Women's Empowerment: Gender-related Indices as a Guide for Policy

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Introduction

The most important determinant of a country's competitiveness is its human talent – the skills, education and productivity of its workforce. And women account for one-half of the potential talent base throughout the world. Over time, therefore, a nation's competitiveness depends significantly on whether and how it educates and utilises its female talents.

To maximise its competitiveness and development potential, each country can strive for gender equality – that is, to give women the same rights, responsibilities and opportunities as men. Gender equality is a development goal in its own right and – as research has shown – is instrumental for the long-term growth prospects of countries.

While significant improvements towards reaching gender equality and empowerment of women have already been achieved (e.g., an impressive increase in girls' school enrolment worldwide over the last five to ten years), the situation of women remains largely still unsatisfactory, especially in developing countries. In these countries women are still largely denied access to the formal labour market, do not have equal opportunities to qualify for higher employment and are consequently less likely to occupy administrative or managerial positions. But also in developed countries – where basic gender equality appears to have been achieved – the challenge is now to fight the more intangible discrimination against working women, especially in managerial positions.

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A better understanding of the main barriers constraining the economic role of women is necessary for designing gender policies that promote gender equality. There are several gender-related analyses of different organisations which produce periodical indices to identify gender equality.

The development of gender indices

The past three decades have witnessed a steadily increasing awareness of the need to empower women through measures that increase social, economic and political equity, and provide broader access to fundamental human rights, basic health and education. Along with the awareness of the lower status of women has come the concept of gender as an overarching socio-cultural variable, seen in relation to other factors, such as race, class, age and ethnicity. Gender is not synonymous with women, nor is it a zero-sum game implying loss for men. Rather, it refers to both women and men, and to their status, relative to each other (Lopez-Claros and Zahidi 2005).

Gender equality means women and men have equal opportunities to realise their individual potential, contribute to their country's economic and social development, and benefit from their participation in society. It refers to that stage of human social development at which the rights, responsibilities and opportunities of individuals will not be determined by the fact of being born male or female. In most societies, however, distinct gender roles and responsibilities restrict the opportunities and resources available to women and men, frequently in ways that contradict women's basic human rights and threaten overall human development (UNDP 2007).

International commitments

In recognition of the importance of establishing gender equality around the world many countries have agreed to respond to these inequalities through different central commitments. In 1984, the United Nations Development Fund for Women (UNIFEM) was established as a separate fund within the United Nations

Development Program (UNDP) with the instruction to ensure women's involvement in mainstream activities. The Commission on the Status of Women has been responsible for organising and following up the world conferences on women in Mexico (1975), Copenhagen (1980) and Nairobi (1985). Many countries also took part in the international negotiations of the 1995 UN Fourth World Conference on Women in Beijing that produced the "Platform for Action".

> "Women's empowerment and their full participation on the basis of equality in all spheres of society, including participation in the decision-making process and access to power, are fundamental for the achievement of equality, development and peace" (UN 1995, para 13).

They expanded the concept of the UNIFEM, calling it "gender mainstreaming" as a mandate for all member states. This concept includes the application of gender perspectives to all legal and social norms and standards, to all policy development, research, planning, advocacy, development, implementation and monitoring. As a result of this conference and many years of work leading up to it more than 100 countries announced new initiatives to improve the status of women (UNDP 2007).

At the 2000 UN Millennium Summit, over 150 countries committed themselves to eight "millennium goals". One of these goals is the promotion of gender equality and the empowerment of women.

> "Eliminate gender disparity in primary and secondary education, preferably by 2005, and at all levels of education no later than 2015:
> 1. Ratios of girls to boys in primary, secondary and tertiary education,
> 2. Share of women in wage employment in the non-agricultural sector,
> 3. Proportion of seats held by women in national parliament" (UN 2000).

Empowerment of women

As one of the important commitments the declaration of Beijing points out the necessity of women's empowerment for the achievement of equality, development and peace in a country. Empowerment is not something that can be done by outsiders (e.g., special initiatives) "to" women. Instead, programmes can help to create the conditions whereby women can become the agents of their own development and empowerment. Women's empowerment can be viewed as a composition of interrelated and mutually reinforcing components:

- Awareness building about women's situation, discrimination, rights and opportunities as a step towards gender quality. Collective awareness building provides a sense of group identity and the power of working as a group.
- Capacity building and skills development, especially the ability to plan, make decisions, organise,

Table 1

Selection of gender-related indices[a)]

Measurement focus	Country coverage	Time coverage	Data sources
Gender-related Development Index (UNDP)			
Inequality in achievement between women and men. The GDI provides a single score calculated from the following: life expectancy at birth; adult literacy rate; combined gross enrolment ratio for primary, secondary and tertiary education; estimated earned income.	157 countries	Annually since 1995	UN, World Bank statistics
Gender Empowerment Measure (UNDP)			
The extent to which women and men are able to actively participate in economic and political life and take part in decision-making. The GEM provides a single score calculated from the following: seats in parliament held by women; female legislators, senior officials and managers; female professional and technical workers; ratio of estimated female to male earned income.	109 countries worldwide	Annually since 1995	UN, ILO, Inter-Parliamentary Union, World Bank statistics
Global Gender Gap Index (World Economic Forum)			
Four subindices composed of 14 different indicators. The subindices are economic participation and opportunity, educational attainment, political empowerment and health and survival. All are explicitly gender-related.	134 countries worldwide	Latest 2007; began 2006 but calculated back to 2000	International data sources

[a)] For more information about other indices see UNDP (2009a).

Source: UNDP (2009a, 52–72).

manage and carry out activities, to deal with people and institutions in the world around them.
- Participation, greater control and decision-making power in the home, community and society.
- Action to bring about greater equality between men and women.

In short, empowerment is a process of awareness and capacity building leading to greater participation, to greater decision-making power and control, and to transformative action (Karl 1995).

Different gender indices

There are several gender-related assessments based on different datasets that provide benchmarks at the country level. The aim is firstly to identify existing strengths and weaknesses as a useful guide for policy to reinforce women's empowerment and gender equity. Secondly with these indices the intention is to learn from the experiences of those countries that have had greater success in promoting the equality of women and men. Table 1 shows three common gender-related indices, which are discussed below in more detail.

