Occupational Gender Segregation and Wage Rate Differentials Among Filipino Youth

Nanette Lee[*] and Linda S. Adair[**]

Abstract

The tendency of men and women to work in different occupations contributes to the persisting gender wage gap. This effect is suggested to be greater at younger ages as people begin their careers. However, this has not been ascertained in the Philippines because of data paucity, particularly among the youth which account for one-fifth of the country's employed population. Using 2005 Cebu Longitudinal Health and Nutrition Survey data on 924 employed youth ages 20-22 years, we examined the: (1) extent of occupational gender segregation using the Karmel and MacLachlan index (I_p); (2) demand and supply side factors associated with occupational choice; and (3) effect of segregation on wage rate. Multivariate regression and Heckman selection models were employed. Results showed that there is occupational gender segregation that is worse among rural residents. Occupational gender segregation is significantly associated with wage rate inequality, even after controlling for human capital and employment requirements.

Introduction

Gender equality is essential for sustainable development. This has been a central theme in global conferences such as the International Conference on Population and Development held in Cairo in 1994 and the World Conference on Women held in Beijing in 1995. One of

* Ph.D. candidate, University of North Carolina, Chapel Hill, USA; Senior Research Associate, University of San Carlos Office of Population Studies, Inc., Cebu, Philippines.

** Research Fellow, Carolina Population Center, University of North Carolina, Chapel Hill, USA.

the areas where efforts are targeted to promote gender equality and empower women is in the labor market. Women and men tend to work in different occupations, and this segregation has been suggested to cause the continuing discrepancies in wages among men and women. Estimates of the wage gap attributed to occupational gender segregation range from five percent to 40 percent depending on the data and statistical methodology, with about 20 to 25 percent considered as the most reasonable estimate (Hakim 1992; Macpherson and Hirsch 1995; Preston 1999).

The Philippines has been making significant strides towards women empowerment and gender equality. Gender concerns are being mainstreamed in government policies and programs. Labor participation rate of women has been steadily increasing in recent years, from 50.5 percent in 1996 to 54.9 percent in 2001 (ILO 2003). However, gender segregation in the labor market persists. Employment data compiled by the Asian Development Bank (ADB 2004) showed gender segregation following socially ascribed roles and responsibilities of men and women. Women were predisposed to be employed in nurturing functions, such as in private households as housekeepers, in education, and in health and social work. By occupation group, the highest concentrations of females relative to males were among laborers and as unskilled workers. This segregation suggests poorer quality of women's work since these occupations do not usually have good terms of employment (i.e., overtime pay, health benefits, tenure).

The youth population (ages 15 to 24 years) is a significant economic force in the Philippines. The working youth accounted for 20 percent of the total employed persons in 2005. At the same time, this group contributed almost half of the total unemployed persons. Young women had a lower labor force participation rate (LFPR) compared to young men (38 percent and 60 percent, respectively) (NSO 2005). A 2002 report on the Filipino youth found that the employment gender disparity is more pronounced in rural areas, where young women's LFPR was 35 percent against men's 64 percent in 2002 (POPCOM 2002).

A study (Warren and others 2002) on occupational stratification using a life course approach in Wisconsin suggests that gender effect on occupation is greater at younger ages -- gender matters most when people are beginning their careers. From career entry, men tend to work in occupations that pay better than the occupations in which women tend to work. Comparing across age groups, the effect of gender segregation on wages was highest among the younger ages (16-29 years) where occupational crowding has been postulated to be more severe (Macpherson and Hirsch 1995). Whether this is true in the Philippines cannot be ascertained, because information on the extent of segregation, particularly among youth workers, has been lacking. Against this context, the authors aim to: (1) determine the presence and extent of occupational gender segregation; (2) examine supply and demand side factors associated with occupational choice; and (3) estimate the effect of occupational gender segregation on

wage rate among the Filipino youth as they undergo a critical but understudied life stage transition.

The paper is organized as follows: (1) overview of the theoretical perspectives on occupational gender segregation and the Philippine youth labor market; (2) data and methods used in the analyses; (3) results; and (4) conclusions.

Theoretical Perspectives

Occupational gender segregation

Occupational gender segregation has persisted over time and is evident in all nations of the world (Grusky and England 2004; Moshe and Frank 1999; Preston 1999; Rosenfeld and Spenner 1992). Anker (1997) noted two major reasons why occupational gender segregation should be a continuing concern. First, it is a major source of labor market rigidity and economic inefficiency. Exclusion of majority of laborers on majority of occupations is a waste of human resources. Second, it is detrimental to women since segregation perpetuates negative views of both men and women, consequently affecting women's status, income, education, skills (Anker 1997). The key consequence associated with occupational gender segregation is the segregation of the payment structures and the persistent sex differential in earnings with women on the negative or lower end. The proportion of the gender wage gap (five to 40 percent) attributed to occupational segregation is reportedly higher than the proportion explained by work interruptions (15 percent) and comparable worth wage upgrading (five percent) (Hakim 1992; Preston 1999). It therefore follows that the theories formulated to explain occupational gender segregation are focused on explaining the gender pay gap. As discussed by Anker (1997), occupational gender segregation theories can be classified into three broad categories: (1) neo-classical and human capital theories; (2) institutional and labor market segmentation theories; and (3) non-economic and feminist or gender theories.

