

## Exploring the Glass Ceiling and Sticky Floor in Malaysia

Wan Liyana Mariah Wan Zainal Abidin<sup>1</sup>, Zaleha Mohd Noor<sup>2</sup> & Wan Azman Saini Wan Ngah<sup>2</sup>

<sup>1</sup> Faculty of Arts & Social Sciences, First City University College, No. 1, Persiaran Bukit Utama, Bandar Utama, Petaling Jaya, Selangor Darul Ehsan, Malaysia

<sup>2</sup> Faculty of Economics and Management, Universiti Putra Malaysia, UPM Serdang, Selangor Darul Ehsan, Malaysia

Correspondence: Wan Liyana Mariah Wan Zainal Abidin, Faculty of Arts & Social Sciences, First City University College, No. 1, Persiaran Bukit Utama, Bandar Utama, 47800 Petaling Jaya, Selangor Darul Ehsan, Malaysia. E-mail: wlm.liyana@gmail.com

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### Abstract

Usage of quantile regression is preferred nowadays to examine the gender earnings differentials across the earnings distribution. Based on Household Income Survey of 2009 and 2012, this paper examines the issue in Malaysia. The objective of this study is to evaluate the extent of gender earnings differentials across the earnings distribution in 2009 and 2012, whether the glass ceiling or sticky floor exists in the labour market in Malaysia. Based on the pooled quantile regression analysis, the established results indicate that the earnings gap is increasingly larger towards the bottom of the earnings distribution, a finding that is consistent with the existence of sticky floor in both years. Besides, the gender earnings gap is also accelerating between 75<sup>th</sup> to 90<sup>th</sup> percentiles, reflecting that the glass ceiling also prevails at the top of the earnings distribution in both years. Furthermore, it is noted that the impact of sticky floor is greater than glass ceiling. Nonetheless, further findings denote that the extent of sticky floor had been reduced whilst glass ceiling had increased within the period.

**Keywords:** glass ceiling, sticky floor, quantile regression

### 1. Introduction

On average, women earn 16 per cent less than men in OECD countries. Nonetheless, at the higher pay scale, the gap had enlarged with female-top-earners gain 21 per cent less than male. This signifies glass ceiling phenomenon, reflecting that women are at disadvantaged in the decision-making process and lower representation at the senior management level. This is due to the fact that women represent only one for every ten men in the boardroom (OECD, 2012). It is no doubt that the term “glass ceiling” had emerged as early as 1970s as the number of women in politics had increased steadily in United States (Palmer and Simon, 2008). Consequently, a report from Wall Street Journal in 1986 described glass ceiling effect as an artificial barrier to the advancement of women into corporate management position (U.S. Glass Ceiling Commission, 1995). Perhaps one possible explanation to explain the glass ceiling effect could result from the common institutional restrictions or societal and cultural perceptions as professional women encountering barriers that limit their career progression (Evertson & Nesbitt, 2004).

In 1991, the Glass Ceiling Act was formed as part of the Title II of the Civil Rights Act of 1991 in United States. Following this, a Glass Ceiling Commission had been established to form a study and proposed recommendations to eliminate the artificial barriers for the advancement of women and enhance opportunities and development experiences for them to enter the management and decision making level (U.S. Glass Ceiling Commission, 1995). On the other hand, “sticky floor” deals with the workers at the lower-income level. It is a situation when the gaps widen at the bottom of the earnings distribution. Booth et al. (2003) describe it as a situation when identical men and women were within similar rank, but the women were appointed at the bottom whilst men went further up the scale. Henceforth, the sticky floor issue is also as important as glass ceiling since both concepts are explaining the detailed gender gap across the earnings distribution. Therefore, this will lead the policy makers to formulate better targeted policies in future to combat the issue of gender earnings differentials.

