percent with p-value of 0.0460. Moreover, estimation for MOR is positively and significantly correlated to GDP which shows a coefficient of 2.018808 and p-value of 0.0000. This can be described as 1 percent increase in MOR, the GDP will increase 2.018808 percent, on average, holding other variables constant. Whereas the estimation results for LABOR shows a positive but insignificant relationship with GDP since the estimated p-value is 0.3252 which is greater than 10 percent significance level. Same to LABOR, estimation for GDI is positive relationship and insignificantly related to GDP by using OLS estimation method. Based on the OLS estimation method, the independent variables of GDS, EDU and MOR are resulted a significant relationship to dependent variable GDP whereas INF, LABOR and GDI are insignificant correlated to GDP.

Based on the GMM method, the GDS is positively related with GDP. This can be described as 1 percent increase in GDS, the GDP coefficient will increase 0.089433 percent, on average, holding other variables constant. However, the relationship of INF and GDP is considered insignificant negative correlated by using GMM estimation approach. This is because the result has stated that the coefficient for INF is -0.016883 and the p-value shown a value of 0.3722 which exceed the level of significant at 10 percent. For the EDU, there is exhibited a significant positive

impact on the GDP at the level form. As 1 percent increase in literacy rate, the GDP coefficient will raise 47.52593 percent, on average, holding other variables constant. Furthermore, MOR also implies a significantly and positively associated with GDP. This means that 1 percent increase in MOR, GDP coefficient will increase 10.61426 percent, on average, holding other variables constant. Other than this, significant positive correlation relationship also exhibited in the LABOR. For 1 percent increase in LABOR, the coefficient of GDP will decline 60.60842 percent, on average, holding other variables constant. As above stated, the GDI and GDP has resulted significant negative correlation. An increase in 1 percent of GDI, the GDP will decrease 57.1809 percent, on average, holding other variables constant.

In order to verify the consistency of expected and actual relationship between each independent variable and dependent variable, Table 4.2.1 has illustrated the difference GMM estimation for the Gross Domestic Product (GDP) in developed and developing countries.

According to Gumbel (2004), an inequality in gender in terms of provision of education level, life expectancy as well as the empowerment of female in the society could lower down the economic progression and indirectly towards the growth. It has exhibited a consistent result on the negative and significant relationship between Gender Development Index (GDI) and economic growth.

Apart from that, even though the impact of inflation could influence the economic growth positively and negatively, however, the economists has observed on a relative high rate of inflation could promote detrimental effects on the aggregate economic performance (Li, 2006; Najaf, 2017). Hence, there is a consistent outcome generated from the expected and actual relationship resulting in an insignificant effect towards economic growth especially when inflation is below threshold level (Mamo,

2012; Nasir & Saima, 2010). This is mainly due to the policy with an aggressive effect being implemented by the policy makers in stabilizing and catering to the relative economic condition whenever there is an extraordinary event happen. As a result, the net effects of inflation towards economic growth could be approximately offset by each positive and negative impact in short run and long run relationship.

In addition, the relationship between literacy rate and economic growth exhibited a positive and significant results which are consistent to the expected sign on literacy towards economy (Pegkas, 2014; Amir, Khan & Bilal, 2015). This has been further illustrated by Hanif and Arshed (2016) on the relationship between literacy and economic growth whereby a greater experienced human capital could promote greater marginal impact on the growth of an economy.

Moreover, there is an inconsistency on the relationship between mortality rate and economic growth between the expected and actual sign. Due to the relative lesser of annual time period included in the estimation, the actual sign tends to be positive which will only be proved validly in short run, however, in long run, the expected sign of mortality should be negatively related to economic growth. This is significantly due to a higher life expectancy could promote a higher rate of return generated from the investment on human capital which would indirectly boost up the growth of an economy (Kalemli-Ozean, 2002; Erdogan, Ener & Arica, 2013).

Furthermore, the consistency of expected and actual results has implied a significant and negative relationship between women labour participation rate and economic growth. Shahid (2014) has further clarified on the statement where the excess of labour force especially who qualified with relatively lesser knowledge or experience could gain lower job opportunities offered in the market, which would

directly serve as a temporary obstacle in earning monthly inflow. This would eventually increase the poverty rate and slow down the economic growth.

As stated by Najarzadeh, Reed and Tasan (2014), there is a positive and significant causal relationship between savings and economic growth. They have further stated that a higher standard of living pursued by the public citizens and policy makers could create a desirable motivation in achieving the target which has indirectly promote to a higher economic growth. There is a consistency resulted from the expected and actual sign on savings towards economic growth.

### **4.3 Diagnostic Checking**

There are two informative tests can be conducted in order to examine for any econometric problems incurred under the underlying estimated model including Sargan-Hansen Test and Arellano-Bond Serial Correlation Test.

Under the test of Sargan-Hansen, it can be concluded that the instrumental variables included in the estimated model are valid with respect to the Gross Domestic Product (GDP). In other words, the instrumental variables are uncorrelated with the error term in the model as the p-value (0.6308) is greater than the significant level of 1%, 5% and 10%.

In addition, the conduction of Arellano-Bond Correlation test has implied that the instrumental variables are valid at significant level of 1%, 5% and 10% through



the p-value results (0.3077) of AR (2). Hence, it will be essentially crucial to refer to the results generated from AR (2) as compared to AR (1) due to the underlying model has been estimated based on differences order level instead of the ordinary level form.

## 4.4 Summary

In brief, GMM approach is more suitable to be applied in this panel data analysis in explaining the relationship between gender inequality and economic growth. One of the reasons is that GMM approach able to capture the extension of the fixed-effects model and internal transformation process of the data for over a time period (Ullah, Akhtar & Zaefarian, 2017). From the table 4.2.1, GMM approach generated contradict results as compared to OLS method which has resulted five out of six independent variables are significant whereas OLS method shown three out of six independent variables are significant. Obviously, major independent variables that included in the model are significantly such as gross domestic savings, literacy rate, mortality rate, women labour participation rate and gender development index to the dependent variable GDP by using the GMM approach.

By using GMM approach, inflation was shown an insignificant relationship to the GDP whereas other variables such as gross domestic savings, literacy rate and mortality rate show positive and significant relationship to the GDP. For gross domestic savings, a higher gross domestic savings will generate a higher GDP in a particular country by stimulating a boost on economy. Same to the literacy rate, a higher literacy rate will lead to a higher economic growth which existed a positive relationship between literacy rate and GDP. However, the results of mortality rate generated as above indicated an inconsistency relationship with the GDP. The actual

sign for this relationship should be negatively related. The main reason for this inconsistency results is due to the relative lesser of annual time period included in the estimation that will only be proved validly in short run. On the other hand, there is a significant and negative relationship between the women labour participation rate and GDP. This can be explained that the labour force who qualified with relatively lesser knowledge or experience tend to gain lower job opportunities offered in market and eventually served as a factor that slow down the economic growth and increase in poverty rate (Shahid, 2014).

Gender Development Index shows a negative sign means that when the gender gap is getting larger, the GDP in a particular country tend to decline. This can be identified that a wider gap between gender will drag back the economic growth. Khayria and Feki (2015) has concluded that an increment in gender inequality would promote detrimental effect to economic growth. Since the GDI consists of three basis dimensions which are health, knowledge and living standards between women and men, a negative sign of GDI generated as above can be identified as gender inequality happened in one country could bring a direct impact towards the economic growth throughout these three dimensions.

