



Munich Personal RePEc Archive

Measuring the Extent of Gender Segregation in the Labour Market: Evidence from Ghana”

Baah-Boateng, William

Department of Economics, University of Ghana

June 2007

Online at <https://mpra.ub.uni-muenchen.de/109701/>
MPRA Paper No. 109701, posted 12 Sep 2021 03:48 UTC

“Measuring the Extent of Gender Segregation in the Labour Market: Evidence from Ghana”

William Baah-Boateng¹

Abstract

This paper makes an attempt to investigate the extent of gender segregation in the Ghanaian labour market using widely used indexes. An assessment of gender differences in the labour market points to a relatively high, but rapidly declining female labour force participation and employment rates in the 1990s as per the GLSS 3&4. The 2000 population census however, puts the employment and participation rate of women marginally below their male counterpart. The market is found to be characterised by higher and increasing unemployment and underemployment rates among women than men and declining female-male earning ratio on account of the concentration of females in low rewarded and less prestigious jobs. A measure of gender segregation however reveals a generally low segregation in the Ghanaian labour market based on distribution of employment by sector, type of employment, occupation and industry. The study nevertheless finds the index as an increasing function of the number of disaggregated groups in the labour force distribution and that the degree of segregation depends on the type of index.

Introduction

One important fact about feminization has it that men and women tend to hold different jobs culminating in the persistence of occupational segregation. The analysis of occupational segregation provides the open-door for investigating gender-related differences in employment outcomes. The feminization of certain jobs has tended to crowd women into specific occupations, industries or sectors of employment and shaped their preferences to the extent that men are discouraged from engaging in such occupations or employment. Similarly, past and current barriers to alternative job opportunities and social pressures that give more weight to the traditional role of women tend to affect the choices of women's occupation. Constraints in occupational choices due partly to prejudices of employers, employees and customers alike also crowd women into jobs or employment perceived to be feminine.

¹ Lecturer, Department of Economics, University of Ghana; e-mail: wbboateng@ug.edu.gh

Considerable evidence about the level of feminization of occupations elsewhere has been adequately established in the literature². Apparently, men and women tend to hold different jobs giving credence to the persistent occupational segregation in many economies. Gender differences in the Ghanaian labour market have incidentally been a subject of debate over the past two decades and beyond. Boateng (1996) observes a seemingly increasing occupational and employment segregation of women between 1975 and 1993 due to the apparent movement of women into occupations already over-represented by women. Women advocates and gender activists have been at the forefront of the fight against the perceived inequality particularly against women. Women representation in parliament, judiciary and the executive has often been cited as an evidence of gender differences in the labour market. Unequal access to education and for that matter jobs has been cited as the major cause of gender-wage disparity in Ghana. Nonetheless, not much attempts have been made to empirically assess the extent of gender segregation in the Ghanaian labour market in recent times. This makes it imperative to assess the degree of gender composition of the labour market in Ghana using alternative method of segregation measure.

The paper therefore seeks to investigate the extent of gender segregation in the Ghanaian labour market. Specifically, the purpose of the is to

- examine the gender dimension of the Ghanaian labour market with the view to capturing gender differences of various forms; and
- measure gender segregation in the labour market in respect of employment type, employment status, occupation, and industry.

The paper makes use of five different indexes widely used in the literature to measure the extent of gender segregation in respect of labour force distribution by industry, occupation, sector of employment as well as employment type. These include the Duncan's index of dissimilarity, size-standardized dissimilarity index, index of concentration, and Karmel Maclachlan index as well as the index of segregation. Each of the indexes is unique with varying strengths and weaknesses and provides a measure of the extent to which the Ghanaian workforce is segregated by gender. The study draws on data from the 2000 population census, the most comprehensive survey in recent times, to compute the various segregation indexes.

The paper is organised into five different sections. Theoretical underpinning of gender segregation is reviewed in section two after outlining the background and the purpose of the study in the introductory section. The third section takes a walk through some relevant labour market indicators to clearly demonstrate the gender differences in the market in terms of earnings, employment, unemployment and underemployment, among others. In section four, we compute five indexes to measure the degree of gender segregation in the Ghanaian labour market in respect of the labour force distribution by employment sector, employment type, occupation and industry using data from the 2000 population and housing census. The paper ends with a brief summary and concluding remarks in section five.

² See Groshen (1991), MacPherson and Hirsch (1995), Petersen and Morgan (1995), Hansen and Wahlberg (2000)

Theoretical and Empirical Considerations

The analysis of gender segregation in the labour market provides an open door for investigating gender related differences in employment outcomes and has been explained empirically by a number of factors. For instance, according to Boateng (1996), the apparent increase in occupational and employment segregation of women between 1975 and 1993 is attributed to the movement of women into occupations already over-represented by women especially in the service sector. Psacharopoulos and Tzannatos (1989) and Schaltz (1990) observes that factors such as the structure of education, fertility, and the pattern of employment as well as other socio-political and demographic factors among others have been the underlying causes of misfortune of females³ in Sub-Saharan African labour markets.

Theoretically, gender segregation has been blamed principally on factors including human capital differences, pre-market differences in family, school inputs and in the socialization process as well as employer discrimination based on preferences or statistical discrimination. The outcome of rational human capital investment decision based on different gender roles in social reproduction influences occupational choice and related wage outcomes. According to human capital model, individual chooses occupations consistent with their life-cycle labour force participation (Mincer and Polachek, 1974)⁴. Women generally opt for occupations with lower investment costs and less depreciation with time away from jobs that men do due to their more abbreviated and discontinuous labour force activity. This framework can explain a substantial aspect of observed differences in occupations by gender across broad categories such as professionals and personal service workers.

Generally, differences in educational attainment by gender tend to push women into certain occupations that are found to be lowly rewarded. Women's access to particular forms of education and training opportunities may be sufficient for women to perceive that their opportunities are limited for them to reject a typical form of training, in particular those leading to trade qualifications. Reskin et al (1999) contend that these factors will be reflected in the gender composition of employees across occupations within workplaces, because organizations differ in the types of skills and level of experience required of their employees. Boateng (2000) observes that cultural belief that a woman must remain home adversely affects public investment in education of girls. He contends that higher education for girls is only recent, and in many cases vacancies available to girls are far more limited than for boys. Thus, low education and training for girls which push women into low occupations can be blamed on cultural factors.