From Malaysian perspective, in 2004, the government plans to fulfil 30 per cent of decision-making positions in the public sector with women, whilst private sector is encouraged to conduct similar practice (Economic

Planning Unit, 2006). Consequently, in June 2011, similar policy had been made compulsory for the private sector. The public sector had achieved 32 per cent of female decision making, which is above the targeted rate in 2012 (NAM Institute of Empowerment Women, 2012). In comparison, in 2013, there exists only 24 per cent of female in top management in Malaysian public listed companies (TalentCorp Malaysia, 2014). Therefore, this paper aims to evaluate the extent of gender earnings differentials across the earnings distribution, whether glass ceiling or sticky floor exists in Malaysia. This research is crucial for Malaysia as it can indicate some important points when addressing the issue of brain drain and minimum wage in the labour market. Furthermore, Malaysia needs to retain the skilled workers at the upper management level whilst at the same time to monitor the well-being of the low income workers to escape from the middle income trap. In addition, this paper will fulfil the gap of the previous economic research in Malaysia which concentrated on the discussion of average gap in earnings. The following discussion is organized as follows. Section 2 presents the literature review of this paper. Section 3 discusses the methodology whilst Section 4 outlays the data description. Section 5 presents the results of pooled quantile regression and finally, Section 6 concludes.

## 2. Literature Review

It is a well-known fact that Becker (1971) taste of discrimination and Mincer (1974) human capital model are the benchmark for researchers to conduct study on gender earnings differentials. In the past, the approach of analyzing the earnings gap is based on average level utilizing the Ordinary Least Squares (OLS) regression. However, the quantile regression approach by Koenker and Bassett(1978) is more popular nowadays to examine the gender earnings differentials across the earnings distribution. Henceforth, the earnings gap could be analyzed at selected points of the conditional earnings distribution. It started off with the study conducted by Newell and Reilly (2001) which discovered that amongst former communist countries of Eastern Europe and the Soviet Union, except for one particular country in the study, had encountered increase in the gender wage gap across the wage distribution. Subsequently, Albrecht et al. (2003) denotes that the gender wage gap increases across the wage distribution and accelerates in the upper tail of the distribution in Sweden for which they describe as the glass ceiling effect.

Following these studies, more evidence of glass ceiling and sticky floor had emerged. A significant study by Arulampalam et al. (2007) analyze the gender wage gap amongst ten European countries and discovered that glass ceilings are more prevalent than sticky floors in most countries. From the perspective of developing countries, Hyder and Reily (2005) analyze the Pakistan labour market within the public and private sectors. They discovered that the public sector in Pakistan had both a more compressed wage distribution and a smaller gender wage gap as compared to the private sector. Similarly, Sabir and Aftab (2007) found that sticky floor exists in Pakistan labour market and acknowledged that gender discrimination is a major factor for the increased gender wage gap in the lower-middle part of the conditional wage distribution. Meanwhile, Gunawardena (2006) report the existence of a sticky floor in both private and public sectors in Sri Lanka.

Subsequently, Fang and Sakellariou (2011) provide evidence of sticky floor in Thailand which is similar to the case of Sri Lanka, Singapore and Philippines. In addition, several studies are conducted based on education. For instance, de la Rica et al. (2008) confirm a glass ceiling at only college/tertiary education level whilst there is a sticky floor for the less educated group level. On the other hand, the glass ceiling effect could also exist when controlled for firm's characteristic (see Verzat & Wolff, 2008; Jellal et al., 2011). Furthermore, there have been studies to investigate the wage distribution across time. Amongst those studies are Nestic (2007) and Chi and Li (2008). Based on 1987, 1996 and 2004 data, it is found that the gender pay gap in Chinese labour market has increased across the wage distribution across time and the increase was greater at the lower quantiles which denotes the sticky floor effect (Chi & Li, 2008).

Within Malaysia perspective, the empirical evidences for gender earnings differentials are rather limited and focused on average gap analysis. A pioneer study examining this issue by Chua (1984) utilized the data from Household Income Survey (1973) and Labour Force Survey (1974). The findings indicate that discrimination exists amongst Malay and non-Malay female workers in rural areas. Later, Schafgan (2000) conducted parametric and semi-parametric analysis based on the Second Malaysian Family Life Survey (MFLS-2) and found that discrimination favouring male in Malaysia. On the other hand, Milanovic (2006) depicts that female earnings is lower as compared to male earnings during the period of 1984, 1989 and 1997 in Malaysia. Women experiences wage discrimination in the study.

