

Measuring Intersectional Inequality in Sub-Saharan Africa*

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Abstract

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JEL codes: I24, I32, J15, J16

Keywords: Inequality, Intersectionality, Measurement, Poverty

*Thanks . . .

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1 Introduction

In recent years, it has become evident that not all groups of people profit equally from the progress in human development (*citation*). If these disparities between social groups arise due to systematic differences inequality of opportunity, they might even be detrimental to growth (cite: Ferreira et al. 2014, Marrero et al. 2013). The concept of horizontal inequality is increasingly being applied to measure inequalities between socially salient groups like gender or ethnicity, (cite: Mancini et al. 2008, Tetteh-Bah et al. (forthcoming)). At the same time, the call that social inequalities have to be studied from an *intersectional* perspective, has largely been unanswered in the empirical literature.

To fill this gap, this paper introduces the concept of intersectionality into the measurement of horizontal inequality. In contrast to the existing literature, this paper investigates whether thinking about horizontal inequalities intersectionally adds valuable information to the measurement of inequality rather than just increasing complexity. In particular, we analyze intersectional education inequality in Sub-Saharan Africa (SSA) by combining gender with ethnicity, religion, and place of residence (urban *versus* rural). First, we estimate horizontal inequalities across pure groups (e.g. *gender*) and intersectional groups (e.g. *gender* \times *ethnicity*) using Group-Gini indices as an outcome. Second, we compare the pure group estimates to the intersectional estimates to analyze whether there is in fact an intersectional component to horizontal inequality. In other words, we explore whether there is an independent additive effect of the interaction of groups, or whether inequality is driven by the sum of the individual effects of being in two disadvantaged groups at the same time. Third, we explore time trends to determine if intersectional inequality in education has increased or decreased over the year, and compare this to time trends in vertical and horizontal inequality.

To this end, we combine data from multiple rounds of the Demographic and Health Surveys (DHS) for 27 countries from 1992 to 2016 resulting in 1'454'637 unique observations on the individual level. We find that [*SUMMARIZE RESULTS*]

This paper contributes to several lines of research. First, it integrates the concept of intersectionality into the growing literature on the measurement of horizontal inequality.

General inequality: - Piketty and Saez 2014 (USA & Europe) - Ravallion 2014 (Developing world)

- Shorrocks (1984)
- Mancini (2008)
- Mancini, Stewart and Brown (2008)
- Brunori (2018)
- canelas, 2018
- cederman (2011)
- cedermann (2015)
- cogneau (2008)
- elbers 2008

- ferreira (2011)?
- Langer 2005
- Langer et al 2007
- Leivas & Dos Santos (2016)

Second, our research relates to the literature on gender inequality in education, especially... - cooray 2011 - Hill and King 1995 - Klasen 2002 - Klasen & Lamanna 2009

Third, this paper speaks to a large empirical literature that explores ethnic and religious inequality on the African continent.

- easterly 1997
- Alesina, 2016
- Alcorta, 2018
- Houle & bodea (2017)
- Montalvo & Reynal-Querol 2005 (ethnic)
- montalvo reynal-querol 2003 religious
- Muller (2017)

Urban rural:

- Günther & Harttgen (2012)
- Harttgen & Klasen (2012)
- Murshed & Gates (2005)
- young 2013

Finally, my research contributes to a strand of literature in sociology, social psychology, feminist and gender studies on the concept of intersectionality in general.

- crenshaw 1990
-

The remainder of this paper proceeds as follows. Section 2 introduces the concept of intersectional inequality. Section 3 presents more information on the data. Section 4 describes the empirical strategy to estimate the intersectional inequalities and for the subsequent analysis. Section 5 presents the results of the analysis. Section 6 concludes.

2 Intersectional Inequality

Describe the concept of intersectionality in relation to vertical and horizontal inequality.

