

# Gender Inequality in Multidimensional Welfare Deprivation in West Africa

The Case of Burkina Faso and Togo

*Akoété Ega Agbodji*  
*Yélé Maweki Batana*  
*Dénis Ouedraogo*

The World Bank  
Africa Region  
Poverty Reduction and Economic Management Unit  
June 2013



## Abstract

The importance of gender equality is reflected not only in the Millennium Development Goals, but also in the World Bank's Gender Action Plan launched in 2007 as well as in other treaties and actions undertaken at regional and international levels. Unlike other work on gender and poverty, which is mostly based on monetary measurement, the present study makes use of a counting approach to examine gender issues in Burkina Faso and Togo using household surveys. Focusing on six dimensions (*housing, basic utilities, assets, education, employment, and access to credit*) largely recognized as Millennium Development Goal targets, the main findings of the study indicate that overall individuals are the most deprived in education in Burkina Faso, while

the reverse situation is true in Togo. Gender inequality is observed in all dimensions since women always seem to be more deprived than men. The situation is also marked by regional disparities. Moreover, the assessment of dimensional contributions shows different patterns for each country. While *employment* proves to be the main contributor of gender inequality in Burkina Faso, three dimensions (*assets, access to credit, and employment*) account together for most of the total contribution to gender inequality in Togo. There is also a positive correlation between multidimensional deprivation and women's age in Burkina Faso, whereas both measures seem to be uncorrelated in Togo.

---

This paper is a product of the Poverty Reduction and Economic Management Unit, Africa Region. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at [ybatana@worldbank.org](mailto:ybatana@worldbank.org).

*The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.*

# Gender Inequality in Multidimensional Welfare Deprivation in West Africa: The Case of Burkina Faso and Togo<sup>1</sup>

Akoété Ega Agbodji, Yélé Maweki Batana, Denis Ouedraogo,

**Keywords:** Multidimensional poverty, deprivation rates, gender inequality, housing, basic utilities, assets, education, employment, access to credit.

**Jel Classification:** C10, D31, I14, I30, I32, O10, O12

**Sector Board:** Poverty Reduction (POV)

---

<sup>1</sup> Corresponding author: Yélé M. Batana, PREM, World Bank, [ybatana@worldbank.org](mailto:ybatana@worldbank.org); Akoété E. Agbodji, Université de Lomé, [adagbodji@yahoo.fr](mailto:adagbodji@yahoo.fr); Denis Ouedraogo, Université Polytechnique de Bobo-Dioulasso, [denisorel@gmail.com](mailto:denisorel@gmail.com). We are grateful to Sabina Alkire and Jean-Yves Duclos for comments on earlier versions. Our acknowledgments also to the participants of the 2nd Development Dialogue of World Bank Ouagadougou Office. The views expressed here are those of the authors and should not be attributed to the World Bank, its Executive Directors, or the countries they represent.

## **1 Introduction**

According to the World Bank (2011a), gender inequality matters for two main reasons. First, the ability to make your own choices for a better life and to be free of absolute deprivation is a basic human right. In this respect, everyone should be equal, especially between genders. The second reason is that gender equality promotes economic efficiency and is helpful to achieving other development outcomes. The promotion of gender equality is also included in the Millennium Development Goals (MDGs), especially in objectives one, two, three and five. Aware that gender equality is crucial to achieving the MDGs, the World Bank Group launched in 2007 a Gender Action Plan whose purpose is to improve women's economic empowerment in order to promote shared growth and to accelerate the achievement of the third MDG (World Bank, 2006).

The gender analysis of poverty usually reports higher poverty rates for women than for men, albeit with a few exceptions. Most of these works (Quisumbing et al., 2001; Moghadam, 2005) that reinforce the feminization of poverty are based on monetary measurements. According to Lanjouw (2012), several pitfalls could arise when using this conventional poverty analysis. For instance, the per capita consumption used to estimate individual welfare is not suitable for capturing the true individual welfare level since it ignores intra-household allocations. Moreover, the probable existence of economies of scale in consumption is also a source of inadequacy. Other studies go beyond monetary poverty to explore gender inequality in terms of assets and non-monetary dimensions (Francisco, 2007; Bastos et al., 2009; Deere et al., 2010). However, information on assets tends to be available only at the household level. It is then often difficult to convert them into an equivalent individual level. A more comprehensive way to address gender inequality issues in poverty analysis is to explore multidimensional poverty across several dimensions of wellbeing. Alkire and Foster (2007, 2011) propose a counting approach that could be appealing for analyzing gender inequality in multidimensional poverty. This approach, based on the concept of capability, provides tools for both

identifying the poor and aggregating the poverty measure. Alkire et al (2012) and Foster (2012) illustrate how this method can be used, for example, to construct an index of women's empowerment in agriculture. Such an approach was also used by Batana (2013) to measure multidimensional poverty for women in 14 Sub-Saharan African countries using four dimensions, namely assets, health, education and empowerment.

However, according to Ravallion (2012), this approach, as well as all other combined indices, experiences issues related *inter alia* to the weakness of the conceptual framework of the measurement, the failure to take adequate account of the correlations between dimensions and the need for robustness tests given the uncertainties about the data and weights. Ravallion (2011) suggests a 'dashboard approach' that develops distinct measures of the dimensions in order to generate a set of multiple indices rather than a single multidimensional one. As pointed out by Ferreira (2011), this dichotomization, single index versus multiple indices, does not really make sense. According to this author, the single index, which corresponds to a joint distribution, provides more information than do multiple indices, which relate to marginal distributions. Moreover, multivariate stochastic dominance techniques<sup>2</sup> seem to be useful to assess multidimensional poverty with joint distributions, without any assumption about the correlations between dimensions. However, if the multidimensional poverty measure proposed by Bourguignon and Chakravarty (2003) is appropriate for such a joint analysis, that suggested by Alkire and Foster (2007, 2011) is less amenable to this analysis since all deprivations are aggregated in one deprivation counting. The dual cutoff identification is tricky for dominance analysis especially when non-union identification is used. Nevertheless, analyzing poverty robustness across various multidimensional poverty cutoffs is in line with joint distribution analysis since it allows us to rank poverty depending on whether the deprivation relates to one dimension or more. Another reason in favor of the use of the multidimensional approach is raised by Maasoumi and Yalonetzky (2013). This reason relates mainly to the fact that it is more difficult to

---

<sup>2</sup> Some bivariate analyses are provided *inter alia* in Duclos et al. (2006) and Batana and Duclos (2010).

analyze trends in each dimension separately, especially when many indicators of wellbeing are considered.

The criticisms of multidimensional poverty measures may be justified in most cases. However, these measures will continue to develop since it is now universally agreed that welfare and poverty are multidimensional. It is clear that income or consumption is not sufficient to capture all aspects of poverty. Following the official definition of the World Bank and United Nations, poverty goes beyond a lack of income, since it means a lack of basic capacities to participate effectively in society. For instance, if there is a lack of health centers, it is difficult to treat illnesses even if we have a high income. Another advantage to our approach is that analysis could be carried out using a single dimension or, alternatively, by combining information on different aspects of poverty. To improve the conceptual framework, the choice of dimensions to be included in wellbeing needs to be better justified. In the absence of a clear consensus on these dimensions, a conceivable way is to connect them to international treaties and agreements such as the MDGs. For instance, the Bristol approach was often used by UNICEF to assess child deprivation in developing countries.

This paper applies the same approach for analyzing gender inequalities in multidimensional deprivation in two countries in West Africa: Burkina Faso and Togo. These two countries have a common border and belong to WAEMU (West African Economic and Monetary Union). Although both are poor economies, one country (Togo) is coastal, while the other (Burkina Faso) is landlocked. Our purpose is to analyze whether the nature of gender inequalities differs from one country to another. The multidimensional poverty estimation is based on recent household surveys. The CWIQ (Core Welfare Indicators Questionnaire) 2011 is used for Togo, while the data for Burkina Faso come from EICVM (Enquête Intégrale sur les Conditions de Vie des Ménages) 2009/2010. Both surveys are nationally representative and include information on several dimensions of wellbeing as well as the usual socioeconomic and demographic characteristics of households. Some dimensions are common to household members and include *housing* (ownership of dwelling, overcrowding/occupancy, roof quality, wall and

floor quality, etc.), *basic utilities* (access to water, electricity, sanitation, telephone and garbage disposal, public infrastructure) and *assets* (television, radio, car, motorbike, bike, refrigerator, etc.). By contrast, other dimensions such as *education*, *employment* and *access to credit* could be considered to be specific to individuals. The main findings include the disparities between women and men in terms of multidimensional poverty. They also highlight the main contributing dimensions to multidimensional poverty by gender and country. The next section describes the retained dimensions with an emphasis on worldwide, regional and national development objectives. Section 3 presents the methodology and data description, while Section 4 discusses the main results. Section 5 concludes the paper.

## **2 Choosing deprivation dimensions**

### ***2.1 Housing***

As stressed by Navarro and Ayala (2008), housing is an important component of material wellbeing since the right to decent housing is recognized by most countries and organizations. For instance, this right is expressed in Article 25 of the Universal Declaration of Human Rights and is included in several other international treaties on human rights. Although the African Charter on Human and Peoples' Rights does not explicitly mention this right, the African Charter on the Rights and Welfare of the Child, which is mandatory for the 41 signatory countries including Burkina Faso and Togo, is clear about this issue. Moreover, the aim to "improve significantly the conditions of at least 100 million slum dwellers by 2020" is one of the targets of the seven MDGs. This clearly indicates the importance given to housing in the social wellbeing of individuals and the necessity to further understand gender inequality.

According to Navarro et al. (2010), deprivation in housing not only reflects a failure of basic functioning, but also has a negative effect on individual health. The links between inadequate housing and several diseases including physical and mental health are recognized by the WHO (2006). In addition, Cattaneo et al. (2007) find that improving the floors in family dwellings in Mexico has positive and significant effects on the health

of young children and adult happiness. The importance of shelter is also recognized by the World Bank, especially the adverse effects the poor moving to cities, in the process of urbanization, may face. The World Bank has thus allocated more than \$16 billion to 278 projects in more than 90 countries to support improvements in shelter conditions over the three decades prior to the mid-2000s (Buckley and Kalarickal, 2006).

