Gender Inequality, GDP per capita and Economic Growth

Master thesis in Economics
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Abstract

The purpose of this thesis is to investigate the effects of gender inequality on GDP and GDP per capita. A cross sectional analysis of 177 countries over the time period 1998 to 2008 is undertaken with the use of linear regressions. There are several different factors that contribute to the gender inequality within a country and several ways to measure that disparity. The most well known measurement is the Gender-related Development Index and the components within this composite index have been studied thoroughly, although the index as a whole has not. This thesis then contributes with an overall view of how the gender inequality is important for the GDP and GDP per capita.

The findings illustrate how significant equality between the genders is for the economy, irrespective of the human development level within the countries. The implication of this is that gender equality is important for the GDP and GDP per capita, which is in accordance with the theories. One large issue is that there is no way of confirming the way of causality between gender equality and GDP or GDP per capita.
List of Abbreviations and Acronyms

CEDAW  Convention on the Elimination of All Forms of Discrimination against Women
GCF    Gross Capital Formation
GDI    Gender-related Development Index
GDP    Gross Domestic Product
GEM    Gender Empowerment Measure
GII    Gender Inequality Index
GIV    Gender Inequality Value
HDI    Human Development Index
HDL    Human Development Level
HDR    Human Development Reports
HPI    Human Poverty Index
HPI-1  Human Poverty Index for developing countries
HPI-2  Human Poverty Index for selected OECD countries
LDCs   Less Developed Countries
LFPR   Labor Force Participation Rate
MDCs   More Developed Countries
MDGs   Millennium Development Goals
PPP    Purchasing Power Parity
SCB    Statistiska centralbyrån
UN     United Nations
UNDP   United Nations Development Programme
UNRISD United Nations Research Institute for Social Development
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1 Introduction

There are always arguments that are being voiced about inequalities in economies. One of these points of view is based on gender. The equality within a nation depends on many different things, but in general women tend to be worse off when it comes to health outcomes, education, and employment (Klasen, 2000). Even if there is no direct intention from a government to make any differentiations depending on gender, problems that are related to it still occur (Cooray & Potrafke, 2010).

There is a large divergence in the education level for men and women, especially in South Asia and Sub Saharan Africa where the female enrollment rates are among the lowest in the world (Subbarao & Raney, 1995; Abu-Ghaida & Klasen, 2004). It has to be noted though that the divergence is not at government level, since the education opportunity is generally the same for both girls and boys. The difference usually arises from situations where the families have to make a decision: sending the girl or boy to school (Barham, Boadway, Marchand, & Pestieau, 1995; Klasen, 2000). The choice is usually linked to the future labor market prospect of the girls versus the boys, which is usually to the females disadvantage (Agarwal, 1995). The traditional role of the girls is usually presents a drawback (Moser, 2007). For example, if the girls miss school more often than the boys or are unable to spend as much time on homework in order to do household work, then there rises a difference in the level of education and it means that the girls have less access to education (Razavi, Gendered Poverty and Social Change: An Issues Paper, 1998; Saith & Harris-White, 2000).

In South Asia and Sub-Saharan Africa most countries have gender gaps already in primary and secondary education, which widens at the tertiary level in favor for males. There are countries that do not have the gap at any level of education as is the case in Latin America and the Caribbean (Saith & Harris-White, 2000). Over the last years the gender gap in primary education has decreased, but there is still a long way to go before there is equality in the education sector (Sida’s Education Division, 2007). Even if there is no gap this has not resulted in the expected social, economic benefits or increase in income for the women (ECLAC, 2009). In the developing countries the gap for wages depending on gender are especially large, but the gaps occur even for developed countries.

Klasen (2000) among others shows that there is a relationship between gender gaps and reduced growth and development within regions such as South Asia. Certain regions are evidently affected by the issue of gender inequalities, but Klasen does not look closer at individual countries. Equality gaps within the regions have impact, thus significantly reducing development in these areas. But the interesting part here is to see if this also is the case on human development level.

The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) has been signed and ratified by many developing countries. Through the CEDAW and Millennium Development Goals (MDGs) reducing gender inequality in itself has been recognized as a development goal. It would then be possible to look closely at an individual country to see if there are any specific inequalities depending on the sex of a
person. If there is an inequality present within the country these conventions provide the foundations for the international forum to demand that the gender discrimination be mitigated. In many developing countries the education accessed by the population is not equal due to several different factors such as availability of schools, cost of education and opportunity costs. The resulting knowledge gaps have decreased over the years, but the speed in which they do so vary. For the poorest countries the changes are slowest (Abu-Ghaida & Klasen, 2004).

There are still gender inequalities that are persistent in the world although different aspects have improved. The education levels for women have improved, as well as life expectancy for women has improved by 15-20 years in developing countries and more women have entered the labor force (The International Bank for Reconstruction and Development & The World Bank, 2001). The gender inequality in different regions in the world can be seen clearly in Figure 1 where a value of 1 represents low gender equality in basic rights and a value of 4 represents high equality.

![Index of gender equality](image)

**Figure 1 - Gender equality in basic rights**

Source: The International Bank for Reconstruction and Development & The World Bank, 2001

The topic of this paper was chosen since the author has a strong interest in equality around the world. The interest is not limited to gender discrepancies as is the focus in this thesis, but as this is a worldwide phenomenon it was chosen due to data availability. In this paper the purpose is to see if there is a clear relation between larger inequalities between the genders and GDP within the human development levels. To investigate this, a comparison must be made between countries that are close to each other, both in terms of development and equality. This way it can be observed whether there is a clear indication
that gender inequalities have an impact on the Gross Domestic Product (GDP) and GDP per capita when comparing these levels. As far as the author is aware there has not been a study previously that has examined the effect of the entire composite index used, the Gender-related Development Index (GDI), only with the dimensions and components within it. There has not been any study with GDP or GDP per capita earlier, only with economic growth. This is something that has not been conducted previously and through this thesis it will be possible to have a clearer overview of the entire situation, with analysis based on previous articles and studies.

1.1 Research Problem

There are several different opinions that are voiced about how to measure the development in countries all around the globe. There are some that are more influential than others when it comes to how to measure it. Stephan Klasen, Shahra Razavi, Naila Kabeer and Dana Schüler are four professors that have provided a lot of the available information within the area of gender related development and empowerment and are often referred to by other authors as well as by the UN. Their focus on the area varies depending on who the author is, but they all agree that the GDI and Gender Empowerment Measure (GEM) are essential for these types of studies. The indicators are necessary to be able to develop and implement action to move towards gender equality, but they are not enough (Saith & Harris-White, 2000). As the indicators are necessary, it is also important to discover if there is a significant relation between GDP or GDP per capita and the GDI. In case there exists a relationship between them, then the question is: does the change of the GDI have an effect on the economy and if so in which direction? It is generally said that the disparities between the genders show that there is economic growth that has been lost since it is not accounted for in the GDP. Therefore the female work efforts are not accounted for in the GDP. This will be the research problem in this thesis.