Subsequently, Rahmah (2011) examined the gender wage gap in the context of service sector in Malaysia. Strong discrimination in the service sector is prevalent. Other studies which found the existence of discrimination in Malaysia are Lee and Nagaraj (1995) and Latifah (1998). Their results contradicted with Rahmah and Zulridah

(2005) which studied the gender wage gap in the manufacturing sector in Malaysia. They concluded that demographic factors and human capital variables are major determinants which formed the gender wage differentials in their study.

Despite considerable discussion of glass ceiling in Malaysia (Ministry of Women, Family and Community Development Malaysia, 2005), nonetheless, most evidences presented are from management perspective (see Norma et al. 1991; Koshal et al., 1998; Tan, 1991; Zubaidah et al., 2009). The glass ceiling syndrome is found to be in practice in Malaysia in 1990s. It is found that women managers in Malaysia encountered obstacles to their career development due to sex discrimination, lack of support, lack of recognition and limited opportunities. Moreover, majority of them occupied the lower and middle occupational level within their respective organizations. They faced difficulties to reach the upper management level (Norma et al., 1991; Koshal et al., 1998; Tan, 1991). On contrary, Zubaidah et al. (2009) provided evidence of few female who had successfully broken the glass ceiling within small organizations. In addition, a comparative study had been conducted to explain glass ceiling effect in Malaysia and Singapore. Dimovski et al. (2010) denotes that female middle managers experienced glass ceiling in their working environment and act as a barrier for them to enter the management level. The study further concluded that female received insufficient organizational support in the form of networking, mentoring and family friendly initiatives.

### 3. Methodology

The underlying framework to explain the objective of this paper lies within the demand perspective; namely statistical discrimination theory (Phelps, 1972; Arrow, 1973) and taste based discrimination theory (Becker, 1971). Statistical discrimination deals with a situation whereby employers cannot observe workers' real productivity due to insufficient information. Hence, their marginal productivity is paid based on expectation conditional on certain observable characteristics such as gender. It depicts that regardless men and women experience similar distribution of productive characteristics, nonetheless, skilled men would earn more than identically skilled women. Thus, statistical discrimination theory could explain the glass ceiling effect since the gap increases as the productivity signal (Fang, 2012). On the other hand, taste-based discrimination signifies the employer's distaste for the minority workers, which lead them to receive a lower wage for an equivalent productivity (Becker, 1971). Therefore, the greater the employers distaste for female workers, the wider is the wage gap. This could lead to prejudice to exist during hiring process and promotion procedures (Baron and Cobb-Clark, 2011; Booth et al., 2003). Sticky floor exists at the hiring process when women will receive relatively lower starting wage as compared to men. It is defined as a situation if women workers remain at the low-level positions without adequate wages (Nestic, 2007). On the other hand, the glass ceiling occurs at the promotion procedures whereby men are likely to secure a high paid job as compared to women (Fang, 2012). The model estimation used in this study is based on quantile regression technique.

Let  $(y_i, x_i)$ ,  $i = 1, 2, \dots, n$ ; be the sample of a population, signifying  $y_i$  as the dependent variable.

Meanwhile,  $x_i$  is a  $k \times 1$  vector of regressors, for the  $\theta$  th quantile of  $y_i$  conditional on the regressor vector  $x_i$ . Thus, the relation is signified as:

$$y_i = x_i' \beta_\theta + \mu_{\theta i} \text{ with } Quant_\theta(y_i | x_i) = x_i' \beta_\theta \quad (1)$$

$\mu_{\theta i}$  denotes an unknown independent and identical distributed error term. According to the classical linear regression model, the normal distribution of the unknown error is specified. Nonetheless, within this particular context, the error term  $\mu_{\theta i}$  is left unspecified. Therefore, the only requirement is to satisfy the constraint of:

$$Quant_\theta(\mu_{\theta i} | x_i) = 0, \quad (2)$$

It is assumed that no other distributional assumption is to be incorporated in this model. Hence, the estimator for  $\beta_\theta$  of the  $\theta$  th quantile regression, is formed by solving:

$$\hat{\beta}_\theta = \underset{\beta_\theta}{\text{arg min}} \left[ \sum_{i: y_i > x_i' \beta_\theta} \theta |y_i - x_i' \beta_\theta| + \sum_{i: y_i < x_i' \beta_\theta} (1 - \theta) |y_i - x_i' \beta_\theta| \right] \quad (3)$$