However, beyond having a shelter, the biggest concern is related to the structural conditions of housing such as the quality of the floors, roof and walls as well as the occupancy/overcrowding. Even though housing could also include basic facilities, the latter are not considered in the current housing deprivation measure because they usually involve the public provision of infrastructure<sup>3</sup>. By excluding basic facilities, considered to be the health environment's attributes, Lachaud (1999) retains only the four previous conditions to define housing deprivation in Burkina Faso. These conditions, such as overcrowding (three or more individuals per room) and the poor quality of dwellings (when dwellings are built from non-durable materials), among others, are sufficient when either holds to classify a household as living in a slum (Baker, 2008). Although urbanization is likely to increase the challenges for urban residents, housing deprivation remains problematic for both rural and urban areas. Access to safe and comfortable housing is very low in Burkina Faso with a higher deprivation for rural areas. In fact, only 12.3% of households lived in dwellings whose walls are built from durable material, which represents 2.3% in rural areas against 46.6% in urban ones in the late 1990s (Ki et al., 2006). The situation is not much better in Togo. While about 58% of households own their dwellings, the proportion of them living in dwellings with durable material walls represented 36.3% in the mid-2000s (15% in rural areas versus 72.6% in urban areas) (Ministère de l'économie et du développement, 2007).

## ***2.2 Basic utilities***

---

<sup>3</sup> Most of these indicators are considered by Sahn and Stifel (2003) to characterize the quality of housing.



Basic utilities such as electricity, water, sanitation, phone and other public infrastructures are crucial both for humanitarian and for pragmatic reasons (Brown, 2009). In fact, access to these services is not only the concern of human rights, but also a public good with many positive externalities (Hailu and Tsukada, 2009). Improving the access of poor people to these basic services allows them to improve their quality of life, health status and education level, and thus be more productive in society. Public utilities such as water supply, sanitation and electricity promote poverty reduction and improve the standards of living of households in several ways (Komives et al., 2005). Moreover, evidence establishes a robust association between access to water and sanitation and both childhood morbidity and mortality (Günther and Fink, 2010). By recognizing the importance of these public services, one of the targets of the seven MDGs is to reduce by half the proportion of people without access to safe drinking water and basic sanitation.

In most cases, African countries are not on track to meet the MDG targets. Statistics show that the lack of basic utilities remains acute, since more than one billion people experience extreme water deprivation in the world, while 40% lack access to clean sanitation services (Hailu and Tsukada, 2009). In the same way, 554 million people in Africa have no access to electricity. These deprivations induce many costs in terms of death, malnutrition and reduced productivity. For instance, water collection often falls to women and children, thereby disadvantaging them and exacerbating intra-household inequality when the water source is far from home. As reported by Banerjee and Morella (2011), the distribution of access to safe water could be more unequal than the distribution of income in most countries. The same authors report that achieving the MDG on access to safe water is likely to generate an economic benefit of \$3.1 billion in Africa. To support water activities, from 1996 to 2007 the World Bank financed or administered 1,864 projects, which cost \$118.4 billion (World Bank, 2010).

**Table 1:** Access (in %) to basic services in Burkina Faso and Togo, 2009–2010

	Coverage	Access to electricity	Access to improved sanitation	Access to improved water	Access to a telephone line
Burkina Faso	<i>National</i>	14.6	17	79	0.9
	<i>Rural</i>	-	6	73	-

	<i>Urban</i>	-	50	96	-
Togo	<i>National</i>	20	13	61	3.5
	<i>Rural</i>	-	3	40	-
	<i>Urban</i>	-	26	89	-
Sub-Saharan African countries	<i>National</i>	32.4	30.7	61.1	1.4
	<i>Rural</i>	-	23.4	48.6	-
	<i>Urban</i>	-	42.4	82.7	-

Source: World Development Indicators

The statistics in Table 1 show that Burkina Faso and Togo are deprived in basic utilities compared with Sub-Saharan Africa as a whole. Electricity access rates are respectively about 15% and 20% for these countries against 32% for the region. Concerning access to a telephone line, Burkina Faso has the lowest access rate with 1%, while Togo displays a relatively high rate of 3.5% against 1.4% for the whole region. Access to improved sanitation seems to be a great challenge since the rates remain low (17% and 13% respectively for Burkina Faso and Togo) against 31% for the region. Finally, regarding access to improved water, the situation seems better in Burkina Faso than it is in the Sub-Saharan region whose access rate is the same as that for Togo (61%). As expected, the situation is always worst in rural areas than in urban ones.

### 2.3 Assets

The asset dimension considered in this study refers only to physical assets such as durable goods. Although assets are not targeted by the MDGs, they can be seen as one of the major concerns of the first MDG, which is to eradicate extreme poverty and hunger. Regarding the gender equality perspectives addressed by the third MDG, OECD (2010) suggests considering asset ownership. In fact, the ownership of physical assets can decrease the probability of being monetary poor (Sackey, 2005a). Given that income is most often volatile, assets are helpful for smoothing consumption (Brandolini et al., 2010) and thus they are likely to capture more closely the permanent part of consumption for households or individuals (Stifel and Christiaensen, 2007; McKay, 2009). Therefore, according to McKay (2009), a lack of assets could be considered to be a good proxy for chronic poverty.

In theory, analyzing the ownership of assets is an important way to explore inequality and gender inequality issues among household members. As stressed by Deere et al. (2010), women's bargaining power within the household may be related to their position towards asset possession. In most surveys in African countries, durable goods possession is not individually assigned and is often accounted for the whole family. Assessing gender inequality is therefore simply analyzing gender distribution according to household deprivation.

#### ***2.4 Education***

Education is an important dimension of wellbeing. The right to education is also enshrined in the Universal Declaration of Human Rights. Moreover, the second MDG is to achieve universal primary education both for boys and for girls, while the third MDG aims to eliminate gender disparity in education. As stressed by Becker (1993), education and health contribute not only to wellbeing improvement, but also to human capital accumulation. Education can help increase income through improved conditions and performance of work (Lam and Duryea, 1999; Sackey, 2005b). This allows individuals to acquire the necessary skills and tools to better meet their needs and those of their children, which promotes household productivity and increases their living standards.

Already in 1980, the World Bank stressed that the development of human resources, with a particular emphasis on adults and young people, is an important way to fight poverty (World Bank, 1980). Over the past 49 years, the World Bank has substantially contributed to educational development around the world by investing \$69 billion into over 1,500 projects. The new approach followed by the group by means of the Education Sector Strategy 2020 is to go beyond schooling for achieving 'Learning for All' in the developing world (World Bank, 2011b). This will be achieved by promoting country-level reforms of education systems. Education has been considered in many studies to be an important dimension of multidimensional wellbeing (see *inter alia* Batana, 2013; Alkire and Santos, 2010; Levine et al., 2011).

Table 2 shows that gender inequality in education exists both in Burkina Faso and in Togo, although the situation has significantly improved since the early 1990s. Moreover, inequality increases with education level. For instance in Togo, while the gross enrollment ratio in primary education was 119% and 111% in 2009, respectively for boys and girls, these numbers were respectively 54% and 28% in secondary education. The situation is less marked in Burkina Faso where the ratios seem to be very low compared with Togo.

**Table 2: Gross enrollment ratios (%) in Burkina Faso and Togo**

School level		Burkina Faso		Togo	
		<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
Primary	1991	41	26	115	75
	2009	83	75	119	111
Secondary	1991	-	-	30	10
	2009	24	19	54	28
Tertiary	1991	1	0	4	1
	2009	5	2	-	-

Source: World Bank (2011a)

## **2.5 Employment**

Employment remains the main source of income for households in the world. In order to eradicate extreme poverty and hunger as pursued by the first MDG, one major target is to achieve full employment and decent work for all individuals, including women. This is in line with the initial objective of the International Labor Organisation, which is to provide an adequate living wage. This objective is reinforced by the Declaration of Philadelphia in 1944, which mandates the International Labor Organisation to continue to promote full employment and the improvement of standards of living (Luebker, 2011). As stressed by Lugo (2007), even though employment is not a new dimension of wellbeing, it is often forgotten, unlike education and health, in human development and poverty reduction analyses.

Beyond addressing the lack of employment for all, assessing gender disparities in African labor markets is a great challenge (Kolev and Sirven, 2010). In fact, it is recognized that

women’s employment and earnings are helpful to fight against poverty (UNICEF, 1999). Increasing employment for women could generate several societal benefits, although in some cases, where women are less educated or younger at first marriage, it may be possible to observe a positive correlation between work and domestic violence (Heath, 2012). Evidence shows that women are generally disadvantaged in labor markets in terms of labor force participation and employment (Kolev and Sirven, 2010). For analyzing employment as one of the important dimensions of poverty and wellbeing, Lugo (2007) suggests a short list of internationally comparable indicators for describing employment in developing countries. The aspects considered are related to protection against adverse situations inherent in the job, income level, occupational hazards (injuries and diseases), and occupational time.

The female labor force is crucial. For instance, in 2010 it was 45.7% of the total labor force in the whole Sub-Saharan African region, while it represented 47.6% and 50.5% respectively in Burkina Faso and Togo (see Table 3). However, there is gender inequality in Sub-Saharan Africa since the employment ratios are 57.6% and 70.4%, respectively for women and men. Inequality also seems to be present in Burkina Faso, where the ratio for women is 75.7% against 86.7% for men. By contrast, the situation seems to be more equal in Togo, with a ratio approaching 75% for both sexes. It is clear that taking into account the quality of employment deepens gender inequality.