The Neoclassical Theory

This theory assumes rational choice on the parts of both the employer and the worker. Further, it assumes that labor markets function efficiently. The workers assess their own assets against constraints and take into account their preferences in deciding to seek the best paying job while the employer's main goal is to maximize profits by minimizing costs and maximizing productivity but is willing to pay the workers' marginal product because of labor market competition. On the supply side, this theory places high values on productivity-related variables such as education and previous work experience. For the neoclassical theorists, women rightfully have lower pay because of their lower productivity. Further, this theory stresses the responsibility of women in terms of housework and childcare that they are

willing to choose occupations that have relatively low penalties for temporary withdrawals from the labor force, i.e., occupations that offer flexible working hours. On the demand side, human capital theorists believe that the factors that influence workers' preferences (education, skills) for particular jobs influence the preference of employers. Therefore, jobs requiring higher education and work skills are offered to men since they supposedly have better education and skills rather than women. In addition, the stereotypical role of women as homemakers and caretakers can lead to higher indirect costs – i.e., compared to men, women will have higher absenteeism, turn-over rate, and require other non-wage benefits such as crèches for their children, separate toilets, etc. Neo-classical complementary theories have also emerged – the employer's taste for discrimination and compensating differentials. *Employer's taste for discrimination* (Becker 1971) assumes that employers are inherently prejudiced against certain groups, and usually these groups are those who are different because of visible characteristics such as age, sex, race, etc. When employers hire someone that they are prejudiced against, it presents higher cost. The *compensating differentials model* states that women prefer occupations that have good working conditions and fringe benefits and avoid occupations with unpleasant and dangerous conditions – these will lead women to accept lower paying jobs with high non-wage pay (Anker 1997).

The Institutional and Labor Market Segmentation Theories

These theories assume that institutions (i.e., unions, large enterprises) significantly influence the hiring, firing, promoting and paying of employees. They also believe that labor markets are segmented. The *dual market theory* segments the market into primary and secondary sectors – the former includes jobs that are relatively good in terms of pay, security, opportunities for advancement and working conditions while the latter includes jobs that tend to be poor in pay, chances for promotion and working conditions. Further, primary sectors are believed to be protected from competition unlike secondary sectors where competition is fierce. This segmentation model then is used to explain occupational gender segregation: female occupations have lower wages because of overcrowding while male occupations have lower competition therefore enjoy higher wage rates. The *statistical discrimination theory* is based on the assumption that there are differences in the productivity of distinct groups and high search and information costs associated with recruitment and promotion decisions. It is therefore believed to be rational for employers to discriminate against low-productivity workers such as women to save on decision-making costs (Anker 1997).

Feminist/Gender Theories

These theories center on non-market variables that put women at a disadvantage in the labor market, such as the patriarchal nature of society where women are seen as subordinates. This patriarchal ordering and the division of responsibilities contribute to why women

accumulate lower human capital and skills. Women are viewed to be responsible for home and childcare while men are the breadwinners, this stereotyping can then help explain why it is perceived that women have lesser need for education and work experience. This theory further shows how female occupations mirror common stereotypical roles. For example, women's caring nature, skill and experience in household work, greater manual dexterity, greater honesty and attractiveness can qualify her for occupations such as nurses, doctors, social worker, teacher, maid, housekeeper, cleaner, etc. while women's lesser physical strength, lesser ability in math and science, and lesser willingness to face danger can disqualify her for occupations such as engineer, mathematician, driller, miner, construction worker, etc. (Anker 1997; Anker and Hein 1985).

The Filipino youth

The Filipino youth, ages 15 to 24 years, comprising 15.1 million (~ 20 percent) out of the 76.5 million Filipinos in 2000; half of this youth population was between ages 20-24 years. With an annual growth rate of 2.1 percent, the Philippine population is expected to double in 33 years. As regards to education, about 42 percent were attending school (NSO 2002 ; POPCOM 2002). The female youth had relatively higher educational attainment than the male youth. In fact, young females were more likely to have college education than males, regardless of age (Ogena and Berja 2003). In 2005, the youth comprised about a third of the country's working age population; with about half of them already in the labor force. While this group accounts for 20 percent of the total number of employed individuals, 44 percent of the unemployed were youths (NSO 2005). The latter suggests lack of job opportunities for the younger population, especially for the young women in rural areas; youth unemployment rate gradually increased in the past six years prior to the 2002 youth survey (Ericta 2003). The Filipino youth's significant share in the labor force underscores their influence in the direction of the socio-economic development of the country.

Among Asian countries included in a cross-national study, the Philippines was reported to have the most gender segregated occupations as measured by the index of dissimilarity (Moshe and Frank 1999). Wage differentials between men and women have been reported and is a serious concern but have not been analyzed in the context of occupational gender segregation (ADB 2004). And as previously stated, few, if any, have examined working preferences and concentration among the younger population – a population that comprise a significant portion of the country's population, and its workforce. Our study explored the applicability of the theories of occupational gender segregation for a population where women are generally more highly educated than men but at the same time a population that still holds strong stereotypical views as regards to female/male responsibilities and occupations (ADB 2004; Ogena and Berja 2003; POPCOM 2002).

