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# 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 care giver in challenging circumstances of high unemployment and HIV/AIDS prevalence, with very limited economic opportunities (Budlender and Lund, 2011).

# Previous literature on gender inequality

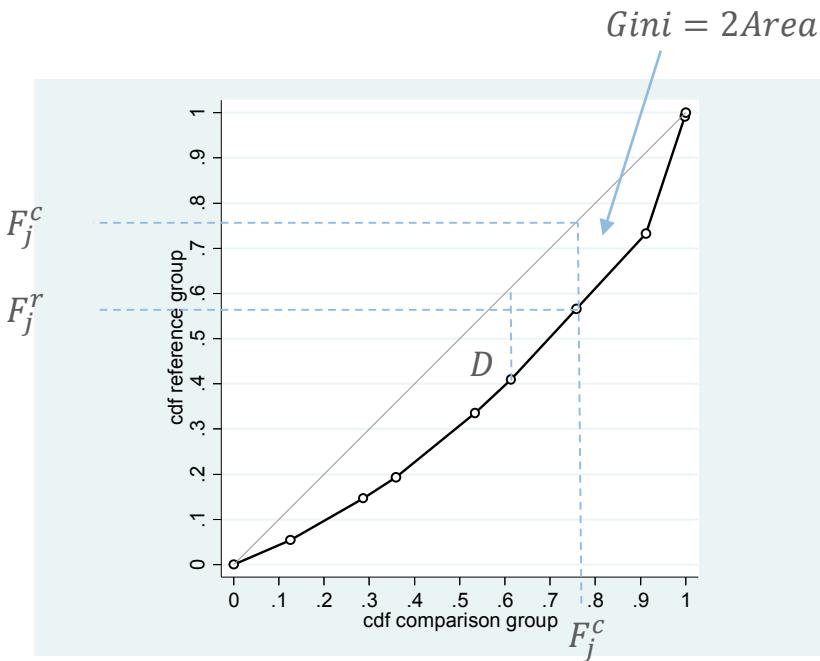
- Growing **feminization** of the labor force after apartheid, with **higher unemployment/self-employment** (Casale and Posel, 2002; Posel, 2014)
  - lower marriage rates, higher education, non-discriminatory legislation;
- **Compared with men**, South African women face:
  - lower **employment** rates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



Occupations sorted by male/female ratio

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

**Dissimilarity:**

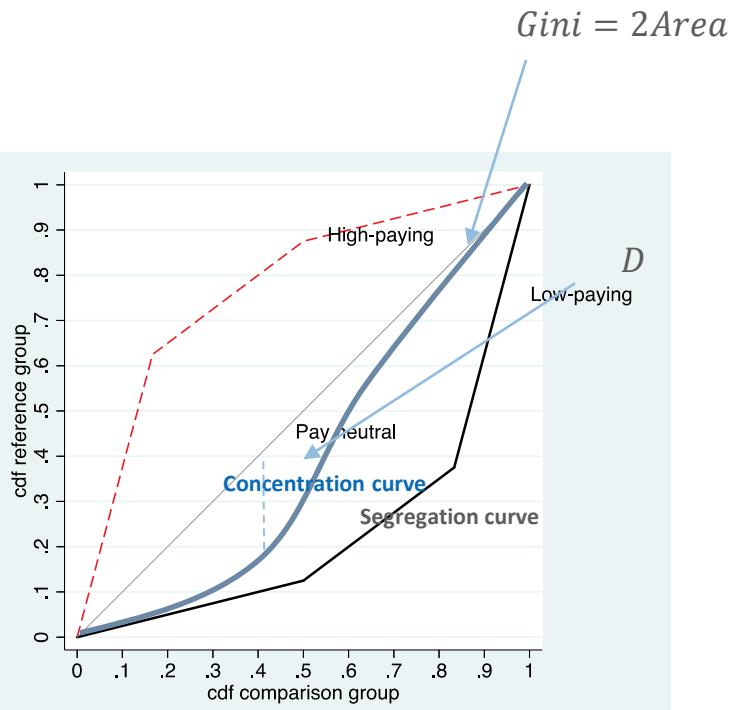
$$D(f^c, f^r) = \frac{1}{2} \sum_{j=1}^T |f_j^c - f_j^r| = \max_{j \in [1, T]} \{F_j^c - F_j^r\}.$$

**Gini:**

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

$$\text{where } \hat{F}_j^i = \frac{1}{2}(F_{j-1}^i + F_j^i) = F_{j-1}^i + \frac{1}{2}f_j^i$$

## Concentration curve (low-pay segregation)



## 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:**

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

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

## Concentration (low-pay ratio)

$$r_S = \frac{S(g^c, g^r)}{S(f^c, f^r)}$$

Occupations sorted by earnings

# Segregation conditional on workers' characteristics

- **Aggregate decomposition** of (low-pay) Segregation into explained and unexplained terms, Gradín (2013) (based on DiNardo et al., 1996 and Gradín, 2014).

$$S(f^c, f^r) = \underbrace{[S(f^c, f^r) - S(f^r, f^r)]}_{\text{Explained}} + \underbrace{S(f^r, f^r)}_{\text{Unexplained}}.$$

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

$$f_j^r = \int_{X \in \Omega_X} f_j^c(X=x) f^r(x) dx = \int_{X \in \Omega_X} f_j^c(X=x) f^c(x) \Psi_x dx;$$

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

- **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** (MPC, U. Minnesota)
- **Labor force surveys:** South Africa - Post Apartheid Labour Market Series (**PALMS**, DataFirst-UCT) 1994-2015, combining different StatsSA surveys.