**Table 3:** Employment by gender in Burkina Faso and Togo in 2010

	Female labor force in % of total labor force	Employment to population ratio for +15 women	Employment to population ratio for +15 men
Burkina Faso	47.6	75.7	86.7
Togo	50.5	74.2	75
Sub-Saharan Africa	45.7	57.6	70.4

Source: World Development Indicators

## ***2.6 Access to credit***

As shown by OECD (2010), the third MDG is not comprehensive enough since it ignores many gender-related dimensions. In fact, other issues including access to credit could be

considered. In addition, one Gender Equality Strategy of the World Bank is to expand women's access to credit. According to Fletschner (2008), an efficiency-based argument could support the idea of enhancing women's access to credit. Cohen (2010) identifies four additional components to consider in the multidimensional poverty assessment tool for rural households, including access to credit.

There are two main channels through which access to credit may affect a household's wellbeing. The first one is related to the opportunity for households to alleviate their capital constraints and to develop income-generating activities. The second channel is by increasing households' abilities to face risks, including strategies that involve consumption smoothing (Diagne and Zeller, 2001). According to Becchetti and Conzo (2013), the credit access effects go beyond the mere change in current income since they also involve a significant improvement in life satisfaction. By addressing the issue of financial ethics, Hudon (2009) argues that to proclaim credit access as a human right is not necessarily a proper decision. In fact, even though there is agreement that credit access may reduce poverty, especially when it is directly used to improve development outcomes, it could, by contrast, induce perverse effects such as indebtedness. Thus, in some cases, women who borrow money may experience a reduction in welfare (Ngo and Wahhaj, 2012). Positive effects can be observed when certain initial conditions hold, including investments in productive activities and large household expenses. Moreover, having access to formal credit without necessarily borrowing is likely to result in positive and significant marginal effects on household income (Diagne and Zeller, 2001). This argues in favor of considering access to credit as an input for welfare. Data from the World Development Indicators show that the proportion of women who possess an account at a formal financial institution represents 10.8% and 9.2% respectively in Burkina Faso and Togo, which remains very low compared with the 21.5% recorded for the whole of Sub-Saharan Africa.

### **3 Methodology and data**

The approach adopted in this paper is a mixture of the inertia approach and the counting method developed by Alkire and Foster (2007, 2011). The first is useful for aggregating indicators within each dimension when necessary. In fact, some dimensions such as housing, basic utilities and assets include several indicators. The use of the inertia method makes it possible to convert each group of indicators into an index of deprivation. Moreover, an advantage of this method is assigning weights to various goods and services directly from the data themselves. The second approach is then used to estimate multidimensional deprivation by counting individual deprivations.

### ***3.1 One-dimensional deprivation index***

The one-dimensional deprivation index is actually known in the literature as a multidimensional deprivation one, which defines and aggregates various specific deprivation magnitudes into a single measure. When a dimension is depicted by many indicators, it is often arbitrary and unrefined to say that households or individuals fall into only two categories: 0 when they are not deprived and 1 otherwise. By contrast, the deprivation index estimated by the inertia approach is a continuous value with a lower value for the least deprived people and an upper value for the most deprived. More specifically, multiple correspondence analysis (MCA) is used to derive the deprivation indices. This is more suitable than principal component analysis when indicators are qualitative variables, as in the present case. The same method is used by Booyesen et al. (2008) and Ezzrari and Verme (2012) to measure multidimensional poverty, respectively in seven Sub-Saharan African countries and in Morocco. Moreover, the indices obtained are usually close to those derived using other methods such as factor analysis (Batana and Duclos, 2010).

Let us consider  $N$  individuals indexed  $i = 1, \dots, N$  and  $J_k$  indicators for the dimension  $k$  indexed  $j_k = 1, \dots, J_k$ . The approach is to estimate a deprivation index in each dimension  $k$  for each individual using a weighted sum of related indicators. Let  $x_{i,k}$  be the deprivation index in dimension  $k$  and for individual  $i$ ,  $x_{ij_k}$  be his or her endowment in

$j_k$ , while  $\alpha_{j_k}$  is the weight assigned to each indicator using MCA.  $x_{i,k}$  is then given by the following expression:

$$x_{i,k} = \alpha_1 x_{i1} + \dots + \alpha_{j_k} x_{i j_k} \quad (1)$$

MCA procedures are detailed in Greenacre (2007), Greenacre and Blasius (2006) and Asselin (2009). After the estimation of the deprivation index, it can be normalized as suggested by Krishnakumar and Ballon (2008) so that 1 represents the deprivation level for the most deprived individuals, while 0 corresponds to that of the least deprived.

It is important to note that, since weights ( $\alpha$ ) are relative to the dataset, normalization relative to the distribution and cutoff relative to both, the MCA indices are not comparable in any meaningful sense between Burkina Faso and Togo or across time. However these indices can be used to compare rural/urban areas, regions or genders within each country.

For binary dimensions (education, access to credit, employment), it is straightforward to estimate the deprivation rate in a single dimension by counting individuals with  $x_{i,k} = 1$ .

The deprivation rate  $P_k(x_k)$  in the population is defined as follows:

$$P_k(x_k) = \frac{1}{N} \sum_{i=1}^N x_{i,k} \quad (2)$$

By contrast, for continuous dimensions such as those derived as deprivation indices from MCA, it is necessary to define first a deprivation threshold  $z_k$  as a fraction of the mean or the median. Then, the deprivation rate will be obtained from the following equation:

$$P_k(x_k, z_k) = \frac{1}{N} \sum_{i=1}^N I(x_{i,k} \geq z_k), \quad (3)$$

where  $I(x_{i,k} \geq z_k)$  is an indicator function taking the value 1 when the condition in the brackets holds and 0 otherwise.



### 3.2 Multidimensional deprivation index

Multidimensional deprivation is based on the method suggested by Alkire and Foster (2007, 2011). This approach, called a counting method, is an extension of the class of decomposable poverty measures developed by Foster et al. (1984). Let us still consider a population of  $N$  individuals and  $K \geq 2$  as the total number of dimensions, some of them being represented by many indicators (e.g. housing, basic utilities and assets). Now, let  $x = [x_{i,k}]$  be the  $N \times K$  matrix of deprivations, where  $x_{i,k}$  is the deprivation status of individual  $i$  in dimension  $k$  ( $k = 1, \dots, K$ ). The matrix of deprivations could be expressed as follows:

$$x = \begin{bmatrix} x_{1,1} & \cdot & x_{1,k} & \cdot & x_{1,K} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ x_{i,1} & \cdot & x_{i,k} & \cdot & x_{i,K} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ x_{N,1} & \cdot & x_{N,k} & \cdot & x_{N,K} \end{bmatrix}$$

By summing each row of the matrix  $x$ , we obtain a column vector of deprivation counts ( $c$ ), which contains  $c_i$ , the weighted sum of deprivations suffered by individual  $i$ .  $c_i$  is then estimated as follows:

$$c_i = \sum_{k=1}^K w_k x_{i,k} \quad (4)$$

$w_k$  is the weight respectively assigned to each dimension  $k$  such that  $\sum_{k=1}^K w_k = D$ , where  $D$  is the maximum deprivation an individual could suffer. This corresponds to the weighted number of dimensions. The weight could be set in practice to 1 for all dimensions, in which case  $c_i$  is the number of deprivations experienced. However, we can also assign various weights to reflect differences in the importance of each of these dimensions. Let us define  $d$  as the minimum number of deprivations an individual should

suffer to be considered to be deprived. Which criteria should we use for identifying multidimensionally deprived individuals?

Unlike the usual case of Alkire and Foster (2007),  $c_i$  is continuous here due to the continuous dimensions (MCA indices). Then, the *union* approach, which defines an individual as deprived when his or her deprivation occurs in at least one dimension, is not the only case where  $d = 1$ . In fact, it can also include some cases where  $d$  is equal to any minimum deprivation suffered by individuals in the continuous dimensions. On the other side, the *intersection* approach considers an individual to be deprived when his or her deprivation covers all dimensions.  $d$  could take a value  $D$  or lower than  $D$  again because of the continuous dimensions. The differences between these approaches are not clear-cut, especially as the third approach, that is the *intermediate* one (Duclos et al., 2006), could be defined over the range 0 and  $D$ .

Let  $P_\beta(x)$  be the class of multidimensional deprivation indices developed by Alkire and Foster (2007, 2011). We also consider the case of household surveys with sampling designs. Let  $s_i$  be the sampling weight assigned to individual  $i$  and normalized such that

$\sum_{i=1}^N s_i = N$ .  $P_\beta(x)$  is given by:

$$P_\beta(x) = \frac{1}{N \times D^\beta} \sum_{i=1}^N s_i c_i^\beta \mathbf{I}(c_i \geq d) \quad (5)$$

When  $\beta = 0$ , we obtain the proportion of poor individuals, which is simply their total number divided by the total population.  $P_0(x)$ , also called the headcount ratio, is a member of Foster-Greer-Thorbecke (FGT) class of poverty measures. This measure is not sensitive to the number of dimensions in which individuals are deprived and thus violates the principle of *dimensional monotonicity*. By contrast,  $P_1(x)$ , called the adjusted headcount ratio, is more satisfactory since it respects such a principle. This is

now known as the multidimensional poverty index (MPI), which was recently presented by Alkire and Santos (2010) for 104 developing countries.