Data and Methods

The authors used data gathered by the Cebu Longitudinal Health and Nutrition Survey (CLHNS) on a community-based sample of individuals born between 1983-84 in metropolitan Cebu, the second largest metropolitan area in the Philippines. A stratified, single stage sampling was used to select 33 barangays (smallest administrative unit) – 17 urban and 16 rural barangays. Households in the selected barangays were surveyed and information was collected on all births occurring between May 1, 1983 and April 30, 1984. The CLHNS collected individual, household and community level data through face-to-face interviews using structured questionnaires in 1983-84, 1994, 1998, 2002, and 2005. This paper is a cross-sectional analysis utilizing data from the last survey round when participants were young adults.

Of the original cohort of 3,080 single live births, 1,912 (1,008 males, 904 females) remained in the 2005 survey; 1,048 were working at the time of the survey but we focused on the 924 paid workers (ages 20-22 years). About 56 percent of the analysis sample were male, most (95 percent) were not currently in school with about two-thids having graduated from high school and only seven percent from college. Urban residents and those who were never married made up majority of the sample (69 percent and 71 percent, respectively). Less than half had previous work experience, most were employees and working full-time, and about 45 percent were in crafts and production occupations.

TABLE 1. Profile of the respondents, CLHNS 2005 (N = 924)

Selected characteristics	n	Percent
Male	517	55.95
Married	268	29.00
Not schooling	878	95.02
Graduated high school	607	65.69
Urban resident	638	69.05
With work experience	385	41.67
Employee (not self-employed)	812	87.88
Working full-time	695	75.22
Occupation:		
Administrative, executive, managerial, professional	51	5.52
Clerical	101	10.93
Sales	127	13.74
Farming, fishing ,hunting, mining	23	2.49
Transportation, communication services	78	8.44
Crafts, production	413	44.70
Service, sports	131	14.18

Details of the analysis methods employed are discussed under each aim as different segregation measures are employed. Aim 1 focuses on measuring segregation at the macro level while Aims 2 and 3 assess characteristics associated with and the effects of segregation measured at the micro level.

Aim 1

For Aim 1, which is *to determine the presence and extent of occupational gender segregation*, we used the Karmel and MacLachlan Index (1988)[1]. This index is based on the understanding that segregation means a different distribution of women and men across occupational categories, and the more equal the distribution over occupations, the less segregation. The Karmel and MacLachlan Index (I_p) can be computed using:

$$I_P = \left(\frac{1}{T}\right)\sum_{j=1}^{n}\left|F_j - a\left(M_j + F_j\right)\right|$$

where T and a are total employment and the female share of total employment, respectively, and F and M are the number of female and male employees in the th occupation. The number of females in occupation j under occupational integration is $a(M_j + F_j)$. This index is interpreted as the proportion of the workforce (persons in employment), which would need to change occupations to remove segregation taking into account the female and male shares of occupations. The index represents the level of employment that would have to relocate, with replacement, to achieve 0 segregation. The I index ranges from 0 in the case of complete equality where women's employment is distributed similarly to men's across occupations to .5 in the case of complete dissimilarity where women and men are in completely different occupations (Emerek and others 2003; Karmel and MacLachlan 1988; Watts 1997; Watts 1998a; Watts 1998b).

In this study, we used the 2-3 digit Philippine Standard Occupation Codes (most detailed, lowest level of occupational grouping available) to classify each respondent's work. Our respondents were employed in 126 occupation groups. These occupation groups were then classified into the seven major occupational groups (see details below) that were used to compute for the I. We also estimated segregation indices stratified by characteristics that may affect the extent of segregation such as residence, employment type (Emerek and others 2003) and schooling status.

Aim 2

In Aim 2, which is *to examine supply and demand side factors associated with occupational choice*, we grouped occupations into three occupational gender-types to represent the dependent variable – integrated, female dominated, and male dominated occupations.

Dependent variable

The CLHNS coded nine major occupational groups: (1) professional, technical workers; (2) administrative, executive and managerial workers; (3) clerical workers; (4) sales workers; (5) farmers, fishermen, hunters, loggers; (6) miners, quarrymen; (7) workers in transport and communications; (8) craftsmen, production-process workers; and (9) service and sports workers. To increase sample size per group, we combined groups (1) n = 9 and (2) n = 42, and combined groups (5) n = 21 and (6) n = 2 resulting in seven major occupational groups (see Table 1 for detailed distribution). These occupational groups were then categorized into three occupational gender-types: integrated, female dominated, or male dominated occupations. There is no standard way of allocating occupations into gender-type categories; examples of the different ways in which these (or similar) categories have been defined in the literature include: (1) determining an occupation to be atypical when a majority of the employed are of the other gender (Corcoran and others 1984; Rosenfeld 1984) with some using set cut-offs such as 70 percent, 80 percent or 90 percent (Melkas and Anker 1997); (2) looking at patterns of mobility to identify blocks that are internally homogenous (Jacobs 1989; Rosenfeld and Spenner 1992); (3) defining integrated jobs as jobs falling within a certain proportion band (i.e., 10, 20, 40 percent) around the average female share of the workforce (Hakim 1992); and, (4) considering female representation in the labor force and classifying occupations that have a given degree of female over/under representation as 'male' or 'female' (Beller 1984; Rytina and Bianchi 1984).