Essentially, women may have different perspectives over the life cycle since they tend to be more concerned with home production than men. These perspectives affect women's educational attainment and training on the job. Since the expected short duration of attachment to the firm lowers the return to investments, women may invest less. In effect,

³ Female's misfortune in the labor market include low female labor participation rate and high rates of unemployment relative to men as well as apparent concentration of women in low paid jobs

⁴ Also see Polachek (1975, 1979, 1981), Zalokar (1982)

low-rewarded occupations or jobs with high concentration of women over time would attract low-skilled men and would lose high skilled women. In this case, the occupational crowding could be explained from the angle of labour quality resulting in lower wages.

The “quality sorting” hypothesis provides some explanation to suggest to some extent that women’s occupational crowding may be derived from quality of labour. Quality sorting model asserts that if women rather than men are concentrated in low rewarded occupations as a result of discriminatory barriers, the gender composition of an occupation or industry tends to be a lower quality index for men and in less extent for women.

Undoubtedly, the constraint in occupational choices resulting partly from discriminatory practices of employers, employees and customers (Becker, 1957, 1971)⁵ tends to crowd women into female occupations or employment. The discriminatory behaviour of employers against women based on prejudice rather than competence and incompatible with profit maximization contributes to gender segregation in the labour market. However, the inability of Becker’s approach to explain the persistence of discrimination and employer’s discrimination on pecuniary grounds prompted further investigations which revealed socio-psychological factors underlying the persistence and prevalence of labour market discrimination (Beck-Gernsheim and Ostner, 1978 and Akerlof, 1985). According to Beck-Gernsheim and Ostner, discrimination is due not so much to the taste for it as to the separate roles for men and women which traditions create but are supported by several mechanisms including childhood socialisation, sex-specific schooling and biological and anthropological differences between men and women.

Employers’ discriminatory behaviour may also be based on statistical discrimination caused by limited past and present information on job search. Aigner and Cain (1977) note that uncertainty about the expected productivity of each separate female individual has led employers to continue to use the relatively known group i.e. males in their establishments. Employers may use gender as a cheap screening device to assign different tasks to men and women without regards to their productive characteristics and this partly underlies the gender segregation across labour markets. In an environment of weak labour market regulation and unemployment, employers can exercise significant discretion in their hiring behaviour especially with respect to women who seek part-time job and constitute a relatively elastic labour supply. This discriminatory practice tends to push women into less prestigious and lowly rewarded jobs which eventually place them below their male counterparts in terms of earnings and sometimes face unfair treatment. Once job becomes sex typed, a complex process of institutional discrimination denies equal occupational opportunities for the sexes (Watts and MacPhail, 2004).

The feminization of certain occupations or jobs also reflects an occupational “crowding” (Bergmann, 1974) such that women can be concentrated in particular occupations based on their preferences or on past and current barriers to alternative occupations. This is supported by Gunderson (1989) who argues that gender differences in preferences play

⁵ Becker (1957) made the maiden attempt to formalize economic thought on discrimination based on neoclassical concept of “taste for discrimination”.

some role in gender differences in occupation. As Power (1975) notes the feminization of some occupations tends to be self-reinforcing in the sense that the associated decline in pay, status and conditions deters male entry.

Additionally, social pressures that emphasize the traditional role of women may affect the choices of women's occupation. In this case, many women may choose traditional female jobs since information on them is easily available. Becker (1983) developed a model to suggest that women seek jobs with attributes consistent with household production where they have a comparative advantage and also household chores where they bear primary responsibility. For instance, the existence of "marriage bars" has tended to prevent married women from holding certain jobs (Goldin, 1991). She adds that policies of some employers have also in the past excluded women from certain jobs thereby promoting gender segregation in the labour market. The literature also emphasizes the role of institutional barriers that have historically excluded women from particular pursuits or impeded their upward progression (Reskin and Hartman, 1986).

The role of "patriarchy" in gender segregation in the labour market has also emerged in the literature (Gelpi et al, 1986). The patriarchy hypothesis posits that on average men are more highly motivated than women to achieve and maintain positions of high status (Heath and Ciscel, 1988). Jobs usually held by women are low in the hierarchy of jobs, and industries dominated by women tend to be those at the end of the hierarchy of industries in terms of earnings, social importance and power (Bergman, 1989). On her part Goldin (2002) appears to blame men for discrimination against women reinforcing the radical feminist model which emphasize the importance male domination in explaining discrimination against women in the labour market. She developed a model that treats discrimination as the consequence of a desire by men to maintain their occupational status or prestige, distinct from the desire to maintain their earnings. She explains that "men's work" was perceived as better than "women's work" and observing a woman doing a man's job signalled that the man's job has been downgraded. This in a static context could be an instrument through which occupational segregation between men and women is institutionalized.

Gender Dimension of the Ghanaian Labour Market

All over the world, gender differences in the labour market have been persistent over time, and Ghana is no exception. Nonetheless, the nature and the magnitude of those differences have gradually changed. All the major labour market indicators clearly points to the obvious gender differences in the market. In many countries, participation rate of women has generally lagged behind the rate for men on account of the high commitment of women to household activities. For example, the 2000 population census puts the participation rate of women at 43.1% as against 44.6% for men (table 1).

Surprisingly, the 1990s saw a relatively higher labour force participation and employment rates for women than men based on the Ghana Living Standard Survey⁶. Female labour

⁶ Based on Heads of Households

force participation rate was higher than that of men by at least 5 percentage points in 1992 but narrowed in 1998 on account of a substantial increase in the rate for men by 7 points compared with 3.5 points gain in the rate for women (table 1). This is supported by AfDB (2005) which puts female participation rate for Ghana marginally above their male counterparts in the 1980s and 1990s. Similarly, the estimated employment rate (defined as the number of people employed as a percentage of the total population) for women exceeded that of men by about 4.5 percentage points in 1992 and reduced to 1.5 percentage points in 1998 due to a significant rise in the rate for men by 6.7 points as against a marginal gain of 1.7 for women. The high employment and labour force participation rate of women relative to men in the 1990s could be partly explained by the campaign of affirmative action and women empowerment which was championed by women's group including the 31st December Women's Movement⁷ particularly in the late 1980s and 1990s.