The Gender-related Development Index (GDI)

The baseline concept of human development

Human development is about the realisation of human potential, i.e., what people can do and become, and about the freedom they have to exercise real choices in their lives (UNDP 2007, 1). It is more than the rise or fall of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests. The fundamental thing is to build human capabilities.[1] The most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community (UNDP 1994).

For decades, countries' levels of welfare were measured in terms of economic growth or an increase in GDP per capita. But GDP as a yardstick for a country's development is inadequate. That means that a more comprehensive measure capturing socioeconomic progress and human well-being was needed. The Human Development Index (HDI) – first introduced in 1990 in the Human Development Report by UNDP (1990) – is a new way of measuring a country's average achievements by combining indicators in three basic aspects of human development: health, knowledge and a decent standard of living. Human development is a broad concept with many dimensions. The HDI is not able to capture the whole concept of human development. For example, it does not reflect political participation, gender disparity and human poverty, but it offers a broad proxy for human development.

Since 1990 the analytical framework of the HDI has been rigorously checked. Currently the HDI takes into account the following dimensions:

- A long and healthy life, measured by live expectancy at birth;
- Knowledge, measured by the adult literacy rate (with two-thirds weight) and the combined gross enrolment ratio at primary, secondary and tertiary levels (with one-third weight) and
- A decent standard of living, measured by GDP per capita in purchasing power parity (PPP) in USD.

GDI as a gender-sensitive adjustment of HDI

The UNDP introduced the GDI in the Human Development Report for the first time in 1995. The aim was to add a more distribution sensitive measure to the HDI. The GDI is a measure of human development that adjusts the HDI for disparities between men and women.[2] The idea behind the GDI is to penalise the HDI if gender inequality exists in one of the three dimensions of the HDI. The larger the gap between women and men in achievements in any of the three dimensions, the more the GDI differs from the HDI. The gap between HDI and GDI is therefore interpreted as the loss of human development due to gender inequality (Klasen and Schüler 2009, 4).

The GDI uses the same variables as the HDI. The difference is that the GDI adjusts the average achievement of each country in life expectancy, educational attainment and income in accordance with the degree of disparity in achievement between women and men. For this gender-sensitive adjustment the UNDP uses a weighting formula that

[1] Capabilities – the range of things that people can do or be in life.

[2] It is therefore not a measure of gender inequality.

expresses a moderate aversion to inequality, setting the weighting parameter, ε equal to 2.[3] This is the harmonic mean of the male and female values. With the inequality aversion parameter the average human development achievement in each dimension is penalised by the existing gender inequality in that dimension (Klasen 2006, 245). Therefore the GDI has to be interpreted as the HDI discounted for gender disparities in its components (Schüler 2006, 163). It is important to know that the variable for education attainment is a composite index. It includes adult literacy with a two-third weight and gross combined primary, secondary and tertiary enrolment with one-third weight.

Table 2

Goalposts for calculating the GDI

Indicator	Maximum value	Minimum value
Female life expectancy at birth, in years (UN)	87.5	27.5
Male life expectancy at birth, in years (UN)	82.5	22.5
Adult literacy rate, in % (UNESCOa)	100	0
Combined gross enrolment ratio, in % (UNESCOb)	100	0
Estimated earned income, in PPP USD (World Bank)	40,000	100

Notes:
UN: UN (2009), World Population Prospects: The 2008 Revision, New York: Department of Social and Economic Affairs.
UNESCOa: UNESCO Institute for Statistics (2009), Correspondence on Adult and Youth Literacy Rate, February, Montreal.
UNESCOb: UNESCO Institute for Statistics (2009), Correspondence on Education Indicators, February, Montreal.
World Bank: World Bank (2009), World Development Indicators, Washington DC.

Source: UNDP (2008a, 358).

The calculation of the GDI takes place in three steps:

1. Performance of each dimension is expressed as a value between 0 and 1. Female and male indices in each dimension are calculated according to the following formula:

$$\text{Dimension index} = \frac{\text{C-Min(C)}}{\text{Max(C)-Min(C)}}$$

where C is the actual value of the indicator, Min(C) and Max(C) are the minimum and maximum sample value of each indicator C (see Table 2 for the goalposts).

2. Female and male indices in each dimension are combined in a way that punishes differences in achievement between men and women. The resulting index, the so-called equally distributed index, is calculated by the following formula:

$$\text{Equally distributed index} = \left\{\left[\text{female population share}\left(\text{female index}^{1-\varepsilon}\right)\right] + \left[\text{male population share}\left(\text{male index}^{1-\varepsilon}\right)\right]\right\}^{1/1-\varepsilon} \quad \text{with } \varepsilon = 2.^{4}$$

3. Calculating the GDI by combining the three equally distributed indices in an unweighted average.

A note on the calculation of the GDP index: The GDP index is calculated using adjusted GDP per capita (PPP USD). Income is adjusted because achieving a respectable level of human development does not require unlimited income. Accordingly, the logarithm of income is used. The GDI covered 157 countries worldwide in 2009 and has been updated every year since 1995. The used data for constructing the GDI are from the UN and the World Bank statistics. Box 1 summarises how the GDI is constructed and gives an illustration for the calculation with the data for Sweden.

The Gender Empowerment Index (GEM)

The GEM aspires to measure the relative empowerment of women and men in political and economic spheres of activity. This measure considers gender gaps in political representation, professional and management positions, and earned incomes. Therefore the GEM focuses on women's opportunities rather than their capabilities. In doing so, the GEM focuses on three key areas:

- Political participation and decision-making power, as measured by women's and men's percentage shares of parliamentary seats.