Therefore, in order to examine the validity of the estimated model, there are two conclusive testing has been imposed for diagnostic checking which are Sargan-Hansen and Arellano-Bond Serial Correlation Test. Both test has concluded a consistent result on validity of the model in which the model is considered to be stable with relevant exogenous variables included in examining the relationship with endogenous variable which is Gross Domestic Product (GDP).

## **CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATION**

### **5.0 Introduction**

In this chapter, an all- embracing detailed discussion about the factor and impact of the research will be presented based on the overall results and findings in the previous chapter. The summary of major findings will be displayed in the first portion. Next, implication of the research will be exhibited to provide several valuable insights for government and non- government organizations (NGOs) to put more effort in addressing and solving the issue of gender inequality in a given country. Lastly, there are some recommendation will be shown to puzzle out the limitation of this research.

### **5.1 Implication of Research**

This study predominantly concentrates on looking over the impact of gender inequality, gender wages gap, women labour participation rate, literacy rate and mortality rate on an economic growth across 42 countries. The findings of this study had indicated that there are several critical information requires guidance and concern from the national policymakers and non-government organizations (NGOs) to address some remarkable ways in making a policy and strategic decisions. Thus, it serves as a useful source for future researchers who are interested in probing the mystery of the

relationship between gender inequality and economic growth. The implications can be categorized into theoretical implications and managerial implications.

### **5.1.1 Theoretical Implications**

There are many researchers have done on the thesis regarding the impact of gender inequality on economic growth in developing and developed countries, but there is a limited study on this topic in the panel data analysis with GMM approach. This is because many researchers only emphasize on single or few countries as well as the application of distinct estimator coefficient. Hence, this research can be served as a reference for future researchers and academicians to develop an integrated model for the investigation of relationship between gender inequality and economic growth across countries. This research is applied with the GMM approach in evaluating the relationship between the gender inequality and economic growth across 42 countries. Thus, the academicians and researchers can use panel data analysis with GMM tool to develop a relevant model on the exploration of relationship between gender inequality and economic growth.

Gender inequality not merely is an ongoing critical social issue but also considered as a significant barrier for a country that tried to achieve its economic development goals. It is essential to recognize the sources of gender inequality on economic growth in order to realize the gender parity that are beneficial towards a nation's economic development. Hence, female will be able to obtain equal opportunities in pursuing their desired lifestyles and demands, equal rights, treatment as well as respectfulness.

Furthermore, this thesis provides empirical evidence to further support the impact of gender inequality on economic growth which identified from past studies. Based on the findings on this research, gross domestic savings, literacy rate, and mortality rate are positively related to economic development while the inflation rate, labor force, and gender development index are negatively related to economic development. It can be a benchmark for future academicians and researchers to conduct more in-depth study on this area.

### **5.1.2 Managerial Implications**

It is critical for government and non-government organizations (NGOs) to understand the impact of gender inequality on economic growth in order to apply wise tactic decisions in fulfilling the goal of gender parity. Based on the results of this research, the government and NGOs are supposed to adopt several effective measures to overcome the gender inequality.

#### **5.1.2.1 Government**

The government plays a key role in strengthening equality between male and female because government is responsible for the environmental policy of nation which could be directed in contributing towards a sustainable economic development. Basically, education served as a path to support the realization of gender equality in society. The government should pay more attention to the gender inequality in education especially in secondary and tertiary schooling. Thus, the nation

policymakers are supposed to ensure that the training provided for educators, lecturers and student advisors with a series of proper tactics for the practical work-related gender inequality issues. Moreover, the government should implement the constitutional provisions and statutes prohibiting sex discrimination in education. Therefore, male and female able to study cheerfully in the healthy learning environment so that they can focus on learning and gaining more knowledge. At the same time, the government should promote gender equality in resource allocation for sports facilities and library services. The government steer the construction of sports facilities so that the demands for both gender is taken into account. On the other hands, the government support library activities that could reduce gender gaps in skills and promote gender equality by funding projects that motivate female to take an interest in pursuing activities related to mathematics and natural sciences whereas improve the reading skills of male. The equal opportunities for self- development, individual learning and growth among gender may reduce gender segregation in education sectors. The higher knowledge and skillset gained by women will tend to reduce child motility rate and drive up contribution to a nation's economic development.

The government should emphasize in promoting the main roles and contributions of female towards a nation's economy and the need for a proper recognition and compensation. Meanwhile, the government might be able to reduce the average gender pay gap by implementing the Equal Pay Programme. From this, the government should set the rules in penalizing strictly to any employee or company that breaks the law and regulations of Equal Pay Programme, such as the case of the large gender pay gap existed in a company for similar job tasks and position. Thus, the pay gap between women and men will reduce significantly as expected. Besides, the numbers of women and men participating in all professions or fields will be increasingly equal and discrimination will decrease. Moreover, the government should provide a series of services and training publicly in order to minimize gender segregation in the labor market. Simultaneously, the government

may encourage parents to share equally on the responsibilities of childcare in families in order to promote equality in accessing education and employment. This may promote to an increasingly equal representation of women and men on listed company boards. Women with leadership skills will not be buried and they can utilize their potential for creating, planning, implementing and integrating the strategic direction of an organization.

Furthermore, the government should adopt zero tolerance policy toward child marriage, sexual harassment, and violence against women. Prevention of sexual harassment and violence against women is one of the effective ways for government to dispute the problems happen. For example, the government undertakes a well-planned and periodic educational campaigns to educate the public that any violence against women socially unacceptable. It is significant for public to be familiar with the forms of workplace sexual harassment and violence against women through numerous of awareness raising activities.

Lastly, the government should be committed to implement the criminal code to address any child marriage, sexual harassment, and violence against women. In such, the government may consider assessing any needs for legislative amendments for more serious punishment to the offender if necessary. Hence, the government may be able to improve the access to justice for vulnerable women and survivors of domestic violence by eliminating unaffordable court fees and enhancing free legal aid services. The government need to provide protection and support for the victims by establishing health and social services as the practice of care pathways for victims of sexual violence including both acute medical and psychosocial support and long-term support.

#### **5.1.2.2 Non- government organizations (NGOs)**

Besides, NGOs also play an important role in furthering gender mainstreaming throughout the country. There are many non-governmental organizations are yet striving to achieve gender equality. NGOs can play a role in creating awareness, motivation, education and training for the society. For instance, HeForShe is a campaign started by UN Women to strive for gender equality by encouraging male to take action against inequalities faced by female. In 20 September 2014, the advocate of UN Women, Emma Watson invited men to step forward, to be seen to speak up, to be the “he” for the “she”. She invoked that there are some actions are needed to be carried out to the world in building a new solidarity movement for gender equality. Besides, there are many NGOs strive for gender equality such as UN Women, World Bank, AIESEC, InterAction and Equality Now. However, there are many actions or strategies can be engaged to achieve gender equality. NGOs can represent the ‘voice of the people’ to work closely with government to achieve the sustainable development for the society. Therefore, NGOs play a critical role in government policy making, in organizational change and even in international law with the respect to multilateral economic institutions to achieve gender equality.