In a similar thread with the last definition, we determined occupational gender types as follows: an occupation was classified (fe)male dominated if its (fe)male share of employment was higher than the overall (fe)male share of employment, otherwise the occupation was classified as integrated (Watts 1998b). For example, we classified an occupational group to be female dominated if the female share of employment in this particular group was significantly higher (alpha set at 0.05) than the over-all share of female employment (44 percent). On the other hand, if its female share of employment was significantly lower than 44 percent, the occupation was classified as male dominated. The resulting classification corresponded well with the Hakim (1992) classification scheme of 20 percent band around the (fe)male share of occupation. Integrated occupations were coded 0^2, female dominated occupations were coded 1, and male dominated occupations were coded 2.

Explanatory variables

Supply side explanatory variables included traditional human capital variables of education and work experience, family structure variables such as living with mother and marital status, geographic residence (urban-rural), and job-finding network. For demand side explanatory variables, we considered job availability as perceived by the young adults, and requirements for education, work experience, physical exertion and work time.

To gather information on these demand side explanatory variables, the study asked the respondents about the requirements/qualifications necessary for their current jobs as regards to these variables. Operationalization of supply and demand side predictors are presented in Table 2.

TABLE 2. Operationalization of supply and demand side predictors

Predictor	Measure
SUPPLY SIDE	
Human capital	
Education	Number of completed years of formal education
In school	Currently schooling/studying 1 = yes (46), 0 = no (878)
Work experience	Worked previously 1 = yes (385), 0 = no (539)
Family structure	
Marital status	Currently/Previously married = 1 (268), never married = 0 (656)
Living with mother	Living with mother 1 = yes (690), 0 = no (234)
Geographic residence	
Urban residence	Urban resident = 1 (638), rural resident = 0 (286)
Job finding network	
Found job by himself	Nobody helped to find job = 1 (361), somebody helped to find job = 0 (563)
DEMAND SIDE	
Job availability	
Only job available	Reason cited for choosing job: only job available = 1 (406), other reasons = 0 (518)
Human capital requirement	
Requires at least high school graduate	Educational requirement of job at least high school graduate 1 = yes (393) , 0 = no (531)
Requires work experience	Job requires previous work experience 1 = yes (257), 0 = no (667)
Physical requirement	
Physical exertion	Main job activity requires moderate/heavy physical exertion 1 = yes (417), 0 = no (507)
Time requirement	
Full time job	Works at least 40 hrs/wk 1 = yes (695), 0 = no (229)

*( ) – n in each category

Analysis approach

To identify supply and/or supply side factors significantly associated with our 3 – level occupational gender type outcome (nominal, with no ordering assumed), we used polytomous logistic regression. This simultaneously models the log of the odds that the occupation is female dominated (divided by the odds that the occupation is integrated) and the log of the odds that the outcome is male dominated (divided by the odds that the occupation is integrated). In contrast to using two or separate dichotomous logistic models, using a polytomous model utilizes the data for all categories of the outcome variable in a single model structure, considering all levels of the outcome simultaneously (Rothman and Greenland 1998). First we ran a model with supply side factors only to determine significant respondent characteristics associated with occupational 'choice', then we entered demand side variables to the model to determine what employer/occupation characteristics influenced the outcome as well as to examine if the addition of these factors modulates the supply side effects. Further, we performed the analyses stratified by gender to see if the same predictors influenced occupational choice among males and females. Lastly, self-employed individuals may have different decision patterns, influences and job market constraints than those who depend on outside employment. Therefore, we assessed sensitivity of results to the inclusion of self-employed respondents by performing all analyses with and without this group (n = 112), coded 1 if self-employed, 0 if an employee. Most self-employed respondents were in transportation and communication (36.6 percent) and in sales (28.6 percent) jobs.

Aim 3

Aim 3 is *to estimate the effect of occupational gender segregation on wage rate among the Filipino youth.* To operationalize the outcome, wage per hour, we divided self-reported usual weekly earnings by the usual number of hours worked per week – both pertaining to the main occupation. The local currency, Philippine peso, was used in the analyses. The main exposure of interest, occupational gender segregation (represented by occupational gender type) and the control variables, human capital characteristics such as education and work experience, and geographic residence were operationalized as previously described.

Multivariate regression models were employed to estimate the effect of being in a gender-dominated occupation on wage rates. Heckman selection models were used to account for potential selection bias that may have resulted from limiting our study to paid workers. For example, the respondent's decision not to work (therefore not having paid wages and excluded in the sample) could be influenced by reservation wages that are higher than the offer wages – therefore it is possible that those who were not in the sample could have had higher wages than those who were actually in the sample if they chose to work. The Heckman selection model assumes an underlying regression relationship:

$$y_i = x_i \hat{a} + u_{1j} \quad \text{(regression equation)}$$

The dependent y variable (wage rate), is not always observed but the dependent variable for observation j is observed if:

$$Z\hat{a} + u_{2j} > 0 \text{ (selection equation) where}$$

$$u_1 \sim N\,(0,\,\acute{o}) \ \text{ and } u_2 \sim N\,(0,\,\acute{o}) \ , \text{corr}\,(u_1,\,u_2) = \tilde{n}$$

When $\tilde{n} \neq 0$, then the regression equation will yield biased results while the Heckman will provide consistent, asymptotically efficient estimates for the parameters in such models (Gronau 1974; Heckman 1976; StataCorp 1999).