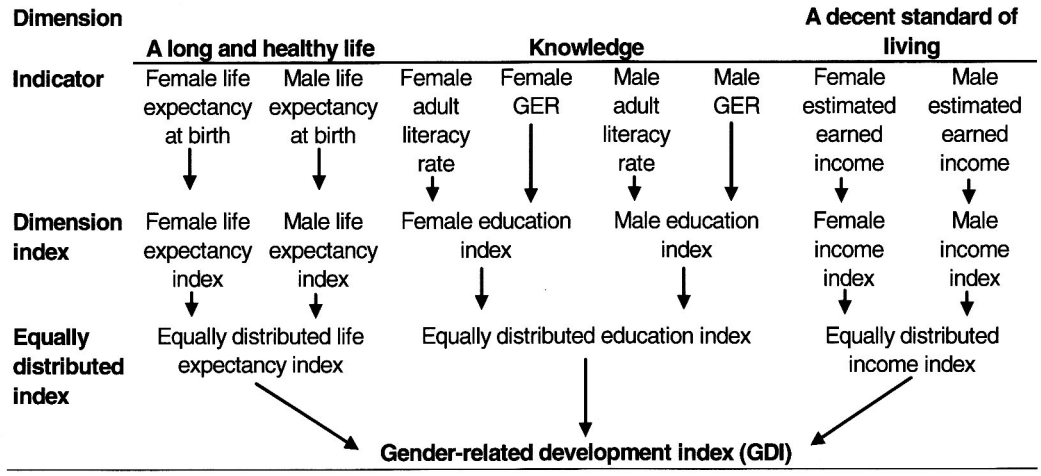
[3] The value of ε is the size of the penalty for gender inequality. The larger the value, the more heavily a society is penalised for having inequalities. If ε = 0, gender inequality is not penalised (in this case the GDI would have the same value as the HDI).

[4] With ε = 2 the general formula becomes:

$$\text{Equally distributed index} = \left\{\left[\text{female population share}\left(\text{female index}^{-1}\right)\right] + \left[\text{male population share}\left(\text{male index}^{-1}\right)\right]\right\}^{-1}.$$

Box 1

Calculating the GDI



An illustration of the calculation of the GDI with data for Sweden:

1. Calculating the equally distributed life expectancy index

Female
Population share: 0.504
Life expectance: 83.0 years

$$\text{Life expectancy index} = \frac{83.0 - 27.5}{87.5 - 27.5} = 0.925$$

Male
Population share: 0.496
Life expectancy: 78.6 years

$$\text{Life expectancy index} = \frac{78.6 - 22.5}{82.5 - 22.5} = 0.935$$

$$\text{Equally distributed life expectancy index} = \left\{\left[0.504\left(0.925^{-1}\right)\right] + \left[0.496\left(0.935^{-1}\right)\right]\right\}^{-1} = 0.930\,.$$

2. Calculating the equally distributed education index

Female
Population share: 0.504
Adult literacy rate: 99.0 %

$$\text{Adult literacy index} = \frac{99.0 - 0}{100 - 0} = 0.990$$

Gross enrolment rate: 99.0%

$$\text{Gross enrolment index} = \frac{99.0 - 0}{100 - 0} = 0.990$$

Male
Population share: 0.496
Adult literacy rate: 99.0%

$$\text{Adult literary index} = \frac{99.0 - 0}{100 - 0} = 0.990$$

Gross enrolment rate: 89.8%

$$\text{Gross enrolment index} = \frac{89.8 - 0}{100 - 0} = 0.898$$

$$\text{Female education index} = \frac{2}{3}(0.990) + \frac{1}{3}(0.990) = 0.990$$

$$\text{Male education index} = \frac{2}{3}(0.990) + \frac{1}{3}(0.898) = 0.959$$

$$\text{Equally distributed education index} = \left\{\left[0.504\left(0.990^{-1}\right)\right] + \left[0.496\left(0.959^{-1}\right)\right]\right\}^{-1} = 0.975\,.$$

3. Calculating the equally distributed income index

Female
Population share: 0.504
Estimated earned income (PPP USD): 29,476

$$\text{Income index} = \frac{\log(29{,}476) - \log(100)}{\log(40{,}000) - \log(100)} = 0.949$$

Male
Population share: 0.496
Estimated earned income (PPP USD): 44,071

$$\text{Income index} = \frac{\log(44{,}071) - \log(100)}{\log(40{,}000) - \log(100)} = 1.016$$

$$\text{Equally distributed income index} = \left\{\left[0.504\left(0.949^{-1}\right)\right] + \left[0.496\left(1.016^{-1}\right)\right]\right\}^{-1} = 0.981\,.$$

4. Calculating the GDI

$$\text{GDI} = \frac{0.930 + 0.975 + 0.981}{3} = 0.962\,.$$

Sources: UNDP (2009), http://hdr.undp.org/en/statistics/, accessed 25/11/09; UNDP (2008a, 355).

- Economic participation and decision-making power, as measured by two indicators
  - Women's and men's percentage shares of positions as legislators, senior officials and managers;[5]
  - Women's and men's percentage shares of professional and technical positions.[6]
- Power over economic resources, as measured by women's and men's estimated earned income (PPP USD).

For each of the three dimensions, an equally distributed equivalent percentage (EDEP) is calculated, as a population-weighted average. The general formula is:

$$EDEP = \left\{ \left[\text{female population share} \left(\text{female index}^{1-\varepsilon} \right) \right] + \left[\text{male population share} \left(\text{male index}^{1-\varepsilon} \right) \right] \right\}^{1/1-\varepsilon}.$$

To be consistent with the methodology of the GDI, UNDP sets the value of ε (measures the aversion of inequality) equal to 2.[7]

Given society's aversion to inequality, the EDEP would be as socially valued as the actual unequal percentages of women and men. If there were perfect equality between women and men, the EDEP would be equal to 50 percent, i.e., the maximum value for the indexation is 50 percent and the minimum value is 0 percent. For the indexation of the income, UNDP uses as maximum value 40,000 USD and as minimum value 100 USD.

The GEM covered 109 countries worldwide in 2009 and has been updated every year since 1995. The used data for constructing the GEM are taken from the UN, ILO (International Labour Organisation), Inter-Parliamentary Union and the World Bank statistics (see A1 for more information). Box 2 summarises how the GEM is constructed and gives an illustration for the calculation with the data for Sweden.

The Global Gender Gap Index (GGI) of the World Economic Forum

The aim of the GGI, introduced by the World Economic Forum in 2005, is "to be a tool for benchmarking and tracking global gender-based inequalities on economic, political, education- and health-based criteria" (Hausmann et al. 2007, 3). Therefore it is an alternative measure to the GDI and GEM – it combines both indices in one and provides additional information on gender equality.