## **5.2 Limitation & Recommendation**

The limitation of the study is the data availability for the GDI which lead to inadequate sample size. We could only manage to gather GDI data from the United Nations Development Program for only six years which is 2010 to 2015. Moreover, this is the only GDI official database that we able to obtain which is relevant to our study core. Due to the insufficient sample size, we are unable to perform GMM test to



compare the hypothesis testing results between countries. Besides, it is also difficult for us to find significant results for specific countries from the data as statistical tests usually require a larger sample size to make sure a representative distribution of the population. This problem is recommended to overcome by using resampling. According to Efron (1980), he indicated that we can simulating new data with the same mean or standard deviation and the analysis result is still valid with increased sample size. As long as the data is normally distributed, by keeping the same mean and standard deviation, the hypothesis testing result will be correct even the sample size is expanded.

Another limitation is the finite data variability. We were only able to obtain two most common gender inequality variables which are GII and GDI. Both variables are different in terms of measurement as GII measured by reproductive health, empowerment and labour market while GDI estimated by living standard, knowledge and healthy life. Our study had been restricted to these variables that inevitably affect the hypothesis testing result. Since both indicators provide different significant result, we had chosen GDI as it provides higher sample size for the study which mentioned in the Chapter 3.

We hope this research design and the model created to conduct the study might be able to modify in the near future which delivering a better perception for the readers. These modifications might include other approaches to carry out the same research more efficiently and might also involve more gender inequality indices which we are unable to obtain during the study period. Furthermore, the modification of sample size is desired for us to conduct the study but it is unavoidable to do so due to the limited resources we had.

REFERENCES

- Ahang, M. (2014). The Impact of Gender Inequality on Economic Growth. *The Accounting, Economics and Financial Management Conference*. Retrieved 21 March, 2018 from <https://www.researchgate.net/publication/281208493>
- Albert, K. (2016). Key Assumptions of OLS: Econometrics Review. Retrieved 24 January 2018, from <https://www.albert.io/blog/key-assumptions-of-ols-econometrics-review/>
- Alfredsson, E. C., & Malmaeus, J. M. (2017). Prospects for Economic Growth in the 21st Century: A Survey Covering Mainstream, Heterodox and Scientifically Oriented Perspectives, *Journal of Economics*, 22(1), 65-87
- Ali, M. (2015). Effect of Gender Inequality on Economic Growth in Pakistan, *Journal of Economics and Sustainable Development*, 6(9), 125-133.
- Amir, H., Khan, M., & Bilal, K. (2015). Impact of Educated Labor Force on Economic Growth of Pakistan: A Human Capital Perspective, *European Journal of Natural and Social Sciences*, 4(4), 814-831, Retrieved 10 March 2018, from <https://www.european-science.com>
- Andrei, E., & Huidumac-Petrescu, C. (2013). Saving and Economic Growth: An Empirical Analysis for Euro area countries. *Theoretical and Applied Economics*, 7(584), 43-58.
- Anoruo, E., & Ahmad, Y. (2001). Causal Relationship between Domestic Savings and Economic Growth: Evidence from Seven African Countries, *African Development Review*, 13(2), 238-249, <https://dx.doi.org/10.1111/1467-8268.00038>
- Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Reviews of Economics Studies*, 58(2), 277-297.

- Aydin, C., Esen, O., & Bayrak, M. (2016). Inflation and Economic Growth: A Dynamic Panel Threshold Analysis for Turkish Republics in Transition Process. *Social and Behavioral Science*, 229, 196-205, <https://dx.doi.org/10.1016/j.sbspro.2016.07.129>.
- Aydin, N., Alrajhi, A. N., & Jouini, J. H. (2018). Estimating the Impact of R&D Spending on Total Factor Productivity for OECD Countries: Pooled Mean Group Approach, *Journal of Developing Areas*, 52(2), 159-168
- Babalola, S. J. (2011). Long Term Relationship between Education and Economic Growth: Evidence from Nigeria, *International Journal of Humanities and Social Science*, 1(14), 123-128,
- Babatunde, M. A., & Adefabi, R. A. (2005). Long Run Relationship between Education and Economic Growth in Nigeria: Evidence from the Johansen's Cointegration Approach, *Journal of Educational Research*, 1-22.
- Bacha, E.L. (1990). A Three-Gap Model of Foreign Transfers and the GDP Growth Rate in Developing Countries, *Journal of Development Economics*, 32(2), 279-96, [https://dx.doi.org/10.1016/0304-3878\(90\)90039-E](https://dx.doi.org/10.1016/0304-3878(90)90039-E)
- Baharumshah, A., Slesman, L., & Wohar, M. (2016). Inflation, Inflation Uncertainty, and Economic Growth in Emerging and Developing Countries: Panel Data Evidence. *Economic Systems*, 40(4), 638-657. <http://dx.doi.org/10.1016/j.ecosys.2016.02.009>
- Bandiera, O., & Natraj, A. (2013). Does Gender Inequality Hinder Development and Economic Growth? Evidence and Policy Implications. *The World Bank*, 28, 2-21.
- Basantia, J. (2017). Women Education in India: Current Status, Recent Initiatives and Future Prospects, *International Journal of Education and Management Studies*, 7(3), p.314.

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
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---

- Baum, C. F. (2009). Instrumental Variables and Panel Data Methods in Economics and Finance. Retrieved 05 February 2018, from <https://fmwww.bc.edu/GStat/docs/StataIV.pdf>
- Baum, C. F. (2013). Dynamic Panel Data Estimators. Retrieved 27 January 2018, from <https://fmwww.bc.edu/EC-C/S2013/823/EC823.S2013.nn05.slides.pdf>
- Becker, G. (1993). Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. *The Economic Journal*, 76(303), 635. <http://dx.doi.org/10.2307/2229541>
- Beer, C. (2009). Democracy and Gender Equality. *Studies in Comparative International Development*, 44(3), 212-27.
- Berik, G., Rodgers, Y. and Seguino, S. (2009). Feminist Economics of Inequality, Development, and Growth. *Feminist Economics*, 15(3), pp.1-33.
- Blackden, C. M., & Bhanu, C. (1999). Gender, Growth, and Poverty Reduction. *World Bank Technical Papers*. <https://dx.doi.org/10.1596/0-8213-4468-4>.
- Bosworth, B. (1993). *Prospects for Saving and Investment in Industrial Countries*. *Brookings.edu*. Retrieved 25 March 2018, from <https://www.brookings.edu/wp-content/uploads/2016/06/Bdp113.pdf>
- Bould, S. (2006). The Need for International Family Policy: Mothers as Workers and as Careers. *Marriage & Family Review*, 39(1-2), 75-98, [https://dx.doi.org/10.1300/J002v39n01\\_05](https://dx.doi.org/10.1300/J002v39n01_05)
- Brenner, M. H. (2005). Commentary: Economic Growth is the Basis of Mortality Rate Decline in the 20<sup>th</sup> century- experience of the United States 1901-2000, *International Journal of Epidemiology*, 34, 1214-1221, <https://dx.doi.org/10.1093/ije/dyi146>
- Brussels (2007). Questions and Answers on Gross Domestic Product (GDP). Retrieved 20 March 2018, from

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

<https://www.bmdw.gv.at/Wirtschaftspolitik/Standortpolitik/Documents/MEMOQuestionsandAnsweronGrossDomesticProduct.pdf>