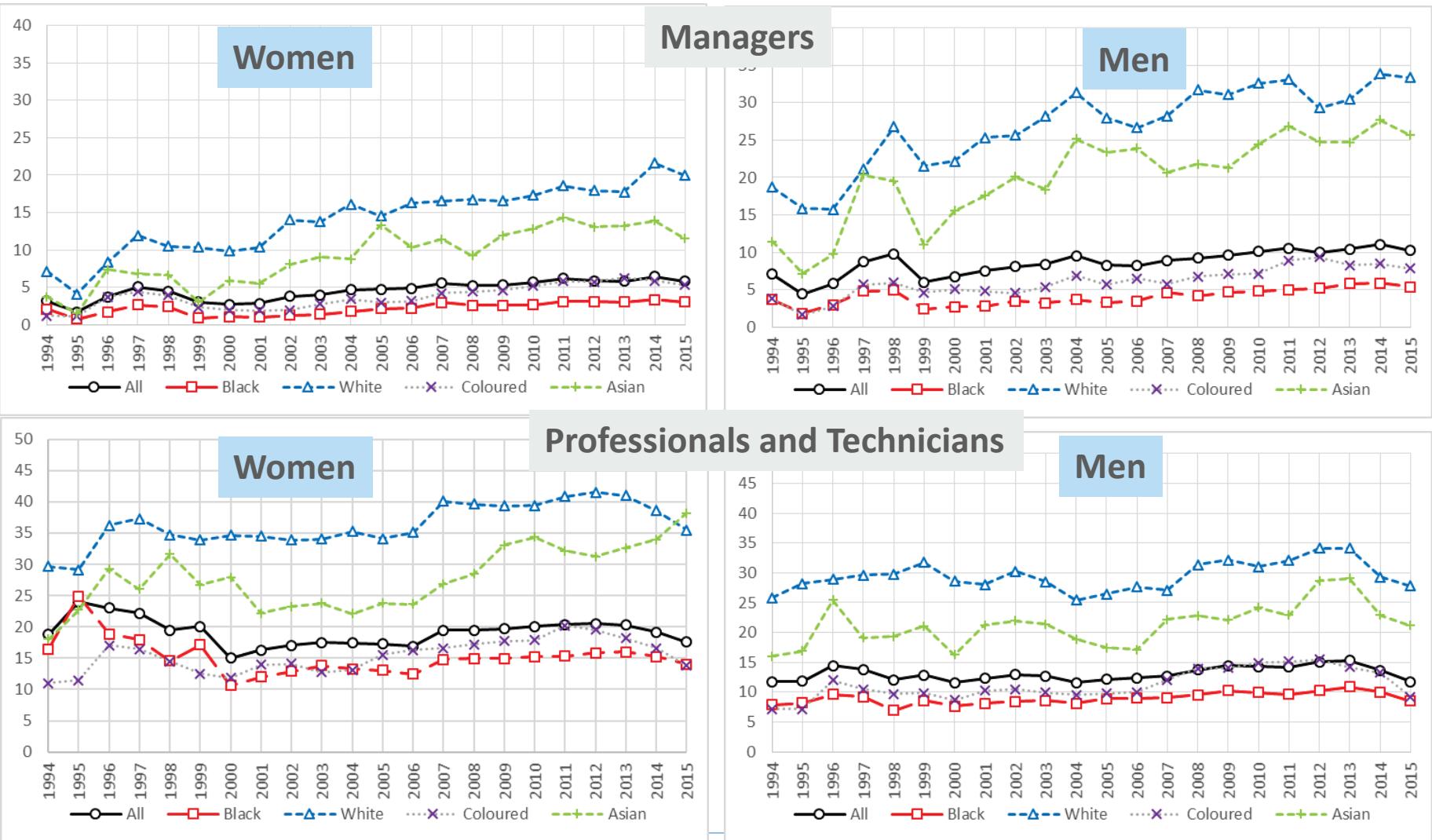
**Sample:** 16-65 employed workers (not in the Armed Forces).

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

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

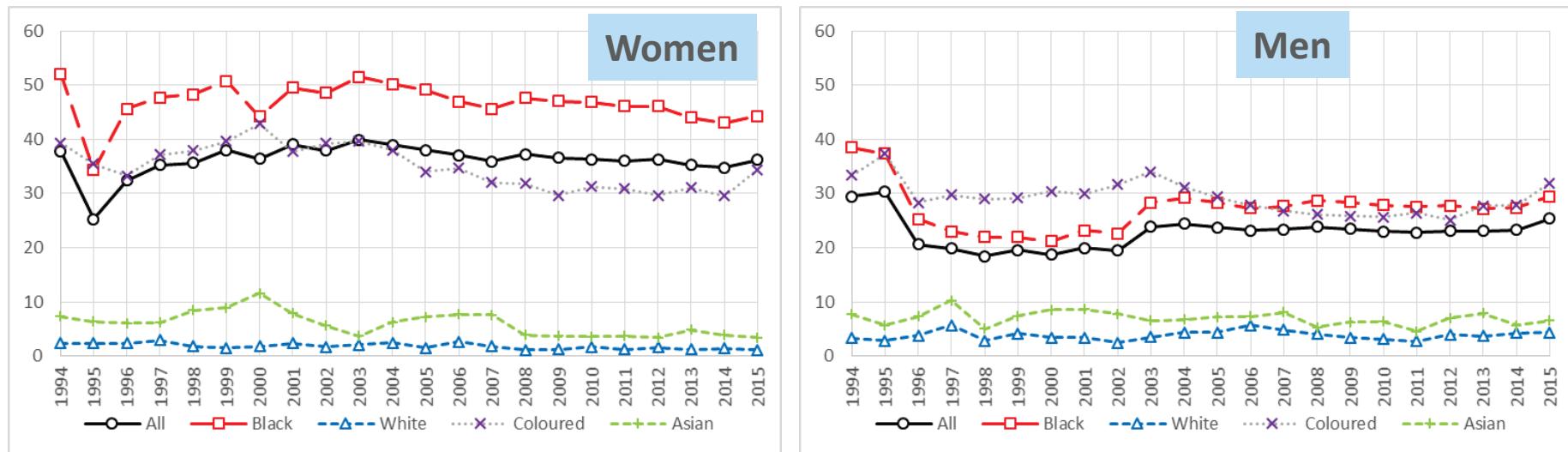
**Workers' characteristics:** province, area of residence, marital status, race, age, attained education, disability, immigration.