### 3.3 Decomposing the deprivation index

#### *Decomposing by subgroup*

Like FGT measures, the class of indices in Equation (5) can be decomposed by subgroup. Let us consider that the  $N$ -size population could be divided into two partitioned groups, by sex in this case, with  $N_M$  and  $N_F$  as the respective population sizes. If the two subgroups are respectively represented by two matrices of deprivations  $x^M$  and  $x^F$ , then the index in Equation (5) could be rewritten as follows:

$$P_\beta(x) = \frac{N_M}{N} P_\beta(x^M) + \frac{N_F}{N} P_\beta(x^F) \quad (6)$$

#### *Decomposing by dimension*

It is straightforward to decompose the MPI into dimensions by disaggregating the counting  $c_i$ . Let us consider  $c_{i,k}$  as the part of the counting in the dimension  $k$ ; then,  $c_i$  can be decomposed following Equation (4) as:

$$c_i = \sum_{k=1}^K c_{i,k}, \quad (7)$$

where  $c_{i,k} = w_k x_{i,k}$ . In the case where  $\beta=1$  (as for the MPI), Equation (5) could be rewritten as follows:

$$P_1(x) = MPI = \sum_{k=1}^K \left[ \frac{1}{N \times D} \sum_{i=1}^N s_i c_{i,k} I(c_i \geq d) \right] = \sum_{k=1}^K MPI_k \quad (8)$$

Decomposition by dimension may be advantageously combined with the subgroup's decomposition in order to determine the largest contributor to subgroup inequality. For

instance, let  $P_1(x^M)$  and  $P_1(x^F)$  be the MPIs for men and women, respectively. The gender difference  $GD = P_1(x^M) - P_1(x^F)$  could be expressed as follows:

$$GD = P_1(x^M) - P_1(x^F) = \sum_{k=1}^K (MPI_k^M - MPI_k^F) = \sum_{k=1}^K \Delta MPI_k \quad (9)$$

It is then easy to compute the contribution as a percentage of each dimension to the gender difference as follows:

$$\pi_k = 100 \times \frac{\Delta MPI_k}{GD} \quad (10)$$

### 3.4 Data

The CWIQ 2011 is used for Togo, while the data for Burkina Faso come from EICVM 2009/2010. Both surveys are stratified two-stage designs and are nationally representative. The EICVM is conducted in four stages, but only the first stage is used by the present study. After data clearance, 8,421 households are retained out of the 9,075 households initially included in the sample. Regarding the CWIQ, 6,048 households are included in the initial sample.

Individuals aged 15 to 64 years are the unit of analysis. In the case of Burkina Faso, the final sample includes all individuals, which represents 26,124 people from 8,258 households, including 11,698 men (45%) and 14,426 women (55%). Also, 27% of people are urban while 73% live in rural areas. By contrast, in Togo, only the household head and his spouses are considered for the question involving financial resources. This leads to retaining 8,229 individuals from 4,980 households, for 3,716 men (45%) and 4,513 women (55%). This large sample drop may introduce a bias in the short sample. In fact, some socio-demographic features (e.g. average household size and average age) appear significantly different from one sample to another. Moreover, this country appears more urbanized than the previous one since urban represents 42% against 58% for rural.

As outlined above, the indices of deprivation are estimated by MCA for *housing*, *basic utilities* and *assets*. The *housing* index is computed using the indicators of the quality of the roof, walls and floors as well as indicators of overcrowding and ownership. For the *basic utilities* index, the indicators involve access to a toilet, water, electricity and phone (both fixed line and mobile). They also include the time to access main services such as drinking water, food market, public transport, health center and primary and secondary schools. Each one of these time indicators is dichotomized in such a way that deprivation corresponds to the case where time to access the service is higher than 30 minutes. With regard to *assets*, indicators on the possession of eight durable goods (radio, television, bike, motorbike, car, refrigerator, ventilator and computer) are used. All this information is collected in both surveys, so that the measures are the same in the two countries even if the MCA makes the index of assets incomparable between countries.

Our definition of deprivation in *education* is in line with the second MDG, namely the effective completion of primary education for all children. From that, it may be suitable to consider an individual to be educationally deprived if his or her number of completed years of schooling is lower than six years. By contrast, the measurement of deprivation in *credit access* and *employment* differs from one country to another. In the case of Burkina Faso, the use of credit is retained as the indicator of *credit access*. However, the non-use of credit by an individual does not necessarily mean that he or she is lacking financial assets. Individuals may not borrow money simply because they do not need it. Thus, an individual is considered to be deprived only when he or she lacks loan guarantees or ignores the procedures for credit access. The measure in Togo is different because of the available information. Here, an individual is considered to be not deprived if he or she has savings or holds an account at a financial institution. These two indicators may be regarded as potential financial assets.

*Employment* is difficult to measure. As mentioned by Lugo (2007), the quality of employment goes beyond salary since several aspects such as safety, protection and occupational time should be considered. In Burkina Faso, people deprived of employment are identified as those who are unpaid apprentices or caregivers, among

individuals who do not currently study. The definition is a little different from that used in Togo. Deprived people are here represented by all non-students who have not worked for pay during the past 12 months. It is clear that this definition could underestimate the deprivation measure since the quality of employment is not considered. Having paid employment does not necessarily guarantee that wellbeing is greater. Unfortunately, the inadequacy of information on employment in the surveys forces us to retain these least refined measures.

## **4 Results**

### ***4.1 Deprivation and poverty rates***

First, one-dimensional deprivation rates (we call these raw headcounts) are estimated to assess deprivation in each dimension, which is in line with the dashboard approach suggested by Ravallion (2011). The results of the estimation are reported in Table 4. Regarding *housing*, *basic utilities* and *assets*, whose indices are continuous values, deprivation thresholds are determined for each one in order to identify poor people. In this case, the mean value of each index is considered to be the threshold. This is a relative deprivation cutoff and is not suitable for country comparisons. The main results indicate that overall individuals are the most deprived in *education* in Burkina Faso, with a deprivation rate of about 72%, while the reverse is true in Togo with a rate of approximately 19%. Gender inequalities are observed in all dimensions since women always seem to be more significantly deprived than men. The highest inequalities, with a gender gap above 10 percentage points, are noticed for *employment* in both countries, for *education* only in Burkina Faso and for *access to credit* only in Togo. This may indicate the existence of different patterns for these countries in terms of both multidimensional deprivation and gender inequality. The breakdown by place of residence shows that rural areas are more deprived than urban ones, which is a common finding in poverty analysis.

**Table 4: Dimensional deprivation rates by gender and by place of residence**

	Dimensions	All	By gender			By place of residence		
			Male	Female	Diff.	Rural	Urban	Diff.
<b>Burkina Faso</b>	<i>Access to credit</i>	52.6	50.2	54.6	-4.4*	53.7	49.9	3.8**
	<i>Employment</i>	49.5	31.9	64.2	-32.3*	55.0	35.7	19.3*
	<i>Education</i>	71.6	63.4	78.4	-15*	83.4	41.7	41.7*
	<i>Housing<sup>a</sup></i>	53.8	53.1	54.3	-1.2*	69.3	14.5	54.8*
	<i>Assets<sup>a</sup></i>	69.5	68.5	70.3	-1.8*	78.1	47.9	30.2*
	<i>Basic utilities<sup>a</sup></i>	54.1	52.5	55.4	-2.9*	69.1	16.1	53*
<b>Togo</b>	<i>Access to credit</i>	56.5	49.9	61.7	-11.8*	62.5	48.1	14.4*
	<i>Employment</i>	11.5	5.0	17.0	-12*	15.6	5.3	10.3*
	<i>Education</i>	18.6	16.6	20.3	-3.7*	20.7	15.7	5.0*
	<i>Housing<sup>a</sup></i>	41.3	38.6	43.4	-4.8*	65.0	8.2	56.8*
	<i>Assets<sup>a</sup></i>	63.6	59.9	66.5	-6.6*	86.0	32.2	53.8*
	<i>Basic utilities<sup>a</sup></i>	45.0	42.4	47.1	-4.7*	69.9	10.2	59.7*

<sup>(a)</sup> indicates that deprivation rates are computed using the mean value of each index as the threshold.

(\*) and (\*\*) mean that the differences are significant at 5% and 10% level respectively.

Multidimensional poverty rates are estimated using equal weights for all dimensions. The results confirm the existence of gender inequalities in both countries. Tables 5 and 6 illustrate the situation for Burkina Faso and Togo, respectively. In the case of Burkina Faso, inequalities seem to be generally higher when the cutoff value is quite high (3 or more). They are observable both in rural and in urban areas. For a cutoff  $d = 3$ , one can notice gender gaps in deprivation headcount, in terms of percentage points, of about -12, -9 and -15 respectively at the national, rural and urban levels. The differences are higher for  $d = 4$ . The MPI measure also confirms such gender inequalities (cf. Table 5).

**Table 5: Multidimensional poverty rates in Burkina Faso**

Level	Cutoff	Headcount H (%)				MPI (%)			
		All	Men	Women	Gender diff.	All	Men	Women	Gender diff.
<b>National</b>	$d = 1$	98.3	97.8	98.7	-0.9*	65.1	59.9	69.3	-9.4*
	$d = 2$	91.6	89.0	93.7	-4.6*	63.4	57.7	68.0	-10.4*
	$d = 3$	78.3	71.8	83.6	-11.7*	57.7	50.4	63.7	-13.4*
	$d = 4$	52.6	40.7	62.5	-21.8*	42.6	32.1	51.2	-19.1*
	$d = 5$	18.4	9.3	25.8	-16.5*	16.8	8.5	23.6	-15.2*
<b>Rural</b>	$d = 1$	99.9	99.9	100.0	-0.1	71.7	66.6	75.7	-9.1*
	$d = 2$	98.1	97.3	98.8	-1.6*	71.2	65.9	75.4	-9.6*
	$d = 3$	90.3	85.4	94.1	-8.7*	67.8	60.8	73.4	-12.6*
	$d = 4$	64.9	51.6	75.3	-23.8*	52.8	40.9	62.1	-21.3*
	$d = 5$	23.6	12.0	32.8	-20.7*	21.7	11.0	30.1	-19.0*
<b>Urban</b>	$d = 1$	93.9	92.7	95.0	-2.3*	47.3	43.4	51.0	-7.6*
	$d = 2$	74.0	68.8	78.9	-10.1*	42.3	37.4	46.8	-9.4*

	$d = 3$	46.1	38.3	53.2	-14.9*	30.6	24.7	36.0	-11.4*
	$d = 4$	19.9	13.8	25.6	-11.8*	15.4	10.4	19.9	-9.4*
	$d = 5$	4.3	2.5	5.9	-3.4*	3.8	2.2	5.3	-3.0*

(\*) and (\*\*) mean that the differences are significant at 5% and 10% level respectively.

By contrast, in Togo, inequalities seem to be more considerable for lower levels of cutoff ( $d < 3$ ). In fact, unlike in Burkina Faso, deprivation rates decrease more strongly when increasing the cutoff. These findings are consistent with gender inequality in monetary poverty since women appear poorer than men in both Burkina Faso (43.7% versus 40.6%) and Togo (53.6% versus 47.3%), which are equivalent respectively to statistically significant values of -3.1 and -6.3 points of percentage in term of gender difference.