Four important dimensions on female empowerment have been chosen for the calculation of the GGI: economic participation and opportunity, educational attainment, political empowerment and health and survival (see A2 for more information on the used sources). Box 3 displays all four dimensions and the 14 different indicators.

The calculation of the GGI is divided into four steps:

1. Convert to ratios
   All used data are converted to female/male ratios. Why? Because the index is meant to capture gaps between women and men's attainment levels and should not capture the levels themselves.[8]
2. Truncate date at equality benchmark
   Now the ratios are truncated at the equality benchmark, i.e., all variables, except the two health variables, are considered to be 1, meaning equal numbers of women and men. The equality benchmark for the sex ratio at birth is set to 0.944[9] and for the healthy life expectancy is set to 1.06[10]. Truncating the data at the equality benchmark yields the same score for countries that have reached parity between women and men, or where women outperform men.

   To capture "gender equality" with the index a "one-sided" scale is used, i.e., this type of scale measures how close women are to reaching parity with men but does not reward or penalise countries for having a gender gap in the other direction.

[5] Legislators, senior officials and managers (percent female): Women's percentage share of positions defined according to International Standard Classification of Occupations (ISCO-88) to include legislators, senior government officials, senior officials of special-interest organizations, corporate managers, directors and chief executives, production and operations department managers and other department and general managers. Source: UNDP (2009c).

[6] Professional and technical workers (percent female): Women's percentage share of positions defined according to the International Standard Classification of Occupations (ISCO-88) to include physical, mathematical and engineering science professionals (and associate professionals), life science and health professionals (and associate professionals), teaching professionals (and associate professionals) and other professionals and associate professionals. Source: UNDP (2009c).

[7] With ε = 2 the general formula becomes:

$$EDEP = \left\{ \left[\text{female population share} \left(\text{female index}^{-1} \right) \right] + \left[\text{male population share} \left(\text{male index}^{-1} \right) \right] \right\}^{-1}.$$

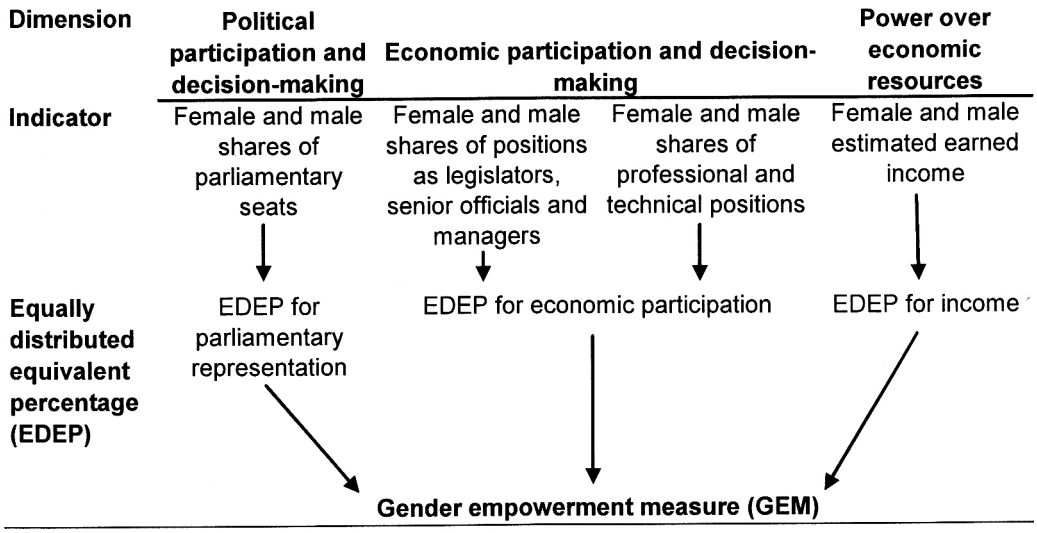
[8] For example a country with 20 percent of women in ministerial positions is assigned a ratio of 20 women/80 men = 0.25 on this variable.

[9] This ratio is based on what is considered to be a "normal" sex ratio at birth, 1.06 males for every female born.

[10] This ratio is based on the standards used in the UN's Gender-Related Development Index, which uses 87.5 years as the maximum age for women and 82.5 years as the maximum age for men.

Box 2

Calculating the GEM



An illustration of the calculation of the GEM with data for Sweden:

1. Calculating the EDEP for parliamentary representation

Female
Population share: 0.504
Parliamentary share: 47.0%

Male
Population share: 0.496
Parliamentary share: 53.0%

$$\text{EDEP for parliamentary representation} = \left\{\left[0.504\left(47.0^{-1}\right)\right] + \left[0.496\left(53.0^{-1}\right)\right]\right\}^{-1} = 49.80 .$$

Then this initial EDEP is indexed to an ideal value of 50%:

$$\text{Indexed EDEP for parliamentary representation} = \frac{49.80}{50} = 0.996 .$$

2. Calculating the EDEP for economic participation

Female
Population share: 0.504
Percentage share of positions as legislators, senior officials and managers: 32.0%
Percentage share of professional and technical positions: 51.0%

Male
Population share: 0.496
Percentage share of positions as legislators, senior officials and managers: 68.0%
Percentage share of professional and technical positions: 49.0%

EDEP for positions as legislators, seniors officials and managers =

$$\left\{\left[0.504\left(32.0^{-1}\right)\right] + \left[0.496\left(68.0^{-1}\right)\right]\right\}^{-1} = 43.40 .$$

$$\text{Indexed EDEP for positions as legislators, senior officials and managers} = \frac{43.40}{50} = 0.868 .$$

$$\text{EDEP for professional and technical positions} = \left\{\left[0.504\left(51.0^{-1}\right)\right] + \left[0.496\left(49.0^{-1}\right)\right]\right\}^{-1} = 50.00 .$$

$$\text{Indexed EDEP for professional and technical positions} = \frac{50.00}{50} = 1.000 .$$

The two indexed EDEP's are averaged to create the EDEP for economic participation:

$$\text{EDEP for economic participation} = \frac{0.868 + 1.000}{2} = 0.934 .$$

Box 2 continued

3. Calculating the EDEP for income

Female
Population share: 0.504
Estimated earned income (PPP USD): 29,476

Male
Population share: 0.496
Estimated earned income (PPP USD): 44,071

$$\text{Female income index} = \frac{29{,}476 - 100}{40{,}000 - 100} = 0.736 \qquad \text{Male income index} = \frac{44{,}071 - 100}{40{,}000 - 100} = 1.102$$

The female and male indices are then combined to create the equally distributed index:

$$\text{EDEP for income} = \left\{\left[0.504\left(0.736^{-1}\right)\right] + \left[0.496\left(1.102^{-1}\right)\right]\right\}^{-1} = 0.881.$$

4. Calculating the GEM

$$\text{GEM is simply the average of the three EDEP indices: } \text{GEM} = \frac{0.996 + 0.934 + 0.881}{3} = 0.937.$$

Sources: UNDP (2009), http://hdr.undp.org/en/statistics/, accessed 25/11/09; UNDP (2008a, 355).