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

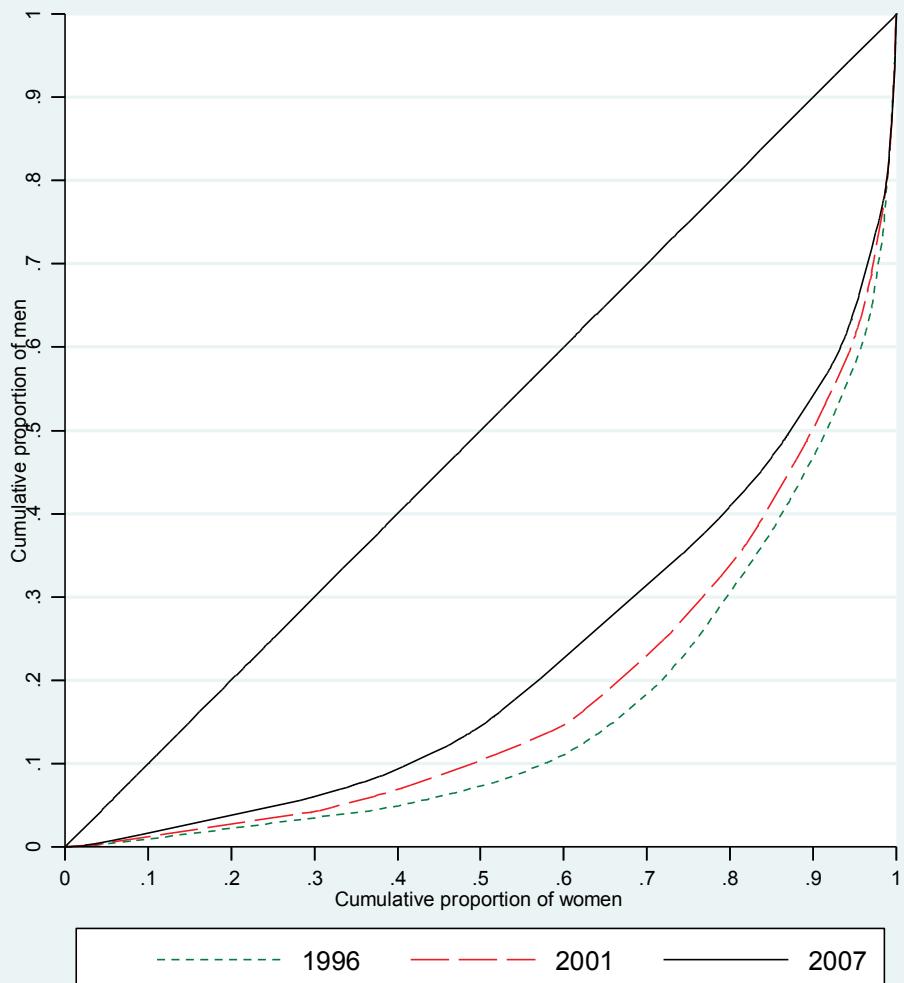


## Elementary occupations

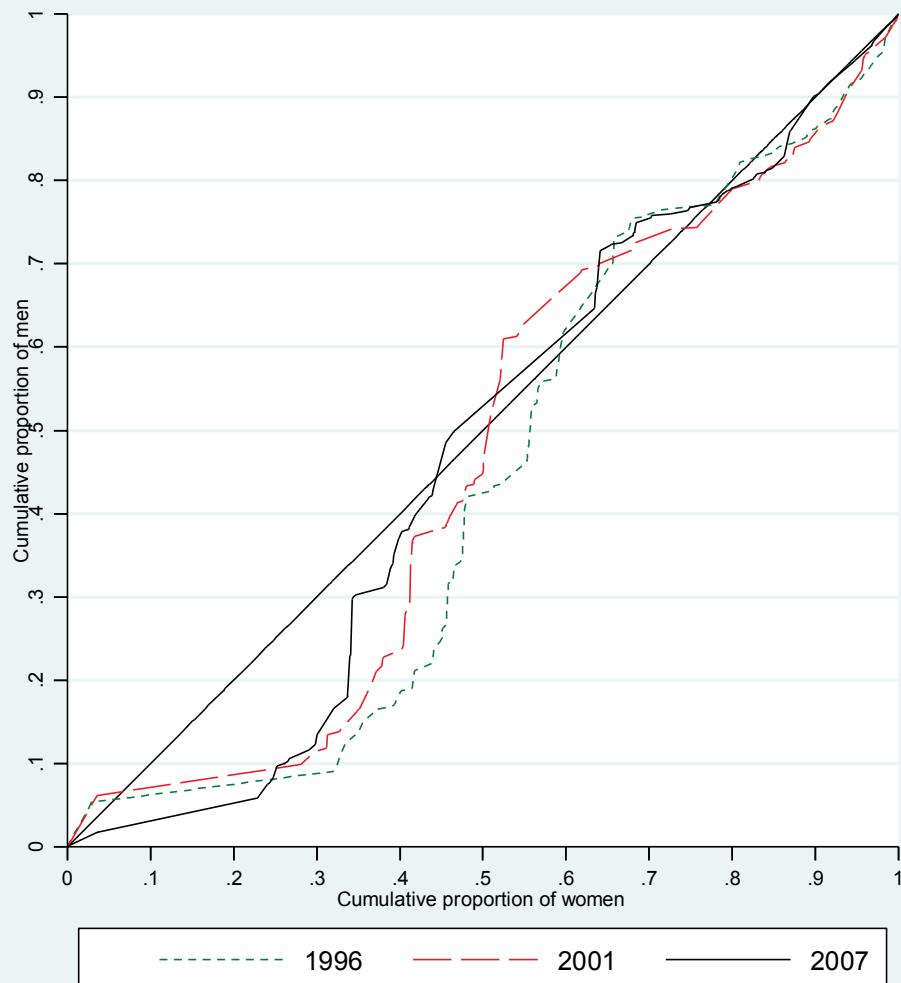
### Labor Force Surveys (PALMS)