Table 1: Relevant Indicators of Gender Differences 1992, 1998 and 2000

Relevant Indicators	1992		1998		2000	
	Male	Female	Male	Female	Male	Female
Population (in millions)	7.2	7.7	8.7	9.4	9.36	9.55
Participation Rate (%)	37.6	43.0	44.3	46.5	44.6	43.1
Employment (%)	36.2	40.7	40.9	42.4	40.1	38.5
Adult unemployment (%)	3.7	5.4	7.5	8.7	10.1	10.7
Underemployment (%)	9.0	7.0	14.2	13.7	---	---
Average basic hourly earnings in industry (¢)	219.3	194.1	1389	814	----	----
Mean hourly earnings Occupation/Job (¢)	357.3	279.5	1834	1258	----	----
Illiteracy rate (%)	39.2	61.5	35.8	62.6	37.1	47.7
School attendance rate 6-25 years (%)	64.9	52.4	66.2	58.4	63.2	51.8

Source: Ghana Living Standard Survey (GLSS) 3 & 4, and 2000 Population Census

The unemployment rate⁸ of women has remained higher than men partly due to the desire of women to be active in the labour market as reflected in the high participation rate, but their effort to get employed has been thwarted by their low educational attainment. As shown in table 1, female unemployment rates, which stood at 5.4% in 1992, rose to 8.7% in 1998 and further surged to 10.7% in 2000. In contrast, male unemployment rate increased from 3.7% to 7.5% between 1992 and 1998 before reaching 10.1% in 2000. In many African countries, including Ghana, women have twice the chance of being unemployed than men (ILO, 1989). Baah-Boateng (2004) argues that the higher unemployment rate among women compared to men, particularly in the early 1990s could be partly explained by the low educational attainment of women relative to men. In

⁷ This is a women's movement established by the first lady as a Non-Governmental Organization to champion the course of women with the full backing of the government

⁸ Defined as a the proportion of labour force who are available for work, have no work and are actively looking for job

addition, the public sector downsizing, which affected women more than men because women occupied the very low level jobs, which the programme targeted, has also contributed significantly to the high female unemployment rates.

Nonetheless, the male-female unemployment rates gap has been narrowing gradually from 1.7 in 1992 to 1.2 in 1998 and further down to 0.6 in 2000. The continuous and gradual decline in the difference between female and male unemployment rates could be partly linked to the improved educational attainment of females lately. Between 1984 and 2000, the proportion of females in tertiary institution increased from 0.4% to 2.2% while post secondary also increased from 0.5% to 1.4%.

The gender difference with regard to the rate of underemployment (defined as those who worked less than 40 hours and were willing to work more hours) tells a different story. The rate has been found to be lower for women than men. In 1992, the female underemployment rate was 2 percentage points below that of men but narrowed in 1998 with 13.7% rate for men compared with 14.2% for women. The underemployment rate, on the contrary, is lower for females than males in Ghana. Analysts have attributed this to the high domestic commitments of females, which tend to prevent them from working more hours and thus making it less likely to make them become visibly under-employed.

Table 2: Distribution of Labour Force by Occupation & Industry – 1992, 1998 & 2000 (%)

Distribution	1992		1998		2000		
	Male	Female	Male	Female	Male	Female	
Occupation	Professional & Technical	5.5	3.2	5.7	2.7	10.1	7.2
	Administrative & Managerial	0.5	---	0.4	0.1	0.4	0.2
	Clerical	3.6	1.6	3.7	1.2	6.9	1.9
	Sales	4.4	23.9	7.8	27.3	8.6	21.3
	Service	3.4	2.2	5.5	4.0	4.3	7.6
	Agriculture	64.3	58.6	59.0	50.3	48.5	47.3
	Production	18.4	10.4	17.9	14.4	18.9	13.5
	Other Labourers	----	----	----	----	2.0	0.6
	New Workers	----	----	----	----	0.4	0.3
Industry	Agriculture	66.2	58.9	59.8	51.1	51.9	49.4
	Mining & Quarrying	1.0	0.1	1.4	0.1	2.5	1.3
	Manufacturing	6.7	9.4	8.9	13.9	11.1	11.9
	Electricity, Gas & Water	0.2	0.1	0.4	0.1	0.6	0.3
	Construction	2.5	0.1	2.8	0.2	4.3	0.7
	Trade	4.7	25.0	7.4	27.4	10.6	20.0
	Transport & Communication	4.5	0.2	4.6	0.1	5.8	1.3
	Finance	0.9	0.2	1.7	0.1	0.7	0.4
	Community Service	13.3	6.0	13.0	7.1	2.8	4.1
	Other	---	----	----	----	9.8*	10.6*

* Comprises Hotels & Restaurants, Real Estate & Business Activity, Public Administration, Education, Health and Social Work, Private Households, and Extra-territorial Organisation.

Source: Ghana Living Standard Survey (GLSS) 3 & 4; and 2000 Population & Housing Census

The gender composition in industry indicates that, whereas majority of the workforce in the trading or commercial sector and manufacturing are females, they are highly under-

represented in mining, construction, utility services, financial services, as well as transport and communication (table 2). Even in the agricultural sector where majority of women are engaged though below that of the men, most of them are engaged as unpaid workers. As shown in table 3, about 10% of males are engaged in unpaid family agricultural work, compared with 20% of females working in unpaid family agricultural employment.

Table 3: Distribution of Employment Type by Gender (%) 1992 & 1998

Type of Work	1992			1998		
	Male	Female	All	Male	Female	All
Wage Employment	20.7	7.5	13.6	23.0	6.2	13.8
Self-employment (non-agric)	12.5	31.8	22.9	18.9	39.6	30.2
Unpaid family worker (non-agric)	1.2	1.7	1.5	1.1	2.6	1.9
Self-employment (agriculture)	46.4	39.6	42.8	47.0	31.4	38.5
Unpaid family worker (agric)	---	---	---	9.6	20.1	15.3
No Employment	19.2	19.4	19.3	---	---	---
Other	---	---	---	0.3	0.1	0.2
Sample	4997	5835	10832	3847	4601	8448

Source: Ghana Living Standard Survey (1991/92 and 1998/99)

A further analysis of gender composition in industry suggests that most of the women are generally engaged in petty trading and small scale manufacturing. In terms of gender distribution in occupation, females are less represented in the highly skilled and well paid occupation such as professional and technical, administrative and managerial, and clerical jobs but heavily represented in jobs that are not adequately remunerated but skill demanding.