3. Calculate subindex scores

The third step contains the calculation of the weighted average of the variables within each subindex to create the subindex scores. "Averaging the different variables would implicitly give more weight to the measure that exhibits the largest variability or standard deviation" (Hausmann et al. 2009, 5). Therefore the variables have to be normalised in terms of equalising their standard deviations.[11] This weighting scheme allows for each variable to have the same relative impact on the subindex. See Table 3 for the used weights.

4. Calculate final scores

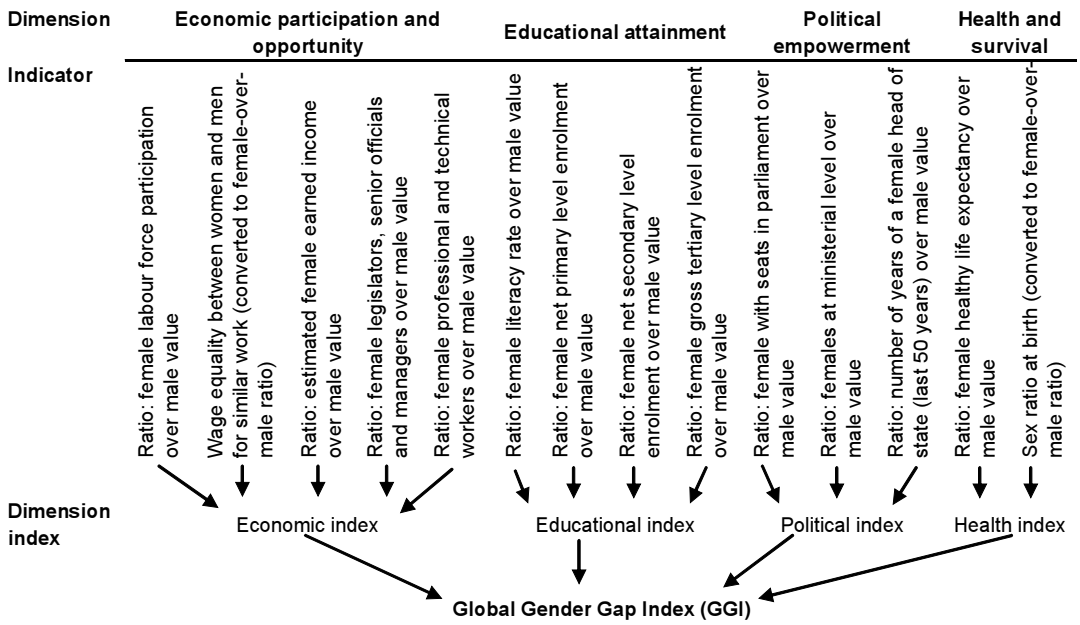
In the case of all subindexes, the highest possible score is 1 (equality) and the lowest possible score is 0 (inequality).[12] To create the overall GGI an

[11] For example, within the educational attainment subindex, standard deviations for each of the four variables are calculated. Then Hausmann et al. determine what a 1 percent point change would translate to in terms of standard deviations by dividing 0.01 by the standard deviation of each variable. These four values are then used as weight to calculate the weighted average of the four variables.

[12] This is not strictly true in the case of the healthy variable, where the highest possible value a country can achieve is 0.9796.

Box 3

Calculating the GGI



Source: Hausmann et al. (2009, 4), own compilation.

Table 3

GGI: Calculation of weights within each subindex

	Standard deviation	Standard deviation per 1% point change	Weights
Economic participation and opportunity subindex			
Ratio: female labour force participation over male value	0.160	0.063	0.199
Wage equality between women and men for similar work (converted to female-over-male ratio)	0.103	0.097	0.310
Ratio: estimated female earned income over male value	0.144	0.069	0.221
Ratio: female legislators, senior officials and managers over male value	0.214	0.047	0.149
Ratio: female professional and technical workers over male value	0.262	0.038	0.121
Total			1
Educational attainment subindex			
Ratio: female literacy rate over male value	0.145	0.069	0.191
Ratio: female net primary level enrolment over male value	0.060	0.166	0.459
Ratio: female net secondary level enrolment over male value	0.120	0.083	0.230
Ratio: female gross tertiary level enrolment over male value	0.228	0.044	0.121
Total			1
Political empowerment subindex			
Ratio: number of females with seats in parliament over male value	0.166	0.060	0.310
Ratio: females at ministerial level over male value	0.208	0.048	0.247
Ratio: number of years of a female head of state (last 50 years) over male value	0.116	0.086	0.443
Total			1
Health and survival subindex			
Ratio: female healthy life expectancy over male value	0.023	0.441	0.307
Sex ratio at birth (converted to female-over-male ratio)	0.010	0.998	0.693
Total			1

Source: Hausmann et al. (2009, 6).

unweighted average of each subindex score is taken. The bounds for the overall index are 1 (equality) and 0 (inequality).[13]

In 2009 the index covered 134 countries.

Comparing the rankings of GDI, GEM and GGI

Even in light of enhanced international awareness of gender issues, it is a disturbing reality that no country has yet managed to eliminate the gender gap. The GDI and GEM of the UNDP and the GGI of the World Economic Forum show this reality. Even the best-performer countries Australia (GDI), Sweden (GEM) and Iceland (GGI) do not reach the value of one[14] (see Table 4).