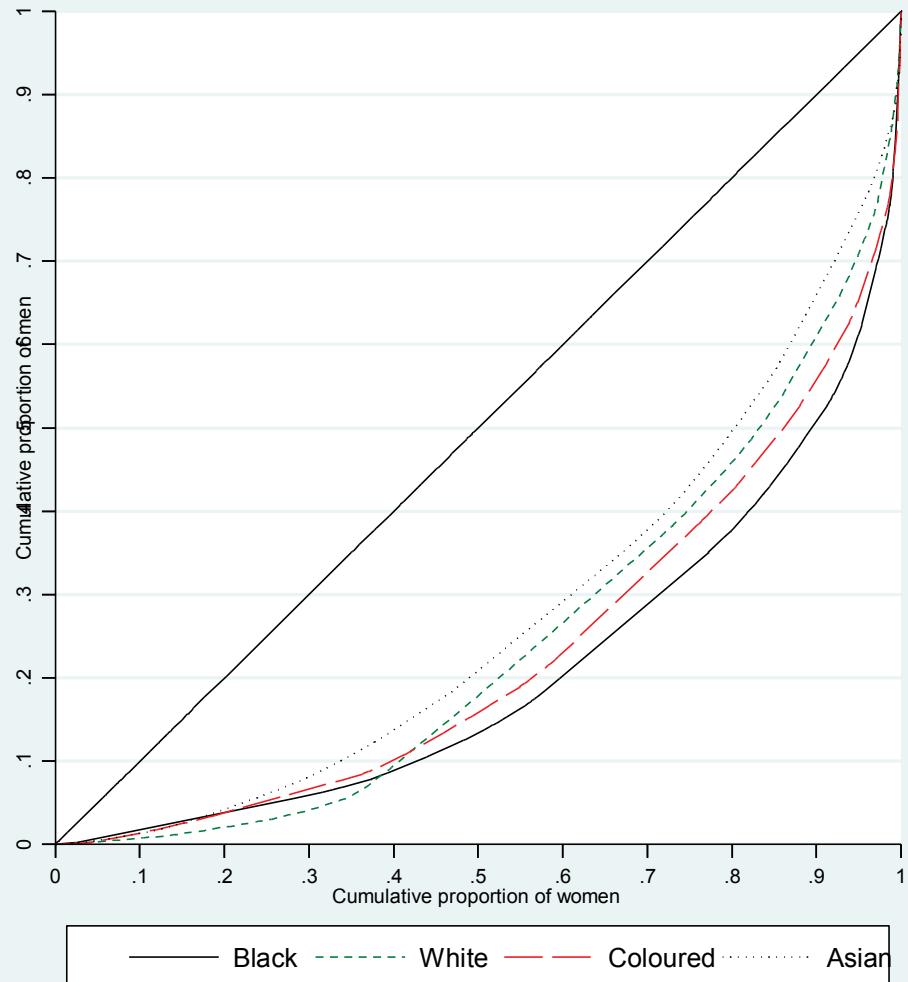
## Gender segregation curves



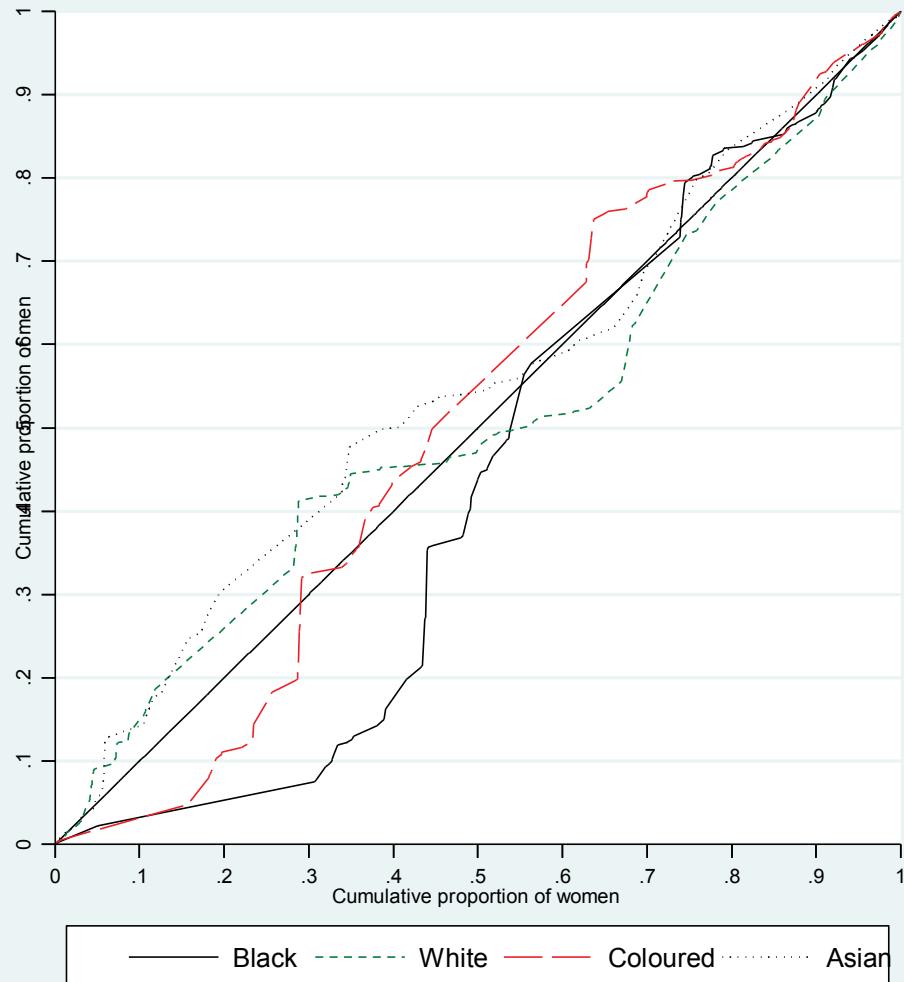
## Gender concentration