Table 6: Multidimensional poverty rates in Togo

Level	Cutoff	Headcount H (%)				MPI (%)			
		All	Men	Women	Gender diff.	All	Men	Women	Gender diff.
National	$d = 1$	94.4	91.9	96.4	-4.5*	41.5	38.0	44.4	-6.5*
	$d = 2$	70.1	62.2	76.8	-14.5*	35.5	30.9	39.5	-8.6*
	$d = 3$	34.7	28.0	40.5	-12.5*	21.0	16.9	24.5	-7.6*
	$d = 4$	7.6	6.0	9.1	-3.1*	5.6	4.4	6.7	-2.3*
	$d = 5$	0.5	0.3	0.7	-0.3*	0.4	0.3	0.6	-0.3*
Rural	$d = 1$	99.8	99.8	99.9	-0.1	49.5	47.6	50.9	-3.3*
	$d = 2$	84.5	80.5	87.5	-7.0*	45.3	42.4	47.5	-5.1*
	$d = 3$	50.7	45.6	54.6	-9.0*	30.9	27.6	33.4	-5.8*
	$d = 4$	12.4	10.5	13.9	-3.4*	9.1	7.7	10.2	-2.5*
	$d = 5$	0.9	0.6	1.1	-0.5**	0.8	0.5	0.9	-0.4**
Urban	$d = 1$	86.3	82.1	90.6	-8.5*	29.6	25.8	33.5	-7.6*
	$d = 2$	48.8	39.4	58.5	-19.2*	21.0	16.3	25.8	-9.5*
	$d = 3$	11.2	6.0	16.5	-10.4*	6.3	3.4	9.4	-6.0*
	$d = 4$	0.6	0.3	0.9	-0.6*	0.4	0.2	0.7	-0.5*
	$d = 5$	0.0	0.0	0.0	-	0.0	0.0	0.0	-

(\*) and (\*\*) mean that the differences are significant at 5% and 10% level respectively.

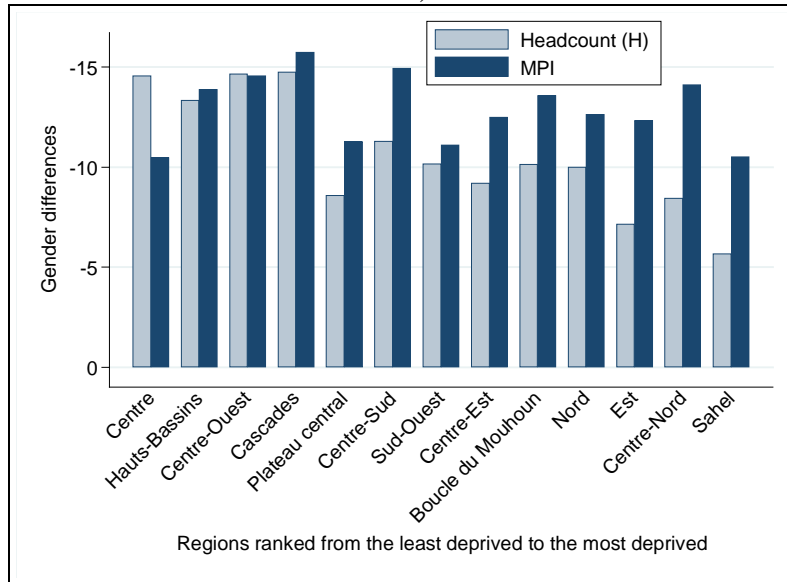
#### 4.2 Regional decomposition of gender inequalities

Gender differences vary from one region to another (see Figures 1 and 2). If we refer to Figure 1, which shows the regional distribution in Burkina Faso, it is clear that the value of the gender gap fluctuates in general between -5 and -15 in terms of percentage points for either the headcount or the MPI. In addition, differences seem relatively higher in least deprived regions such as Centre, Hauts-Bassins, Centre-Ouest and Cascades. Also, inequality is greater for MPI because not only women are poorer than men, but their average deprivation intensity is higher. This intensity seems to be important for poor



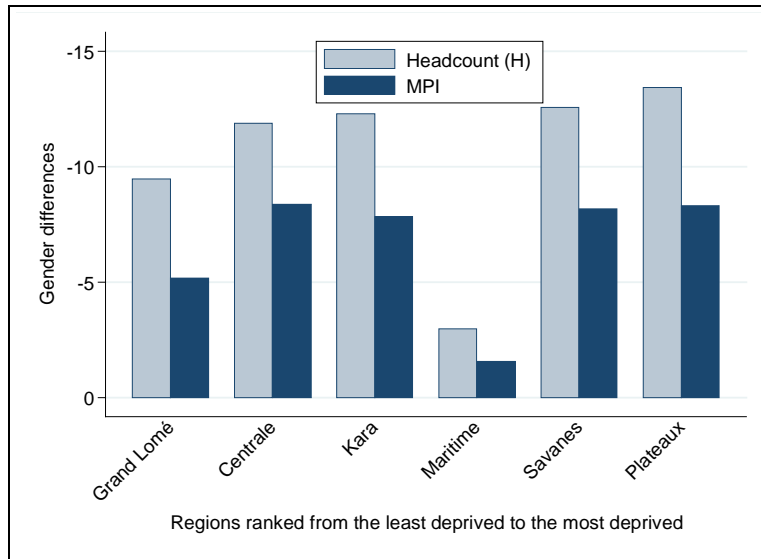
regions, which could explain why the differences in MPI appear relatively (as compared to headcount) greater for the poorest regions such as Est, Centre-Nord and Sahel. It should be noted that the multidimensional analysis upsets in certain extent the regional ranking compared to the monetary poverty analysis. For instance Sahel region is not the poorest one when regions are ranked according to monetary poverty.

Figure 1: Gender absolute differences by region in multidimensional poverty in Burkina Faso ( $d = 3$ )



Disparities in gender inequality also exist in Togo (Figure 2). Except for the Maritime region where gender inequality seems to be very low, all other regions register values between -5 and -15 as in the case of Burkina Faso.

Figure 2: Gender absolute differences by region in multidimensional poverty in Togo ( $d = 3$ )



### 4.3 Robustness analysis by gender

A robustness analysis is carried out next to compare the levels of multidimensional poverty between genders. As deprivation rates vary in function of multidimensional cutoff  $d$ , it is therefore appropriate to check whether the gender gap holds for a significant range of  $d$  values. Figures 3 and 4 present the situation, respectively for Burkina Faso and Togo. Figure 3 suggests that gender inequality in the MPI is still observed in Burkina Faso with value of  $d$  between 0.5 and 5.5. We can say that women are stochastically dominated by men in terms of multidimensional poverty. This is almost the case for the headcount (H), except that the deprivation rates for men and women are very close for small values of  $d$  ( $d < 1$ ). Figure 4 shows that this dominance also holds in Togo for most values of  $d$ . Regarding the MPI, the gender gap seems to be significant enough for values lower than 4, beyond which this gap becomes more negligible. A similar pattern can be observed for the headcount measure.

Figure 3: Comparisons of multidimensional poverty between genders in Burkina Faso

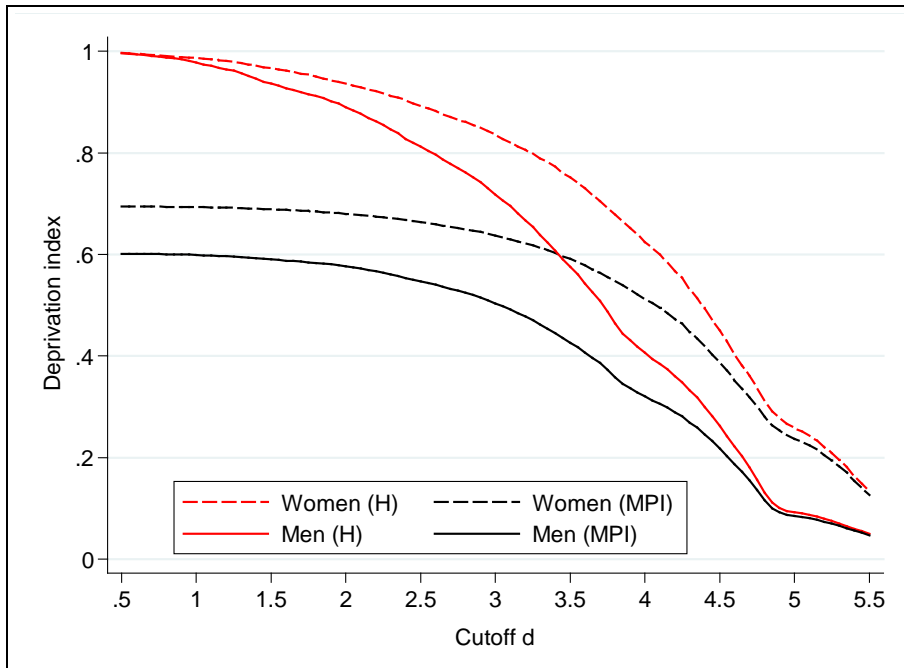
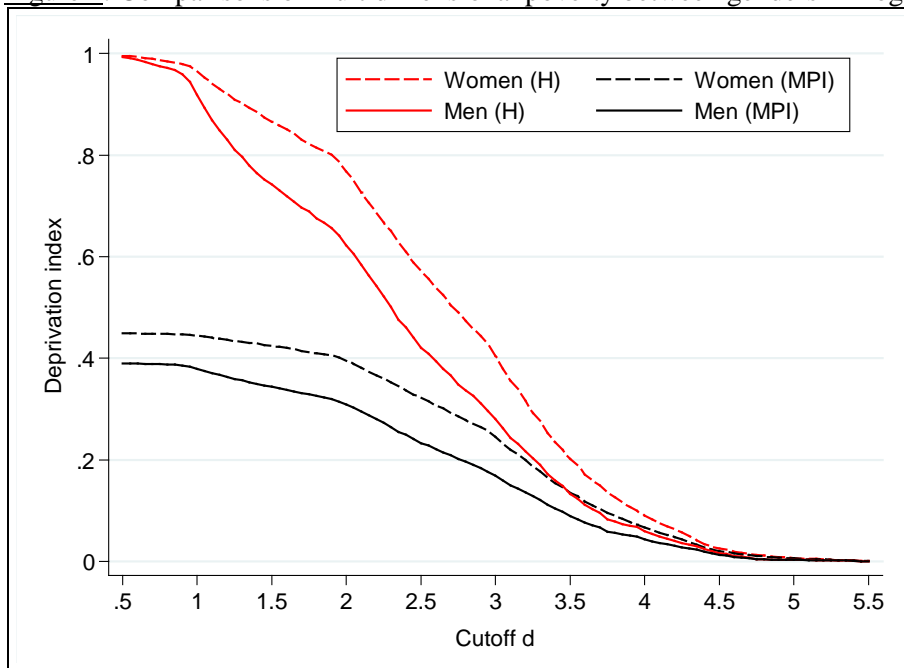