1.2 Purpose

This paper will analyze the gender inequalities and the impact it has had on the economy. The author wants to investigate and analyze how the economy is affected by gender inequalities: Whether the gender disparities affect the GDP and GDP per capita negatively or positively and if it is possible to see to what extent it does so. This is done with reference to the theory that the countries with lower human development and those that are in transition have lower gender equality (Klasen, 2000). With the improvement in the dimensions of the GDI and thus the index as a whole, what will the effect be on the economy? The purpose of this thesis is thus to answer the following question:

*Can improvements in gender equalities have a positive effect on the GDP and GDP per capita?*
1.3 Method and Limitations

This thesis will achieve this by using the data that is provided within Human Development Reports (HDR) and to look closer at the different components within the index to see which dimensions are influential for the result of the index. The indices that are used are already calculated by the UNDP and provided within the Human Development Reports. Thus all the data available for the UN has been used calculate the composite indices and their information depends on the government published data. It has to be kept in mind that social indicators are useful in revealing gender differences in well-being outcomes, but they are limited in the type of analysis that they can generate. The interpretation can only be done on the dimensions included in the indices as this is the only information they contain (Razavi, 2000).

This thesis is limited to analyzing the GDI because this is one of the indexes with most available data over time, there are also several articles written about the subject detailing both positive and negative aspects of the composite index. The difference between the Human Development Index (HDI) and GDI differs depending on which country, there are however certain general patterns that can be found. The gap between the GDI and the HDI is what is important to measure, since this gives the level of gender inequality. This is the correct way of using the GDI to get the information that is available (Schüler, 2006). This thesis seeks to disclose the effect that the gender inequalities have had on GDP and GDP per capita.

Great care has been taken to make sure that the information that is presented in the essay is correct by double checking the facts in several works before using them in this paper. The articles have been the foundation of the current theories of gender inequalities and up to date information about the economic effects resulting from the disparities between genders. The web pages used are those of the United Nation Development Programme (UNDP), United Nations Research Institute for Social Development (UNRISD), World Bank and Statistiska centralbyrån (SCB; Statistics Sweden).

The Labor Force Participation Rate (LFPR) data that has been collected from the World Bank’s website is unreliable since the data comes from sectors which represent only a small fraction of the working population in many of the development countries (Klasen & Schüler, 2011). The consequence of this is that it does not really make a good representation of the incomes earned (Bardhan & Klasen, 1999). However, the LFPR is a more reliable measurement for employment than the by the government published unemployment rates and will therefore be used in this thesis.

There are several regressions that are to be run to be able to answer the research question. The data used is collected over the years 1998 to 2008. The regressions are to be explained and illustrated later in the paper, in chapter 4 the Empirical Finding.
1.4 Outline

This paper will be organized as follows:

Section 2 will define certain important terms as well as discuss the different indices used to measure development. Section 3 will discuss the theoretical framework and illustrate the previous work that will be used within this paper. Section 4 will present the data and describe the econometric specifications. Section 5 will provide a discussion of the empirical results based on the theoretical framework. Section 6 will conclude the paper.
2 Background

2.1 Definitions

The term ‘gender’ refers to the issue of what it means to be a man or a woman in a certain context. The gender is socially established and it changes over time, culture, religion and the geographical location. The means that the possibilities and limitations that are available for men and women is determined by it. Gender is also determined by other variables like age, ethnicity and class. (The International Bank for Reconstruction and Development & The World Bank, 2001)

The terms ‘gender inequality’ and ‘gender disparity’ means that there are differences between the genders. These disparities can arise in different aspects such as within education, income or by empowerment in political and economic forums. In this paper the terms refer to the disparities between men and women within life expectancy, education and income, as these are the dimensions within the GDI and GIV. (The International Bank for Reconstruction and Development & The World Bank, 2001)

The term ‘composite index’ means that there are several different components, dimensions or indexes that are combined in a standardized way. They are meant to give a statistical measure for an overall market or a performance over a period of time. The composite indices have been criticized for ‘concealing more than they reveal’. They are however used frequently in similar ways to an average and to compare at a global scale, before focusing on a particular region or country (Saith & Harris-White, 2000).

2.2 Development Indices

There are several different ways to calculate development indices. The most commonly known is the HDI which was developed by UNDP. The UNDP updates the HDI every year and it is extensively used throughout research and policy works even if it is heavily criticized for the fact that it does not incorporate as much as it should and hides more than it reveals (McGillivray, 2006). The HDI was quickly seen as an important first step to be able to integrate sustainability and development, despite the heavy criticism and the need to improve it (Noorbakhsh, 1998; Sagar & Najam, 1998; Neumayer, 2001). There were two new measures that were introduced in 1995 to highlight the status that women have, these are GDI and GEM (UNDP, 2001; UNDP, 2010).

The GDI is very similar to the HDI in the sense that it uses the same dimensions, a long and healthy life, knowledge and living standard. The only difference is that the GDI takes the inequalities depending on gender into account, which means that it captures the inequalities between men and women. (UNDP, 2001) The GDI does not measure women’s achievement, but instead takes the overall assessment of aggregate well-being in a country while incorporating the gender inequality (Bardhan & Klasen, 1999). Once again it has to pointed out that the GDI is actually identical to HDI, only that it is regulated according to gender. When the GDI is lower than the HDI, it indicates that there are gender disparities within that country (Klasen & Schüler, 2011). This same index could be used to find the inequalities between other groups such as different ethnicities or castes (Saith & Harris-
White, 2000). The GEM on the other hand, displays women’s positions within economic and political environment. Through this it is possible to see to what extent women participate within decision making, political and economic life (UNDP, 2010).

Additional to these indices there are other ways of measuring development. As previously mentioned, looking at the GDP per capita can give an indication at the general level of income within a nation. However it can give misleading information if there is a high gini coefficient which indicates inequality of the distribution of income. The GDP per capita is the aggregated economic income per person, but it does not give any information about the distribution of income or the wealth.

There are some poverty indices which have been used not just to measure the poverty, but also to measure the development level within nations. The Human Poverty Index (HPI) is calculated with different measures that show how large part of the nation lives in poverty. The HPI is calculated for developing countries (HPI-1) and for selected OECD countries (HPI-2) (UNDP, 2000).

These different indices are the ones that are important for measuring development within countries and to be able to compare the results across the globe. The UNDP uses most of these and publishes information about it in the form of the indices. These are then composite of other weighted indices, where the main indices are HDI, HPI-1, HPI-2, GDI and GEM. Each and every index has its own positive and negative features that have to be considered when using them, but they are kept relatively simple in order to make sure that the different measurements within the indices can be easily acquired and calculated for different countries. The different weights put on the measurements are to make sure that different development criteria are incorporated within the calculation to see how a nation fares according to those international standards. According to several authors the HDI is still the most appropriate way of measuring the development; the GDI is the measurement that allows for most information about the gender inequalities and the GEM for empowerment (Moser, 2007; Klasen & Schüler, 2011). For this reason the GDI will be used to measure the gender inequality.