- Capraro, C. (2017). Rights and Realities: A Briefing on Women and the Economy. *Womankind.org.uk*. Retrieved 02 April 2018, from <https://www.womankind.org.uk/policy-and-campaigns/women's-rights/women's-rights-organisations>
- Carnoy, M., Lobo, J., Toledo, A., & Velloso, J. (1981). Can Educational Policy Equalize Income Distribution? *Prospects*, 8(1), 3-18, <https://dx.doi.org/10.1007/bf02220340>
- Castellano, R., & Rocca, A. (2016). The Dynamic of the Gender Gap in the European Labour Market in the years of Economic Crisis, *International Journal of Methodology*, 51(3), 1337-1357. <https://dx.doi.org/10.1007/s11135-016-0334-1>
- Chaaban, J., & Cunningham, W. (2011). Measuring the Economic Gain of Investing in Girls: The Girl Effect Dividend.
- Chandra, S. J. (2015). Why Gender and Income Inequality are linked. Retrieved 20 March 2018 from <https://www.weforum.org/agenda/2015/10/why-gender-and-income-inequality-are-linked/>
- Charles, M., & Grusky, D. B. (2004). *Occupational ghettos: The Worldwide Segregation of Women and Men* (Vol. 71). LIT Verlag Münster.
- Chen, B. L., Hsu, M., & Lai, C. F. (2014). Labor Force and Relationship between Long-run Growth and Unemployment. Retrieved 29 January 2018, from [https://editorialexpress.com/cgi-bin/conference/download.cgi?db\\_name=MWNSpring2015&paper\\_id=82](https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=MWNSpring2015&paper_id=82)
- Chung, Y. (1996). Gender Earnings Differentials in Hong Kong: The Effect of the State, Education, and Employment. *Economics of Education Review*, 15(3), 231-243. [https://dx.doi.org/10.1016/0272-7757\(96\)00012-x](https://dx.doi.org/10.1016/0272-7757(96)00012-x)

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Cooper, R. (2017). Why Educational Investment in Teenage Girls is a necessity. Retrieved 26 February 2018, from <https://www.weforum.org/agenda/2017/06/why-educational-investment-in-teenage-girls-is-a-necessity/>
- Cuberes, D., & Teignier, M. (2011). Gender Inequality and Economic Growth: A Critical Review. *Journal of International Development*, 26(2), 260-276. <https://dx.doi.org/10.1002/jid.2983>
- Denton, F. T., & Spencer, B. G. (1997). Population, Labor Force, and Long-term Economic Growth. McMaster University, Quantitative Studies in Economics and Population Research Report.
- Dilli, S. (2015). *A Historical Perspective on Gender Inequality and Development in the World Economy. 1850-2000*. (Doctoral dissertation, Utrecht University Repository).
- Dollar, D., & Gatti, R. (1999). *Gender Inequality, Income, and Growth: Are Good Times Good for Women? The World Bank*. Retrieved 17 February 2018, from <https://documents.worldbank.org/curated/e/251801468765040122/Gender-inequality-income-and-growth-are-good-times-good-for-women>
- Dormekpor, E. (2015). Poverty and Gender Inequality in Developing Countries. *IISTE*, 5(10).
- Edwards, S. (1995). Why are Saving Rates so Different across Countries?: An International Comparative Analysis. *Journal of Development Economics*, 51(1), 5-44. Retrieved from <http://www.nber.org/papers/w5097>
- Efron, B. (1980). Nonparametric Estimates of Standard Error: The Jackknife, the Bootstrap and Other Methods. *Biometrika*, 68(3), 589. <https://dx.doi.org/10.2307/2335441>

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Ellis, A., Cutura, J., Dione, N., Gillson, I., Manuel, C., & Thongori, J. (2007). Gender and Economic Growth in Kenya: Unleashing the Power of Women. World Bank Publications.
- Erdogan, E., Ener, M., & Arica, F. (2013). The Strategic Role of Infant Mortality in the Process of Economic Growth: An Application for High Income OECD Countries, *Journal of Social and Behavioral Science*, 99, 19-25, <https://dx.doi.org/10.1016/j.sbspro.2013.10.467>
- Fatima, G. (2010). Female Education as a Determinant of Economic Growth: The Case Study of Pakistan.
- Fernandez, R., & Fogli, A. (2009). Culture: An empirical Investigation of Beliefs, Work and Fertility. *The National Bureau of Economic Research*. 1(1), 146–167
- Foddy, M., & Smithson, M. (1999). Can Gender Inequalities Be Eliminated? *Social Psychology Quarterly*, 62(4), 307. <https://dx.doi.org/10.2307/2695831>
- Forbes, K. (2000). A Reassessment of the Relationship between Inequality and Growth. *American Economic Review*, 90(4), 869-887.
- Forsthuber, B., Horvath, A., & Motiejunaite, A. (2010). Gender Differences in Educational Outcomes: Study on the Measures Taken and the Current Situation in Europe. *Education, Audiovisual and Culture Executive Agency*. <http://dx.doi.org/https://www.eurydice.org>
- Foschi, M. (1996). Double Standards in the Evaluation of Men and Women. *Social Psychology Quarterly*, 59(3), 237. <https://dx.doi.org/10.2307/2787021>
- Foschi, M. (2000). Double Standards for Competence: Theory and Research. *Annual Review of Sociology*, 26(1), 21-42. <https://dx.doi.org/10.1146/annurev.soc.26.1.21>

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Foschi, M., Lai, L., & Sigerson, K. (1994). Gender and Double Standards in the Assessment of Job Applicants. *Social Psychology Quarterly*, 57(4), 326.  
<https://dx.doi.org/10.2307/2787159>
- Furness, H. (2018). BBC China editor Carrie Gracie Praised for Resigning over 'secretive and illegal' Pay Inequality. *The Telegraph*. Retrieved 10 February 2018 from <https://www.telegraph.co.uk/news/2018/01/07/bbc-china-editor-carrie-gracie-resigns-post-protest-gender-pay/>
- Gale, T. (2008). Ordinary Least Squares Regression. Retrieved 23 January 2018, from <https://www.encyclopedia.com/social-sciences/applied-and-social-sciences-magazines/ordinary-least-squares-regression>
- Gillard, J. (2017). Changing the Lives of Millions of Girls, One School at a time. Retrieved 15 February 2018, from <https://www.weforum.org/agenda/2017/10/this-is-how-we-can-change-the-lives-of-millions-of-girls>
- Goldin, C., & Sokoloff, K. (1982). Women, Children, and Industrialization in the Early Republic: Evidence from the Manufacturing Censuses. *Journal of Economics History*, 42(4), 741-774.
- Gumbel, D. (2004). The Influence of Gender Inequality on Economic Growth. Retrieved 16 February 2018, from [https://davidguembel.de/uploads/media/Ausarbeitung\\_Seminar\\_Wirtschaftsgeschichte\\_Gender\\_Inequality.pdf](https://davidguembel.de/uploads/media/Ausarbeitung_Seminar_Wirtschaftsgeschichte_Gender_Inequality.pdf)
- Gylfason, T. (2001). Natural Resources, Education and Economic Development, *European Economic Review*, 4(6), 847-859, [https://dx.doi.org/10.1016/S0014-2921\(01\)00127-1](https://dx.doi.org/10.1016/S0014-2921(01)00127-1)
- Hakura, D., Hussain, M., Newiak, M., Thakoor, V. and Fan, Y. (2016). Inequality, Gender Gaps and Economic Growth: Comparative Evidence for Sub-Saharan Africa. *International Monetary Fund*.



DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Hall, A. R. (2005). *Generalized Method of Moments*. New York: Oxford University Press Inc
- Hanif, N., & Arshed, N. (2016). Relationship between School Education and Economic Growth: SAARC Countries, *International Journal of Economics and Finance Issues*, 6(1), 294-300.
- Hannum, E., Kong, P., & Zhang, Y. (2009). Family Sources of Educational Gender Inequality in rural China: A Critical Assessment. *International Journal of Educational Development*, 29(5), 474-486.  
<https://dx.doi.org/10.1016/j.ijedudev.2009.04.007>
- Hansen, L. P. (1982). Large Sample Properties of Generalized Method of Moments Estimators, *Journal of Econometric Society*, 50(4), 1029-1054,  
<https://dx.doi.org/10.2307/1912775>
- Hartocollis, A., & Alcindor, Y. (2017). Women's March Highlights as Huge Crowds Protest Trump: 'We're Not Going Away'. The New York Times. Retrieved 19 February 2018, from <https://www.nytimes.com/2017/01/21/us/womens-march.html>
- Hasanov, F. (2011). Relationship between Inflation and Economic Growth in Azerbaijani economy: Is there any threshold effect? *Asian Journal of Business and Management Sciences*, 1(1), 1-11. Retrieved 28 January 2018, from <https://mpira.ub.uni-muenchen.de/id/eprint/33494>
- Hill, M. A., & King, E. (1995). Women Education and Economic Well-Being. *Feminist Economics*, 1(2), 21-46,  
<https://dx.doi.org/10.1080/714042230>
- Hippe, R., & Perrin, F. (2017). Gender Equality in Human Capital and Fertility in the European Regions in the past, 13(3), 166-179.  
<https://dx.doi.org/10.1016/j.ihe.2017.02.001>
- Hurlin, C. (2010). Panel Data Econometrics. Retrieved 05 February 2018, from [http://www.univ-orleans.fr/deg/masters/ESA/CH/Geneve\\_Chapitre0.pdf](http://www.univ-orleans.fr/deg/masters/ESA/CH/Geneve_Chapitre0.pdf)

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Inglehart, R., & Norris, P., & Welzel, C. (2002). Gender equality and democracy. *Comparative Sociology*, 1(3-4), 321-345.
- Jappelli, T., & Pagano, M. (1994). Savings, Growth and Liquidity Constraints, *Quarterly Journal of Economics*, 109(1), 83-109.
- Jayachandran, S. (2014). The Roots of Gender Inequality in Developing Countries. *Annual Review of Economics*, 7(1), 63-88.  
<https://dx.doi.org/10.1146/annurev-economics-080614-115404>
- Jong, P. D., & Tsiachristas, A. (2008). Can labor force participation growth and productivity growth be combined? *European Employment Observatory*, 1- 10.
- Kabeer, N. (2005). The Beijing Platform for Action and the Millennium Development Goals: Different processes, different outcomes, 1-13.  
<http://dx.doi.org/https://EGM/BPFA-MD-MDG/2005/EP.11>
- Kaldor, N. (2010). Alternative Theories of Distribution. *The Review of Economics Studies*, 23(2), 83-100. Retrieved 28 January 2018, from <https://www.jstor.org/stable/2296292>
- Kalemli-Ozcan, S. (2002). Does the Mortality Decline Promote Economic Growth? *Journal of Economic Growth*, 7(4), 411-439,  
<https://dx.doi.org/10.1023/A:1020831902045>
- Kamberidou, I. (2011). Gender Devaluation and Gender Fatigue: Getting Women on the Glass Escalator. Retrieved 20 February 2018, from [https://eclass.uoa.gr/modules/document/file.php/PHED269/1.\\_DigitalAgendaPresentatio.Dr.\\_Irene\\_Kamberidou.2.pdf](https://eclass.uoa.gr/modules/document/file.php/PHED269/1._DigitalAgendaPresentatio.Dr._Irene_Kamberidou.2.pdf)
- Kargi, B. (2014). Labor force participation rate and economic growth: observations for Turkey, *Universal Journal of Management and Social Sciences*, 4(4), 46-54
- Kassa, S. (2015). Challenges and Opportunities of Women Political Participation in Ethiopia. *Journal of Global Economics*, 3(4).

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Kennedy, T., Rae, M., Sheridan, A., & Valadkhani, A. (2017). Reducing Gender Wage Inequality Increases Economic Prosperity For All: Insights From Australia, 55, 14-24. <https://dx.doi.org/10.1016/j.eap.2017.04.003>
- Kenworthy, L., & Malami, M. (1999). Gender Inequality in Political Representation: A Worldwide Comparative Analysis. *Journal of Social Forces*, 78(1), 235-268.
- Khan, M. S., & Ssnhadji, A. S. (2001). Threshold Effects in the Relationship between Inflation and Growth, *IMF Staff Papers*, 48(1), 1-21, <https://dx.doi.org/10.2307/4621658>
- Khayria, K. (2015). Gender Inequality and Economic Development. *Journal of Business and Economics*, 6(4), 1-4.
- Khayria, K., & Feki, R. (2015). Gender Inequality and Economic Development, *Unit Development Economics Research (UDER)*, *Journal of Business and Economics*, 6(4), 1-3. <https://dx.doi.org/10.4172/2151-6219.1000180>
- Kilgour, M. A. (2013). The Global Compact and Gender Inequality: A Work in Progress. *Journal of Business and Society*, 52(1), 105-134. <https://dx.doi.org/10.1177/0007650312459918>
- King, E., Klasen, S., & Porter, M. (2008). Copenhagen Consensus 2008 Challenge: Women and development. *Copenhagen Consensus Center, Copenhagen*.
- Klasen, S. (2000). Does gender inequality reduce growth and development? Evidence from cross-country regressions.
- Klasen, S. (2002). Low Schooling for Girls, Slower Growth for all? Cross-country Evidence on the Effect of Gender Inequality in Education on Economic Development. *The World Bank Economic Review*, 16(3), 345-373.
- Klasen, S. and Lamanna, F. (2009). The Impact of Gender Inequality in Education and Employment on Economic Growth: New Evidence for a Panel of Countries. *Feminist Economics*, 15(3), 91-132.

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Lahoti, R., & Swaminathan, H. (2016). *Economic Growth and Female Labour Force Participation in India* (Undergraduate). Indian Institute of Management Bangalore.
- Levanon, A., & Grusky, D. B. (2016). The Persistence of Extreme Gender Segregation in the Twenty-first Century. *American Journal of Sociology*, 122(2), 573-619, <https://dx.doi.org/10.1086/688628>
- Li, M. (2006). Inflation and Economic Growth: Threshold Effects and Transmission Mechanisms. *Journal of Economics*. Retrieved 20 February 2018, from <https://economics.ca/2006/papers/0176.pdf>
- Lleras-Muney, A. (2005). The Relationship between Education and Adult Mortality in United States, *Review of Economic Studies*, 72(1), 189-221, <https://dx.doi.org/10.1111/0034-6527.00329>
- Madgaykar, A. (2015). Why gender inequality is worse than you think. Retrieved 19 January 2018, from <https://www.weforum.org/agenda/2015/11/why-gender-inequality-is-worse-than-you-think>
- Mallik, G., & Chowdhury, A. (2001). Inflation and Economic Growth: Evidence. From Four South Asian Countries, *Asia-Pacific Development Journal*, 8(1), 123-135.
- Mamo, F. T. (2012). Economic Growth and Inflation: A panel data analysis, *Journal of Economics*. Retrieved 18 February 2018, from <https://www.diva-portal.org/smash/get/diva2:576024/fulltext01.pdf>
- McArthur, J. (2014). The Origins of the Millennium Development Goals. *SAIS Review of International Affairs*, 34(2), 5-24.
- Misztal, P. (2011). The Relationship between Savings and Economic Growth in Countries with Different Level of Economic Development, *e-Finance: Finance Internet Quarterly*, 7(2), 17-29, Retrieved 10 March 2018, from <http://hdl.handle.net/10419/66731>