Figure 4: Comparisons of multidimensional poverty between genders in Togo



#### 4.4 Dimensional contributions to gender inequalities

Table 7 shows that the sources of gender inequality vary between Burkina Faso and Togo. For instance, when considering a cutoff  $d = 3$ , *employment* is found to be the main dimension explaining the gender gap in Burkina Faso since its contribution represents about 41%. *Education* proves to be the second contributor with 20%. The remaining dimensions (*access to credit*, *housing*, *assets* and *basic utilities*) explain the other 40%. Regarding Togo, three dimensions, namely *assets* (24.6%), *access to credit* (23%) and *employment* (22.6%), contribute together about 70% of gender differences. The *education* contribution seems to be relatively low (5%). This can be partly explained by the retained sample, which consists only of the head of household and his spouses. These are more likely to have a better education level than the other adults in the household, which may minimize the observable gender differences.

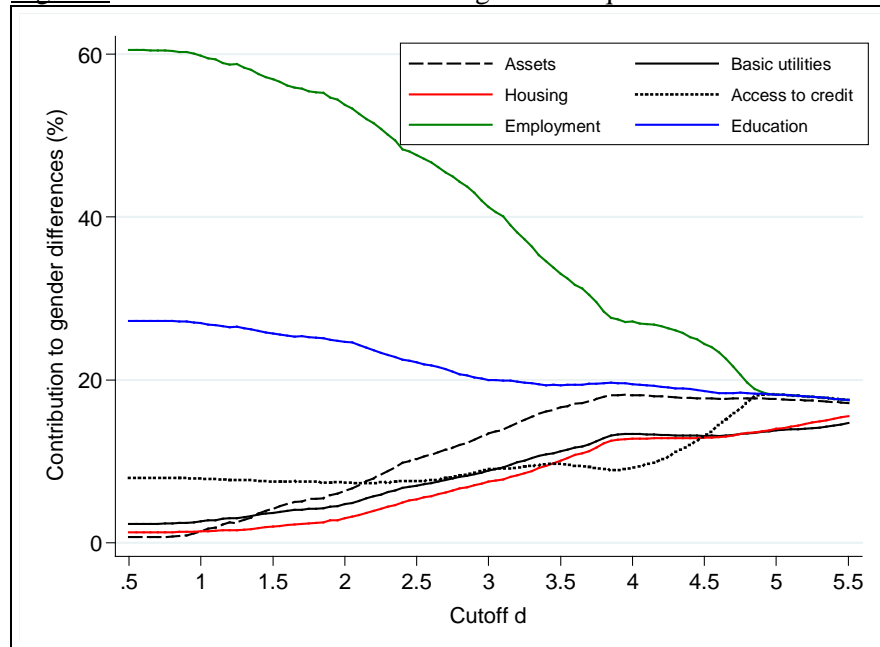
A sensitivity analysis is performed in order to understand how the contributions of these dimensions could vary along the cutoff  $d$ . The results are presented in Figures 5 and 6, respectively for Burkina Faso and for Togo. Figure 5 shows that the contributions of *employment* and *education* decrease as the cutoff increases in Burkina Faso. The contribution of *employment* to gender inequality, which is about 60% when  $d$  is equal to 0.5, gradually decreases to hit 20% when the cutoff reaches 5. The trend is less pronounced for *education*, whose contribution decreases from about 27% to a little less than 20% for the same cutoff levels. By contrast, the contributions of *assets*, *housing* and *basic utilities* seem to be negligible for lower cutoff values. However, they gradually increase to over 10% for cutoff values exceeding 3.5. Regarding *Access to credit*, its contribution remains stable when the cutoff varies from 0.5 to 4, before increasing to nearly 20% for cutoffs equal to or more than 5.

Table 7: Contribution of dimensions to gender inequalities for a cutoff  $d = 3$

Dimensions	Contribution to gender differences (%)	
	Burkina Faso	Togo
<i>Access to credit</i>	9.0	22.9
<i>Employment</i>	41.2	22.6
<i>Education</i>	20.0	4.9
<i>Housing</i>	7.5	8.2

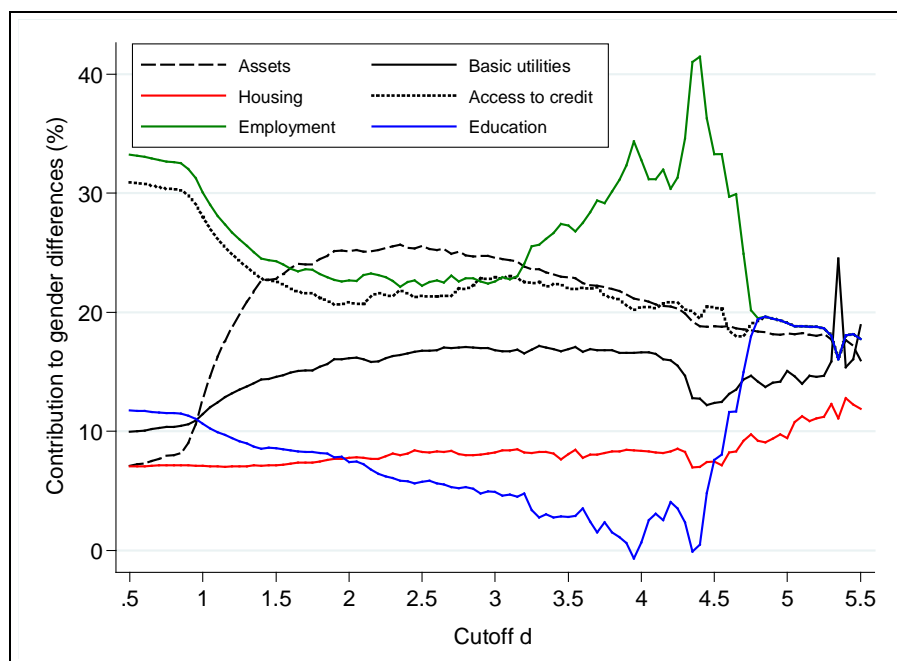
<i>Assets</i>	13.4	24.6
<i>Utilities</i>	8.9	16.8

Figure 5: Dimensional contributions to gender inequalities in Burkina Faso



The patterns of contributions to gender inequality seem to be less monotonic in the case of Togo (cf. Figure 6). For lower levels of  $d$ , *employment* and *access to credit* display the highest contributions with values above 30%. The *assets* contribution, which was below 10%, increases rapidly from  $d = 1$  to be more than 20% for values of  $d$  between 1.4 and 4. The contributions of these three dimensions remain higher than those of others, with a level generally above 20%. For its part, *education* undergoes a significant decline, with a contribution from about 10% to nearly 0% when the cutoff value is close to 4. It is clear from these two figures that the dimensions' contributions to gender inequalities are to a certain extent sensitive to the choice of cutoff. However, the analysis confirms the results reported in Table 7, which shows the predominance of *employment* and *education* in Burkina Faso and that of *employment*, *assets* and *access to credit* in Togo.

Figure 6: Dimensional contributions to gender inequalities in Togo



#### 4.5 Comparisons between age groups

Another important issue to explore is the correlation between deprivation and gender inequality by age. Table 8 presents the results of this analysis for both Burkina Faso and Togo. When the measure of deprivation headcount (H) is considered, the women’s deprivation rate increases with age in Burkina Faso. In fact, this rate, which represents 73.5% among people aged 15 to 19 years, rises to 92% for people aged 55 years and over. The same pattern is observed with the MPI even though it seems to be less monotonic. Gender inequality remains present in all age groups but it is more acute in the middle aged population (people aged 30 to 44 years). By contrast, gender differences are relatively less considerable for extreme age groups.