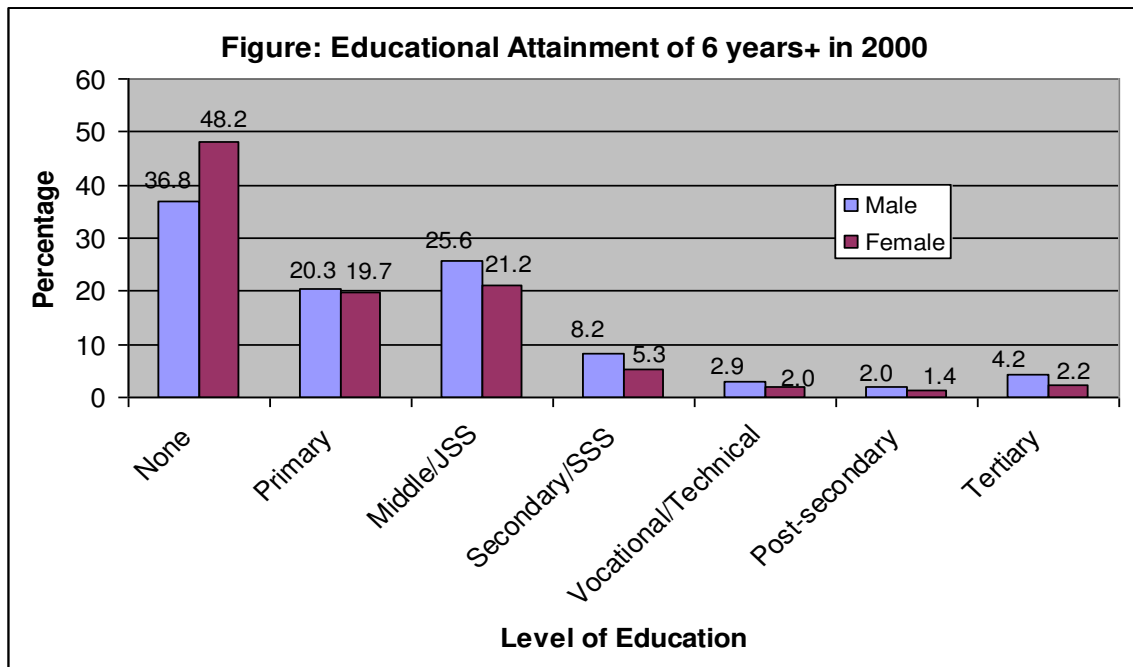
Table 4: Distribution of Apprentices by Main Trade learnt (%)

Main Trade Learnt	Urban		Rural		National	
	Male	Female	Male	Female	Male	Female
Carpentry	16.0	0.4	15.7	---	15.8	0.2
Masonry	8.5	---	11.4	---	10.2	---
Tailoring	13.2	64.4	12.5	68.1	12.8	66.4
Blacksmithing	4.0	---	3.4	---	3.6	---
Mechanical	17.2	0.3	11.2	0.4	13.6	0.3
Electrical/Electronics	8.9	---	5.0	---	6.5	---
Painting/Spraying	4.8	1.1	3.1	0.7	3.7	0.9

Source: Ghana Living Standard Survey, 1998/99 (Ghana Statistical Service)

The gender bias in the labour market is reinforced by gender segregation in apprenticeship training. With the exception of tailoring which saw female representation of 66% compared with 13% for men in 1998/99, all the trades are significantly dominated by men (table 4). The low representation of women in high skilled occupation is evidently explained by the low educational attainment of women compared to men. The proportion of women with no education reached a high of 48% as against 35% for men in 2000 (see figure below). However, as a result of relatively high school drop out rate

among females the proportion of women at various levels of education drops below their male counterpart as they move up the educational ladder and this reflects the high female illiteracy rate of 61.5% compared to 39.2% among men (table 1). With the cultural and traditional practices emphasizing girls' commitment to housekeeping activities and thus resulting in a lower school attendance rate among females, their representation in well paid and highly skilled jobs would continue to place them below their male counterparts and widen the wage disparities between men and women.



Source: 2000 Population and Housing Census, Ghana Statistical Service

The gender distribution of employment indicates that women are mostly concentrated in low paid and less prestigious but skill-demanding occupations and industry. Consequently, the average basic hourly earnings of women continue to be lower than that of men and have worsened in the 1990s. As reported in table 1, female average earning as a percentage of male earnings in occupation dropped from 78% in 1992 to 69% in 1998. Similarly, female earnings as a percentage of the earnings of their male counterpart in industry declined from 89% to 59% between 1992 and 1998. This could be partly traced to the unequal distribution of the type of work engaged in by men and women. According to the GLSS 3 & 4, while the proportion of males engaged in wage employment increased from 20.7% in 1991/92 to 23% 1998/99, the proportion of females in wage employment rather dropped from 7.5% to 6.2% over the same period (table 3).

The revelations of gender differences in the Ghanaian labour market is a clear indication of the fact that, apart from biological factors, which may prevent women from engaging in certain activities, the cultural and religious factors, which have established some

negative perceptions that discourage women from acquiring higher education to become more productive, has not been fully overcome. There are still a number of Ghanaians who still hold the belief that higher education of women is likely to cost them their reproductive capacity. Until these negative beliefs and perception that are fuelled by cultural and religious entrenchment are removed, gender gap in terms of income, employment and education would be difficult to overcome.

Measurement of Occupational Gender Segregation in the Labour Market

The outcome of segregation measures of all forms is influenced by the choice of index. Various studies on segregation have used different indexes to measure the extent of segregation in the labour market. There is however no agreement about the correct index and as a result, index “wars” break out from time to time (Karmel and Maclachlan, 1988)⁹. None of the segregation indexes have been proven to be absolutely perfect without any flaws. Consequently, the study adopts five indexes, which are widely used in the literature to investigate the extent of gender segregation in the Ghanaian labour market.