Similar to the analysis approach used for Aim 2, we assessed the effect of having self-employed respondents by estimating effects with and without this group.

Results

Presence and extent of occupational gender segregation

There is occupational gender segregation among Filipino youth. As measured by the I index shown in Table 3, about 27.9 percent of the sample needed to switch occupations to remove segregation; segregation was worse among those still in school, 43 cases of them (I = 41.3 percent), living in rural areas (I = 34.3 percent) and were self-employed (I = 30.0 percent) (Table 3). It is noteworthy that the index value estimates are substantial and within the range as or slightly higher than the national estimates for most E.U. countries known to have relative high levels of segregation and for Japan (Emerek and others 2003; Grusky and England 2004). However, since the index is not margin-free and can be influenced by occupational classification and distribution, direct comparison of index estimates should be viewed with caution. Also, we focused on the youth population while most studies have not specifically analyzed this age group.

With the presence of occupational gender segregation, it is interesting to see how the labor force is distributed by gender in each occupation or to know which occupations are gender-biased. Table 4 shows clerical and sales occupation groups are female-dominated; farming, fishing, hunting, mining and transportation-related occupations are male-dominated while administrative, executive, managerial, professional, crafts and production, and service and sports occupational groups are gender-integrated jobs. The classifications of these major occupational groups, although not exactly the same, are similar to results indicated by previous studies and somehow follow stereotypical expectations posited by the gender/feminist theorists (ADB 2004; Anker 1997; Grusky and England 2004; Watts 1995).

TABLE 3. I$_p$ index values by selected characteristics: 2005

Group	Index	N
In school:		
No	.2783	878
Yes	.4130	46
Residence:		
Rural	.3433	286
Urban	.2848	638
Self-employed:		
No	.2743	812
Yes	.3004	112
All	.2787	924

*based on 2-3 digit occupation codes; sample distributed in 126 occupations

TABLE 4. Gender distribution by occupational group (n = 924)

Occupational group	Male	Female	n
Administrative, executive, managerial, professional	47.06	52.94	51
Clerical*	28.71	71.29	101
sales*	45.67	54.33	127
Farming, fishing ,hunting, mining*	95.65	4.35	23
Transportation, communication services*	92.31	7.69	78
crafts, production	56.42	43.58	413
Service, sports	60.31	39.69	131
All	55.95	44.05	924

*difference in proportions between total proportion per gender versus occupational group proportion p < .05

Looking at the distribution of males and females by occupational gender-type, we observed that the majority (65 percent of males, 64 percent of females) was working in integrated occupations; interestingly, only about 1.7 percent of females were in male-dominated occupations while about 17 percent of males were in female-dominated occupations (Table 5). This shows that females are more likely to be concentrated in specific occupational groups than males and supports the dual market theory as regards to 'crowding' of females. Given the types of occupational groups that were classified as male dominant, it is not surprising that the youth in male-dominated occupations were more likely to be out of school, rural resident, and self-employed. Only about seven percent of urban youth workers were in farming, fishing, hunting, mining, or transportation-related occupations (Table 6); moreover, this proportion was concentrated on the last group as public utility (motorized and non-motorized) vehicle drivers and to a lesser extent as stevedores. Also, the observations that: (1) almost all workers in male-dominated occupations were males and, (2) these occupations were more likely in rural areas and held by the self-employed, may be driving the higher I$_P$ index among these groups.

TABLE 5. Gender distribution by occupation gender type, 2005 (n = 924)

Occupation gender-type	Male %	Female %	ALL %
Integrated	64.99	63.64	64.39
Female dominated	16.83	34.64	24.68
Male dominated	18.18	1.72	10.93
N	517	407	924

*difference in proportions between total proportion per gender versus occupational group proportion p < .05

TABLE 6. Percent distribution according to occupation gender type, by selected characteristics, 2005 (n = 924)

Occupation gender-type	In school (%)		Residence (%)		Self-employed (%)		ALL (%)
	No	Yes	Rural	Urban	No	Yes	
Integrated	65.26	47.83	62.94	65.05	69.21	29.46	64.39
Female dominated	23.69	43.48	17.13	28.06	24.14	28.57	24.68
Male dominated	11.05	8.70	19.93	6.90	6.65	41.96	10.93
n	878	46	286	638	812	112.	924

Supply and demand side characteristics associated with occupational gender type

Question 1: What supply and demand side characteristics were significantly associated with being in a female-dominated job versus an integrated job among the youth? (Table 7)

For both genders combined, respondents with more years of formal schooling and those living in urban communities were significantly more likely to be in female-dominated than integrated occupations (Odds ratios (OR) 1.13 and 1.55, respectively). When stratified by gender, this pattern is observed only among females but not males. The only supply side characteristic that significantly influenced males to choose female-dominated over gender-integrated occupations was schooling at the time of the survey (OR 2.65).