It is noted that  $0 < \theta < 1$ , whilst  $\beta_\theta$  which minimizes the sum of weighted residuals is chosen to obtain the estimator for the  $\theta$ th quantile. If the residual is negative, the weight is  $(1 - \theta)$ , in contrast, for a positive residual the weight is  $\theta$ . An advantage of quantile regression technique is that it enables the estimation of the marginal effect of a covariate on log earnings at various points in the distribution, not limited to the mean level. Therefore, this technique enables estimation of the effect of gender, education, occupation, industry and all other controls on log earnings, for instance at 90<sup>th</sup> percentile, 50<sup>th</sup> percentile and 10<sup>th</sup> percentile. Coefficient  $\beta_\theta$  denotes the estimated returns to individual characteristics at the  $\theta$ th quantile of the log earnings distribution.

Henceforth, if the earnings gap is wider at the upper end of earnings distribution, it shows the glass ceiling effect. In contrast, earnings gap which is wider at the bottom end of the distribution suggest a sticky floor effect (Nestic, 2007).

In order to examine the existence of glass ceiling and sticky floor effects, the Mincer- type regression is estimated for male and female employees based on pooled quantile regression. The model specification is based on Albrecht et al. (2003) Arulampalam et al. (2007), Sakellariou (2004) and Kee (2006). It is stated as:

$$\text{LnEarnings} = \beta_0 + \beta_1 \text{Gender} + \beta_2 \text{Age} + \beta_3 \text{Age Squared} + \beta_4 \text{Education} + \beta_5 \text{Marital Status} + \beta_6 \text{Location} + \beta_7 \text{Occupation} + \beta_8 \text{Industry} + \mu \quad (4)$$

The dependent variable is natural logarithm of monthly labour market earnings. It is noted an analysis using the hourly earnings rate is more preferred. It is because it provides more accurate measurement as men's working experience is greater than women's as they usually work longer hours per week as compared to women (see Papapetrou, 2011; Gunawaderna, 2006). Nonetheless, the information on the hourly earnings is unavailable from the Household Income Survey (HIS), thus, the annual earnings data which had been obtained are converted into monthly earnings. This is consistent with other studies whereby the data of hours of work is unavailable for the respective countries (see Sakellariou, 2004; Chi & Li; 2008). The gender dummy is coded as 0=male and 1=female. Age variable focuses on employees between 15-64 years old. Next, education comprises of several dummies which are no formal schooling, primary, secondary and tertiary. Next variable to be incorporated in the model is age-squared. In this paper, age squared is used instead of experience based on following reasons; the information of actual experience is not available from the datasets; and secondly, potential experience is inappropriate to be used by women as they encountered breaks from the labour market due to childbearing (Fang & Sakellariou, 2011). Furthermore, marital status is also included in the study in the form of dummy variable. It is considered as 1 if the individual is married/divorced/separated and 0 if never married. Women without husbands are expected to engage in continuous job experience. In contrast, the labour force participation of married women, tend to diminish as they need to meet up with the demand to spend more time with their family (Mincer and Polachek, 1974). Location is also incorporated in the model. It is concluded that employees working at the urban area receive higher earnings as compared to those working at the rural area (Schafgans, 2000). This is expected as employees who live in urban area receive higher earnings as they encounter higher costs of living. In this research, location is classified into urban, which is coded as 1 and rural, which is coded as 0. Other studies using location variable include Milanovic (2006) and Fang (2012). Subsequently, occupation variable at 2-digit occupational level is based on Malaysia Standard Classification of Occupations (MASCO) 1998 for HIS 2009 and Malaysia Standard Classification of Occupations (MASCO) 2008 for HIS 2012. Finally, the variable for industry at 1-digit level is based on Malaysia Standard Industrial Classification (MSIC) 2000 for HIS 2009 and Malaysia Standard Industrial Classification (MSIC) 2008 for HIS 2012 are also incorporated in the study (see Kee, 2006; Ozcan, 2010).