Segregation Indexes

In an effort to examine the extent of gender segregation in the Ghanaian labour market, Boateng (1996) adopts Duncan’s index and OECD formula to measure segregation of women and finds an increasing index of segregation between 1975 and 1993 using SSNIT¹⁰ 1993 data. In this article, we adopt five indexes widely used in the literature to measure the degree of gender segregation in the labour market. These are Duncan’s Index of Dissimilarity (D), Size-Standardized Dissimilarity Index (D_s), Index of Concentration (C), Karmel Maclachlan (KM), and Index of Segregation (S).

❖ *Duncan’s Index of Dissimilarity (D)*

Duncan and Duncan (1955) proposed this dissimilarity index, which has arguably become the most used index for measuring segregation. The index measures the absolute sum of the difference between the proportion of the female labour force in a certain occupation and the proportion of the male labour force in that occupation. It indicates the proportion of males (or females) that would have to change occupations in order to maintain the gender ratio of each occupation equal to the gender ratio of the labour force as a whole. Thus, the index is interpreted as the percentage of the labour force that has to be shifted in order to make the two distributions equal though such transfers may not be feasible. The index is expressed as:

$$D = \frac{1}{2} \sum_{i=1}^n |F_i/F - M_i/M| * 100 \quad (1)$$

⁹ See also Blackburn, Jarman and Siltanen (1993), Grusky and Charles (1998), Watts (1994, 1998) etc.

¹⁰ SSNIT stands for Social Security and National Insurance Trust.

where i = total number of occupations; F_i and M_i represent the number of females and males respectively in occupation i while F and M = number of female and male workers in overall labour force. Consequently, F_i/F and M_i/M denote the proportion of female and male labour force respectively in specific occupation.

The index (D) therefore is the percentage of the labour force that should change occupations to yield the perfect correspondence between the gender ratio of each occupation and the gender ratio of the overall labour force.

The index is assumed to take a value ranging from 0 as minimum (when there is no difference between male and female occupational distribution) to a maximum of 100, which suggests complete segregation. The fundamental limitation of the index however is its failure to provide a threshold above which one could conclude that segregation is getting out of hand. It is also found to be sensitive to the occupational composition rather than the overall gender shares of employment. Nonetheless, it is very useful in comparing segregation in terms of employment type, occupation, and industry for a given period.

❖ *Size-Standardized Dissimilarity Index (D_s)*

The size-standardized dissimilarity index is the absolute measure of segregation that controls for the effect of occupational structure, using all occupations as if they were of the same size, computed over a fixed number of comparable occupational categories (Williams 1979)¹¹. The index is expressed as:

$$D_s = \frac{1}{2} \sum_{i=1}^n \left| \frac{(F_i/T_i) - (M_i/T_i)}{\sum_{i=1}^n (F_i/T_i) \sum_{i=1}^n (M_i/T_i)} \right| * 100 \quad (2)$$

where T_i = total number of males and females in occupation i ; the numerators (F_i/T_i) and (M_i/T_i) index the female and male proportions in occupation i ; the denominators adjust such values on the proportions in other occupations.

The index takes values ranging from 0 to 100. The closer the index to 100 the greater the degree of dissimilarity and if the index is close to 0, the extent of dissimilarity is deemed low.

Since the index standardizes each of the i occupations to the same size, it is not affected by the shape of the occupational distribution. By not allowing changes in the size of the occupations in time to affect the value of the index makes it immuned to occupational effects. However, the fact that the index potentially solves the problem of the size, the weighting procedure used generates a biased estimate. This tends to increase the impact of small categories and decreases the influence of the largest categories. As noted by

¹¹ See also Senyonov & Scott (1983); Charles and Grusky (1995).

Jacobs (1989) and Semyonov (1980) among others¹², while this standardization eliminates a kind of marginal dependence, it has the perverse effect of introducing a new dependence on the rate of female labor force participation. The index also fails to provide a benchmark with which one could determine the seriousness of segregation. In addition, it increases with the number of disaggregated groups thereby posing some degree of difficulty in making comparison among different classification when the number of disaggregated group differs.

❖ *Index of Concentration (C)*

The concentration index compares the female labour force with the overall labour force. It measures the extent to which the distribution of the female labour force is different from the overall labour force. The index is measured by

$$C = \frac{1}{2} \sum_{i=1}^n |F_i/F - T_i/T| * 100 \quad (3)$$

where T_i/T denotes the proportion of the total labor force in specific occupation.

The values assumed by the index vary from a minimum of 0 to a maximum of 100. The closer the index to 100 the larger the difference between the distribution of female labour force and the overall labour force. On the other hand, the closer the index to zero, the smaller the gap between the distribution of female and the overall labor force. The index however suffers from the same limitation as the Duncan's index since the index does not give a benchmark above which an issue of differences in gender distribution could be raised. Nonetheless, it is useful in making comparison across regions or countries with the same occupational or specific labour market classification.

❖ *Karmel Maclachlan Index (KM)*

The Karmel Maclachlan index also measures the disparity of the gender shares of employment across occupation. It is defined as;

$$KM = (1/T) \sum_{i=1}^n |F_i - a(M_i + F_i)| \quad (4)$$

where T = total employment; a = female share of total employment; n = the number of occupation; F_i and M_i denote the number of females and males respectively in the i th occupation.

The index gives the total employment that would have to relocate with replacement to achieve zero segregation by gender, but maintains the occupational structure and the total overall gender shares of employment. The index assumes values ranging from a minimum of 0 to a maximum of 1. The closer the index to zero, the smaller the disparity of the gender shares of employment across occupation while a value closer to 1 gives an

¹² For example, Charles and Grusky (1995), Jacobsen (1994)

indication of larger disparity of gender shares of employment across occupation. However, the index fails to provide a threshold by which one can readily infer the seriousness or otherwise of occupational dissimilarity by gender. Like the size-standardized index of dissimilarity, the KM index appears to increase with the number of disaggregated groups. Although, the Duncan index is related to KM index according to the overall gender shares, the former cannot be readily decomposed to highlight the contribution of different occupational group to the overall level of segregation (Watts & MacPhail, 2004).