curves



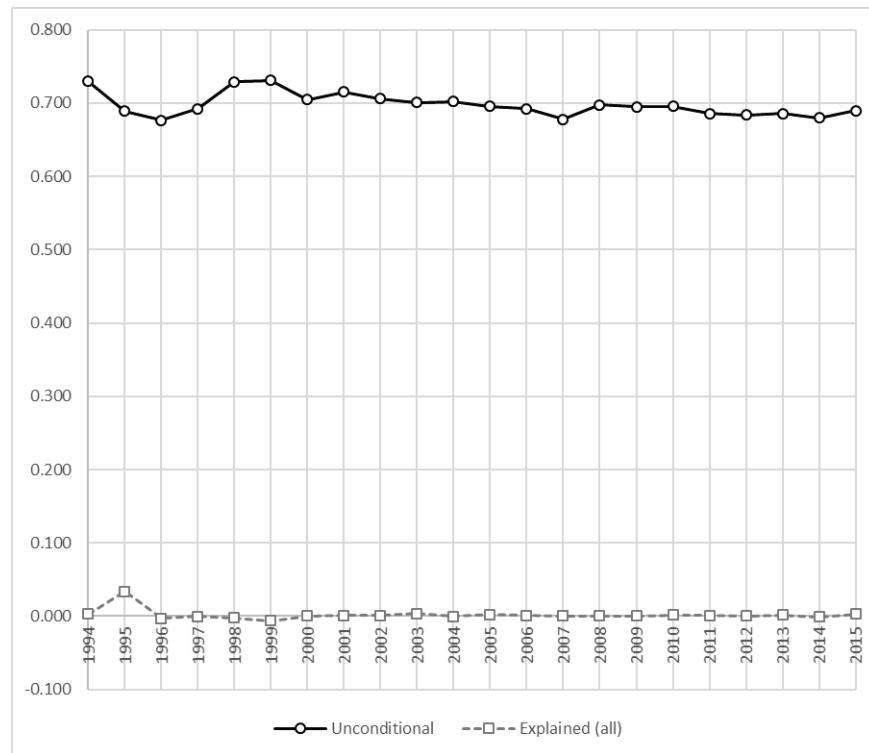
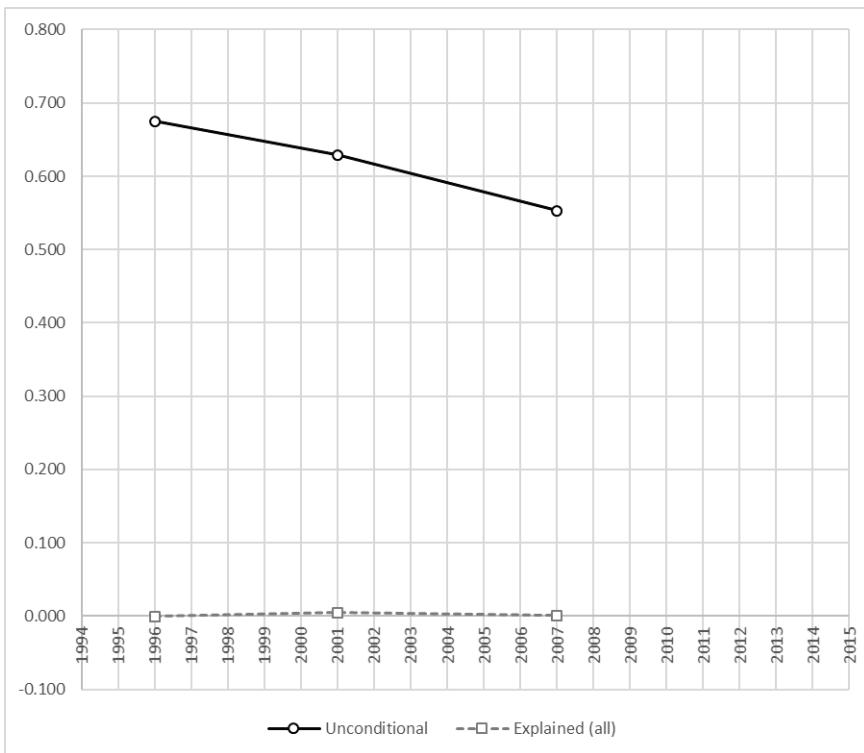
## Gender segregation curves by race: 2007