There is a need to look closer at the index that is to be used most within this paper, the GDI. Even though the GDI is calculated in the exact same way as the HDI but also accounting for gender, it shows that there is no country on the world that treats women equally to men since GDI is always lower than the HDI (Moser, 2007). Even if the index is relatively easily compiled compared to others it is still difficult to calculate and interpret, especially since there are many misunderstandings of what the GDI actually stands for and what it includes. The GDI reflects the average achievement inequalities between men and women within the dimensions that are incorporated in within the index (UNDP, 2007).

---

1 Combining the indices for life expectancy, education and income with equal weight
The gap between the GDI and HDI is important, it represents the loss of human development due to gender inequalities and it gives a penalty for that inequality (Schüler, 2006). It is important to remember while interpreting that the indicators only provide limited information (Saith & Harris-White, 2000). One major problem with the GDI is the reliability of the sources used to calculate the composite index and the fact that it does not truly reflect the problems of developing nations. Despite these problems and the available alternative indices, the GDI is still the most widely and most commonly used when measuring inequality between the genders. The GDI is proclaimed to be useful when seeing the inequality as a part of development and part of one of the MDGs (Bardhan & Klasen, 1999; Klasen & Schüler, 2011).
3 Theoretical Framework
There are certain issues that have to be considered before looking closer at the question at hand. To be able to analyze and interpret the results we must first establish the theoretical framework within which we can then deduce the implication of the outcome. This framework will be outlined in the following section.

3.1 Economic Growth and Development
To be able to understand the different variables that are important in the regressions, the first step is to look at the concept of economic growth. In this thesis growth accounting, neoclassical growth theory and endogenous growth are being used. To see how inequality affects the GDP and GDP per capita, it is not enough to just study economic growth. Economic development must be considered as well.

3.1.1 Growth Accounting
Growth accounting consists, as a simplification, of labor (N) and capital (K) as the important inputs. The output (Y) is dependent on the two inputs and the level of technology (A) with respect to time (t), which gives a production function (1). This comes from the fact that the Solow model is focused on these four variables (Romer, 2006).

\[ Y(t) = F(K(t), A(t)N(t)) \]  

(1)

This simplistic formula and model shows that both the labor and capital contribute to the output or national income. The human capital is increased by investing in for example schooling and health, depending on the development level in the country (Dornbusch, Fischer, & Startz, 2004). If including human capital (H) the production function would be

\[ Y = AF(K, H, N) \]  

(2)

3.1.2 Neoclassical Model
Within the neoclassical growth theory the focus lies on capital accumulation and the link it has to saving decisions. Due to the fact that the model implies that the economy reaches a long run equilibrium called the steady-state equilibrium there is a need for a certain level of investment, depending on population growth (n), the depreciation rate (d) and the capital per worker (k). The required level of investment is \((n+d)k\). Savings (s) is a constant fraction of the income and income per capita is \(y\). The importance of this theory is the capital deepening and capital widening. There is not any effect on the growth rate in the long run by an increase in the savings, although it does increase the long run level of capital and output per capita (Dornbusch, Fischer, & Startz, 2004; Romer, 2006).
3.1.3 **Endogenous Growth**

Modifying the production function from the neoclassical theory to allow for endogenous growth makes the model more realistic. With endogenous growth theory there are substantial external returns to capital. Inventions and discoveries contribute to human capital which causes positive externalities and results in indefinite knowledge growth. Therefore it is believed that the key to understanding the long run growth is investment in human capital and in research and development.

3.1.4 **Economic Development**

There are several different factors that are part of the development of countries. One of the issues that are important is labor, which has been pointed out already by Adam Smith. If there are more people that participate there will be more output in the country, thus improving the GDP. The Lewis model has two sectors, where capital is fixed and the labor is mobile which shifts towards where there are higher wages. The wage level that Lewis proposed is however no longer in place since the urban-rural wage difference has widened far beyond that level (Thirwall, 2006). The implication from this larger wage gap is that people will migrate to urban areas due to the higher expected value of their wages there (Todaro & Smith, 2006). This migration is due to unemployment and the issue of unemployed individuals will be present in pretty much any economy at any given time.

There is a level of natural unemployment in an economy below which it is not possible to keep the unemployment level (Romer, 2006). If a country has higher unemployment levels than the natural unemployment rate there is a loss of production. This is because there are individuals whom could be employed and thus increasing the level of output (Thirwall, 2006). It is also said that there are different requirements of labor needed for development to occur, since in a Less Developed Country (LDC) there is a higher demand for labor whereas in a More Developed Country (MDC) there is a larger demand for capital (Thirwall, 2006).

3.2 **Calculating Gender-related Development Index (GDI)**

To see how the different factors influence the final result closer attention must be paid to how the GDI is computed. The indicators that are gender sensitive can add knowledge about the relationship between the gender and economic growth as well as GDP. By using these it is possible to see if gender equalities contribute to the economic development (Chant, 2003). Just like the HDI all the different dimension indexes are calculated as follows (UNDP, 2007):

\[
Dimension\ index = \frac{actual\ value - minimum\ value}{maximum\ value - minimum\ value}
\]  

(3)

\[
a_1 = \frac{i_1 - j_1}{k_1 - j_1}
\]  

(4)

\[
a_2 = \frac{i_2 - j_2}{k_2 - j_2}
\]  

(5)
In all the formulas for calculating GDI the dimensions have to be calculated for men and women separately. In order to do this 1 indicates women and 2 men. Where $a$ is Life Expectancy Index, $i$ is the actual value, $j$ is the minimum value and $k$ is the maximum value. The values that are the same for all the countries are the minimum life expectancy value, which is 87.5 and the maximum value, is 27.5 (UNDP, 2001). When looking at the Sweden context, the actual value for men is 77.99 and 82.41 for women (SCB, 2007). In Sweden the life expectancy index for men is then 0.8415 and 0.9152 for women.

These two values are then combined in order to see the Equally Distributed Life Expectancy Index, $b$. The life expectancy indices are combined in a formula using the percentage of the population that is of each gender, where $x$ represent the female population ratio and $y$ the male population ratio within a nation. These ratios are used in all calculations. In 2009 Sweden had a female population share of 0.5023 and a male population share of 0.4977 (SCB, 2010). Using the formula below it is possible to see that the equally distributed life expectancy index has a value of 1.14 and this value is later used again in calculating the GDI. All the equally distributed indices for the GDI are calculated in this manner.

$$b = \left( \frac{x}{a_1} + \frac{y}{a_2} \right)^{-1} \quad (6)$$

Calculating the equally distributed education index is similar to that of life expectancy, although this index has two parts that are combined to get the value. The indices for adult literacy rate and gross enrollment ratios for primary, secondary and tertiary education combined are calculated separately for the genders. There are only a few other indicators apart from adult literacy that are capable of capturing the imbalances in the inequalities between men and women as this measurement does (UNESCO, 1995). This is quite easy, since it is only to change the values from percentage form, in which they are published, to decimal. This is calculated for both genders individually, before combining it in the same way as done for the life expectancy index.