#### 4. Data Description

This paper uses the 2009 and 2012 Household Income Survey (HIS) which provides knowledge of socioeconomic information of 184,447 individual households in 2009 as obtained from Economic Planning Unit Malaysia. In contrast, for 2012, it is based on 56,101 individual households, comprised of 30 per cent of full dataset as obtained from Department of Statistics Malaysia. The subsample is later chosen focuses on employees aged 15-64 years old with reference to occupational classification based on MASCO 1998 for HIS 2009 and MASCO 2008 for HIS 2012, on variables such as earnings, education and demographic characteristics. Other categories of employment which refers to employers, own-account workers, unpaid family workers are not included. It is noted that the armed forces are also excluded from the analysis. The remaining subsample in 2009 consist of 32,539 of male employees and 18,252 of female employees in 2009. Meanwhile, 4829 male and 3236 female employees are available in 2012. Table 1 presents the descriptive statistics of the dependent variable and the independent variables by gender in 2009 whilst Table 2 depicts the results for 2012.

Table 1. Descriptive Statistics by Gender in 2009

Variable	Male (32,539)		Female (18,252)	
	Mean	Standard Deviation	Mean	Standard Deviation
Monthly Earnings	2174.164	2297.753	1898.163	1652.581
Log-Earnings	7.368712	0.791839	7.225198	0.8578483

Variable	Male (32,539)		Female (18,252)	
	Mean	Standard Deviation	Mean	Standard Deviation
Age	36.74034	11.13684	34.44691	10.29202
<b>Location</b>				
Urban	0.610037	0.487749	0.662722	0.4727936
Rural	0.389963	0.487749	0.337278	0.4727936
<b>Marital Status</b>				
Never Married	0.305234	0.4605134	0.337442	0.4728502
Married	0.679707	0.4665961	0.589196	0.4919933
Widowed	0.008574	0.0922012	0.041475	0.1993914
Divorced	0.005624	0.0747834	0.026956	0.1619591
Separated	0.000861	0.0293222	0.004931	0.0700494
<b>Education</b>				
No Formal Schooling	0.018163	0.1335421	0.020765	0.1426001
Primary	0.125788	0.3316148	0.077964	0.2681224
Secondary	0.627094	0.4835849	0.526846	0.4992924
Tertiary	0.228956	0.4201673	0.374425	0.4839873
<b>Occupation</b>				
Legislators & Senior Officials	0.005347	0.0729315	0.003068	0.0553074
Directors & Specialised Managers	0.035281	0.1844913	0.02597	0.1590494
General Managers (Medium/Small Enterprises)	0.011986	0.1088225	0.004986	0.0704356
Physical, Mathematical & Engineering Science Professionals	0.02474	0.1553327	0.011834	0.108143
Life Science & Health Professionals	0.00292	0.053955	0.003506	0.0591131
Teaching Professionals	0.023418	0.1512295	0.066568	0.2492793
Business Professionals	0.012385	0.1105989	0.025203	0.1567447
Legal Professionals	0.001291	0.0359045	0.002082	0.0455823
Professionals Not Elsewhere Classified	0.003657	0.0603646	0.002904	0.05381
Physical & Engineering Science Associate Professionals	0.072498	0.2593141	0.019066	0.1367622
Life Science & Health Associate Professionals	0.007775	0.0878355	0.044324	0.2058194
Teaching Associate Professionals	0.019976	0.1399199	0.087059	0.2819292
Finance, Sales & Related Business Associate Professionals	0.01635	0.126818	0.015176	0.1222576
Supervisors	0.052091	0.2222146	0.017258	0.1302362
Associate Professionals Not Elsewhere Classified	0.026	0.1591363	0.027887	0.1646546
Office Clerks	0.05624	0.2303885	0.219044	0.4136102
Customer Services Clerks	0.009312	0.0960493	0.03238	0.177012
Mail Distribution Clerks	0.002643	0.0513427	0.000219	0.0148026
Transport Clerks	0.000584	0.0241576	0.000493	0.0222009
Clerical Workers Not Elsewhere Classified	0.000061	0.0078398	0.00011	0.0104676
Personal & Protective Service Workers	0.102124	0.3028154	0.083717	0.2769703