3 Data

- Data sets, Sample
- Descriptive Statistics (Variable description)

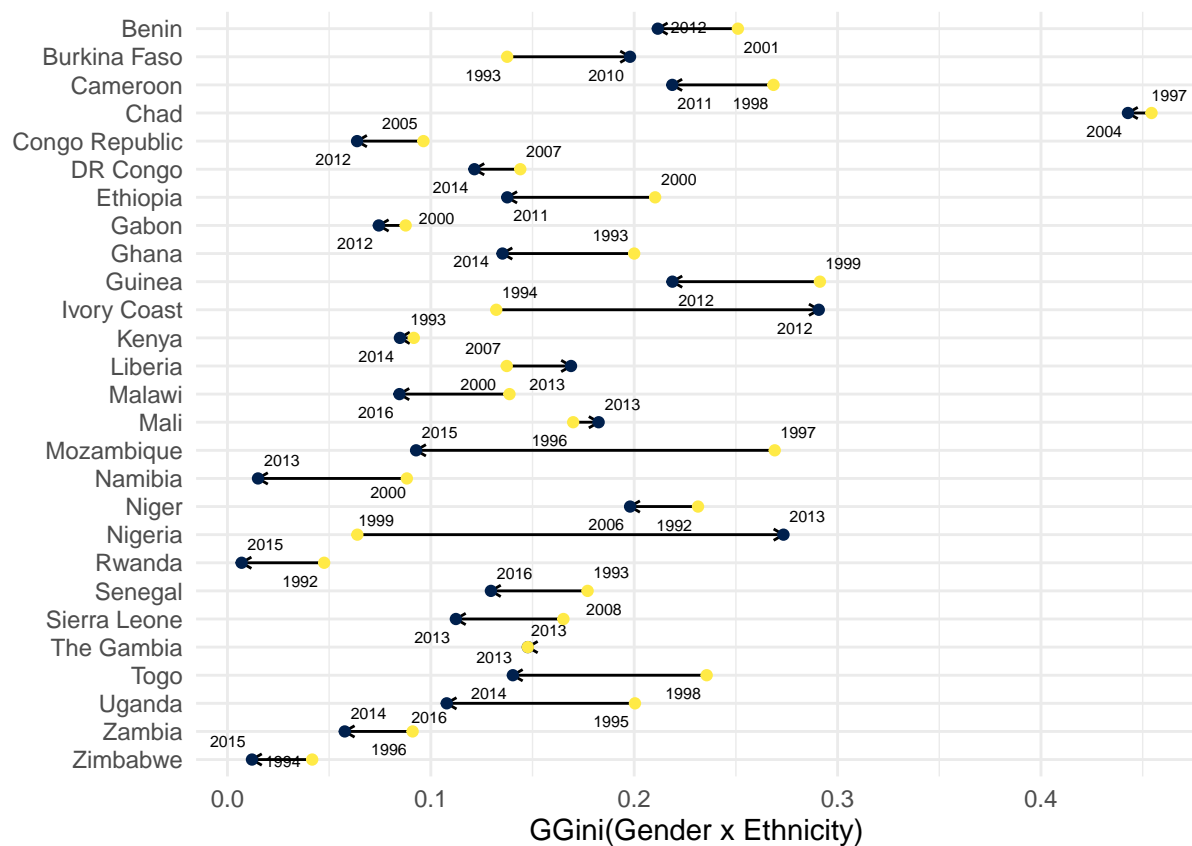


Figure 1: ref:foo

A Figure note.

4 Empirical Strategy

5 Results

```
df_nest %>%
  ggplot(aes(x=gg_gen, y=unlist(res_gen_ratio))) +
  geom_point() +
  stat_cor(method = "pearson") +
  labs(caption = "Groups: Gender", x="GGini", y="Ratio lowest/highest")
```