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Mohan, R. (2006). Causal Relationship between Savings and Economic Growth in Countries with Different Income Levels, *Economics bulletin*, 5(3), 1-12, Retrieved 11 March 2018, from <https://www.economicsbulletin.com/2006/volume5/EB-05E20002A.pdf>
- Mohindra, K. and Nikiéma, B. (2010). Women's Health in Developing Countries: Beyond an Investment? *International Journal of Health Services*, 40(3), 543-567.
- Mohseni, M., & Jouzaryan, F. (2016). Examining the Effects of Inflation and Unemployment on Economic Growth in Iran (1996-2012). *Procedia Economics and Finance*, 36, 381-389. [http://dx.doi.org/10.1016/s2212-5671\(16\)30050-8](http://dx.doi.org/10.1016/s2212-5671(16)30050-8)
- Mukherjee, P., & Mukhopadhyay. (2013). Impact of Gender Inequality on Economic Growth: A Study of Developing Countries. *IOSR Journal of Humanities and Social Science*, 13(2), 61-69, <https://dx.doi.org/10.9790/0837-1326169>
- Murphy, E., & Oesch, D. (2016). The Feminization of Occupations and Change in Wages: A Panel Analysis of Britain, Germany, and Switzerland, 94(3), 1221-1255, <https://dx.doi.org/10.1093/sf/sov099>
- Murthi, M., Guio, A. C., & Dreze, J. (1995). Mortality, Fertility, and Gender Bias in India: A District-level Analysis. *Population and development review*, 745-782.
- Murtin, F., & Wacziarg, R. (2013). The democratic transition. *Journal of Economic Growth*, 1-41.
- Najaf, R. (2017). The Causal Relationship between Inflation and Economic Growth in Nigeria, *Journal of Accounting and Marketing*, <https://dx.doi.org/10.4172/2168-9601.1000208>
- Najarzadeh, R., Reed, M., & Tasan, M. (2014). Relationship between Savings and Economic Growth: The Case for Iran. *Journal of International Business and Economics*, 2(4), 107-124, <https://dx.doi.org/10.15640/jibe.v2n4a7>

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Nasir, I., & Saima, N. (2010). Investment, inflation and economic growth nexus. *Munich Personal RePEc Archive: The Pakistan Development Review*, 48(4), 144-210. Retrieved 15 March 2018, from <https://mpira.ub.unimuenchen.de/27163/>
- NSW Council of Social Service. (2017). Gender Segregation in the Workplace and its Impact on Women's Economic Equality. Retrieved 02 April 2018, from [https://www.ncoss.org.au/sites/default/files/public/policy/170303\\_NCOSS%20Submission\\_Gender%20Segregation\\_PDF.pdf](https://www.ncoss.org.au/sites/default/files/public/policy/170303_NCOSS%20Submission_Gender%20Segregation_PDF.pdf)
- Oluwatayo, I. B., & Ojo, A. O. (2018). Walking Through a Tighpore: The Challenge of Economic Growth and Poverty in Africa, *Journal of Developing Area*, 52(1), 59-69.
- Oner, C. (2010). *Back to Basics: What is Inflation?* Retrieved 24 March 2018, from <https://www.imf.org/external/pubs/ft/fandd/2010/03/pdf/basics.pdf>
- Paxton, P., & Hughes, M. M., & Green, J. L. (2006). The International Women's Movement and Women's Political Representation, 1893–2003. *American Sociological Review*, 71(6), 898–920.
- Pegkas, P. (2014). The Link between Educational Levels and Economic Growth: A Neoclassical Approach for the Case of Greece, *International Journal of Applied Economics*, 11(2), 38-54.
- Perlmann, J., & Margo, R. A. (2002). Women's Work? American Schoolteachers 1650- 1920. *American Journal of Sociology*, 107(5), 1379-1381.
- Podesta, F. (2000). Recent Developments in Quantitative Comparative Methodology: The Case of Pooled Time Series and Cross-Sectional Analysis. Retrieved 24 March 2018, from <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.464.841&rep=rep1&type=pdf>

- Preston, S. H. (2007). The Changing Relation between Mortality and Level of Economic Development, *International Journal of Epidemiology*, 36(1), 484-490, <https://dx.doi.org/10.1093/ije/dym075>
- Rai, S. M. (Eds.) (2008). Women and Political Representation, *The Companion to Development Studies*, (pp. 370-377). New York: Great Britain.
- Rasmidatta, P. (2011). The Relationship between Domestic Saving and Economic Growth and Convergence Hypothesis: Case Study of Thailand. Retrieved 25 March 2018, from <https://www.diva-portal.org/smash/get/diva2:425833/ATTACHMENT01.pdf>
- Razavi, S. (2007). Liberalisation and the Debates on Women's Access to Land. *Third World Quarterly*, 28(8), 1479-1500.
- Robeyns, I. (2003). Sen's Capability Approach and Gender Inequality: Selecting Relevant Capabilities. *Feminist Economics*, 9(2-3), 61-92.
- Robitaille, M. (2013). Determinants of Gender Inequality in Child Mortality in India: Do Gods Matter? *Department Of Economics*.
- Sargan, J. D. (1958). The Estimation of Economic Relationships using Instrumental Variables, *Journal of Econometric Society*, 26(3), 393-415, <https://dx.doi.org/10.2307/1907619>
- Seguino, S. (2000). Gender Inequality and Economic Growth: A Cross-Country Analysis, *Journal of World Development*, 28(7), 1211-1230, [https://dx.doi.org/000110.1016/S0305-750X\(00\)00018-8](https://dx.doi.org/000110.1016/S0305-750X(00)00018-8)
- Senadza, B., Fiagbe, A. K., & Quartey, P. (2017). The Effect of External Debt on Economic Growth in Sub-Saharan Africa, *International Journal of Business and Economic Science Applied Research*, 11(1), 61-69, <https://dx.doi.org/10.25103/ijbesar.111.07>
- Shahid, M. (2014). Impact of Labour Force Participation on Economic Growth in Pakistan, *Journal of Economics and Sustainable Development*, 5(11), 89-93

