Occupational gender segregation in post-apartheid South Africa

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Motivation

• South Africa: dysfunctional labor market with low employment rates among women and black Africans.

• Apartheid left South Africa with large racial inequalities with blacks facing:
  – Higher poverty and deprivation (Gradín, 2013)
  – Lower employment rates and wages (e.g. Rospabé, 2002)
  – Lower occupational attainment (e.g. Treiman et al., 1996)
  – Occupational segregation of blacks into low-paying occupations (Gradín, 2017b).

• ... but also affected gender equality: Temporary migration of black men (Gelb, 2004):
  – Disruption of family life: Women had to fulfil the role of both breadwinner and caregiver in challenging circumstances of high unemployment and HIV/AIDS prevalence, with very limited economic opportunities (Budlender and Lund, 2011).
Previous literature on gender inequality

• Growing **feminization** of the labor force after apartheid, with **higher unemployment/self-employment** (Casale and Posel, 2002; Posel, 2014)
  - lower marriage rates, higher education, non-discriminatory legislation;

• **Compared with men**, South African women face:
  - lower employment rates (e.g. Leibbrandt et al., 2010)
  - lower earnings (e.g. Burger and Yu, 2007; Wittenberg, 2014)
  - and none of them is fully explained by their different **endowments**.
  - Women also tend to be over-represented at both, the **bottom** (e.g. domestic service) and **top** (e.g. professionals) of skills categories (Winter, 1999; Rospabé, 2001).
Previous literature on gender inequality

• Much less about gender **occupational segregation** or **stratification**:  
  – Occupational attainment (Rospabé, 2001); Occupational segregation (Parashar, 2008).

• Occupational **segregation** by **race**:  
  – The labor market is still strongly **stratified** by race with blacks systematically overrepresented at the lowest-paying occupations,
  – ... even after controlling for the differences by population group in **education** and other observed characteristics of workers (Gradín, 2017).

• **Aim**: To **extend the analysis** of **segregation and stratification** of occupations to **gender** in post-apartheid South Africa using the same approach and data sources.
The approach

Segregation curve

Segregation indices $S(f^c, f^r)$

Dissimilarity:

$$D(f^c, f^r) = \frac{1}{2} \sum_{j=1}^{T} |f^c_j - f^r_j| = \max_{j \in [1,T]} \{F^c_j - F^r_j\}.$$ 

Gini:

$$Gini(f^c, f^r) = 2 \sum_{j=1}^{T} (\hat{F}^c_j - \hat{F}^r_j) f^c_j;$$

where

$$\hat{F}^i_j = \frac{1}{2}(F^i_{j-1} + F^i_j) = F^i_{j-1} + \frac{1}{2}f^i_j$$

Occupations sorted by male/female ratio
Concentration (low-pay segregation) indices: $S(g^c, g^r)$

**Dissimilarity:**

$$D(g^c, g^r) = G_S^c - G_S^r,$$

where $|G_S^c - G_S^r| = \max_{j\in[1,J]} \{|G_j^c - G_j^r|\}$.

**Gini:**

$$\text{Gini}(g^c, g^r) = 2 \sum_{j=1}^T (\hat{G}_j^c - \hat{G}_j^r)g_j^c$$

where $\hat{G}_j^i = \frac{1}{2}(G_j^{i-1} + G_j^i)$

Concentration (low-pay ratio)

$$r_S = \frac{S(g^c, g^r)}{S(f^c, f^r)}$$
Segregation conditional on workers’ characteristics


\[ S(f^c, f^r) = [S(f^c, f^r) - S(f^γ, f^r)] + S(f^γ, f^r). \]

\[ \text{Explained} \quad \text{Unexplained} \]

- \( f^γ \): **Counterfactual** with \( c \) reweighted (propensity score) \( \rightarrow \) distribution of characteristics \( (X) \) of \( r \):\[ f^i_j (X) = \int_{x \in \Omega_X} f^i_j (X = x) f^i (x) \, dx \]

\[ f^γ_j = \int_{x \in \Omega_X} f^c_j (X = x) f^r (x) \, dx = \int_{x \in \Omega_X} f^c_j (X = x) f^c (x) \Psi_x \, dx; \]

\[ \Psi_x = \frac{f^r (x)}{f^c (x)} = \frac{f^c \, Pr(i=r|x)}{f^r \, Pr(i=c|x)}. \]

- **Detailed decomposition of the explained term** (Shapley).
- Same applies to \( S(g^c, g^r) \).
Data

- **Census**: 1996 and 2001 Census, and 2007 Community Survey from [IPUMS-I](https://ipums.org) (MPC, U. Minnesota)

- **Labor force surveys**: South Africa - Post Apartheid Labour Market Series ([PALMS](https://datafirst.uct.ac.za), DataFirst-UCT) 1994-2015, combining different StatsSA surveys.

**Sample**: 16-65 employed workers (not in the Armed Forces).

**Occupations**: 3-digit IPUMS-I modified version of ISCO-1988 (+ unknown occupation)

**Earnings**: income before taxes (midpoint interval); real earnings

**Workers’ characteristics**: province, area of residence, marital status, race, age, attained education, disability, immigration.

Relevant issues regarding the codification of jobs by occupations, reporting of earnings, or the representation of domestic help workers.
Elementary occupations

Labor Force Surveys (PALMS)

Women

Men
Gender segregation curves

Gender concentration curves

- 1996
- 2001
- 2007
Gender segregation curves by race: 2007

Gender concentration curves by race: 2007
Gender occupational segregation indices (Gini)
Gender occupational segregation indices by race (Gini)

Census

LFS
Gender occupational stratification indices (Gini)
Cumulative proportion of men

Cumulative proportion of women

Concentration curves, 2007

- Unconditional
- Conditional
Gini low-pay segregation of women (Census)

a. Unconditional

b. Conditional
Concluding remarks

• We have analyzed gender inequalities in the distribution of occupations in post-apartheid South Africa,
  – Limited available data, contributing to the understanding of segregation in developing countries.

• Long-term trend (census):
  – Substantial decline; women persistently holding lower-paying jobs (especially black and Coloured women), but at the same time increasingly filling higher paying positions (especially true for Asian and white women).

• Most recent trend (LFS):
  – Segregation, more persistent; less in the case of stratification.
Concluding remarks (Cont.)

• Not the result of the distinctive characteristics of male and female workers.
  – No segregation can be justified on these terms.
  – Only the over-representation of women in some higher-paying professional positions may be justified on their higher education and other attributes, but not their over-representation at the bottom of the pay scale.

• That is, men and women with similar characteristics tend to work in different occupations, with a tendency for (black) women to work in lower-paying jobs.
Gender segregation curves
Gender concentration curves