Including demand side variables did not substantially influence the significant effects of number of years of education and urban residence. Among the supply side characteristics, skills and physical exertion requirements are negatively associated with being in a female-dominated occupation. Although we observed the same direction of effects for males, these associations were not statistically significant.

Question 2: What supply and demand side characteristics were significantly associated with being in a male-dominated job versus an integrated job among the youth? (Table 7)

Opposite to what was observed above, number of years of education and urban residence decreased the likelihood of having a male-dominated job versus an integrated job; for males, being in school and being married were also significant factors (OR 2.64, 2.02, respectively). Living in urban areas decreased the odds of having a male-dominated job over an integrated job by as much as 22 percent.

Similar to the first occupational gender type contrast, demand side variables had independent effects on occupational choice and did not significantly attenuate the effects of supply side characteristics. Compared to integrated jobs, male-dominated jobs were more likely chosen because of job (in)availability, more likely to require physical exertion and less likely to have higher educational requirement.

The exclusion of self-employed respondents from the analyses did not change the direction of the relationships among supply and demand side characteristics and occupational gender type. In general, for the supply side variables, the associations involving the education variables were strengthened while that of urban residence was slightly decreased. For the demand side variables, the negative associations between education and physical exertion requirements with the odds of choosing a male-dominated job over an integrated job were weakened.

TABLE 7. Odds ratio (ORs) comparing having a gender-dominated job versus integrated job (reference)

Predictors	Both genders (n = 924)		Males (517)		Females (407)	
	Model 1*	Model 2*	Model 1*	Model 2*	Model 1*	Model 2*
Female dominated versus integrated (reference)						
SUPPLY SIDE VARIABLES						
No. of years of education	1.13**	1.10**	1.01	1.00	1.24**	1.22**
In school	1.76^+	1.81^+	2.65**	2.33^+	1.57	1.64
Living with mother	1.04	0.96	1.04	0.98	0.94	0.86
Married	0.98	0.97	1.22	1.32	0.84	0.83
Urban residence	1.55**	1.54**	0.79	0.77	2.90**	2.99**
Work experience	1.01	0.99	0.85	0.85	1.11	1.10
Found job by him/herself	1.04	1.00	0.90	0.88	1.19	1.20
DEMAND SIDE VARIABLES						
Only job available		1.04		1.34		0.73
Require HS graduate		1.06		1.17		0.87
Require work experience		0.52**		0.63		0.52**
Need physical exertion		0.59**		0.66		0.59
Full time		1.09		0.74		1.64
Log Likelihood						
Male dominated versus integrated (reference)						
SUPPLY SIDE VARIABLES						
No. of years of education	0.82**	0.92**	0.85	0.93	n/a	n/a
In school	2.57	2.76	2.64**	2.66	n/a	n/a
Living with mother	1.20	1.19	1.31	1.39	n/a	n/a
Married	1.23	1.10	2.08**	2.08**	n/a	n/a
Urban residence	0.35**	0.37**	0.22**	0.23**	n/a	n/a
Work experience	0.94	0.87	0.78	0.76	n/a	n/a
Found job by him/herself	1.16	1.66**	1.00	1.39	n/a	n/a

	Both genders Model 1	Both genders Model 2	Males Model 1	Males Model 2	Females Model 1	Females Model 2
DEMAND SIDE VARIABLES						
Only job available		1.74**		1.93**		n/a
Require HS graduate		0.19**		0.13**		n/a
Require work experience		1.30		1.36		n/a
Need physical exertion		2.11**		1.25		n/a
Full time		0.93		0.61		n/a
Log Likelihood	-752.96	-717.07 (24)	-425.59	-402.99	-268.12	-260.69
LR chi2 (df)	103.10 (14)	174.88 (24)	68.97 (14)	114.18 (24)	53.69 (14)	68.55 (24)
Prob > chi2	0.00	0.00	0.00	0.00	0.00	0.00

* Model 1: Includes supply side predictors only; Model 2: Includes supply and demand side predictors.
** p-value < .05; + p-value <.10
n/a only 7 females in male dominated-occupations

TABLE 8. Odds ratio (ORs) comparing having a gender-dominated job versus integrated job (reference), self-employed excluded

	Both genders (n = 812)		Males (436)		Females (376)	
Predictors	Model 1*	Model 2*	Model 1*	Model 2*	Model 1*	Model 2*

Female dominated versus integrated (ref)

	Both Model 1	Both Model 2	Males Model 1	Males Model 2	Females Model 1	Females Model 2
SUPPLY SIDE VARIABLES						
No. of years of education	1.17**	1.12**	1.05	1.01	1.26**	1.24**
In school	1.75	1.93+	2.73**	3.12**	1.70	1.56
Living with mother	1.23	1.12	1.44	1.26	1.02	0.98
Married	0.88	0.88	1.45	1.43	0.64	0.61
Urban residence	1.39+	1.39	0.61+	0.62	2.76**	2.80**
Work experience	1.06	1.04	0.79	0.77	1.26	1.26
Found job by him/herself	0.97	0.86	0.79	0.68	1.06	1.07
DEMAND SIDE VARIABLES						
Only job available		1.10		1.42		0.77