## Gender concentration curves by race: 2007

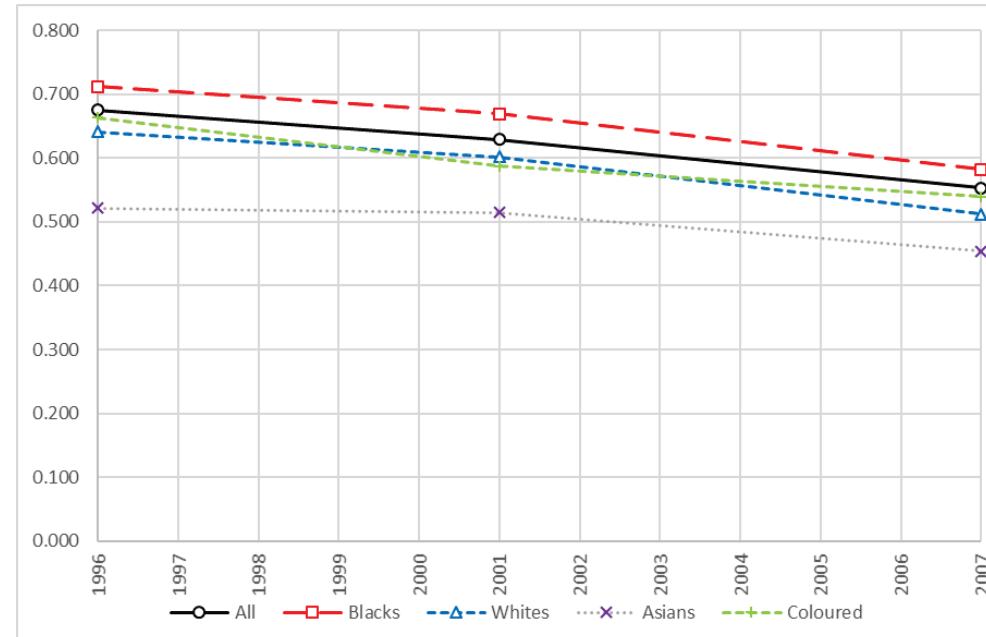


## Gender occupational segregation indices (Gini)

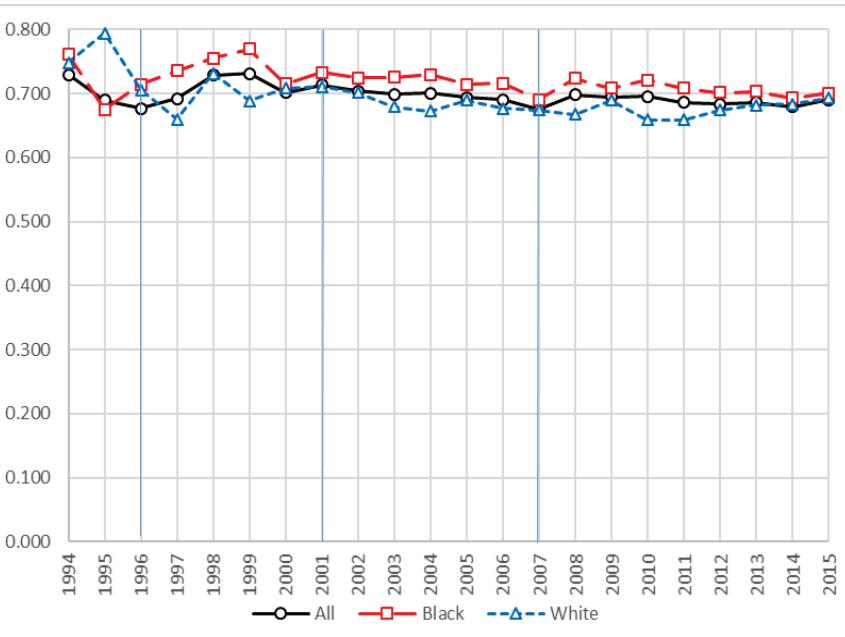


## Gender occupational segregation indices by race (Gini)

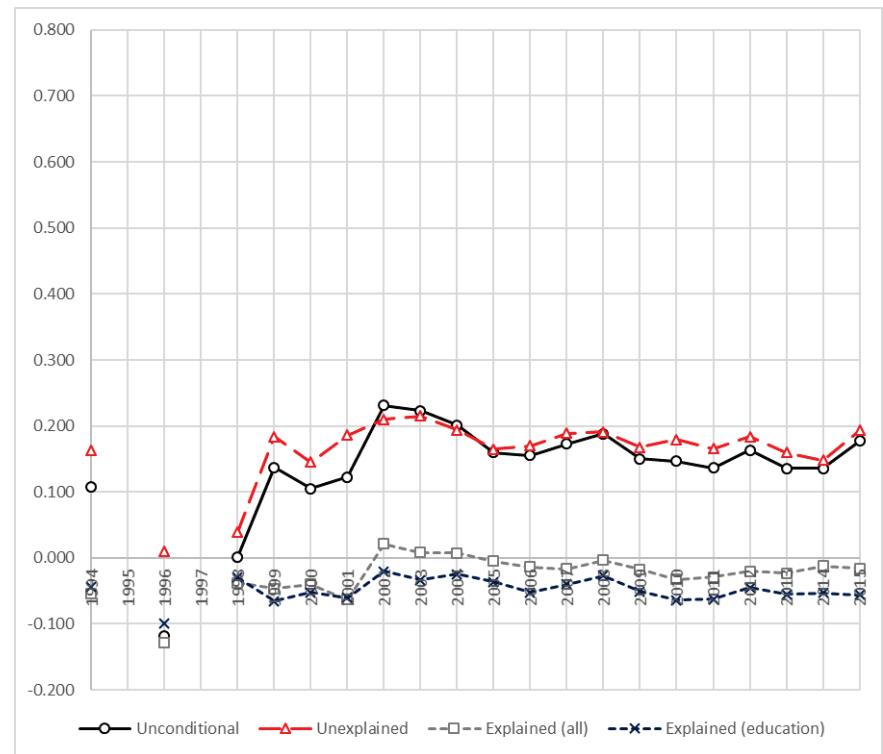
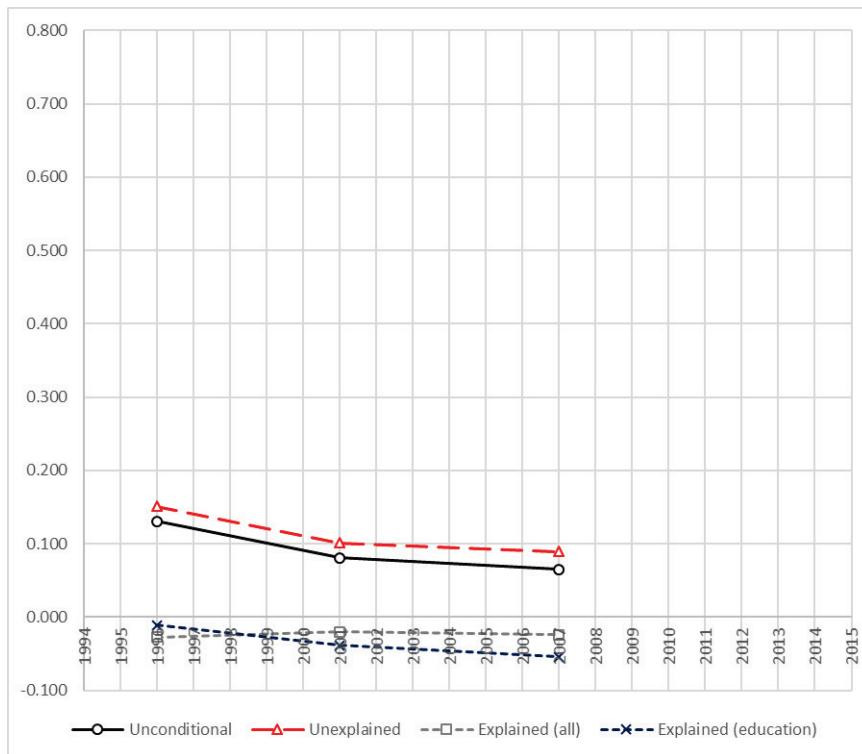
Census