Table 8: Multidimensional deprivation rates by gender and age group, for a cutoff  $d = 3$

Country	Age groups (years)	Population shares (%)		Headcount H (%)				MPI (%)			
		Men	Women	All	Men	Women	Gender diff.	All	Men	Women	Gender diff.
Burkina Faso	15–19	9.8	10.0	70.8	68.1	73.5	-5.3*	52.8	50.3	55.2	-4.9*
	20–24	6.6	8.5	74.5	66.3	80.8	-14.5*	55.6	48.7	61.0	-12.3*
	25–29	5.5	7.9	79.1	72.6	83.5	-10.9*	58.8	51.4	63.9	-12.5*
	30–34	4.6	6.9	77.5	68.6	83.4	-14.8*	57.2	46.5	64.3	-17.7*
	35–39	4.0	5.4	79.4	68.4	87.5	-19.1*	58.7	46.1	68.1	-22.0*

	40–44	4.1	4.6	82.3	75.7	88.2	-12.5*	59.9	50.9	68.0	-17.1*
	45–49	3.3	3.8	83.8	77.4	89.3	-11.9*	60.6	52.3	67.8	-15.6*
	50–54	2.9	3.7	83.9	76.4	89.8	-13.4*	61.3	52.1	68.5	-16.3*
	55–59	2.4	2.3	86.6	80.3	92.9	-12.6*	62.7	54.5	71.1	-16.6*
	60–64	1.9	1.9	89.5	86.7	92.5	-5.8*	64.0	59.5	68.6	-9.1*
Togo	15–19	0.6	1.1	44.6	13.0	62.8	-49.8*	28.0	8.3	39.3	-31.0*
	20–24	2.2	5.3	43.1	24.3	51.0	-26.7*	26.3	14.7	31.1	-16.5*
	25–29	6.3	10.5	36.2	26.9	41.8	-14.9*	22.2	16.4	25.7	-9.3*
	30–34	7.5	7.6	32.4	27.1	37.6	-10.5*	19.4	16.4	22.5	-6.1*
	35–39	7.6	9.1	32.8	26.5	38.2	-11.7*	20.0	15.9	23.4	-7.5*
	40–44	7.1	6.4	34.1	28.7	40.0	-11.3*	20.6	17.2	24.4	-7.3*
	45–49	5.4	5.6	31.0	24.4	37.4	-13.0*	18.8	14.9	22.5	-7.7*
	50–54	4.6	3.8	31.9	29.0	35.4	-6.4	18.6	17.0	20.5	-3.5
	55–59	2.6	2.4	37.9	39.1	36.7	2.3	22.4	23.6	21.1	2.5
60–64	2.2	2.1	39.9	39.7	40.1	-0.5	23.2	23.4	23.1	0.3	

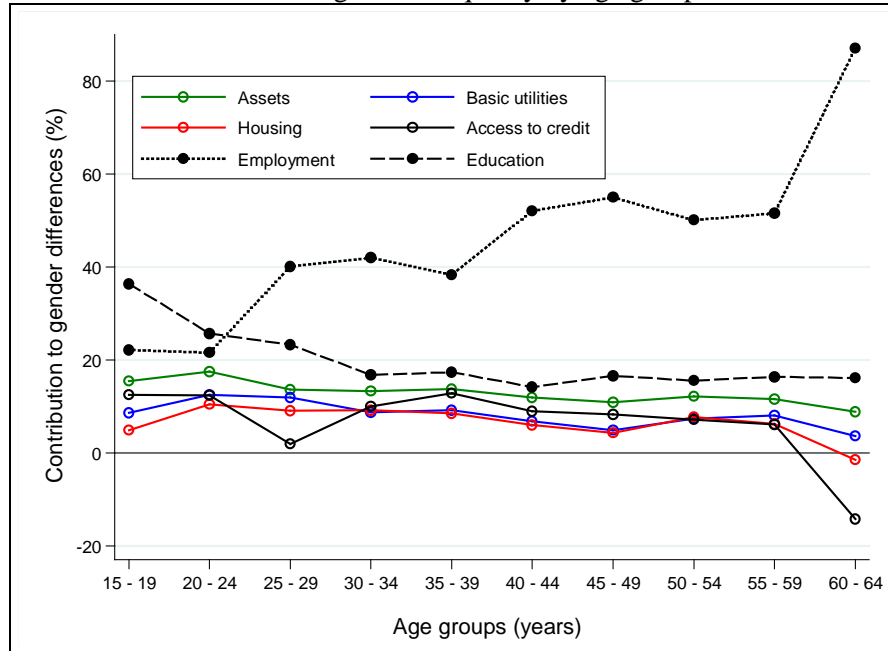
(\*) and (\*\*) mean that the differences are significant at 5% and 10% level respectively.

Concerning Togo, gender differences are observed for most age groups, except for 55 to 64 years for whom some equality, even a slight inequality in favor of women, can be noted. The highest gender inequalities occur in the youngest age groups, especially among individuals under 30 years. The deprivation headcount gaps in terms of percentage points are -49.8, -26.7 and -14.9, respectively for age groups of 15–19 years, 20–24 years and 25–29 years. This tendency remains the same with the MPI since the gaps are -31.0, -16.5 and -9.3, respectively. These results are unexpected insofar as, with all women empowerment programs implemented during recent decades, we expected rather more inequality for oldest age groups than for youngest ones, especially for dimensions such as *education* and *employment*.

It may be interesting to check whether the relative contributions of dimensions to gender inequality vary by age group. Figure 7 illustrates the case of Burkina Faso when the cutoff is equal to 3. It is clear from this figure that the *employment* contribution increases sharply with age. In fact, it varies from about 20% among 15–24 year olds to 40% among 25–39 year olds and to around 50% among 40–59 year olds, before jumping to 80% for people aged 60 and over. An inverse and less pronounced correlation is obtained when considering the *education* contribution. It gradually decreases between the youngest group (15–19 years) where it represents 40% and the age group of 30–34 years where it drops below 20% before stabilizing for older groups. The contribution patterns are almost

stable for *assets*, *basic utilities* and *housing* even though quite notable declines are noticed for individuals aged 60 and over.

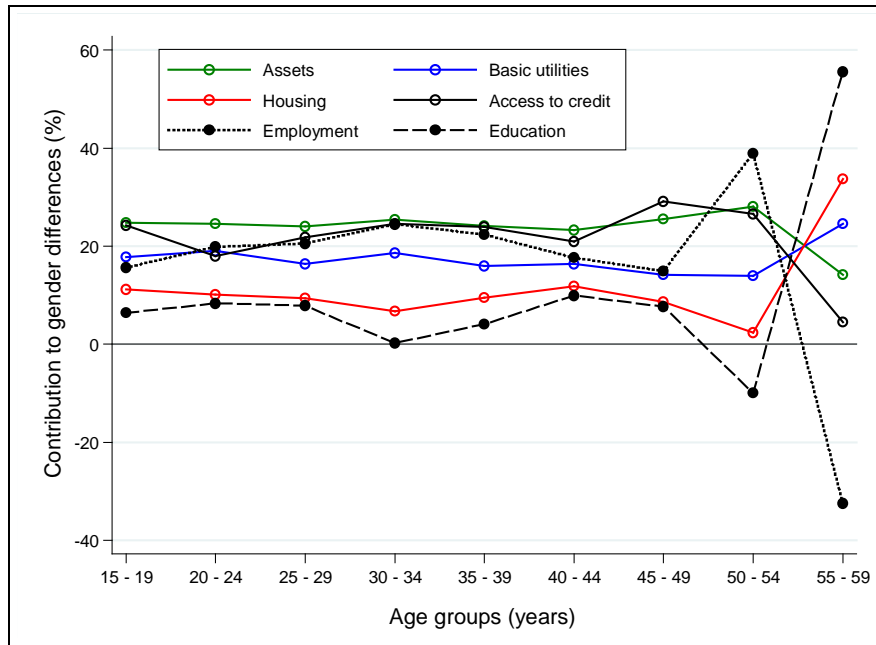
**Figure 7:** Dimensional contribution to gender inequality by age group in Burkina Faso, with  $d = 3$



In Togo, there is no correlation between the contributions of dimensions and age groups. Indeed, under 50 years old, Figure 8 shows that all contributions are represented by almost horizontal lines meaning that correlations do not exist. However, beyond 50 years, notable variations can be observed, especially in *employment*, *education* and *housing*. The contribution of *employment* jumps from less than 20% for the age group of 45–49 years to about 40% for the group of 50–54 years, before shifting negatively to around -32% for the age group over 54 years. A reverse pattern is obtained for the contribution of *education* since it declines to -10% for the 50–54 years group before jumping drastically to about 56% for individuals over 54 years. The pattern for *housing* is similar to that for *education* except that its magnitude is lower.

**Figure 8:** Dimensional contribution to gender inequality by age group in Togo, with  $d = 3$





## 5 Conclusion

Gender inequality should be tackled not only for reasons of equity, but also with a view to promoting economic efficiency for the better achievement of development outcomes. Like several studies based on the monetary measurement of poverty, this study, which is more focused on multidimensional deprivation, shows that gender inequalities in poverty exist in Burkina Faso and Togo. Furthermore, the analysis confirms that the extent of inequality could differ from one country to another. Regional disparities are also noted in both countries. Moreover, it is clear from these analyses that the sources of inequality are different. In fact, inequalities in *education* and *employment* largely explain gender inequality in Burkina Faso, while those in *assets*, *access to credit* and *employment* are the main sources in Togo.

However, there is one caveat when comparing countries. The samples of individuals retained for the two countries do not necessarily allow for comparison. In fact, the sample of Burkina Faso includes all individuals aged 15 to 64 years, while that of Togo, due to missing information, consists only of household heads and their spouses from the same age group. In addition, some of the definitions of certain dimensions such as *employment*

and *access to credit* are somewhat different while the use of MCA to estimate *housing, assets* and *basic utilities* indices introduces another non-comparability issue.

Although multidimensional poverty measurement is criticized for its weak theoretical framework and inherent aggregation problems, this approach seems to be increasingly useful and even essential in poverty assessment, including gender analysis. Poverty measures based on income or consumption remain the most appropriate, but they are insufficient to capture the multidimensional aspects of poverty, especially in poor countries. Therefore, it becomes wise to strengthen the theoretical and empirical bases of the use of such a multidimensional approach. The measure suggested by Alkire and Foster (2007, 2011) is an interesting one because of its simplicity and compliance with several desirable properties. For the choice of dimensions and their weights, it may be appropriate to adopt a consensual approach involving worldwide stakeholders. Already, the MDGs provide a good starting point for such consensus.

## References

Alkire, S. and J. E. Foster (2007), "Counting and multidimensional poverty measures," OPHI Working Paper no 7, University of Oxford.

Alkire, S. and J. E. Foster (2011), "Counting and multidimensional poverty measurement," *Journal of Public Economics*, 95: 476–487.

Alkire, S., Meinzen-Dick, R. S., Peterman, A., Quisumbing, A. R., Seymour, G. and A. Vaz (2012), "The Women's Empowerment in Agriculture Index," IFPRI Discussion Paper No 01240.

Alkire, S. and M. E. Santos (2010), "Acute Multidimensional Poverty: A New Index for Developing Countries," OPHI Working Paper no 38, University of Oxford.

Asselin, L. M. (2009), *Analysis of Multidimensional Poverty: Theory and Case Studies*, Springer/IDRC: New York.

Baker, J. L. (2008), "Urban Poverty: A Global View," Urban Papers UP-5, Urban Sector Board, The World Bank, Washington DC.