Require HS graduate	1.25		1.48		0.92	
Require work experience	0.59**		0.79		0.57+	
Need physical exertion	0.51**		0.62		0.49**	
Full time	1.12		1.14		1.23	

Male dominated versus integrated (ref)

SUPPLY SIDE VARIABLES

No. of years of education	0.81**	0.86**	0.82**	0.86**	n/a	n/a
In school	3.18	2.75	3.68	3.26	n/a	n/a
Living with mother	1.05	1.11	1.16	1.26	n/a	n/a
Married	0.60	0.60	0.95	1.12	n/a	n/a
Urban residence	0.53**	0.55+	0.34**	0.34**	n/a	n/a
Work experience	0.93	0.95	0.86	0.94	n/a	n/a
Found job by him/herself	0.95	1.28	0.71	0.98	n/a	n/a

DEMAND SIDE VARIABLES

Only job available		1.55		1.97+		n/a
Require HS graduate		0.40**		0.28**		n/a
Require work experience		0.79		0.95		n/a
Need physical exertion		1.20		0.79		n/a
Full time		0.62		0.45**		n/a
Log Likelihood	-593.74	-576.24	-310.13	-298.87	-240.04	-231.28
LR chi2(df)	76.07	111.07	42.22	64.74	58.70	76.21
	(14)	(24)	(14)	(24)	(14)	(24)
Prob > chi2	0.00	0.00	0.00	0.00	0.00	0.00

* Model 1: Includes supply side predictors only; Model 2: Includes supply and demand side predictors.
** p-value < .05; + p-value <.10
n/a only 6 females in male-dominated occupations

Restricting the analysis to those in gender-biased occupations, Table 9 presents the odds of being in male-dominated jobs compared to the odds in female-dominated jobs by gender. Regression results showed that among males, urban residence (OR .27) and educational requirements (OR .11) significantly decreased the odds of being in male-dominated jobs; among females, the odds of having male-dominated jobs was positively associated with finding the job herself. Note that few females in male-dominated occupations affected the precision of the regression estimates involving females only

TABLE 9. Odds ratio (ORs) comparing having a female-dominated job
versus male-dominated job (reference)

Predictors	ALL		Excluding self-employed	
	Males (181)	Females (148)	Males (116)	Females (87)
SUPPLY SIDE VARIABLES				
No. of years of education	0.92	0.82	0.85 +	1.01
In school	1.15	—	1.07	—
Living with mother	1.53	0.80	0.91	0.34
Married	1.49	0.54	0.68	0.75
Urban residence	0.27**	1.46	0.63	1.90
Work experience	0.77	0.30	1.23	0.40
Found job by him/herself	1.88	7.71+	2.01	3.96
DEMAND SIDE VARIABLES				
Only job available	1.17	0.46	1.21	0.25
Require HS graduate	0.11**	3.81	0.19**	—
Require work experience	1.90	2.21	0.99	0.81
Need physical exertion	1.56	0.97	1.00	—
Full time	0.98	—	0.51	—
Log Likelihood	-96.13	-23.55	-63.01	-19.49
LR chi2(df)	58.38(12)	9.28 (10)	31.31 (12)	4.67 (8)
Prob > chi2	0.00	0.50	0.00	0.79

** p-value < .05; + p-value <.10
— no estimates, category predicts failure perfectly

In sum, compared to being in other occupational gender types, the odds of being in female-dominated occupations were higher among those who were more educated and those living in urban areas, and lower among those who require previous work experience and moderate/heavy physical exertion. Gender-segregated occupations, especially male-dominated occupations, were more likely chosen because they were the only jobs available for the youth (based on their own self-report) and because these jobs were less likely to require completion of high school education.

Association between occupational gender type and wage rates

Hourly wage rates among the youth have a very wide range of variation, owing mostly to self employment wages – mean wage rate (standard deviation) for self-employed was P50.10

(136.94), while that of the employee was P26.30 (33.79). Accordingly, the log of wage rate (earnings/hour) is used in the multivariate analysis.

Examining mean wage rates per occupational gender type, we found that mean wage rates for male-dominated occupations were higher than female-dominated and integrated occupations. This pattern of wage differentials persisted after excluding the self-employed.

TABLE 10. Wage per hour (pesos) by gender type occupation, by sex

Occupation gender type	Both genders		Males		Females	
	mean	s.d.*	mean	s.d.*	mean	s.d.*
ALL EMPLOYED						
Integrated	26.84	30.94	27.47	29.42	26.01	32.84
Female dominated	31.19	49.95	30.27	30.83	31.75	58.83
Male dominated	38.48	138.41	38.87	143.46	33.21	16.72
TOTAL	29.18	57.61	30.02	66.69	28.12	43.48
EXCLUDING SELF-EMPLOYED						
Integrated	25.49	29.34	26.70	29.07	23.88	29.69
Female dominated	27.34	45.74	23.68	13.94	29.29	55.67
Male dominated	30.92	25.09	30.13	26.13	37.23	14.13
TOTAL	26.30	33.79	26.61	26.95	25.93	40.34