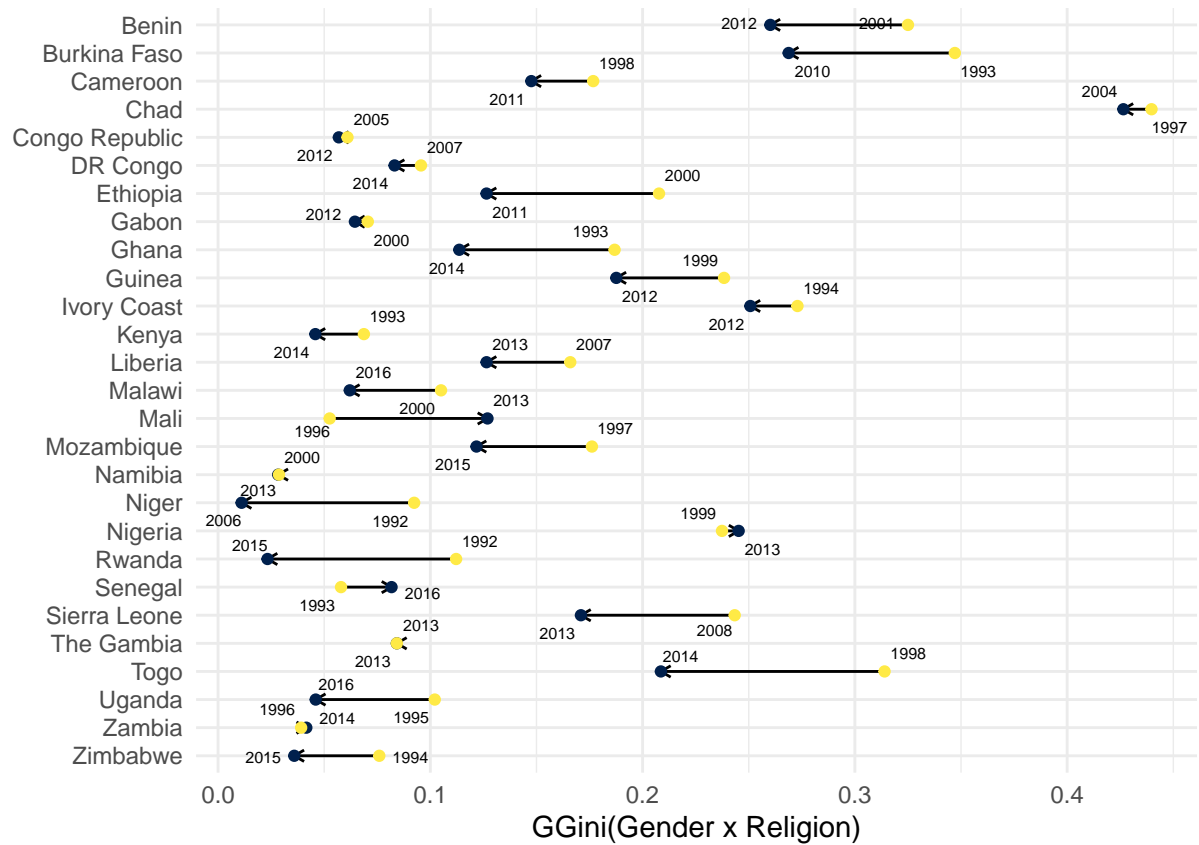


Figure 2: ref:fig-trends-rel

(ref:note-trends-rel)