❖ *Index of Segregation (S)*

The index of segregation compares the distribution of the female labour force to that of the total labour force across occupations. As a result, it provides a measure of the extent to which females are concentrated or segmented from the rest of the labour force. The index measures the extent to which females are represented in an occupation after adjusting for the share of females in the total labour force. This index is sometimes referred to as the coefficient of female representation. The index is measured by:

$$S = \sum_{i=1}^n |1 - F_i/T_i| / (F/T) * T_i/T \quad (5)$$

where F_i/T_i is the proportion of female labour force in a specific occupation and F/T = the proportion of female in the total labour force. The index ranges from a minimum of 0 to a maximum of 1 and provides a benchmark of 0.6 over which one can conclude that there is over segregation. Under segregation on the other hand is said to exist if the index falls below the benchmark.

Apparently, most of the indexes suffer from the failure of providing a threshold or interval with which a definite conclusion could be made regarding the degree of segregation. The paper however adopts the range and benchmarks used by Jahn, Schmid and Schrag (1947) in the dissimilarity index¹³. This dissimilarity index has been widely used due to its intuitive appeal albeit some inherent undesirable properties (see Echenique and Fryer, 2004). The index which ranges from zero to one designate a value less than 0.3 as low; between 0.3 and 0.6 as moderate; and above 0.6 as high¹⁴.

Source of Data

Data for the study has been drawn mainly from the National Population and Housing Census which took place in 2000. It is supplemented by data from the third and fourth round of a national household survey dubbed the Ghana Living Standard Survey (GLSS), which took place in 1991/92 and 1998/99 respectively. The 2000 population census data

¹³ The dissimilarity index measures the percentage of a group's population that would have to change residence for each neighborhood to have the same percentage of that group as the metropolitan area overall

¹⁴ In terms of percentages, less than 30% - low; between 30% and 60% - moderate; greater than 60% - high

is adopted in the computation of the five segregation indexes and supplemented by the GLSS in reviewing of the Ghanaian labour market.

Outcomes of Segregation Measure

The results of the segregation indexes based on the 2000 population and housing census data are presented in table 5. The outcome of the measurement of segregation appears to be generally low on the basis of classification provided by Jahn, Schmid and Schrag (1947) that considers an index of less than 0.3 or 30% as low. This suggests that gender segregation is not too serious in the Ghanaian labour market in 2000. This is in contrast with findings of Boateng (1996), which suggests moderate gender segregation in 1993 in Ghana and high (or at best moderate) degree of segregation in Brazil reported by Oliveira (2001).

Essentially, all the five indexes evidently produced values less than 0.3 or 30%, across the four types of employment distribution by sex, suggesting that the degree of dissimilarity or segregation is low. The KM index and index of concentration produced figures to the effect that the degree of dissimilarity is very low in the labour market with index values ranging from 0.05 or 5% for employment distribution by sector to about 0.08 or 8% for occupational distribution. The Duncan's index of dissimilarity and index of segregation for distribution of employment produced values ranging between 0.1 or 10% and 0.17 or 17%. The size standardized dissimilarity index however produced values of 25% and 29% for employment distribution by occupation and industry while index values of less than 14% were recorded for employment sector and type using the same index. Nonetheless, the low segregation index produced by the five indexes for the four different forms of employment distribution could be linked to the degree of disaggregation based on broad classification.

Table 5: Index of Gender Segregation in the Ghanaian Labour Market 2000

Index	Employment Sector	Employment Type	Occupation	Industry
<i>Number of Group Disaggregation</i>	<i>6</i>	<i>7</i>	<i>9</i>	<i>17</i>
Duncan's Index of Dissimilarity, D (%)	10.43	13.107	15.982	15.591
Size-standardized Dissimilarity Index, Ds (%)	13.26	13.666	25.081	28.54
Index of Concentration, C (%)	5.24	6.592	8.039	7.842
Karmel Maclachlan Index, KM	0.0521	0.0655	0.0799	0.0779
Index of Segregation, S	0.105	0.132	0.161	0.157

Employment sector comprises public, private formal, private informal, semi public or parastatal, NGOs or International organisations, and other while employment type refers to wage employment, self employment, unpaid family worker, apprentice and domestic employee. Industry and Occupation are shown in table 2.

Source: Computed by the Author based on the 2000 Population and Housing Census (Ghana Statistical Service)

Generally, the outcome of the five segregation indexes points to low gender segregation in the labour market. The index of segregation ranging from 0.13 for employment type to 0.16 for occupation implies a low segmentation or concentration of females from the rest of the labour force. The KM index of under 0.1 implies a relatively smaller number of men and women in employment that would have to relocate with replacement to achieve zero segregation by gender, and still maintain the structure of occupation, industry, employment type or sector and the total overall gender shares of employment.

Similarly, an observed low Duncan's index of dissimilarity ranging from 10.4% for employment sector to 16% for occupation suggests a minimal proportion of men and women that would have to change occupation, industry, employment type or sector in order to maintain the gender ratio of each occupation equal. It also implies a fairly perfect correspondence between the gender ratio of each occupation, industry or employment and the gender ratio of the overall labour force. Boateng (1996) reports Duncan's index of 32% and OECD index of 49% in Ghana in 1993 suggesting moderate gender segregation based on Jahn, Schmid and Schrag (1947). The low index of concentration below 9% also means that the distribution of female labour force in occupation, industry and employment is not fairly similar to the overall labour force distribution.

The results of the measure of segregation of all forms show that the degree of segregation depends on the type of index under consideration. While the size-standardized dissimilarity index produced values higher than other four indexes for all the four forms of employment distribution the KM index and index of concentration recorded very low measure of gender segregation across the four employment distribution. The general observation from table 5 clearly points to the effect that the difference in gender composition in occupation is relatively low compared to Brazil. Oliveira (2001) measures degree of occupational gender composition in Brazil between 1981 and 1999 and obtains at least 34% and 40% using Duncan index and standardized index of dissimilarities respectively as against 16% and 25% in Ghana. The difference in the outcome of occupational segregation for the two countries may be accounted for by the differences in the degree of disaggregation used in the computation of the indexes.

The outcome of the measures of segregation reveals that the indexes largely increase with the number of disaggregated groups, but the degree of sensitivity varies among the indexes. This confirms the observation that the degree of occupational segregation tends to be higher, the more disaggregated the occupational groups (Oliveira, 2001). The size standardized dissimilarity appears to be highly sensitive to changes in the level of aggregation compared with other indexes producing values of 14% and 25% with a level of aggregation of 7 and 9 for employment type and occupation respectively and 29% for industry with aggregation level of 17.