In the GDI index the leading countries (besides the best-performers) are Canada and the North-European countries Norway, Iceland and Sweden. Germany is ranked at position (20). The large eastern European countries do not achieve a better position than rank (31). Turkey is at the bottom of this index.

Those countries that have succeeded in narrowing the gap in the GEM are the Scandinavian countries. But also countries like the Netherlands, Belgium, Australia, Iceland and Germany have made considerable progress in recent decades in removing obstacles to the full participation of women in their respective societies. In contrast, France, Italy and Greece performed poorly. Turkey is again the worst country, far behind the eastern European nations.

The ranking of the GGI, which measures global gender-based inequalities, provides a more detailed picture. Beside the winner Iceland, the Scandinavian countries are again well positioned. But those countries with high income do not automatically have a high ranking. Countries like Canada, the United States or Austria did not perform as well. The large eastern

[13] Because of the special equality benchmark value of 0.9796 for the health and survival subindex, it is not strictly true that the equality benchmark for the overall index score is 1. In fact, this value is (1 + 1 + 1 + 0.9796)/4 = 0.9949.

[14] In the case of GGI the maximum value for the equality benchmark is 0.9949.

Table 4

Rankings of GDI, GEM and GGI, 2009

Country	Gender Development Index (UN)		Gender Empowerment Measure (UN)		Global Gender Gap Index (World Economic Forum)	
	Rank	Value	Rank	Value	Rank	Value
Australia	1	0.966	7	0.870	20	0.728
Austria	23	0.930	20	0.744	42	0.703
Belgium	11	0.948	6	0.874	33	0.717
Bulgaria	50	0.839	61	0.613	38	0.707
Canada	4	0.959	12	0.830	25	0.720
Cyprus	27	0.911	32	0.603	80	0.671
Czech Republic	31	0.900	31	0.664	74	0.679
Denmark	12	0.947	4	0.896	7	0.763
Estonia	36	0.882	40	0.665	37	0.709
Finland	8	0.954	3	0.902	2	0.825
France	6	0.956	17	0.779	18	0.733
Germany	20	0.939	9	0.852	12	0.745
Greece	21	0.936	28	0.677	86	0.666
Hungary	37	0.879	52	0.590	65	0.688
Iceland	3	0.959	8	0.859	1	0.828
Ireland	10	0.948	22	0.722	8	0.760
Italy	15	0.945	21	0.741	72	0.680
Japan	14	0.945	57	0.567	75	0.677
Korea	25	0.926	61	0.554	115	0.615
Latvia	44	0.865	48	0.648	14	0.742
Lithuania	42	0.869	46	0.628	30	0.718
Luxembourg	16	0.943			63	0.689
Malta	32	0.895	38	0.531	89	0.664
Mexico	48	0.847	39	0.629	99	0.650
Netherlands	7	0.954	5	0.882	11	0.749
New Zealand	18	0.943	10	0.841	5	0.788
Norway	2	0.961	2	0.906	3	0.823
Poland	39	0.877	38	0.631	50	0.700
Portugal	28	0.907	19	0.753	46	0.701
Romania	52	0.836	63	0.512	70	0.681
Slovak Republic	40	0.877	32	0.663	68	0.685
Slovenia	24	0.927	29	0.641	52	0.698
Spain	9	0.949	11	0.835	17	0.735
Sweden	5	0.956	1	0.909	4	0.814
Switzerland	13	0.946	13	0.822	13	0.743
Turkey	70	0.788	101	0.379	129	0.583
United Kingdom	17	0.943	15	0.790	15	0.740
United States	19	0.942	18	0.767	31	0.717

Note: Only European countries and non-European OECD countries are shown in this Table but many more countries have been included in the calculation of the index: GDI: 157 countries, GEM: 109 countries, GGI: 134 countries.

Sources: UNDP (2009b, 181–90); Hausmann et al. (2009, 8).

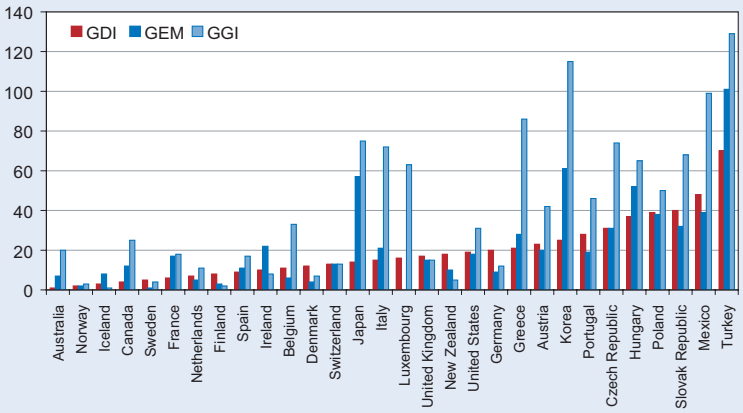
European countries do not rank better than position (50). In contrast, Latvia is placed at rank (14). Mexico, Korea and Turkey are positioned very far behind.

The comparison of the rankings by country indicates differences in the indices (see the Figure). Scandinavian countries ranked worse within the GDI than within the GGI.[15] Furthermore, the GEM rankings are always better than the GGI rankings.[16] These results show that in Scandinavia the empowerment of women in political and economic spheres is high. In contrast, the moderate gender equality in dimensions like life expectancy and knowledge has a negative influence on the ranking according to the GDI.

Countries like Canada, Japan and the United States, and Mediterranean countries like France, Italy and Spain have the best results within the GDI. The general gender equality measured by the GDI is better than the empowerment situation. The political participation of women is not well developed. The relatively high level of general gender equality in Korea is remarkable. In contrast, Mexico has a relatively well developed empowerment situation for women.

[15] Except Norway, that has nearly the same ranking at GDI than at GGI.
[16] Except Finland, that has nearly the same ranking at GEM than at GGI.

COMPARISON OF RANKINGS OF GDI, GEM AND GGI OF OECD COUNTRIES, 2009



Sources: UNDP (2009b, 181–90); Hausmann et al. (2009, 8).

Discussion of GDI, GEM and GGI

Since establishing the indices a lot of research has dealt with discussing these indices to improve their quality. In the following the main arguments are briefly presented.