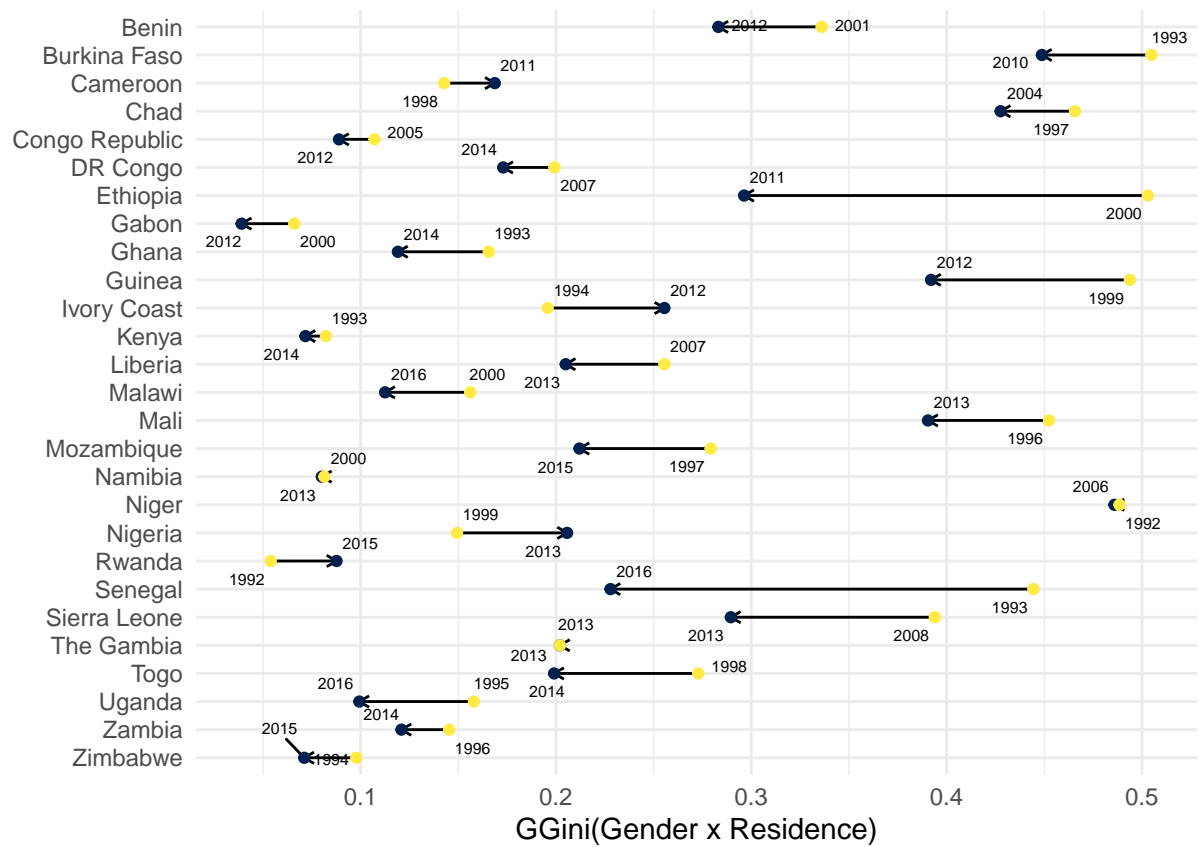
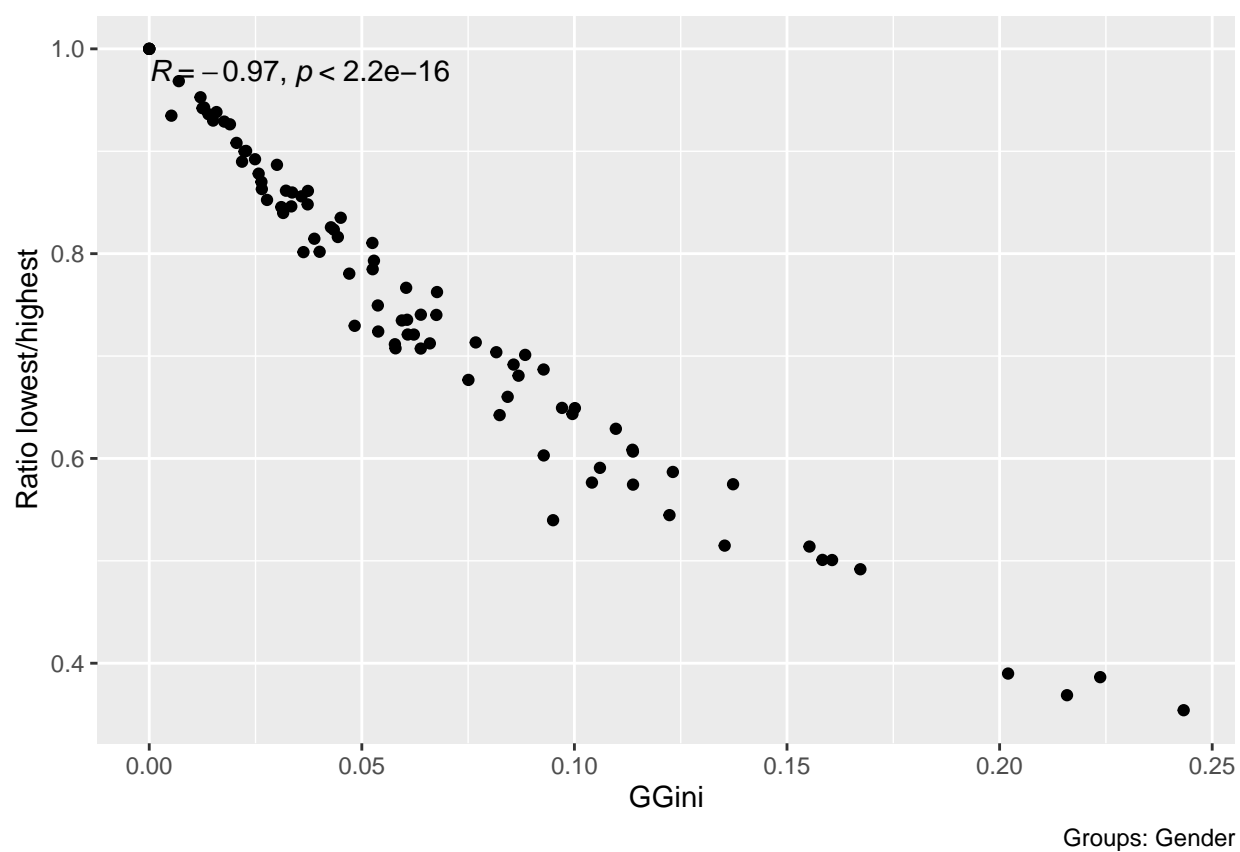