Banerjee, S. G. and E. Morella (2011), *Africa's Water and Sanitation Infrastructure: Access, Affordability, and Alternatives*, The World Bank, Washington DC.

Bastos, A., Casaca, S. F., Nunes, F. and J. Pereirinha (2009), "Women and poverty: A gender-sensitive approach," *The Journal of Socio-Economics*, 38: 764–778.

Batana, Y. M. (2013), "Multidimensional Measurement of Poverty Among Women in Sub-Saharan Africa," *Social Indicators Research*, 112, 337-362.

Batana, Y. M. and J.-Y. Duclos (2010), "Multidimensional poverty among West African children: testing for robust poverty comparisons," in: Cockburn, J. and J. Kabubo-Mariara (eds), *Child Welfare in Developing Countries*, Springer-IDRC-PEP, New York.

Becchetti, L. and P. Conzo (2013): "Credit access and life satisfaction: evaluating the nonmonetary effects of microfinance," *Applied Economics*, 45: 1201–1217.

Becker, G. S. (1993), *Human Capital*, Columbia University Press, New York.

Booyesen, F., Von Maltitz, M., Van Der Berg, S., Burger, R. and G. Du Rand (2008): "Using an Asset Index to Assess Trends in Poverty in Seven Sub-Saharan African Countries," *World Development*, 36: 1113–1130.

Bourguignon, F. and S. Chakravarty (2003): "The measurement of multidimensional poverty," *Journal of Economic Inequality*, 1: 25–49.

- Brandolini, A., Magri, S. and T. M. Smeeding (2010): "Asset-Based Measurement of Poverty," *Journal of Policy Analysis and Management*, 36: 1113–1130.
- Brown, A. C. (2009), "Poverty Issues in Infrastructure Regulation: Why, Who and How?," *Poverty in Focus*, 18: 13–15.
- Buckley, R. M. and J. Kalarickal (2006), *Thirty Years of World Bank Shelter Lending: What Have we Learned?*, The World Bank, Washington, DC.
- Cattaneo, M. D., Galiani, S., Gertler, P. J., Martinez, S. and R. Titiunik (2007), "Housing, Health and Happiness," Impact Evaluation Series No IE 14, World Bank Policy Research Working Paper No 4214, Washington, DC.
- Cohen, A. (2010), "The Multidimensional Poverty Assessment Tool: A new framework for measuring rural poverty," *Development in Practice*, 20: 887–897.
- Deere, C. D., Alvarado, G. E. and J. Twyman (2010), "Poverty, Headship, and Gender Inequality in Asset Ownership in Latin America," CEPAL Working Paper no 296.
- Diagne, A. and M. Zeller (2001), "Access to Credit and Its Impact on Welfare in Malawi," IFPRI Research Report No 116, Washington, DC.
- Duclos, J.-Y., Sahn, D. and S. Younger (2006): "Robust multidimensional poverty comparisons," *Economic Journal*, 116: 943–968.
- Ezzrari, A. and P. Verme (2012), "A Multiple Correspondence Analysis Approach to the Measurement of Multidimensional Poverty in Morocco, 2001-2007," World Bank Policy Research Working Paper No 6087, Washington, DC.
- Ferreira, F. H. G. (2011), "Poverty is multidimensional. But what are we going to do about it?," *Journal of Economic Inequality*, 9: 493–495.
- Fletschner, D. (2008), "Women's Access to Credit: Does It Matter for Household Efficiency?," *American Journal of Agricultural Economics*, 90: 669–683.
- Foster, J. E. (2012), "New Frontiers in Poverty Measurement," PREM Knowledge and Learning Weeks, World Bank, May 8.
- Foster, J. E., Greer, J. and E. Thorbecke (1984), "A Class of Decomposable Poverty Measures," *Econometrica*, 52: 761–766.
- Francisco, J. S. (2007), "Gender Inequality, Poverty and Human Development in South East Asia," *Development*, 50: 103–114.
- Greenacre, M. (2007), *Correspondence analysis in practice*, Second Edition, Chapman and Hall/CRC: New York.

Greenacre, M. and J. Blasius (2006), *Multiple correspondence analysis and related methods*, Chapman and Hall: London.

Günther, I. and G. Fink (2010), "Water, Sanitation and Children's Health: Evidence from 172 DHS Surveys," World Bank Policy Research Working Paper No 5275, Washington, DC.

Hailu, D. and R. Tsukada (2009), "Equitable Access to Basic Utilities: An Overview," *Poverty in Focus*, 18: 3–5.

Heath, R. (2012), "Women's Access to Labor Market Opportunities, Control of Household Resources, and Domestic Violence," World Bank Policy Research Working Paper No 6149, Washington, DC.

Hudon, M. (2009), "Should Access to Credit a Right?," *Journal of Business Ethics*, 84: 17–28.

Ki, J. B., Sawadogo, D. and B. Ki (2006), "Diversification des Mesures de la Pauvreté: Approche Multidimensionnelle au Burkina Faso," African Economic Research Consortium (AERC), September.

Kolev, A. and N. Sirven (2010), "Gender Disparities in Africa's Labor Markets: A Cross-Country Comparison Using Standardized Survey Data," in Arbache, J. S., Kolev, A. and E. Filipiak (eds), *Gender Disparities in Africa's Labor Market*, The World Bank, Washington, DC.

Komives, K., Foster, V., Halpern, J. and Q. Wodon (2005), *Water, Electricity, and the Poor: Who Benefits from Utilities Subsidies?*, The World Bank, Washington DC.

Krishnakumar, J. and P. Ballon (2008): "Estimating Basic Capabilities: A Structural Equation Model Applied to Bolivia," *World Development*, 36: 992–1010.

Lachaud, J.-P. (1999), "Le différentiel spatial de pauvreté au Burkina Faso: 'capabilités' versus dépenses," Document de travail No 36, CED, Université Montesquieu-Bordeaux IV.

Lam, D. and S. Duryea (1999), "Effects of schooling on fertility, labour supply and investments in children, with evidence from Brazil," *The Journal of Human Resources*, 34: 160–192.

Lanjouw, P. (2012), "Counting Women in Poverty: Potential Pitfalls in Conventional Poverty Analysis," PREM Knowledge and Learning Weeks, World Bank, May 8.

Levine, S., Muwonge, J. and Y. M. Batana (2011), "A Robust Multi-Dimensional Poverty Profile for Uganda," PMMA Working paper 2011-20, PEP.

- Luebker, M. (2011), "Chapter 2. Labour Productivity," in Sparreboom, T. and A. Albee (eds), *Towards Decent Work in Sub-Saharan Africa Monitoring MDG Employment Indicators*, International Labor Office, Geneva.
- Lugo, M. A. (2007), "Employment: A Proposal for Internationally Comparable Indicators," *Oxford Development Studies*, 35: 361–378.
- Maasoumi, E. and G. Yalonetzky (2013), "Introduction to Robustness in Multi-dimensional wellbeing Analysis," *Econometric Review*, 32: 1–6.
- McKay, A. (2009), "Assets and chronic poverty: Background paper," Working Paper no 100, Chronic Poverty Research Centre.
- Ministère de l'Économie et du Développement (2007), *Questionnaire des indicateurs de base de bien-être*, Rapport final, June 2007.
- Moghadam, V. (2005), "The 'Feminisation of Poverty' and Women's Human Rights," *Papers in Women's Studies and Gender Research*, No 2, July.
- Navarro, C. and L. Ayala (2008), "Multidimensional housing deprivation indices with application to Spain," *Applied Economics*, 40: 597–611.
- Navarro, C., Ayala, L. and J. M. Labeaga (2010), "Housing deprivation and health status: Evidence from Spain," *Empirical Economics*, 38: 55–582.
- Ngo, T. M.-P. And Z. Wahhaj (2012), "Microfinance and gender empowerment," *Journal of Development Economics*, 99: 1–12.
- OECD (2010), "Gender Inequality and the MDGs: What are the Missing Dimensions?," *At Issue*, September.
- Quisumbing, A. R., Haddad, L. and C. Peña (2001), "Are women overrepresented among the poor? An analysis of poverty in 10 developing countries," *Journal of Development Economics*, 66: 225–269.
- Ravallion, M. (2011), "On Multidimensional indices of poverty," *The Journal of Economic Inequality*, 9: 235–248.
- Ravallion, M. (2012), "Mashup Indices of Development," *The World Bank Research Observer*, 27: 1–32.
- Sackey, H. A. (2005a), "Poverty in Ghana from an Assets-based Perspective: An Application of Probit Technique," *African Development Review*, 17: 41–69.
- Sackey, H. A. (2005b), "Female labour force participation in Ghana: The effects of education," AERC Research Paper 150, Nairobi, September.

Sahn, D. E. and D. Stifel (2003), "Exploring Alternative Measures of Welfare in the Absence of Expenditure Data," *Review of Income and Wealth*, 49: 463–489.

Stifel, D. and L. Christiaensen (2007), "Tracking Poverty Over Time in the Absence of Comparable Consumption Data," *The World Bank Economic Review*, 21: 317–341.

UNICEF (1999), "Women in Transition," Regional Monitoring Report No 6, UNICEF, Florence.

WHO (2006), *Report on the WHO Technical Meeting on Quantifying Disease from Inadequate Housing*, Bonn, Germany, 28-30 November 2005, Copenhagen: WHO Regional Office for Europe.

World Bank (1980), *World Development Report 1980*, The World Bank, Washington, DC, August.

World Bank (2006), *Gender Equality as Smart Economics: A World Bank Group Gender Action Plan (Fiscal years 2007-10)*, The World Bank, Washington, DC.

World Bank (2010), *Water and Development: An Evaluation of World Bank Support, 1997-2007*, Volume 1, IEG Study Series, The World Bank, Washington, DC.

World Bank (2011a), *World Development Report 2012: Gender Equality and Development*, The World Bank, Washington, DC.

World Bank (2011b), *Learning for All: Investing in People's Knowledge and Skills to Promote Development*, The World Bank Group Education Strategy 2020, The World Bank, Washington, DC.