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- Sheppard, K. (2015). Generalized Method Of Moments (GMM). Retrieved 27 January 2018, from <https://www.kevinshppard.com/images/5/55/Chapter6.pdf>
- Stachura, P., & Śleszyński, J. (2016). Gender indicators of the United Nations Development Programme. *Economic and Environmental Studies*, 16(4), 511-530. Retrieved 29 March 2018, from <https://centrum.uni.opole.pl/strona-czasowo-niedostepna/#>
- Stein, P., Hendrix, S., & Hauslohnner, A. (2017). Women's marches: More Than One Million Protesters Vow to Resist President Trump. The Washington Post. Retrieved 20 January 2018, from [https://www.washingtonpost.com/local/womens-march-on-washington-a-sea-of-pink-hatted-protesters-vow-to-resist-donald-trump/2017/01/21/ae4def62-dfdf-11e6-acdf-14da832ae861story.html?utm\\_term=.32ac67512de0](https://www.washingtonpost.com/local/womens-march-on-washington-a-sea-of-pink-hatted-protesters-vow-to-resist-donald-trump/2017/01/21/ae4def62-dfdf-11e6-acdf-14da832ae861story.html?utm_term=.32ac67512de0)
- Stewart, F. (2014). *Gender Development Index. Malaysia Human Development Report*. Retrieved 24 March 2018, from <http://www.mhdr.my/page/225/Gender-Development-Index/>
- Summers, L. H. (1994). Investing in All the People: Educating Women in Developing Countries," Washington, DC: World Bank, *Economic Development Institute Seminar Paper No. 45*.
- Sundaram, A., & Vanneman, R. (2007). Gender Differentials in Literacy in India: The Intriguing Relationship with Women's Labor Force Participation. *World Development*, 36(1), 128-143.
- The Global Gender Gap Report. (2017). Switzerland. Retrieved 18 March 2018, from [http://www3.weforum.org/docs/WEF\\_GGGR\\_2017.pdf](http://www3.weforum.org/docs/WEF_GGGR_2017.pdf)
- The Millennium Development Goals Report. (2015), 1-75. Retrieved 22 February 2018, from <https://www.un.org/millenniumgoals>



DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- The Millennium Development Goals Report. (2015). Retrieved 16 March 2018, from [http://www.un.org/millenniumgoals/2015\\_MDG\\_Report/pdf/MDG%202015%20rev%20\(July%201\).pdf](http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf)
- Thomas, D. (1990). Intra-household Resource Allocation: An inferential approach. *Journal of human resources*, 635-664.
- Towson, S., Zanna, M., & MacDonald, G. (1984). Self-Fulfilling Prophecy: Sex Role Stereotypes as Expectations for Behavior. *Imagination, Cognition and Personality*, 4(2), 149-160. <https://dx.doi.org/10.2190/hlcy-tlq2-9hmw-ra7g>
- Tzannatos, Z. (1999). Women and Labor Market Changes in the Global Economy: Growth Helps, Inequalities Hurt and Public Policy Matters. *World Development*, 27(3), 551- 569.
- Ullah, S., Akhtar, P., & Zaefarian, G. (2017). Dealing with Endogeneity Bias: The Generalized Method of Moments (GMM) for Panel Data. *Industrial Marketing Management*, <https://dx.doi.org/10.1016/j.indmarman.2017.11.010>
- UN Department of Public Information. (2018). *Millennium Development Goal and Beyond 2015*. New York: United Nation. Retrieved 24 March 2018, from [http://www.un.org/millenniumgoals/pdf/Goal\\_3\\_fs.pdf](http://www.un.org/millenniumgoals/pdf/Goal_3_fs.pdf)
- UNFPA. (2000). Lives Together, Worlds Apart: Men and Women in a Time of Change. *The State of World Population 2000*, 1-84. Retrieved 14 March 2018, from <https://www.unfpa.org/publications/state-world-population-2000>
- United Nations. (2015). *The World's Women 2015 Trends and Statistics*. *Unstats.un.org*. Retrieved 08 March 2018, from [https://unstats.un.org/unsd/gender/downloads/worldswomen2015\\_report.pdf](https://unstats.un.org/unsd/gender/downloads/worldswomen2015_report.pdf)
- United Nation Development Programme. (2018). *Millennium Development Goals*. *UNDP*. Retrieved 01 March 2018, from [http://www.undp.org/content/undp/en/home/sdgoverview/mdg\\_goals.html](http://www.undp.org/content/undp/en/home/sdgoverview/mdg_goals.html)

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

- United Nations Children's Fund (UNICEF). (2015). *Promoting Gender Equality: An Equity-Focused Approach to Programming*. *Unicef.org*. Retrieved 05 March 2018, from [https://www.unicef.org/gender/file/Overarching\\_Layout\\_Web.pdf](https://www.unicef.org/gender/file/Overarching_Layout_Web.pdf)
- Verick, S. (2014). Female labor force participation in developing countries. *IZA World of Labor*. <https://dx.doi.org/10.15185/izawol.87>
- Walters, H. (2017). The Long Road to the Women's March. *HER Magazine*. Retrieved 02 April 2018, from <http://hermag.co/the-long-road-to-the-womens-march/>
- Wei, K. C. J., & Chiang, R. (2004). A GMM Approach for Estimation of Volatility and Regression Models when Daily Prices are Subject to Price Limits. *Pacific-Basin Finance Journal*, 12(4), 445-461, <https://dx.doi.org/10.1016/j.pacfin.2004.01.001>
- Williford, M. (1975). Bentham on the Rights of Women. *Journal of History of Ideas*, 36(1), 167-176.
- Wilson, S., Peterson, G., & Wilson, P. (1993). The Process of Educational and Occupational Attainment of Adolescent Females from Low-Income, Rural Families. *Journal of Marriage and The Family*, 55(1), 158. <https://dx.doi.org/10.2307/352966>
- World Bank. (2001). *Engendering development*. Washington, DC: The World Bank.
- Yao, Y., & You, W. (2018). Women's Political Participation and Gender Gaps of Education in China: 1950-1990. *World Development*, 106, 220-237.
- Yelfign, W., (2001). Ethiopia: From Bottom to Top in Higher Education – Gender Role Problems, *International Journal of Sociology and Social Policy*, 21(2), 98-104, <https://dx.doi.org/10.1108/01443330110789619>
- Yumusak, I., Bilen, M. and Ates, H. (2013). The Impact of Gender Inequality in Education on Economic Growth in Turkey. *13th International Educational Technology Conference*.

DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH?  
A PANEL DATA WITH GMM APPROACH

---

Zaidi, S. (1996). Gender Perspectives and Quality of Care in Underdeveloped Countries: Disease, Gender and Contextuality, *Social Science & Medicine*, 43(5), 721-730. [https://dx.doi.org/10.1016/0277-9536\(96\)00116-5](https://dx.doi.org/10.1016/0277-9536(96)00116-5)

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**APPENDIXES**

Table 1.1: Gender Parity in 2017 By Region and Distance

Region	Distance from gender parity 2017 (%)
Western Europe	75
North America	72
Eastern Europe and Centre Asia	71
Latin America and the Caribbean	70
East Asia and the Pacific	68
Global Weighted Average	68
Sub-Saharan Africa	68
South Asia	66
Middle East and North Africa	60

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Source: Global Gender Gap Index 2017

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Table 3.1: Definition and Sources of Variables

<b>Variables</b>	<b>Description</b>	<b>Data source</b>
<b>GDI</b>	<b>Gender Development Index</b>  Measures gaps in human development disparities between genders in three basic aspect of human development; health, knowledge and living standards	United Nations Development Program
<b>INF</b>	<b>Inflation</b>  A continuous increment in the general price levels which resulting in the loss of currency value	WDI
<b>EDU</b>	<b>Literacy Rate</b>  Total number of literate persons which is expressed as a percentage of the total population	WDI
<b>MOR</b>	<b>Mortality Rate</b>  Number of deaths during a period among a particular type or group of people	WDI
<b>LABOR</b>	<b>Women labour participation rate</b>  Measure the percentage of a country's female working age population that involve actively in the labour market, either by working or by looking for employment (Verick, 2014)	WDI