$$c_1 = \frac{2}{3} g_1 + \frac{1}{3} h_1 \quad (7) \quad c_2 = \frac{2}{3} g_2 + \frac{1}{3} h_2 \quad (8)$$

$$d = \left( \frac{x}{c_1} + \frac{y}{c_2} \right)^{-1} \quad (9)$$

In these formulas the different variables represent the following: $c$ is the education index, $g$ is the adult literacy index, $h$ gross enrollment index and $d$ is the Equally Distributed Education Index. As seen above the $g$ gets a weight of $2/3$ and $b$ gets $1/3$ of the weight.
The third dimension in the GDI is the equally distributed income index, where the female and male income is measured in PPP US$. The income is adjusted by the use of logarithms, just as for the HDI. For details and further interest of how to calculate this, information is available in the technical note 1 addendum in the Human Development Report 2007/2008 (UNDP, 2007).

\[ e_1 = \frac{\log(l_1) - \log(m_1)}{\log(n_1) - \log(m_1)} \quad (10) \]

\[ e_2 = \frac{\log(l_2) - \log(m_2)}{\log(n_2) - \log(m_2)} \quad (11) \]

\[ f = \left( \frac{x}{e_1} + \frac{y}{e_2} \right)^{-1} \quad (12) \]

these formulas the variables represents: \( e \) is the income index, \( l \) is the actual value, \( m \) is minimum value, \( n \) is maximum value and \( f \) is the Equally Distributed Income Index. After the income indices for the genders have been completed they are combined to find the equally distributed income index. These three dimensions are then combined with equal weight on the averages of the three composite indices.

\[ GDI = \frac{1}{3} b + \frac{1}{3} d + \frac{1}{3} f \quad (13) \]

Combining of the different dimensions into the GDI is done by appointing equal weight on all dimensions. The different calculations of the equally distributed indices done earlier are used. Once again it can be seen that this is identical to the way of calculating the HDI with the only difference being that each of the dimensions for male and female are done independently instead of a combination.

Looking at the GDI alone will give misleading information about how the level of inequality between men and women, one way to get correct information is by observing the gap between the HDI and GDI (Schüler, 2006). Another way to get a clear view of how large the divergence is one can use the GIV. The problem with the GIV is that it is much narrower in its scope and does not give as much information as the GDI does. The GIV is obtained by using the following formula (UNDP, 1995)

\[ \frac{(HDI-\text{GDI})}{HDI} \times 100 \quad (14) \]
With the use of this formula it is easier to see if there is a larger differential between the genders than can be seen initially by just comparing the HDI value and GDI value. It has become apparent quite often during the use of this measure that, the female income component is substantially lower and that in turn this lowers the GDI. It gives that country a poorer inequality rank (Saith & Harris-White, 2000). According to the theories there is a negative relation between the GIV and GDP or GDP per capita (Saith & Harris-White, 2000) and this is also shown in Figure 4 on page 17.

### 3.3 Increase in Inequality

One of the theoretical foundations for this thesis is the Grün and Klasen (2000) article of how income and well-being is reduced through the transition of countries. Many of the traditional economic development and growth theories have stated that since the economic activity increases the standard of living rises. It has however been proven, that this is not always the case, since the distribution of the national income is not equal. Due to this many countries that are in transition have suffered from contractions in income levels. Countries that move from having moderate levels of income and low inequality to start with have, after the transition, much higher inequality and loss of income through this. The inequality has to be considered as important and it has a large impact on the well-being and therefore also on development.

With the transition the countries move from one development level to another and while doing this the general idea would be that most of the indices would improve, but that is not the case. While moving from one development group to another the inequality values increase drastically. There is a close relation between the fall of income and the rise in inequality, which in turn has a negative effect on the economy (Grün & Klasen, 2000). The data shows that there is a high positive correlation between gender equality and income per capita (Lagerlöf, 2003) as well as for economic growth (Klasen, 2002).

In another paper by Klasen it is illustrated how the gender bias in education and employment has a significant negative effect on the economic growth (Klasen, 2000). One model that is used in Klasen’s paper as well as in this paper is from an article by Lagerlöf that looks at effects from gender inequality in education on the economic growth (Lagerlöf, 1999). In this model the gender disparities in the education may cause a poverty trap which needs government interference to avoid that situation.

### 3.4 Female Education

One of the very important issues with gender bias is the education that is provided, a fact that it is included both in the HDI and the GDI. As mentioned earlier in the thesis it has been shown that young women receive considerably less education than the young males in most developing countries, which is not due to the governments’ actions (Todaro & Smith, 2006). There is however always an especially large need to focus on making sure that there is enough knowledge, information and social resources in urban areas and it is particularly important to educate women (Sida, 2006).
A population that is better educated has more possibilities since the human capital in that country is higher. Improving the knowledge of all the people is thus in the interest of the nation. The government cannot do all of the work to improve this, even if they can stimulate the fact that girls as well as men should be educated. If the population is educated they can participate more in the formal market and contribute to the GDP and thus the economic growth of the country. The issue with women being uneducated leads to the fact that even if they are included in the labor force they are unable to participate within high paying sectors, which leads to women receiving lower income than men (Heintz, 2006). The lower level of income for women has lead to the female headed families to be the poorest of the poor (Chant, 2003).

It has been stated that the gender disparities that exists in the world have been influenced by religious and social beliefs, which in turn has lead to the fact that men have priority over women in many societies both for education and work (Wals & Kieft, 2010). The view of gender issues, economic growth and poverty has altered over the years, from being seen as a helpless group to the link between education for women, poverty and economic growth (Whitehead & Lockwood, 1999). There is a clear need for expertise to handle the issue of gender inequalities, just as there is a need for expertise when handling the economy and the environment (Sida’s Gender Equality Team, 2009).

Studies by the UN have shown that female education is one of the most cost efficient ways of improving the health standards locally (UNDP, 2001). The rate of return on education of women is higher than that of men in most developing countries. As the proverb says “Educate a man and you educate an individual… Educate a woman and you educate a nation.” If there are women who teach their children at home this also gives a positive effect, due to the positive externality, just as formal education at schools does, but not to the same extent (Wals & Kieft, 2010). The increase of female education increases their productivity and leads to larger LFPR, but it also reduces the fertility rate and promotes child health (Subbarao & Raney, 1995).