* s.d. = standard deviation

Table 11 presents the results of the multivariate regression models. After adjusting for education, work experience and place of residence, the Heckman selection corrected model showed that compared to integrated occupations, male-dominated occupations had higher wage rate, especially when the self-employed were excluded (regression coefficient male-dominated occupation versus integrated occupation: .295, p<.05). Integrated and female-dominated jobs had comparable wage rates. The difference between male-dominated occupation wage rate and that of female-dominated occupation was about P1.40 (regression coefficient male dominated occupation versus female dominated occupation: .333, p<.05). To put the wage differences into context, the minimum hourly wage rate in metro Cebu at the time of the survey was about P25.00. Additionally adjusting for gender yielded similar results – male-dominated occupations excluding the self-employed have significantly higher wage rate that the other occupation groups (regression coefficient male dominated occupation versus integrated occupation: .237, p<.05).

TABLE 11. Regression coefficients on wage rate

Occupation gender type	Log Wage/hr (pesos)			
	Model 1 *[1]		Model 2 * *[2]	
	Coefficient	p-value	Coefficient	p-value
ALL EMPLOYED				
Integrated	reference	Reference	reference	reference
Female dominated	.012	.829	.048	.404
Male dominated	.080	.323	.010	.899
EXCLUDING SELF-EMPLOYED				
Integrated	reference	Reference	reference	reference
Female dominated	-.039	.491	.006	.921
Male dominated	.295	.002	.237	.013

*adjusted for education, previous work experience, and urban residence
**adjusted for gender, education, previous work experience, and urban residence
[1] For all employed: Log likelihood = -2259.53, Prob > chi2 = 0.001, Wald chi2(6) = 22.82;
  Excluding self-employed: Log likelihood = -2062.63, Prob > chi2 = 0.000, Wald chi2(6) = 54.77
[2] For all employed: Log likelihood = -2246.29, Prob > chi2 = 0.000, Wald chi2(7) = 48.92;
  Excluding self-employed: Log likelihood = -2050.97, Prob > chi2 = 0.000, Wald chi2(6) = 80.68

Conclusions

Although this study is mostly descriptive, we examined a serious labor concern in a significant segment of the population. We found that occupational gender segregation exists among Filipino youth and it is significantly associated with (1) human capital, place of residence, and job requirements; and (2) wage rate inequality, even after controlling for human capital.

Examining the demand and supply side characteristics allowed us to assess which theories more closely explain occupational segregation by gender among the Filipino youth. No single theory can explain occupational gender segregation in our sample; occupational choice was driven by conditions associated with parts of the major theories. The theory least compatible with occupational choice in our sample is the neoclassical theory. We found that the neoclassical theory argument wherein male-dominated jobs have higher wages because of greater human capital does not hold. In our sample, workers in female-dominated occupations were most likely to have more years of schooling while workers in male-dominated occupations were least likely to have more years of schooling. On the supply side, male-dominated jobs were the least likely to require a high school diploma. There is however some evidence supporting the compensating differentials model, a complementary of the neoclassical model – women tend to concentrate on jobs that do not require heavy physical exertion. Nonetheless,

controlling for physical exertion requirements did not change the wage rate inequality results (data not shown) – male-dominated jobs still had higher wage rate than female or integrated jobs. As stated, the distribution of males and females across the occupation gender types may lend support to the dual market model of overcrowding. Lastly, focusing on the gender-biased occupations, the concentration of males on stereotypically male occupations (driving, farming, fishing, etc) and women on stereotypically female occupations (clerical jobs) can lend support to the gender/feminist theory.

To conclude, our findings suggest that policies aiming to reduce gender wage gap should continue to be concerned with reducing occupational gender segregation; and to reduce occupational gender segregation, policies should not only aim at improving the human capital investments (i.e., education) or productivity of women but also aim at changing gender stereotypes in the labor market.

This study characterized occupational segregation by gender and its association with wage rate differentials among young adults that may be holding transitional jobs. The next challenge therefore is for future studies to examine occupational mobility and assess if this study's findings will persist throughout the later stages of their career and life course.

Notes

1   The Karmel and MacLachlan Index is one of the many indices used to measure occupational gender segregation (i.e. Index of Dissimilarity, Charles' Structural Log Index, Gini Index). We chose to use the Karmel and MacLachlan Index since we intend to follow-up this population and examine the trend in occupational gender segregation over time. The Karmel and MacLachlan Index has properties that make it more suitable for time-series analysis of horizontal segregation. The index can be decomposed to reveal margin-free components (particularly its composition effects) and can be extended to capture the influence of different occupational groups to the level and change in the segregation index. Being margin-free means that changes in the magnitude of the index over time are independent of the interrelated changes in the overall shares of employment by gender and occupational structure (Karmel and Maclachlan 1988; Watts 1997, Watts 1998, Watts 1998b). Karmel and McLachlan 1988 and Watts 1998 provide details on Karmel and McLachlan Index decomposition that we will employ in future analyses.

2   Integrated occupations set as reference category because we are interested in knowing how different are the characteristics of individuals that take on segregated occupations compared to those that are integrated occupations.

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