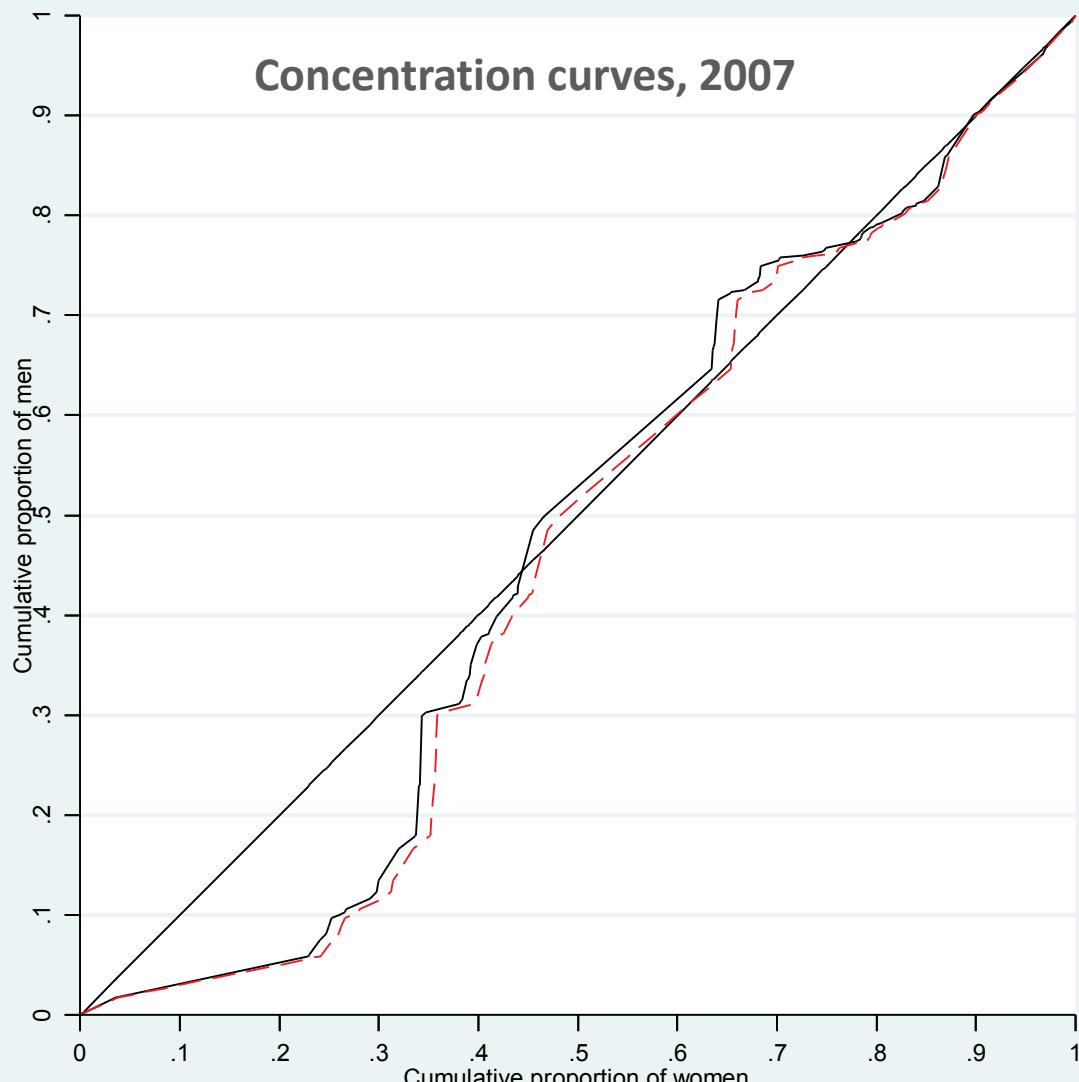
LFS



## Gender occupational stratification indices (Gini)

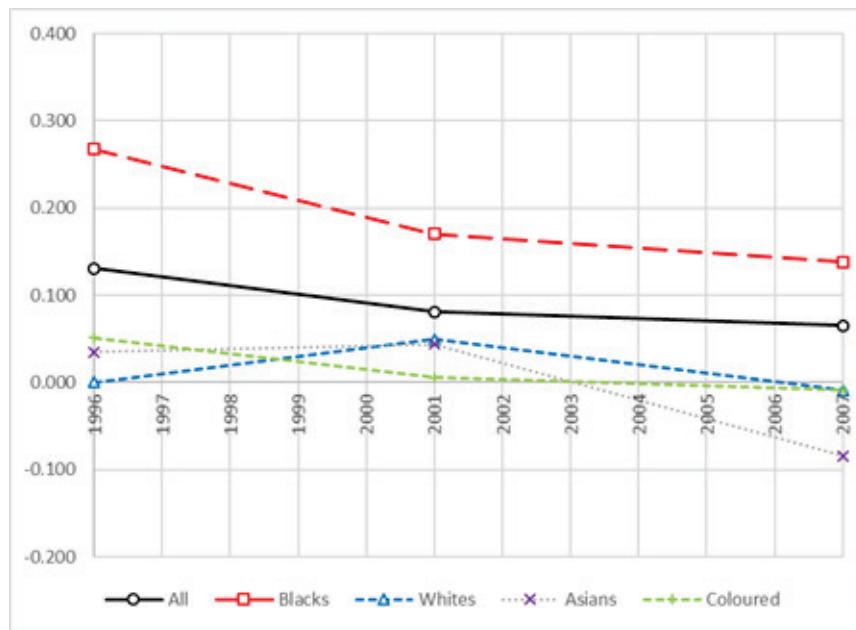


## Concentration curves, 2007

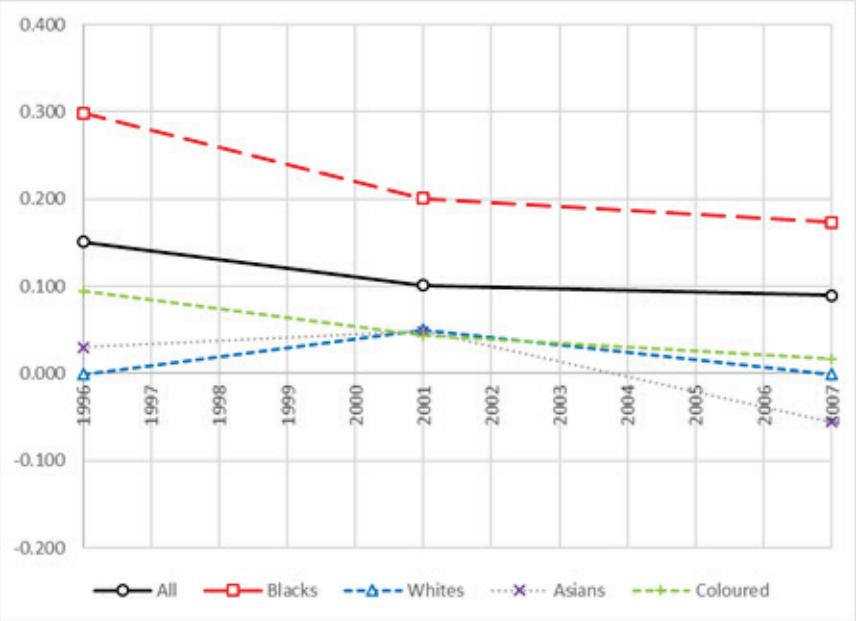


### Gini low-pay segregation of women (Census)

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.

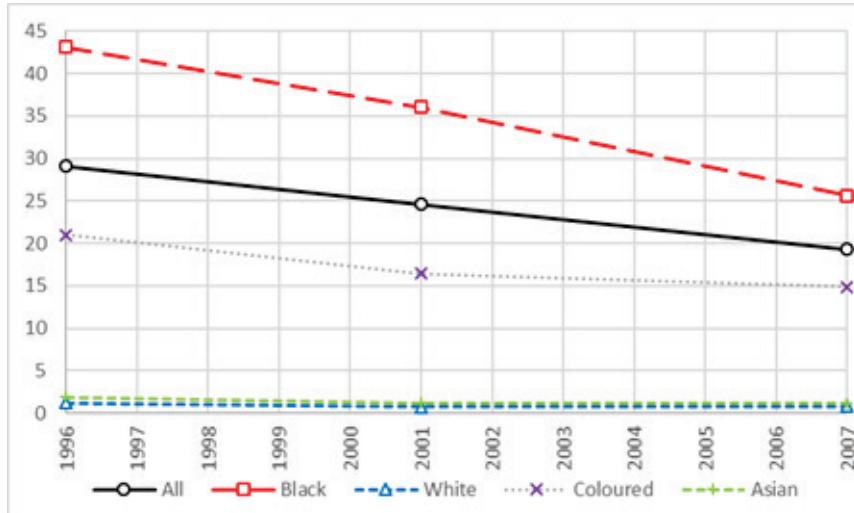
# Concluding remarks (Cont.)