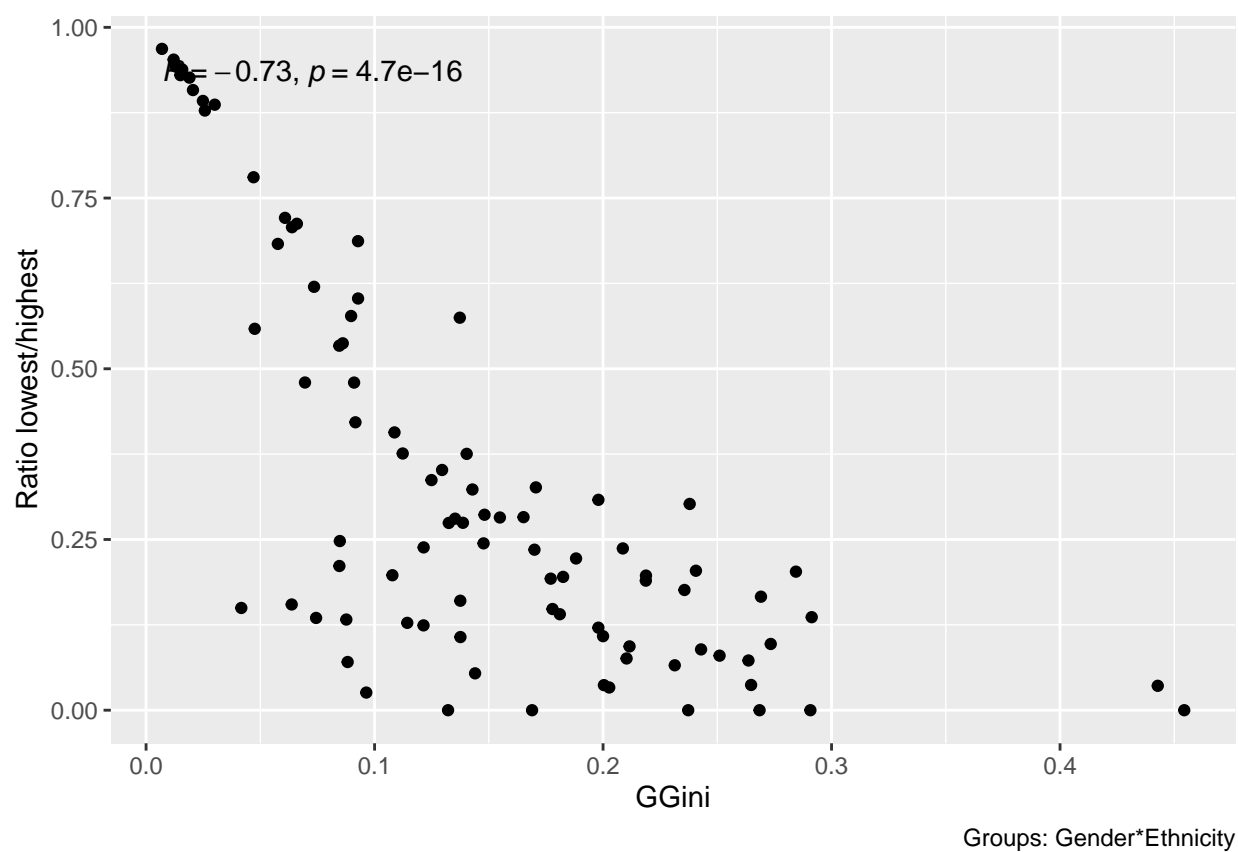