Generally, the use of segregation index to measure gender occupation may not be conclusive due to the inherent shortcomings in the indexes as already noted. The lack of consistency in occupational classification – definition of occupation and number of categories – over a period affects the reliability of the summary measure and may undermine comparison of data in time series. In addition, the detailing level of the

occupational classification determines the estimated segregation values since the measures are sensitive to the number of categories. Nonetheless, the use of the five indexes provides an idea of the extent of occupational or employment composition in terms of gender in the Ghanaian labor market and affords us the platform to make a comparison in respect of occupation, industry and employment type.

Concluding Remarks

The paper makes an effort to assess the degree of gender segregation in the Ghanaian labour market with the adoption of relevant segregation indexes. A review of the labour market reveals a relatively higher but rapid declining employment and labour force participation rate and high unemployment rate among women than men. The female participation and employment rates however fell marginally below their male counterparts in 2000. Women are also generally observed to be engaged in low and less prestigious occupations culminating in their lower average earnings. However, the paper generally finds fairly weak or moderate gender segregation in the labour market except one index which produced higher gender segregation for labour distribution by industry.

The outcome of the measure of gender segregation suggests that the degree of segregation clearly depends on the type of index under consideration. While the size-standardized index indicates the highest degree of gender segregation for distribution by industry, the highest segregation measure reported by the four other indexes were reported in occupational distribution of employment. The index also depends on the number of disaggregated groups. The relationship between the index and the number of disaggregated groups was quite clear with regard to the size-standardized index, which recorded its highest measure in industry with 17 disaggregated groups and lowest in employment sector with 6 disaggregated groups. The four other indexes increase with increasing number of disaggregated groups up to 9. However, reduced indexes were reported for a higher number of disaggregated groups of 17.

The relatively higher labour force participation and employment rates for women than men against the low average earnings of women compared with men confirms the assertion that women mostly operate at the lower echelon of many establishments. Women are also engaged in unpaid agricultural work and self employment with low returns. This calls for further investigation into the female composition effect on earnings to ascertain whether female dominated jobs are lowly paid and that men pay a penalty for engaging in predominantly female jobs. Further breakdown of labour force distribution by gender in respect of employment, occupation and industry could produce a clearer segregation measure that would be in line with the lower female-male earning ratio.

References

- Aigner, Dennis J and Cain, Glen G. (1977), "Statistical Theories of Discrimination in the Labour Markets"; *Industrial and Labour Relations Review*, 36 (2), 175-187
- Akerlof, G (1985), "Discriminatory, Status-based Wages among Traditional-Oriented Stochastically Trading Coconut Producers". *Journal of Political Economy*, 93, 265-276
- Baah-Boateng, W. (2004), "Employment Policies and Sustainable Development: The Experience of Ghana," in *The Ghanaian Banker, Journal of The Chattered Institute of Bankers (GH)*, 1st Quarter, Jan – Mar, 2006 Vol. 1 ISSN 0855 - 13401
- Becker, Gary (1957) "The Economics of Discrimination" Chicago: *University of Chicago Press*
- Becker Gary (1983), "The Allocation of Effort, Specific Human Capital and Differences between Men and Women in Earnings and Occupations", in Currie J. and Chaykowski R. (1992) "Male Jobs, Female Jobs and Gender gaps in Benefits Coverage, *NBER Working Paper # 4106*,
- Beck-Gernsheim and Ostner (1978), in Boateng K (1996) "Labour Market Discrimination against Women in Ghana", *Journal of Management Studies, published by School of Administration, University of Ghana*
- Bergmann Barbara R (1974), in Macpherson David and Hirsch Barry (1995) "Wages and Gender Composition: Why do Women's Job Pay Less?" *Journal of Labor Economics, Vol. 13, No. 3 (July), 426-471*
- Bergmann Barbara (1989), "Does the Market for Female Labour Need Fixing?" *Journal of Economic Inquiry*, 3(1); 43-60
- Blackburn R.M, Jarman J and Siltanen J. (1993), "The Analysis of Occupational Gender Segregation over Time and Place: Consideration of Measurement and Some New Evidence" in Watts and MacPhail (2004), "Gender Segregation by Industry and Occupation in Canada 1987-2003"; *Centre of Full Employment and Equity, The University of New Castle, Australia*
- Blau D. Francine and Khan M. Lawrence (2000), "Gender Differences in Pay", *NBER working paper #7732*
- Boateng K (1996), "Labour Market Discrimination against Women in Ghana", *Journal of Management Studies, published by School of Administration, University of Ghana*
- Boateng K (2000), "Economics of the Labour Market: and the Ghanaian Experience"; *Department of Economics, University of Ghana, unpublished*
- Charles M. and Grusky D. B. (1995), "Models for Describing the Underlying Structure of Sex Segregation in Oliveira Ana Maria (2001), "Occupational Gender Segregation and Effects on Wages in Brazil" *XXIV General Population Conference*,
- Currie J. and Chaykowski R. (1992), "Male Jobs, Female Jobs and Gender gaps in Benefits Coverage, *NBER Working Paper # 4106*,
- Duncan O.D, and Duncan B. (1955), "A Methodological Analysis of Segregation Indices in Oliveira Ana Maria (2001) "Occupational Gender Segregation and Effects on Wages in Brazil" *XXIV General Population Conference*
- Echenique Federico and Fryer Roland (2004), "On the Measurement of Segregation" *NBER Working Paper No. 11258*