- 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.**

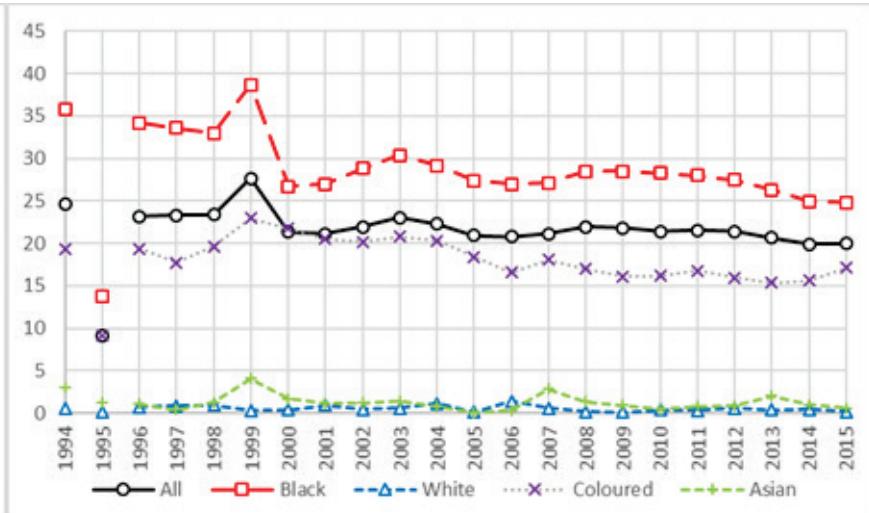


### Percentage of women in domestic service

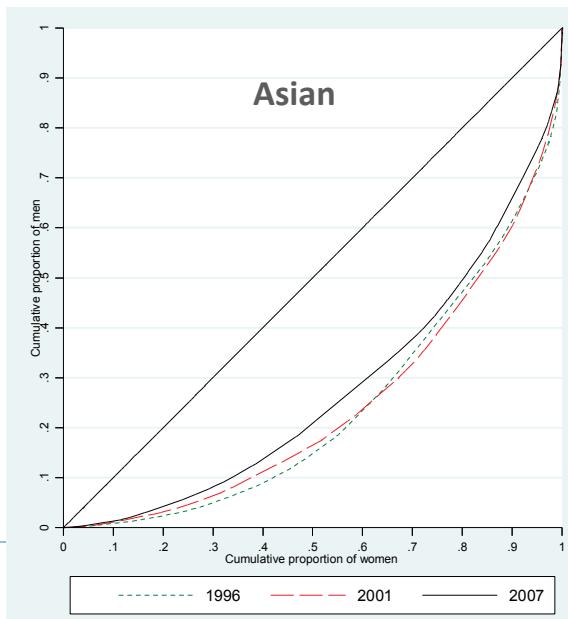
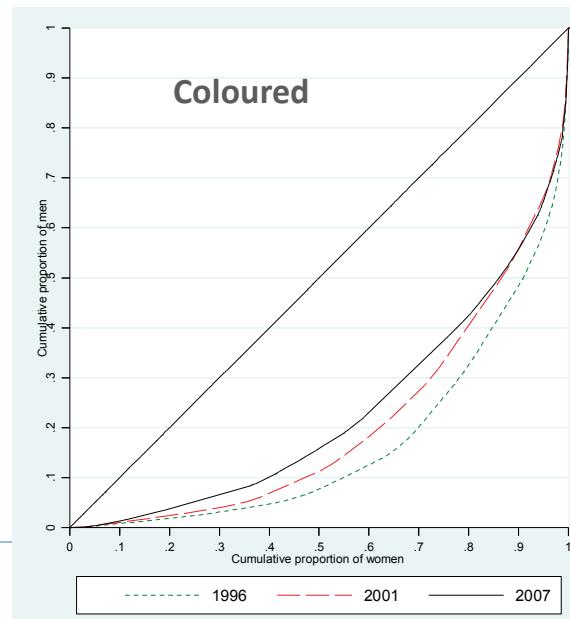
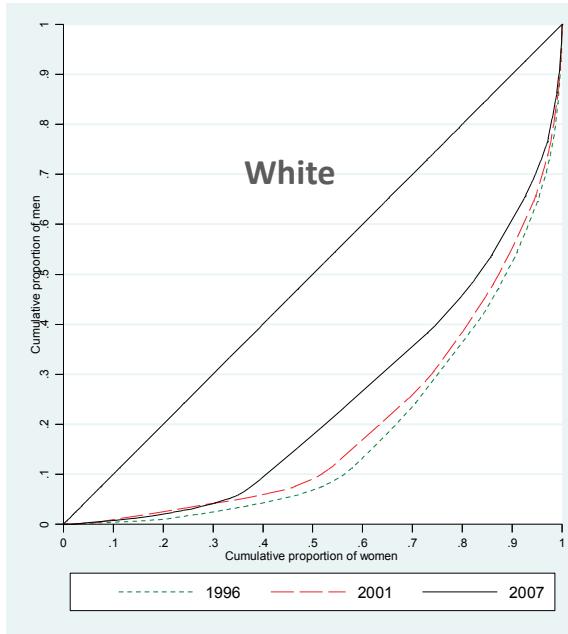
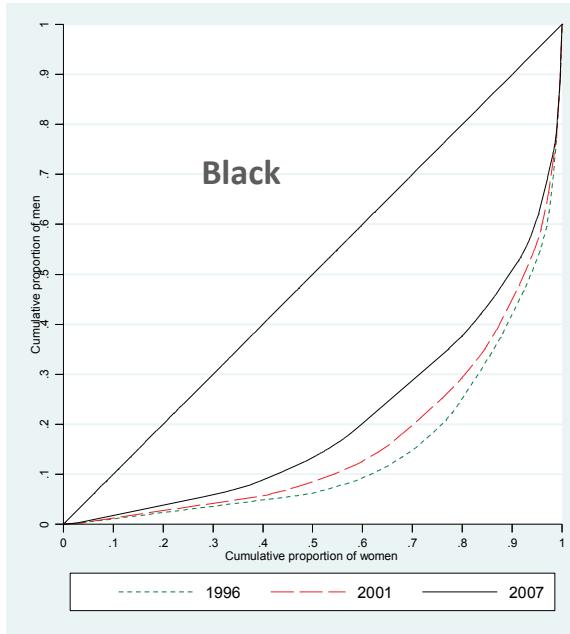
a. Census



b. LFS



## Gender segregation curves



## Gender concentration curves