Figure 3: ref:fig-trends-res

(ref:note-trends-res)





6 Conclusion

testing a citation (Fields, 2003)

References

Fields, G. S. (2003). *Accounting for Income Inequality and its Change: A New Method, with Application to the Distribution of Earnings in the United States* (Vol. 22, pp. 1–38). Emerald Group Publishing Limited. [https://doi.org/10.1016/S0147-9121\(03\)22001-X](https://doi.org/10.1016/S0147-9121(03)22001-X)

A Group Gini Results

Table 1: Intersectional Group Gini Indices by Year and Country

year	gender	religion	ethnicity	residence	gen*rel	gen*eth	gen*res
Benin							
2001	0.16	0.27	0.15	0.16	0.33	0.25	0.34
2012	0.11	0.21	0.14	0.11	0.26	0.21	0.28
Burkina Faso							
1993	0.06	0.32	0.10	0.06	0.35	0.14	0.50
1999	0.16	0.30	0.16	0.16	0.36	0.26	0.59
2003	0.12	0.26	0.16	0.12	0.32	0.24	0.54
2010	0.10	0.22	0.14	0.10	0.27	0.20	0.45
Cameroon							
1998	0.04	0.16	0.26	0.04	0.18	0.27	0.14
2004	0.05	0.14	0.22	0.05	0.16	0.24	0.16
2011	0.04	0.13	0.21	0.04	0.15	0.22	0.17
Chad							
1997	0.24	0.33	0.33	0.24	0.44	0.45	0.47
2004	0.22	0.33	0.35	0.22	0.43	0.44	0.43
Congo Republic							
2005	0.04	0.03	0.07	0.04	0.06	0.10	0.11
2012	0.04	0.03	0.04	0.04	0.06	0.06	0.09
Democratic Republic of the Congo							
2007	0.09	0.01	0.09	0.09	0.10	0.14	0.20
2014	0.08	0.01	0.07	0.08	0.08	0.12	0.17
Ethiopia							
2000	0.09	0.15	0.13	0.09	0.21	0.21	0.50
2005	0.12	0.12	0.11	0.12	0.20	0.20	0.43
2011	0.09	0.07	0.07	0.09	0.13	0.14	0.30
Gabon							
2000	0.03	0.05	0.08	0.03	0.07	0.09	0.07
2012	0.02	0.05	0.07	0.02	0.06	0.07	0.04
Ghana							
1993	0.05	0.13	0.17	0.05	0.19	0.20	0.17
1998	0.06	0.13	0.14	0.06	0.17	0.18	0.14
2003	0.07	0.12	0.14	0.07	0.17	0.18	0.15
2008	0.05	0.10	0.12	0.05	0.13	0.15	0.13
2014	0.04	0.08	0.12	0.04	0.11	0.14	0.12
Guinea							
1999	0.20	0.07	0.14	0.20	0.24	0.29	0.49

Table 1: Intersectional Group Gini Indices by Year and Country (*continued*)

year	gender	religion	ethnicity	residence	gen*rel	gen*eth	gen*res
2005	0.22	0.08	0.10	0.22	0.26	0.28	0.47
2012	0.16	0.06	0.11	0.16	0.19	0.22	0.39
Ivory Coast							
1994	0.00	0.27	0.13	0.00	0.27	0.13	0.20
1999	0.11	0.25	0.24	0.11	0.30	0.24	0.26
2012	0.11	0.20	0.25	0.11	0.25	0.29	0.26
Kenya							
1993	0.04	0.04	0.07	0.04	0.07	0.09	0.08
1998	0.03	0.02	0.05	0.03	0.05	0.07	0.08
2003	0.02	0.06	0.11	0.02	0.07	0.11	0.08
2009	0.02	0.05	0.08	0.02	0.06	0.08	0.08
2014	0.01	0.04	0.08	0.01	0.05	0.08	0.07
Liberia							
2007	0.14	0.05	0.00	0.14	0.17	0.14	0.26
2013	0.10	0.04	0.11	0.10	0.13	0.17	0.20
Malawi							
2000	0.06	0.06	0.11	0.06	0.11	0.14	0.16
2004	0.03	0.05	0.10	0.03	0.07	0.11	0.12
2010	0.02	0.05	0.08	0.02	0.06	0.09	0.09
2016	0.03	0.04	0.07	0.03	0.06	0.08	0.11
Mali							
1996	0.00	0.05	0.17	0.00	0.05	0.17	0.45
2001	0.00	0.06	0.13	0.00	0.06	0.13	0.42
2006	0.14	0.05	0.09	0.14	0.17	0.19	0.42
2013	0.11	0.02	0.11	0.11	0.13	0.18	0.39
Mozambique							
1997	0.10	0.11	0.20	0.10	0.18	0.27	0.28
2003	0.09	0.08	0.00	0.09	0.16	0.09	0.29
2011	0.06	0.08	0.21	0.06	0.11	0.24	0.23
2015	0.09	0.04	0.00	0.09	0.12	0.09	0.21
Namibia							
2000	0.01	0.02	0.07	0.01	0.03	0.09	0.08
2007	0.03	0.02	0.00	0.03	0.04	0.03	0.09
2013	0.02	0.02	0.00	0.02	0.03	0.02	0.08
Niger							
1992	0.05	0.04	0.21	0.05	0.09	0.23	0.49
1998	0.03	0.02	0.18	0.03	0.05	0.21	0.46
2006	0.00	0.01	0.20	0.00	0.01	0.20	0.49