An increase in female human capital generates a number of effects. The first is that the labor cost per hour for women increases. This results in a fall in the fertility rates while income per capita increases as a result from the increase in human capital (Lagerlöf, 2003). Therefore there is a clear need to overcome barriers and requires structural changes to promote gender equality as well as women’s rights (Törnqvist & Schmitz, 2009). If there is gender inequalities in education this might generate further poverty that creates to poverty trap (Klasen, 2000). The investment in education as well as empowerment for women aids the poor households to withstand poverty; additionally it increases the possibility of the family to move out of poverty (Ghosh, 1998; Kabeer, 2009).
It has been proven many times over that education and improved standard of living increases the productivity and participation of the people. It helps the people to move out of poverty as well as increasing the macroeconomic growth (Sida Health Division, 2007). The large gap that is present between female and male education can be linked with a lower economic growth (Klasen, 2000). The lower income for the female part of the population of the country is another part of the inequality measure and is one of the main reasons why the inequality values are so high between the genders. The first step to reduce the income inequality is to educate the girls and empower them to be able to use the education that has been provided (The World Bank & the International Monetary Fund, 2004). This is however easier said than done, since there are many barriers that may have to be overcome, such as social and religious beliefs. These prohibit females to be educated or participate in the labor force. Educating women creates a positive spiral since improving the human capital and expanding knowledge leads to a possible decline in prejudices, which in turn makes households less inclined to make choices that are gender discriminatory. Therefore it can be seen that there is a need for economical, social and political transformations before any real result of improvement can be noticed (UNRISD, 2010).

3.5 Economic Incentives

There are always different reasons for people to join the labor force and most of these are economic incentives. When a family needs to get more income they will send more family members to work, but when there are large amounts of unemployment the families will send boys or men to work. One reason why daughters are assumed to need less education is because they are assumed to marry a man who will support them since he is presumed to be better educated and thus have a higher wage (Lagerlöf, 2003). Whereas males are sent to work and earn a wage women do unpaid domestic work. Only when there are enough jobs and high enough LFPR will the women be included in the labor force. It has been shown that the women’s LFPR increases with economic crises and by policies that trigger labor displacement, instability in work as well as rising unemployment rates (Heintz, 2006).

A family where a woman is head of the family requires that the woman is allowed into the labor force and is empowered enough to support her family. For this to be possible the women have to be viewed as economic actors just as men are. Women in countries with high levels of inequality have less skills and education than their male counterparts. Female-headed households in these countries therefore tend be the ones at the lower end of the income distribution. The economic empowerment of women contributes not only to the improvement of their own lives, but also to the progress of human capital and capabilities (Kabeer, 2009).
4 Empirical Findings
Before evaluating the empirical results there are some important issues to consider while looking at the data. One is to make sure that there is no problem with the way of causality. In order to avoid this in the case of how investment affects GDP the values were lagged. An attempt was done to lag the GDI values to avoid the problem of causality, but this resulted with insignificant results.

4.1 Visual Relations between Variables
There is a no real clear visual relation between GDP and the GDI value (Figure 2). It is however possible to see that there are three distinct parts of increases of the curve and these will be investigated further with the regressions. There is a very apparent nonlinear relationship between GDP per capita and the GDI value (Figure 3). As the GDI increases GDP and GDP per capita increases as well. The relation is more distinct with GDP per capita. This can be seen in the in the two following figures: Figure 3 and Figure 4. It has been proven that the gender equality accelerates over time, so the largest improvements occurs late (Lagerlöff, 2003). As mentioned earlier there is a tendency for a negative relation between the GDP per capita and the GIV, this means that as the GIV increases there is a fall in the GDP per capita (Figure 4).

![Figure 2 - Relation between GDP and GDI](image)

Figure 2 - Relation between GDP and GDI
Looking closer at Figure 2 by doing a division according to human development level it is very clear to see definite sections. Figure 5 is the section that is furthest to the right. Figure 6 is the middle section and Figure 7 is the one to the left. In that order these represent high, medium and low HDL. This means that there is a clear difference in the GDI value depending on which development level there is in the countries. Once again this division of levels is according to the difference that has been said to occur with different levels of human development (Klasen, 2000; Grün & Klasen, 2000). The graphs below are to be described further with the use of regressions.
Figure 5 - Relation between GDP and GDI value for High Human Development

Figure 6 - Relation between GDP and GDI value for Medium Human Development

Figure 7 - Relation between GDP and GDI value for Low Human Development
4.1.2 Relation between GDP per capita and GDI Depending on Level of Development

When looking closer at the relation between GDP per capita and the GDI value it is very interesting to see how it is divided according to human development level. The high development level shown in Figure 8 gives a clear indication that there is an exponential (non-linear) relationship. The medium human development level shown in Figure 9 illustrates that there is only a slightly positive relation, as for the low human development level in Figure 10 it can be seen that the variance of the observations increases and that there is a minor positive relation.

This division according to development levels follows the ideas that there are different effects on factor such as GDP, income and equality depending on the level of development (Klasen, 2000; Grün & Klasen, 2000). It has also been shown that there is a drop in the level of equality between men and women within countries that are in transition as well as there being a low GDI value. Also that the GDI tends to have difficulties to catch all information especially for developing countries (Klasen, 2000). One of the causes is said to be, is that if there is a low LFPR there is no push for the economy to incorporate more people to fill a demand. This usually means that the women are left out of the labor market, especially from the technical and professional employment (McGillivray M., 2006).

![Figure 8 - Relation between GDP per capita and GDI value for High Human Development](image-url)
4.2 Regression Model

In order to see the effects on the GDP and the GDP per capita, the author will do a number of regressions. The dependent variables in the regressions are GDP and GDP per capita. The GDP per capita does give more reliable information about the conditions for the individuals in the country than the GDP does. Therefore the author will use the GDP to get an overall picture and the GDP per capita to see more specific properties. These measurements do not give any information about the distribution of income though and that has to be kept in mind. Gender Inequality Value (GIV), GDI, LFPR, Gross Capital Formation (GCF) and lagged GCF are the independent variables that are used. These variables are combined in the regressions to see which variables are significant over the time period 1998 to 2008. The author applies these the regressions with regard to all countries, the development levels and the change of development level.
Five different types of regressions were run to see if there is a real impact of gender inequality on economic growth. The first two were run with GDP as dependent variable, whereas the last three were run with GDP per capita as dependent variable. The GDP does not give as much information since it is more important to see how it is per person and therefore the GDP per capita is more appropriate for the regressions.

There are many different econometric models used when running the regressions. There is a basic format to the equations based upon Function 2. GDI incorporates the human capital, GCF the capital and LFPR the labor. Variants of the regression are created depending on which variables are included in the regression. The different variables that are included are to see their effect on the dependent variable GDP or GDP per capita. The following equations are those that are being estimated:

\[
\begin{align*}
\text{GDP}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \varepsilon \\
\text{GDP}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \hat{\beta}_2 \text{LFPR}_i + \varepsilon \\
\text{GDP}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \hat{\beta}_2 \text{LFPR}_i + \hat{\beta}_3 \text{GCF}_i + \varepsilon \\
\text{GDP}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \hat{\beta}_2 \text{LFPR}_i + \hat{\beta}_3 \text{lagGCF}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GIV}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GIV}_i + \hat{\beta}_2 \text{LFPR}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GIV}_i + \hat{\beta}_2 \text{LFPR}_i + \hat{\beta}_3 \text{GCF}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GIV}_i + \hat{\beta}_2 \text{LFPR}_i + \hat{\beta}_3 \text{lagGCF}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \hat{\beta}_2 \text{LFPR}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \hat{\beta}_2 \text{LFPR}_i + \hat{\beta}_3 \text{GCF}_i + \varepsilon \\
\text{GDP per capita}_i &= \hat{\beta}_0 + \hat{\beta}_1 \text{GDI}_i + \hat{\beta}_2 \text{LFPR}_i + \hat{\beta}_3 \text{lagGCF}_i + \varepsilon
\end{align*}
\]