Variable	Male (32,539)		Female (18,252)	
	Mean	Standard Deviation	Mean	Standard Deviation
Sales Workers, Demonstrators & Models	0.054458	0.2269222	0.089963	0.2861362
Agricultural & Related Workers	0.03021	0.1711671	0.015012	0.1216039
Fishery Workers, Hunters & Trappers & Gatherers	0.00587	0.0763911	0.000164	0.0128198
Extraction & Construction Trades Workers	0.046252	0.210034	0.002246	0.0473435
Metal, Machinery & Related Trades Workers	0.070715	0.2563524	0.002739	0.0522692
Precision, Printing & Related Trades Workers	0.001782	0.0421824	0.001753	0.041836
Food Processing, Woodworking, Textile, Leather & Related Trades Workers	0.008206	0.0902134	0.013752	0.1164626
Stationary Plant & Related Operators	0.014106	0.1179305	0.007287	0.0850539
Machine-Operators & Assemblers	0.048096	0.2139727	0.093798	0.2915554
Drivers & Mobile Plant Operators	0.103199	0.3042236	0.001425	0.0377167
Sales & Services Elementary Occupations	0.019392	0.1379008	0.051994	0.2220216
Messengers, Porters, Attendants & Related Workers	0.025723	0.1583101	0.01178	0.1078954
Labourers & Related Workers	0.085313	0.2793512	0.015231	0.1224746
<b>Industry</b>				
Agriculture, Hunting & Forestry	0.05707	0.2139798	0.024326	0.1540638
Fishing	0.006607	0.0810185	0.000603	0.0245427
Mining & Quarrying	0.011617	0.1071552	0.003506	0.0591131
Manufacturing	0.189311	0.3917617	0.190774	0.3929217
Electricity, Gas & Water Supply	0.011094	0.1047456	0.004328	0.065649
Construction	0.13639	0.3432077	0.023614	0.151847
Wholesale & Retail Trade; Repair of Motor Vehicles, Motorcycles & Personal & Household Goods	0.131934	0.3384242	0.133739	0.3403808
Hotels & Restaurants	0.044531	0.2062752	0.079991	0.2712871
Transport, Storage & Communications	0.089093	0.2848824	0.030079	0.1708091
Financial Intermediation	0.025416	0.1573863	0.049474	0.2168615
Real Estate, Renting & Business Activities	0.060512	0.2384367	0.066349	0.2488978
Public Administration & Defence; Compulsory Social Security	0.13765	0.3445378	0.109303	0.3120277
Education	0.055656	0.2292603	0.172748	0.3780398
Health & Social Work	0.015428	0.1232481	0.063938	0.2446495
Other Community, Social & Personal Service Activities	0.024709	0.1552386	0.030353	0.1715609
Private Households with Employed Persons	0.002889	0.0536711	0.016656	0.1279812
Extra-territorial Organisations & Bodies	0.000092	0.0096016	0.000219	0.0148026

Table 1 indicates the difference of monthly earnings between male and female in 2009 is of RM276 whilst Table 2 denotes the difference of RM 274 in 2012. This signifies that the difference is insignificant between 2009 and 2012. Besides, the average age of male employee in 2009 is 37 years old whilst for female employee is 35 years old. In contrast, the average age of male is 36 years old in 2012 which is similar to female. From another perspective, a significant higher proportion of female compared to male reside in the urban area whilst more male reside in rural area in both years. Interestingly, more female reside in urban area in 2012 as compared to

2009. Subsequently, with reference to the marital status, regardless of gender, majority of employees are married in 2009 and 2012. Nevertheless, the percentage of married male is higher as compared to female for both years. Approximately 68 per cent of male are married in 2009 as compared to female at 59 per cent. On the other hand, the value decreased in 2012 to 59 per cent of married male in 2012 as compared to female with the value of approximately 57 per cent. On the other hand, the larger proportion for female within the categories of widowed, divorced and separated as compared to male in 2009 and 2012 could be due to the need for female to support their living.