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<b>GDS</b>	<b>Gross Domestic Saving</b>	<b>WDI</b>
	The amount of money that a person deducts from his disposable income to put in a bank as asset	

Table 4.1: Descriptive Statistics for total countries

<b>Variables</b>	<b>Mean</b>	<b>Median</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Standard Deviation</b>
<b>GDP</b>	4.06196	4.06127	14.43474	-6.60868	3.08284
<b>GDI</b>	0.92301	0.95100	1.01000	0.58000	0.08302
<b>INF</b>	5.27370	3.76675	34.34074	-17.58773	5.82422
<b>EDU</b>	0.98158	0.99800	1.11091	0.62951	0.07372
<b>MOR</b>	4.72714	4.78691	6.42462	3.53422	0.63527
<b>LABOR</b>	3.65829	3.72476	4.00501	2.75023	0.27497
<b>GDS</b>	17.15153	16.31801	67.56291	-33.14760	18.76123

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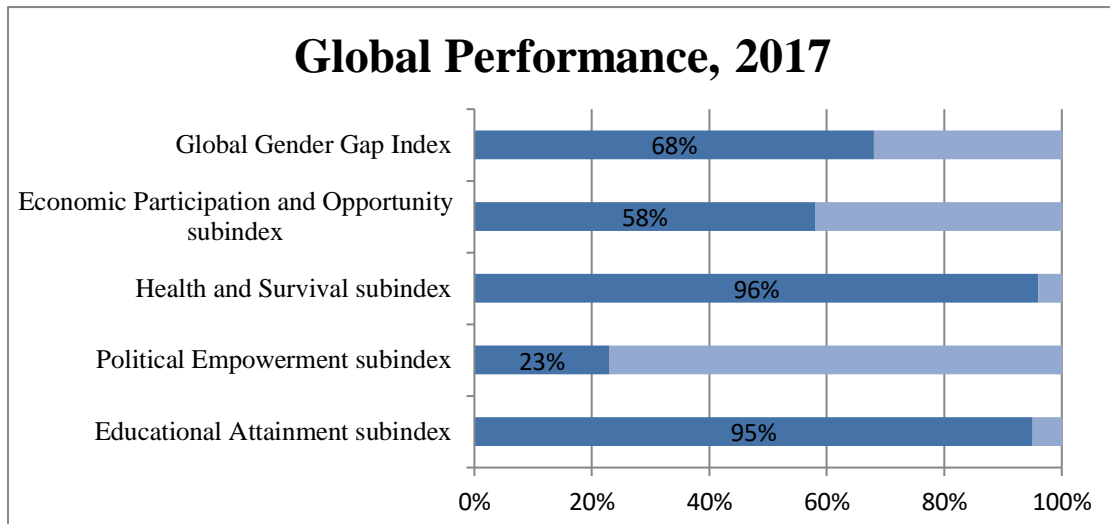
Table 4.2: Dynamic panel GMM estimations in total countries

**Dependent Variable: Gross Domestic Product (GDP)**

Variables	Difference GMM (Dependent: GDP)	
	OLS	GMM
GDP <sub>t-1</sub>	-	-0.12582 (0.0000)***
Gender Development Index	0.58251 (0.9155)	-57.18090 (0.0210)**
Inflation	-0.01514 (0.6400)	-0.01688 (0.3722)
Literacy Rate	-8.21846 (0.0460)**	47.52593 (0.0000)***
Mortality Rate	2.01881 (0.0000)***	10.61426 (0.0122)**
Women Labour Participation Rate	1.14416 (0.3252)	-60.60842 (0.0000)***
Gross Domestic Savings	0.05319 (0.0000)***	0.08943 (0.0228)**
No. of Observations	252	168
No. of Countries	42	42
Sargan Test	-	31.49625 (0.638016)
AR(1)	-	-2.22603 (0.0260)**
AR(2)	-	-1.01999 (0.3077)

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Figure 1.2: Global Performance of 2017



Source: Global Gender Gap Index 2017 (Covers all 144 countries featured in the 2017 index.)



# DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH? A PANEL DATA WITH GMM APPROACH

## Estimation Results of Difference GMM Model

Dependent Variable: GDP  
Method: Panel Generalized Method of Moments  
Transformation: First Differences  
Date: 08/25/17 Time: 09:08  
Sample (adjusted): 2012 2015  
Periods included: 4  
Cross-sections included: 42  
Total panel (balanced) observations: 168  
White period instrument weighting matrix  
White period standard errors & covariance (d.f. corrected)  
Instrument specification: @DYN(GDP,-2) @DYN(EDU) @DYN(MOR)  
                                  @DYN(LABOR) @DYN(GDI)  
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.125819	0.020054	-6.274027	0.0000
GDS	0.089433	0.038895	2.299326	0.0228
INF	-0.016883	0.018865	-0.894907	0.3722
EDU	47.52593	5.763540	8.245961	0.0000
MOR	10.61426	4.188654	2.534051	0.0122
LABOR	-60.60842	12.21401	-4.962207	0.0000
GDI	-57.18090	24.52866	-2.331187	0.0210

### Effects Specification

Cross-section fixed (first differences)			
Mean dependent var	-0.343605	S.D. dependent var	3.106757
S.E. of regression	2.939827	Sum squared resid	1391.456
J-statistic	31.49625	Instrument rank	42
Prob(J-statistic)	0.638016		

# DOES GENDER INEQUALITY IMPEDE ECONOMIC GROWTH? A PANEL DATA WITH GMM APPROACH

## Estimation Results of OLS Model

Dependent Variable: GDP  
Method: Panel Least Squares  
Date: 03/12/18 Time: 23:07  
Sample: 2010 2015  
Periods included: 6  
Cross-sections included: 42  
Total panel (balanced) observations: 252

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDS	0.053190	0.011113	4.786212	0.0000
INF	-0.015143	0.032341	-0.468221	0.6400
EDU	-8.218459	4.098080	-2.005441	0.0460
MOR	2.018808	0.412786	4.890684	0.0000
LABOR	1.144161	1.160557	0.985872	0.3252
GDI	0.582514	5.482776	0.106244	0.9155
C	-2.969932	3.187457	-0.931756	0.3524
R-squared	0.195085	Mean dependent var	4.061960	
Adjusted R-squared	0.175373	S.D. dependent var	3.082843	
S.E. of regression	2.799498	Akaike info criterion	4.924142	
Sum squared resid	1920.111	Schwarz criterion	5.022182	
Log likelihood	-613.4419	Hannan-Quinn criter.	4.963591	
F-statistic	9.896672	Durbin-Watson stat	1.139155	
Prob(F-statistic)	0.000000			

## Arellano-Bond Serial Correlation Test

Arellano-Bond Serial Correlation Test  
Equation: EQ01A  
Date: 03/12/18 Time: 23:12  
Sample: 2010 2015  
Included observations: 168

Test order	m-Statistic	rho	SE(rho)	Prob.
AR(1)	-2.226027	-345.0024...	154.985713	0.0260
AR(2)	-1.019992	-87.780107	86.059611	0.3077