4.3 Regressions with GDP as Dependent Variable

The first two forms of regressions were run with a different dependent variable than the other three; these had the absolute GDP as dependent variable instead of the GDP per capita. Equations (15) to (18) were used in these two types of regressions. The first type regression was done to see if there was an overall relationship between all the countries and the variables. The second sort of regression was done to see if the HDL was important for the variables. A regression with the GIV was attempted, but all the results showed that the variables were insignificant, thus having no effect on GDP.
4.3.1 All Countries

This type of regression was run with the entire data set and it was shown that all GDI values are significant (Appendix 1). The GCF and lag GCF are both negative and significant, but the GCF is larger than the other. The LFPR is significant for all three cases, but is the largest when included with GCF. The adjusted $R^2$ is quite large for all four, but is slightly larger when GCF or the lag GCF is included. It has to be noted though that all the variables are significant at a 0.01 significance level. The F-Value is extremely large for all, but it does decrease with the amount of variables included.

4.3.2 Human Development Level

While dividing the data for the HDL it is possible to see a typical trend occurring for the different development levels. Running the regression with this specification gives us that the result that vary for the high, medium and low development countries.

High Human Development Level

The regressions show that those having a high HDL have significant t-values for all the GDI values already at a 0.01 significant level, the GCF is significant also (Appendix 2). The LFPR on the other hand is insignificant for all the cases, just as the lag GCF is insignificant as well. The adjusted $R^2$ is quite low for all the four cases, but the F-Value is still significantly large.

Medium Human Development Level

For the countries that belong to the group with medium HDL, just as with the group with high HDL, the GDI values and the GCF are all significant, but here the LFPR is also highly significant (Appendix 3). The only variable which is insignificant is the lag GCF. The adjusted $R^2$ is lower than that of the high HDL and is highest when the GCF is included. The F-Values are significant for all the cases.

Low Human Development Level

In this group all variables apart from the lag GCF are significant, but what is different from the other two groups is that the LFPR is negative (Appendix 4). The adjusted $R^2$ and the F-Value is slightly higher than for the other two groups.

4.4 Regressions with GDP per capita as Dependent Variable

The equations used for the remaining types of regressions were (19) to (26). The third type of regression was run when looking at all countries combined to see an overall relationship for the different variables. The fourth kind of regression was run to see if there is a clear indication that the different Human Development Level (HDL) is important for the different impact variables. The HDL is used to divide the countries according to their development. The fifth and last type of regression was run with respect to the change in HDL to see if the countries that have improved or worsened have different impact on the variables. All the regressions were run with the dependent variable GDP per capita and independent variables GIV, GDI, LFPR, GCF and lag GCF. The regressions with GIV are shown first since these provide less information than the GDI does.
4.4.1 All Countries

For this type of regression the author looked at the entire data set. Running the regression with all countries gives us high and significant GDI and GIV values (Appendix 5). With all the countries it shows that most of the variables are significant, only the GCF that is included with the GIV is insignificant. The adjusted $R^2$ and the F-Values are larger with the GDI than with that for the GIV.

4.4.2 Human Development Level

Once again the data was divided according to the HDL to see the trend that occurs for the different development levels. Running the regression with this specification once more gives us results that vary for the high, medium and low development countries.

**High Human Development Level**

The regression shows that the t-values are significant for GDI and LFPR independent of what other variables are included in the regression (Appendix 6). The GCF has been shown to be insignificant for when have been included both with GDI and GIV. The lagged GCF is only significant when included in the regression with the GIV. The GIV is important when including the LFPR and the combination of LFPR and lag GCF, but not otherwise. The adjusted $R^2$ and the F-Value are highest when running the regressions for GDI and much lower for the GIV.

**Medium Human Development Level**

For the countries that are in the group of medium HDL the regression shows that the t-values are significant for all but the GCF and the GIV when it is alone in the regression (Appendix 7). The values for the adjusted $R^2$ and the F-Values are once again larger for the GDI than the GIV.

**Low Human Development Level**

When looking at the countries with low HDL there are slightly different results (Appendix 8). The lag GCF and the GIV alone is insignificant, but all the other variables have shown to be significant. Just as with the other development levels the GIV has lower adjusted $R^2$ and the F-Values than the GDI. Although in this development level the values are much smaller than the ones in for the other two.

4.4.3 Changes in Human Development Level

For this regression the author had to distinguish between the countries that remained within the same HDL, those that have improved their level and those where the change in development has been indecisive. This was done by placing the different countries within the appropriate groups. One group for those that had no change, two for improvements where one was from medium to high and the other from low to medium, the fourth group were for those countries that have been indecisive. The regressions for this have been done with respect to the changes in HDL to see if there are any differences when it comes to the relations between the variables in countries that belong in the different development levels.
No Changes Human Development Level

Looking at the group with no changes it is possible to see that all the variables have significant t-values, apart from the lag GCF when included in the regression with the GDI (Appendix 9). Just as for the regressions for HDL the adjusted $R^2$ and the F-Values are higher for GDI than for GIV.

Changes from Medium to High Human Development Level

For the countries that have improved their HDL from medium to high there is a difference in the variables that are significant (Appendix 10). The GDI and the GIV are significant for all the different regressions, but these two are the only that are significant in all regressions. The LFPR are only significant when included for the GDI, just as the GCF and the lag GCF are only significant when included with the GIV.

Changes from Low to Medium Human Development Level

For the group that has moved from low to medium HDL there are some interesting results that show how the variables are significant in some regressions, but not in others (Appendix 11). In this case it is the LFPR and lag GCF which are significant in all regressions and the GCF is insignificant for all. The GIV is significant for all apart from when it is the only variable. The GDI is significant for all, but when included with the LFPR and the GCF. The adjusted $R^2$ and the F-Value are higher for regressions II, IV, VI and VIII, this means that two are important for GDI and two for GIV which is different from the other groups.

Fluctuations in Human Development Levels

The fluctuation in the HDL means that the countries shifted both from low to medium or medium to high and back. A distinction was not made between the countries that moved from either low or medium, since countries were equally difficult to sort into appropriate development levels. Here the GIV and GDI have significant t-values for all the regressions, whereas lag GCF is insignificant for all (Appendix 12). The LFPR and GCF are just significant when included with the GIV and insignificant when included with the GDI. In this case the adjusted $R^2$ and F-Value are quite high for all the regressions apart from when GIV is the only variable.
5 Analysis

The purpose of this paper was to see if improvements of the gender equalities have positive effect on the GDP and GDP per capita. With this in mind the data presented in the previous section will be analyzed in accordance with the appropriate theories and those were outlined in the theoretical framework. There has been evidence that there is a positive relation between economic growth and increased equality in education as well as employment. Testing whether GDI and GIV influences GDP and GDP per capita tells us how gender equality affects economic growth. There is however one aspect of these regressions that have to be considered and that is the direction of causality. The results for these regressions were mentioned in the previous chapter and these will be analyzed here to see what the outcome is.