Critical points of the GDI

The GDI complements the HDI with a distributive-sensitive measure by discounting the HDI for gender inequalities in its component indicator. Therefore the most important weakness of the GDI is that the GDI is often misunderstood and misinterpreted as a measure of gender inequality. This is incorrect. The GDI has to be compared with the HDI because the gap between the HDI and GDI is to be interpreted as the loss of human development due to gender inequality. The GDI is not interpretable in itself if conclusions about the welfare loss due to gender inequality are to be drawn (Schüler 2006, 164). Rather the GDI adjusts the HDI with a welfare penalty for gender inequality, and thus the GDI is a gender-inequality adjusted measure of overall human development (Klasen and Schüler 2009, 4).[17]

Another critical point is the used weighting scheme. The three indicators have the same weight in the overall index. If the variances of the three indicators differ widely, then the indicator with the largest variance will have the strongest weight in the overall index (Klasen 2006, 249 or Dijkstra 2002, 313).

A further problem exists in the use of the earned income component as a proxy for gender gaps in consumption at the household level. The earned income component disaggregated by sex does not measure what it is intended to assess – that is, gender gaps in human development achievements resulting from incomes, such as differences in nutrition, shelter and clothing (Klasen 2006, 249 and UNDP 2008b, 16).[18] There is extensive evidence of intra-household inequality. Decisions on individual consumption, for example, are influenced by gender power relations that are not captured in the income component of the GDI. A further problem is that earned income as a measure for human development can also give the misleading impression that unpaid work (like care activities), which is mainly undertaken by women, does not contribute to human development (UNDP 2008b, 16 and Klasen 2006, 249). Care of children and family members and other work in the household contributes immensely to human development. Furthermore, there are practical data problems. The difficulty in accessing direct measures of income disaggregated by sex means that the index has to rely on the estimated female-to-male ratio of non-agricultural wages. However, earnings are not adequately measured in poorer countries, and this ratio is unlikely to hold in all sectors (UNDP 2008b, 16).

Two issues have been raised with regard to life expectancy at birth:

1. whether women's biological advantage in terms of longevity should be considered as a gender gap or normal[19], and
2. whether the measure should consider the "potentially alive" as a relevant population for determining the inequality aversion parameter – this would take into account missing girls due to sex-selective abortion or post-birth neglect (UNDP 2008b, 16).[20]

[17] Thus it is not possible to infer from a certain index value of the GDI whether gender gaps in a particular country are large or small, or have large or trivial consequences (Klasen 2006, 246).

[18] The reason why this is the case is that incomes of females and males are typically shared at the household level so that the contributor of earnings and the beneficiary of consumption need not be the same (Klasen 2006, 249).

[19] It is true that females, if treated equally as males, will outlive them by three to seven years. Whether one should treat this biological advantage of female as normal largely depends on how one defines inequality (Klasen 2006, 247).

[20] In a number of countries, including China, India and South Korea, the sex ratio at birth (defined as the ratio of males to females born) has risen considerably as a result of increased incidence of sex-selective abortions of female foetuses. At the same time the treatment of living female children has improved and thus female life expectancy of those who are allowed to be born has risen. Therefore the gender gap in life expectancy of the GDI has been reduced as the girls that were never born are not considered (Klasen 2006, 248).

The same penalty for inequality is used regardless whether the gap affects females or males. Hence, the areas where women are disadvantaged (e.g., earned income) are offset by those where they fare better (e.g., life expectancy or education).[21] This poses a problem in interpreting the results of the GDI. Possible interpretations can only be done if the underlying gender gaps in each component are also examined to understand whether the gaps all favour one sex or not.

Critical points of the GEM

The GEM seeks to reflect the extent to which women and men are able to participate actively in economic and political life and take part in decision-making. While the GDI focuses on expansion of capabilities, the GEM is concerned with their use. According to Beteta (2006, 222), the criticism of GEM can be grouped in three lines:

The first problem is the way GEM deals with relative inequality between women and men. Like the GDI, GEM does not measure gender inequality as such, but some combination of absolute levels of attainment and relative female attainments. Additionally, inequality is accounted for in different ways for the three indicators that compose the GEM (Dijkstra 2002, 303). Here two problems occur: as with the GDI there is the problem of the symmetrical treatment of gender gaps. A further problem is that the earned income component is based on income levels and not like the other two components on shares (Klasen 2006, 259).

The second type of weakness lies in the construction of the GEM. As with the GDI a simple arithmetic average is taken of the scores of the three indicators. The problem that occurs is if the weights are the same for all three indicators but the variances of the three indicators differ widely, then the indicator with the largest variance has the strongest weight in the overall index (Dijkstra 2002, 313). The income variable has a much larger spread than the other two variables.

The third problem concerns the choice of dimension and indicators used in the GEM. According to Beteta (2006, 222) the GEM is an incomplete and biased index on women's empowerment, which measures inequality among the most educated and economically advantaged and fails to include the most important non-economic dimensions of decision-making power both at the household level and over women's bodies and sexuality. This problem is known as a serious elite bias (Klasen 2006, 258).[22] Another problem in this context is the earned income component in the GEM. This component uses both in the calculation of the GEM: income levels and female and male income shares. But income levels tend to dominate the index. The result is that countries with low income levels cannot achieve a high GEM score even where gender disparities in the distribution of earnings and other components of the GEM are minimal.[23]

Critical points of the GGI

The GGI of the World Economic Forum covers 134 countries. Because it is a global index, the GGI does not reflect all gender issues in its measure. According to Hausmann et al. (2009, 7) a country must have data available for a minimum of 12 indicators out of the 14 that enter the index.

The overall index, composed of four dimensions, is calculated by converting the data into female/male ratios. Furthermore, all subindices with values higher than 1 are truncated at 1.[24] Thus countries which have reached perfect equality are treated the same way as countries where men have lower human development than women (Klasen and Schüler 2009, 6). According to Hausmann et al. (2009, 3) the relative values are used because of the requirement that "the Index is constructed in such a way to rank countries on their gender gaps, not on their development level". It is questionable how meaningful a relative comparison is given an unequal starting point.