Within education perspective, the proportion of female exceeds male at tertiary level in both years, reflecting the effectiveness of the government policy based on Eighth Malaysia Plan (2001-2005) and Ninth Malaysia Plan (2006-2010) on the provision of education and training opportunities for women. Nevertheless, based on MASCO occupational categories at 2-digit level, female were largely concentrated within categories such as office clerks, customer services, teaching professionals in 2009 and 2012 as compared to male. Within the science and engineering professionals category, female had slightly outnumbered male in 2012 as compared to 2009. This improvement further outlays the significance of government policy implementation during Eighth Malaysia Plan (2001-2005) and Ninth Malaysia Plan (2006-2010) to encourage the participation of female within science field. Finally, based on sectoral perspective, female slightly outweigh male in manufacturing industry whilst concentrated in education and health and social work in 2009. On contrary, significant proportions of male worked in construction and public administration, defence and compulsory social security in 2012. Female were largely employed in human health and social work activities, education and professional, scientific and technical activities sectors in 2012. On the whole, gender occupational segregation could be reflected based on the results presented for both years.

Table 2. Descriptive Statistics by Gender in 2012

Variable	Male (4829)		Female (3236)	
	Mean	Standard Deviation	Mean	Standard Deviation
Monthly Earnings	2563.997	2608.544	2290.017	2059.397
Log-Earnings	7.524308	0.8077753	7.408977	0.8542718
Age	36.254917	11.6193	36.408218	11.19077
<b>Location</b>				
Urban	0.695382	0.4602931	0.75618	0.4294515
Rural	0.304618	0.4602931	0.24382	0.4294515
<b>Marital Status</b>				
Never Married	0.392421	0.5026849	0.363721	0.4811439
Married	0.584593	0.4928431	0.56953	0.4952185
Widowed	0.012839	0.1125917	0.03492	0.1836047
Divorced	0.009319	0.0960925	0.027812	0.1644596
Separated	0.000828	0.0287718	0.004017	0.0632645
<b>Education</b>				
No Formal Schooling	0.018016	0.1330234	0.021014	0.1434517
Primary	0.108718	0.3113175	0.078801	0.2694695
Secondary	0.605094	0.4888811	0.475587	0.4994808
Tertiary	0.268171	0.4430532	0.424598	0.4943583
<b>Occupation</b>				
Chief Executives, Senior Officials & Legislators	0.006834	0.0823919	0.006799	0.0821851
Administrative & Commercial Managers	0.013667	0.1161181	0.023486	0.1514638
Production & Specialized Services Managers	0.014082	0.1178396	0.012361	0.1105076