The GIV contains the GDI and the GDI itself is in turn made up from three different components. Of these components it has been proven that education is an important factor for improving not just the living standard of the women that are educated, but for increasing the well-being of all individuals in the nation. It is possible to see that as the education levels increase, there is a positive effect on the equality which is illustrated in the improvement of both GDI and GIV. This improvement has been noted in the data set which shows that there is a positive trend where the education gap to become smaller. Education is, as previously mentioned, not the only component of the measurements. Since the life span of women tends to be longer than that of men this is not an issue that can be helped by improving the gender equality. The last component is the income which is strongly linked to that of the education and one that is generally much lower for women.

The use of the GDP as the dependent variable for the regressions was meant to get an overview of the situation in the countries and in the different HDLs. Only when the countries are all together there is explanatory level that is sufficiently high and gives good performance in the specification tests (Appendix 1). Regressions (15) to (18) all confirm the theories that the labor and investment, both current and previous, are important for the economy and GDP. The high LFPR shows that as more people are participating in the production in a country and that there is a lower loss of output by including more of the labor force in the production. The need of a high LFPR and investment in the economy is thus supported by the results in this thesis as well as previous studies. The GDI is extremely high for the regressions looking at the entire world, which strongly indicate that when there is more equality between the genders there is a high positive effect on the GDP. That the composite index effects the GDP is in line with the theories that claim that the improvements of the different components, such as education and income, have a positive effect on economic growth.

However, looking at the results from the different HDLs the theory state that capital is more important than labor for the MDCs or countries with high HDL and this is the case for this data set (Appendix 2). According to the same theories both labor and capital should be significant for the development in the countries that are in between the high and low extremes. In this case, this is true for the medium HDL countries (Appendix 3).
Lagged GCF is not significant however saying that those investments in the past have not had that much impact whereas investments now have more effect. For the countries with low HDL the lagged GCF is not significant, but the GCF and the LFPR are (Appendix 4). This shows how important labor and investment are for the countries to have a high level of development and economic growth. In all the different HDLs GDI is significant at the 0.01 level indicating how important equality is for the GDP. That result would then signify that no matter how developed a country is, gender equality is always an important factor.

Moving on to the analysis of the regressions with the GDP per capita as the dependent variable with the use of all countries in the regressions will give a clearer look at how things improve for the individual. For theses regressions the equations (19) to (26) were used for all the regressions with GDP per capita as dependent variable. With the use of the GDP per capita the GIV was shown to be significant as well, in many cases at a 0.01 significance level. The GIV is a measure of inequality that the theories state should be negatively correlated with economic growth and this is clearly the case with GDP per capita (Appendix 5). All the values for the GIV are very strongly negative for these four regressions. The explanatory power is however quite low and that means that even if the GIV shows that there is an effect this is minute to the total outcome of the GDP per capita. The GCF is insignificant, but the LFPR and lagged GCF are significant and negative. This would say that as the unemployment decreases, LFPR increases and this would have a negative impact on the GDP per capita which is quite unlikely. Instead, when looking at the regressions with the GDI as the measure for equality there is a higher explanatory power and the equality is highly correlated with a positive effect on GDP per capita, also at 0.01 significance level. Here there is once again an indication that the improvement of equality in a country has that strong effect on the GDP per capita. The GCF and the lagged GCF are both negatively significant. There is a need for substantial lags in the adjustment of investment to the changes in the output, so the GCF might not capture the true value of the investment on the GDP per capita.

The results for the regressions done for the GDP per capita and HDL were mentioned earlier. For the high HDL the narrow GIV does not give as many significant values as the broader GDI does and the adjusted $R^2$ is also higher with the GDI (Appendix 6). Interestingly enough the LFPR is significant here, indicating that the LFPR is important for the GDP per capita whereas the GCF and lagged GCF are not. For the medium HDL the GDI is more significant and yields higher explanatory power, showing that it is more appropriate to use to capture more of what is occurring (Appendix 7). Here the LFPR are all negative, the lagged GCF are positive and GCF insignificant. With the GCF it would show that the investment in the previous year has been important for the GDP per capita this year. Also with the low HDL the GIV significant, but less so than the GDI, which once again has a higher adjusted $R^2$ (Appendix 8). The LFPR and the GCF when included with the GDI are significant although negative, but the other variables are not. For these regressions then there are some contradictions between the result and the theories, since the results show opposite results from what should be expected from the theories. One thing that is very clear is that the gender equality is significant for the GDP per capita irrespective of the HDL.
For the regressions including the GDP per capita and the changes of the HDL there is no real theory since the countries that have stayed in the same category or have improved their development level. For the countries where there was no change the GIV was negatively significant and the GDI strongly positively significant (Appendix 9). For these countries the LFPR is positive for the GDI and negative for GIV, the rest are also negative showing that there is a negative correlation between the investment and the GDP per capita. For the countries that have improved both from medium to high (Appendix 10) and from low to medium (Appendix 11) there are similarities. Both have GIV that in absolute value is almost as large as that of the GDI, and both have adjusted R² that are almost on the same level. Once again the LFPR are shown to be negatively significant. The GCF and lag GCF are positive, meaning that the investment is important for the GDP per capita which is also in accordance with the theories. There is a need for investment in order for development to occur. Even for the countries that move back and forth between different development levels show that the equality measures are significant for explaining the GDP per capita, even if the GDI has a higher value of adjusted R² (Appendix 12). For these countries the investment is also indicated to be more important than that of the labor force. The labor force is negatively significant for the GIV values. For the regressions including GDI, only the GDI is significant and the other have no impact on the GDP per capita.

In this paper the major focus is on all the countries together, since this provides an overview of the situation and also allows for more universal implications. Another objective in this thesis is to present an indication of how inequality affects GDP in countries at different stages of development. This is increasingly important in a world where gaps in both development and gender equality show no signs of decreasing. With the use of the different tables that contain the regressions with the results it has been possible to see that there are different outcomes when using different dependent variables. The GDP per capita allows for comparing the conditions for an individual with that of the entire country. The major difference between the two is that the GIV was insignificant to be included with the GDP. Moreover, since the adjusted R² is so low for including the narrow GIV value the focus from here on in the analysis will be on GDI.