In order to ensure that each component of a subindex has an impact on the subindex score, a weighted average score is calculated. Weights are computed by calculating the standard deviation per one percentage point change of each component and then translating these values into weights, i.e., a country with a large gender gap in primary enrolment (low standard deviation) is penalised harder

[21] The gender gaps in the opposite direction are therefore cumulated in the GDI (Klasen 2006, 250).

[22] Participation of women in grass-roots organisations or at the local level and female employment at the lower levels of the employment hierarchy are not taken into account (Klasen 2006, 258).

[23] Besides these problems there is another critical point: The number of developing countries included in the measure is still very low. Under-representation of developing countries is due to the absence of data for economic and institutional components.

[24] With one exception: the life expectancy subindex is truncated at 1.06.

than a country with a large gender gap in tertiary enrolment (high standard deviation; Klasen and Schüler 2009, 6).

Most of the indicators used are from the Human Development Index of the UNDP. According to UNDP (2008a, 227) the chosen indicators for developing the HDI are not the best to differentiate between rich countries. "The indicators…used in the index yield very small differences among the top HDI countries, and thus the top of the HDI ranking often reflects only very small differences in these underlying indicators" (UNDP 2008a, 227). It would be more reasonable to make a comparison based on different income groups (Hausmann et al. 2009, 12).[25]

Conclusion

Reaching gender equality is an important topic for countries that seek to maximise their competitiveness and economic potential. Therefore it is necessary to develop equal opportunities for women and men in areas like economy, education and politics.

To design the appropriate policies countries need information about their strengths, weaknesses and standing within other countries. Gender-related indices yield this information. There are different indices provided by several organisations, but this article focuses on three main indices: the GDI and the GEM of the UNDP and the GGI of the World Economic Forum. The GDI refers to the general categories life expectancy, education and income. The GEM gives information about the empowerment situation of women in politics and economy. The recently introduced GGI combines both indices in one and adds new variables of gender equality.

However, research on these indices has shown that there are weaknesses in the calculation and that a more discriminating view of the variables is necessary. For long-term quality and acceptance of the indices further development is important. One example of enhancement is the Social Institutions and Gender Index (SIGI)[26] which complements and improves existing measures in several ways. While traditional indicators of gender equality measure inequality outcomes, the SIGI focuses on the root causes behind these inequalities.

For a further development of gender-related indices it is also important to consider social transformations in the respective countries. These transformations are dependent on welfare and progress in the country. Building an index separately for developing and developed countries would be advantageous because it would provide a more detailed picture of gender inequalities in the particular country group. Prospective challenges in developed countries include, e.g., balancing wage differences as well as providing a work-family-balance, both of which should be measured by future indices.

[25] Based on different assumptions (see the calculation method of the GGI above) the highest possible value for a country in the healthy subindex is 0.9796. Therefore the overall index score can never achieve a value of 1.

[26] The SIGI is compiled by the OECD Development Centre, in collaboration with a research team from Göttingen University. It is currently applied to 124 low and middle income countries and measures gender discrimination based on social institutions in five areas: Family Code, Physical Integrity, Son Preference, Civil Liberties and Ownership Rights. For more information see http://genderindex.org/.

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A1

Sources of the GEM

Indicators	Sources
Female and male shares of parliamentary seats	Data on parliamentary seats from IPU (2009), Correspondence on year women received the right to vote and to stand for election and year first woman was elected or appointed to parliament, June, Geneva.
Female and male shares of positions as legislators, senior officials and managers	Occupational data from ILO (2009), LABORSTA database, http://laborsta.ilo.org/ (accessed May 2009).
Female and male shares of professional and technical positions	Occupational data from ILO (2009), LABORSTA database, http://laborsta.ilo.org/ (accessed May 2009).
Female and male estimated earned income	Data on GDP (in PPP USD) and population from the World Bank (2009), World Development Indicators, Washington DC: World Bank, and data on wages and economically active population from ILO (2009), LABORSTA database, http://laborsta.ilo.org/ (accessed May 2009).

Source: UNDP (2009c).

A2

Sources of the GGI, 2007

Subindex	Variables	Sources
Economic participation and opportunity	Ratio: female labour force participation over male value	International Labour Organization, Key Indicators of the Labour Market 2007.
	Wage equality between women and men for similar work (converted to female-over-male ratio)	World Economic Forum, Executive Opinion Survey 2009.
	Ratio: estimated female earned income over male value	United Nations Development Programme, Human Development Report 2008 Update and Human Development Report 2007/2008, 2005 or latest available data.
	Ratio: female legislators, senior officials and managers over male value	International Labour Organization, LABORSTA Internet, online database, 2007 or latest year available; United Nations Development Programme, Human Development Report 2008 Update and Human Development Report 2007/2008, 2005 or latest available data.
	Ratio: female professional and technical workers over male value	International Labour Organization, LABORSTA Internet, online database, 2006 or latest year available; United Nations Development Programme, Human Development Report 2008 Update and Human Development Report 2007/2008, 2005 or latest available data.
Educational attainment	Ratio: female literacy rate over male value	United Nations Development Programme, Human Development Report 2008 Update and Human Development Report 2007/2008, 2005 or latest available data; UNESCO Statistics Division, Education Indicators, 2007 or latest data available; World Bank, World Development Indicators, Online Database, 2007 or latest year available.
	Ratio: female net primary level enrolment over male value	World Bank, World Development Indicators Online (accessed June 2007); 2005 data or latest year available.
	Ratio: female net secondary level enrolment over male value	World Bank, World Development Indicators Online (accessed June 2007); 2005 data or latest year available.
	Ratio: female gross tertiary level enrolment over male value	World Bank, World Development Indicators Online (accessed June 2007); 2005 data or latest year available.
Political empowerment	Ratio: female seats in parliament over male value	International Parliamentary Union, April 2007.
	Ratio: number of females at ministerial level over male value	United Nations Development Programme, Human Development Report 2006.
	Ratio: number of years of a female head of state (last 50 years) over male value	Hausmann et al. (2007).
Health and survival	Ratio: female healthy life expectancy over male value	World Health Organization, "World Health Statistics 2007" and "The World Health Report 2007".
	Sex ratio at birth (converted to female-over-male ratio)	CIA World Fact Book, U.S. Census Bureau, International Data Base (accessed May 2007).

Source: Hausmann et al. (2009, 5).