- Ghana Statistical service (2002), “2000 Population and Housing Census: *Summary Report of Final Results*”
- Ghana Statistical Service (2000), “Ghana Living Standard Survey (GLSS): Report on the 4th Round, September 1991-September 1992”
- Ghana Statistical Service (1995), “Ghana Living Standard Survey (GLSS): *Report on the 3rd Round, April 1998-March 1999*”
- Goldin Claudia (2002), “A pollution Theory of Discrimination: Male and Female Differences in Occupations and Earnings, *NBER Working Paper No. 8985*”
- Goldin Claudia (1991), “Understanding the Gender gap”, in Currie J. and Chaykowski R. (1992) “Male Jobs, Female Jobs and Gender gaps in Benefits Coverage, *NBER Working Paper # 4106*,
- Goldin Claudia (1986), “Monitoring Costs and Occupational Segregation by Sex: A Historical Analysis”; *Journal of Labor Economics, Vol. 4 No. 1*
- Groshen Erica (1991), “The Structure of Female/Male Differential: Is it Who You Are or What You Do or Where You Work?” *Journal of Human Resources 26(3): 457-72*
- Grusky, D. B., and Charles, M (1998), “The Past, Present and Future of Sex Segregation Methodology” in Watts and MacPhail (2004) “Gender Segregation by Industry and Occupation in Canada 1987-2003”; *Centre of Full Employment and Equity, The University of New Castle, Australia*
- Gunderson, Morley (1989), “Male-Female Wage Differentials and Policy Responses.” in Blau D. Francine and Khan M. Lawrence (2000) “Gender Differences in Pay” *NBER working paper #7732*
- Hansen Jorgen and Wahlberg Roger (2000), “Occupational Gender Composition and Wages in Sweden in Oliveira Ana Maria (2001) “Occupational Gender Segregation and Effects on Wages in Brazil” *XXIV General Population Conference, IUSPP*
- Heath J.A and Ciscel D. H (1988), “Patriarchy, Family Structures and the Exploitation of Women’s Labour”; *Journal of Economic Issues, 22(3): 783-794*
- ILO/JASPA (1989), “From Redeployment to Sustained Employment Generation: Challenges for Ghana’s Program of Economic Recovery and Development, *ILO*”
- Jacobs, J.A (1989), “Long-Term Trends in Occupational Segregation by Sex” in Oliveira Ana Maria (2001) “Occupational Gender Segregation and Effects on Wages in Brazil” *XXIV General Population Conference, IUSPP 2001*
- Jacobsen J. P. (1994), “The Economics of Gender” in Oliveira Ana Maria (2001) “Occupational Gender Segregation and Effects on Wages in Brazil” *XXIV General Population Conference, IUSPP 2001*
- Jahn, Julius A., Schmid, Calvin F., and Schrag, Clarence (1947), “The Measurement of Ecological Segregation” in Echenique and Fryer, (2004) On the Measurement of Segregation” *NBER Working Paper # 11258*
- Karmel T., and Maclachlan M., (1988), “Occupational Sex Segregation – Increasing or Decreasing” in Watts and MacPhail (2004) “Gender Segregation by Industry and Occupation in Canada 1987-2003”; *Centre of Full Employment and Equity, The University of New Castle, Australia*
- Macpherson David and Hirsch Barry (1995), “Wages and Gender Composition: Why do Women’s Job Pay Less?” *Journal of Labor Economics, Vol. 13, No. 3 (July)*,
- Mincer Jacob and Polachek, Solomon (1974), “Family Investment in Human Capital: Earnings of Women”, *Journal of Political Economy, 82 (March/April) S76 – S108*

- Oliveira Ana Maria (2001), "Occupational Gender Segregation and Effects on Wages in Brazil" *XXIV General Population Conference, IUSPP 2001*
- Petersen, Trond and Morgan, Laurie (1995), "Separate and Unequal: Occupation-Establishment Sex Segregation and the Gender wage Gap". *American Journal of Sociology*, 10(2): 329-65
- Polachek Solomon (1975), "Differences in Expected Post-school Investment as Determinant of Market Wage Differentials", *International Economic Review June*
- Polachek Solomon (1979), "Occupational Segregation among Women: Theory, Evidence and a Prognosis" **in** Goldin Claudia (1986) "Monitoring Costs and Occupational Segregation by Sex: A Historical Analysis"; *Journal of Labor Economics*, Vol. 4 #1
- Polachek Solomon (1981), "Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure", *Review of Economics and Statistics* 63
- Power M (1975), "Women's Work is Never Done by Men: A Socio Economic Model of Sex Typing in Occupations" *Journal of Industrial Relations* 17(3) 225-239
- Psacharopoulos, G and Tsannatos Z (1989), "Female Labour Force Participation: An International Perspective". *The World Bank Research Observer*, 4 (2) July
- Reskin Barbara et al (1999), "The Determinants of Consequences of Workplace Sex and Race Composition" **in** Watts, M and MacPhail F. (2004) "Gender Segregation by Industry and Occupation in Canada 1987-2003"; *Centre of Full Employment and Equity; the University of New Castle, Australia*
- Reskin Barbara and Hartmann Heidi (1986), "Women's Work, Men's Work: Sex Segregation on the Job" **in** Blau D. Francine and Khan M. Lawrence (2000) "Gender Differences in Pay" *NBER Working Paper #7732*
- Schultz, T.P (1990), "Women's Changing Participation in the Labour Force: A World Perspective". *Economic Development and Cultural Change*, 38 (3)
- Semyonov M., and Scott R. I., (1983), "Industrial Shifts, Female Employment and Occupational Differentiation: the Dynamic Model for American Cities, 1960-1970" **in** Oliveira Ana Maria (2001) "Occupational Gender Segregation and Effects on Wages in Brazil" *XXIV General Population Conference, IUSPP 2001*
- Semyonov M. (1980), "The Social Context of Women's Labor Participation: Comparative Analysis" **in** Oliveira Ana Maria (2001) "Occupational Gender Segregation and Effects on Wages in Brazil" *XXIV General Population Conference, IUSPP 2001*
- Watts M. J. (1994), "A Critique of Marginal Matching" **in** Watts and MacPhail (2004) "Gender Segregation by Industry and Occupation in Canada 1987-2003"; *Centre of Full Employment and Equity, The University of New Castle, Australia*
- Watts Martin and MacPhail Fiona (2004), "Gender Segregation by Industry and Occupation in Canada 1987-2003"; *Centre of Full Employment and Equity; the University of New Castle, Australia*
- World Bank (1995), "World Development Report 1995", *Washington D. C.*
- Zalokar, Catherine Nadja (1982), "A Human Capital Model of Sex Differences in Occupational Distribution and Wages" **in** Goldin Claudia (1986) "Monitoring Costs and Occupational Segregation by Sex: A Historical Analysis"; *Journal of Labor Economics*, Vol. 4 No. 1