Table 1: Intersectional Group Gini Indices by Year and Country (*continued*)

year	gender	religion	ethnicity	residence	gen*rel	gen*eth	gen*res
Nigeria							
1999	0.06	0.21	0.00	0.06	0.24	0.06	0.15
2003	0.07	0.23	0.00	0.07	0.26	0.07	0.17
2008	0.06	0.20	0.25	0.06	0.23	0.26	0.17
2013	0.07	0.21	0.25	0.07	0.25	0.27	0.21
Rwanda							
1992	0.01	0.11	0.04	0.01	0.11	0.05	0.05
2005	0.02	0.04	0.00	0.02	0.05	0.02	0.09
2008	0.03	0.04	0.00	0.03	0.05	0.03	0.09
2010	0.01	0.02	0.00	0.01	0.03	0.01	0.08
2015	0.01	0.02	0.00	0.01	0.02	0.01	0.09
Senegal							
1993	0.06	0.00	0.15	0.06	0.06	0.18	0.44
1997	0.08	0.00	0.10	0.08	0.08	0.14	0.40
2005	0.08	0.05	0.11	0.08	0.12	0.15	0.34
2011	0.08	0.04	0.13	0.08	0.12	0.17	0.30
2014	0.05	0.04	0.10	0.05	0.08	0.12	0.23
2016	0.05	0.03	0.11	0.05	0.08	0.13	0.23
Sierra Leone							
2008	0.11	0.17	0.07	0.11	0.24	0.17	0.39
2013	0.09	0.11	0.04	0.09	0.17	0.11	0.29
The Gambia							
2013	0.06	0.03	0.12	0.06	0.08	0.15	0.20
Togo							
1998	0.17	0.24	0.13	0.17	0.31	0.24	0.27
2014	0.10	0.16	0.07	0.10	0.21	0.14	0.20
Uganda							
1995	0.08	0.04	0.16	0.08	0.10	0.20	0.16
2001	0.06	0.03	0.00	0.06	0.08	0.06	0.14
2006	0.05	0.04	0.00	0.05	0.08	0.05	0.12
2011	0.03	0.03	0.11	0.03	0.05	0.12	0.12
2016	0.03	0.03	0.09	0.03	0.05	0.11	0.10
Zambia							
1996	0.04	0.00	0.07	0.04	0.04	0.09	0.15
2002	0.04	0.01	0.06	0.04	0.05	0.09	0.14
2007	0.05	0.01	0.05	0.05	0.05	0.07	0.14
2014	0.04	0.01	0.04	0.04	0.04	0.06	0.12
Zimbabwe							

Table 1: Intersectional Group Gini Indices by Year and Country (*continued*)

year	gender	religion	ethnicity	residence	gen*rel	gen*eth	gen*res
1994	0.03	0.06	0.01	0.03	0.08	0.04	0.10
1999	0.02	0.04	0.00	0.02	0.05	0.02	0.09
2006	0.02	0.03	0.00	0.02	0.04	0.02	0.07
2011	0.02	0.02	0.00	0.02	0.04	0.02	0.06
2015	0.01	0.02	0.00	0.01	0.04	0.01	0.07

B Test two

another appendix chapter