Throughout all the regressions it has been clear that the GIV and GDI are significant. Irrespective if the regression was run with all countries or a division according to HDL the gender equality indices tended to be significant at either 0.01 or 0.05 significance level. The implication of this would mean that gender equality is important for the GDP and GDP per capita. Graphically it was shown that there was clearly an exponential relationship between the GDI and GDP per capita implying that once the striving for equality has started it will improve significantly (Figure 3). More explicitly this was visualized with Figure 8 and Figure 9, that once reaching and going beyond medium HDL the GDP per capita and GDI improve considerably. Due to the issue of causality all that can be stated from this is that gender equality and GDP per capita are strongly correlated. The improvement of one of these variables is then important for the progress of the other.
It is very clear to see that the results from the regressions with both the GDP and GDP per capita give almost identical results which make it very easy to analyze. As can be seen from the values of the GDI, as the level of equality in the country increases both the nation and the individual benefit strongly as the economy grows. The LFPR is also very positive showing that as the number of employed increase or unemployed decrease the productivity and output increases which results in a larger GDP and thus also GDP per capita. There is a negative impact from the GCF and the lag GCF on both GDP and GDP per capita. The negative relationship might be due to a crowding out effect, since increasing public investment will increase the country’s budget deficit, which in turn reduces the national savings, investment and the GDP. The adjusted $R^2$ for these regressions are decent enough to explain the full effect on GDP and GDP per capita. All in all the equations and regressions are significant to explain the GDP and GDP per capita since the F values are so incredibly high. Even if the individual observations were not normally distributed with the amount of observations that is no problem for this data set since it exceeds the rule of thumb for central limit theory.
6 Conclusion

Inequality between genders within in country manifests itself in many ways. In several studies it has been shown that there is a clear link between the gender equality within a country and the GDP and GDP per capita. There are several measurements that include gender inequality. The most frequently used are the GDI and GIV. These composite indices include the life expectancy index, income index and education index which is composed of the adult literacy rate and gross enrollment. All of these components are important for the understanding of inequality and they have been studied previously in other papers.

According to the economic theories from these previous papers it is clear that the reduction of inequality in education and income will increase the economic growth in a country. From other papers it has also showed that if women are empowered there is a reduction in the inequality and improvement of the economic growth. These individual components were not investigated in this paper, but from the literature it was clear that an improvement in the components should have a positive effect on the GDP and GDP per capita.

Stated in many theories labor, capital and human capital are important for the GDP, which was also confirmed when running the regression in this thesis. In the case of development though, it was not clear from the regressions whether the distinction that the MDCs use more capital whereas LDCs use labor was correct. The labor was still shown to have a significant impact on the GDP and so did the GCF. This is in line with the theories that these two variables have a significant impact on the total value of output, economic growth and GDP.

It has been shown in several regressions throughout this thesis that there is a very strong correlation between gender equality and GDP. This is in accordance with the theories that state that gender equality is important to be able to reduce the economic loss and improve economic growth. Thus it is clear to see that there is a link between gender equality and the economy, although it is not possible to state the exact direction of the effects. Stating that the gender equality is correlated with the GDP is in accordance with the theories that have been established. To conclude, this thesis has shown, in line with the previous studies, that the improvements in the gender equality can have positive effect on the GDP and GDP per capita. Although it cannot be stated conclusively that this is the direction of the effects.

6.1 Further Research

The UN has started to use a new measurement the Gender Inequality Index (GII) to be able to better see the level of inequality in a country. This composite index has different components than that of GDI and GEM, but it still measures the loss of potential human development. A potentially very interesting field of future research would be to see if there is a correlation between the economic growth or GDP and the GII.
7 References


ECLAC. (2009). *Gender Equality, Poverty and Achieving the MDGs in the Caribbean Subregion*. Trinidad and Tobago: Economic Commission for Latin America and the Caribbean.


http://data.worldbank.org/indicator/NY.GDP.MKTP.CD

http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG

http://data.worldbank.org/indicator/NE.GDI.TOTL.ZS


8 Appendix

Appendix 1 - The effect on GDP when looking world wide

<table>
<thead>
<tr>
<th>Variable</th>
<th>I</th>
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<th>IV</th>
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<tbody>
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<td>GDI Value</td>
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<td>0.764</td>
<td>0.747</td>
</tr>
<tr>
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<td>(31.676)</td>
<td>(31.873)</td>
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<tr>
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<td></td>
<td></td>
<td>(-2.672)</td>
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| Adj. R²    | 0.396  | 0.448  | 0.460  | 0.460  |
| F-Value    | 852.144 | 524.135 | 354.395 | 339.648 |
| No. Of Obs | 1296   | 1288   | 1246   | 1193   |

The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ± 2.58

Appendix 2 - The effect on GDP when looking at countries with a high Human Development Level

<table>
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<td>(5.924)</td>
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<tr>
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<td>(0.726)</td>
<td>(0.857)</td>
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<td></td>
<td></td>
<td></td>
<td>(-1.665)</td>
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| Adj. R²      | 0.089  | 0.088  | 0.095   | 0.091  |
| F-Value      | 46.065 | 23.228 | 17.164  | 15.492 |
| No. Of Obs   | 463    | 463    | 463     | 435    |

The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ± 2.58
Appendix 3 - The effect on GDP when looking at countries with a medium Human Development Level

**Dependent variable: GDP**

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<th>IV</th>
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<td></td>
<td></td>
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<td>Adj. R²</td>
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<td>0.040</td>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ±2.58

Appendix 4 - The effect on GDP when looking at countries with a low Human Development Level

**Dependent variable: GDP**

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<td>GDI Value</td>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ±2.58
Appendix 5 - The effect on GDP per capita when looking world wide

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<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
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<tbody>
<tr>
<td>GIV percent</td>
<td>-0.276</td>
<td>-0.227</td>
<td>-0.276</td>
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<td>GDI Value</td>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ± 2.58

Appendix 6 - The effect on GDP per capita when looking at countries with a high Human Development Level

<table>
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<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-0.087</td>
<td>-0.082</td>
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<td>0.633</td>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ± 2.58
### Appendix 7 - The effect on GDP per capita when looking at countries with a medium Human Development Level

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<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
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<td>0.091</td>
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</tr>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ±2.58

### Appendix 8 - The effect on GDP per capita when looking at countries with a low Human Development Level

<table>
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<th>VIII</th>
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<td>0.081</td>
<td>0.152</td>
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<td>0.201</td>
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<td>7.755</td>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ±2.58
Appendix 9 - The effect on GDP per capita when looking at countries that have not changed their Human Development Level

**Dependent variable: GDP per capita**

<table>
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<tr>
<th>Variable</th>
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<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
</tr>
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<td>-0.315</td>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ± 2.58

Appendix 10 - The effect on GDP per capita when looking at countries that have improved their Human Development Level from Medium to High

**Dependent variable: GDP per capita**

<table>
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<th>Variable</th>
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<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
</tr>
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<tbody>
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<td>GIV percent</td>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ± 2.58
Appendix 11 - The effect on GDP per capita when looking at countries that have improved their Human Development Level from Low to Medium

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<tr>
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The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ±2.58

Appendix 12 - The effect on GDP per capita when looking at countries that have changed their Human Development Level by fluctuating

<table>
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<th>VI</th>
<th>VII</th>
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<td>GIV percent</td>
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</table>

The t-values represented within brackets. Significant at 0.05 and 0.01 level at ±1.96 and ±2.58