Variable	Male (4829)		Female (3236)	
	Mean	Standard Deviation	Mean	Standard Deviation
Hospitality, Retail & Other Services Managers	0.007041	0.0836222	0.010198	0.1004833
Science & Engineering Professionals	0.020087	0.1403124	0.020396	0.141371
Health Professionals	0.005591	0.0745728	0.007726	0.0875687
Teaching Professionals	0.058397	0.2345172	0.097342	0.2964692
Business & Administration Professionals	0.018844	0.1359897	0.034611	0.1828198
Information & Communications Technology Professionals	0.004556	0.0673498	0.005871	0.0764119
Legal, Social & Cultural Professionals	0.003313	0.0574719	0.008035	0.089289
Hospitality, Retail & Other Services Professionals	0.000414	0.0203489	0.000309	0.0175791
Science & Engineering Associate Professionals	0.069994	0.255163	0.051607	0.2212663
Health Associate Professionals	0.016152	0.1260746	0.037392	0.1897494
Business & Administrations Associate Professionals	0.030648	0.1723804	0.03801	0.1912497
Legal, Social, Cultural & Related Associate Professionals	0.004763	0.0688563	0.005253	0.0723009
Information & Communications Technicians	0.009733	0.0981842	0.010198	0.1004833
Office Clerks	0.046593	0.2107884	0.08869	0.2843393
Customer Services Clerks	0.013253	0.1143692	0.019468	0.138186
Numerical & Material Recording Clerks	0.025885	0.1588095	0.042336	0.2013862
Other Clerical Support Workers	0.004556	0.0673498	0.007417	0.0858128
Personal Services Workers	0.044109	0.2053574	0.049135	0.2161827
Sales Workers	0.078691	0.2692841	0.092398	0.2896318
Personal Care Workers	0.015324	0.1228511	0.01885	0.1360177
Protective Services Workers	0.059226	0.2360707	0.031829	0.1755729
Market-Oriented Skilled Agricultural Workers	0.034169	0.1816808	0.025958	0.1590345
Market-Oriented Skilled Forestry, Fishing & Hunting Workers	0.00642	0.0798728	0.001854	0.0430264
Subsistence Farmers, Fishers, Hunters & Gatherers	0.002485	0.0497928	0.004635	0.0679359
Building & Related Trades Workers, Excluding Electricians	0.043901	0.204897	0.016378	0.1269448
Metal, Machinery & Related Trades Workers	0.041831	0.2002226	0.020705	0.1424154
Handicraft & Printing Workers	0.002485	0.0497928	0.001854	0.0430264
Electrical & Electronic Trades Workers	0.011597	0.1070724	0.006799	0.0821851
Food Processing, Wood Working, Garment & Other Craft & Related Trades Workers	0.013667	0.1161181	0.015142	0.1221371
Stationary Plant & Machine Operators	0.033754	0.1806151	0.027503	0.1635694
Assemblers	0.022779	0.1492138	0.032447	0.1772127
Drivers & Mobile Plant Operators	0.076413	0.2656858	0.030902	0.1730799
Cleaners & Helpers	0.014496	0.1195349	0.030902	0.1730799
Agricultural, Forestry & Fishery Labourers	0.035618	0.1853553	0.016996	0.1292772
Labourers in Mining, Construction, Manufacturing & Transport	0.048871	0.2156215	0.020087	0.140318



Variable	Male (4829)		Female (3236)	
	Mean	Standard Deviation	Mean	Standard Deviation
Food Preparation Assistant	0.006005	0.0772694	0.002781	0.0526719
Street & Related Sales & Services Workers	0.001242	0.0352308	0.001545	0.0392837
Refuse Workers & Other Elementary Workers	0.032512	0.1773736	0.023795	0.1524329
<b>Industry</b>				
Agriculture, Forestry & Fishing	0.075585	0.2643603	0.02534	0.1571797
Mining & Quarrying	0.013046	0.1134841	0.005562	0.0743854
Manufacturing	0.170222	0.3758663	0.168418	0.3742947
Electricity, Gas, Steam, & Air Conditioning Supply	0.005591	0.0745728	0.001854	0.0430264
Water Supply; Sewerage, Waste Management & Remediation Activities	0.007248	0.0848342	0.002163	0.0464667
Construction	0.142887	0.3499935	0.021014	0.1434517
Wholesale & Retail Trade; Repair of Motor Vehicles & Motorcycles	0.137295	0.3441947	0.153894	0.3609026
Transportation & Storage	0.068337	0.2523497	0.020705	0.1424154
Accommodation & Food Service Activities	0.052806	0.2236691	0.073857	0.2615778
Information & Communication	0.021122	0.1438072	0.021632	0.1455
Financial & Insurance/Takaful Activities	0.021951	0.1465378	0.041718	0.1999753
Real Estate Activities	0.004349	0.0658081	0.006489	0.080308
Professional, Scientific & Technical Activities	0.019259	0.1374469	0.036774	0.188235
Administrative & Support Service Activities	0.052806	0.2236691	0.047899	0.2135848
Public Administration & Defence; Compulsory Social Security	0.112031	0.3154378	0.085909	0.2802722
Education	0.056326	0.2305747	0.158529	0.3652928
Human Health & Social Work Activities	0.021951	0.1465378	0.073239	0.260568
Arts, Entertainment & Recreation	0.006627	0.0811424	0.006489	0.080308
Other Service Activities	0.008905	0.0939525	0.020705	0.1424154
Activities of Households as Employers; Undifferentiated Goods- & Services- Producing Activities of Households for Own Use	0.001657	0.0406725	0.027194	0.1626737
Activities of Extraterritorial Organization & Bodies	0	0	0.000618	0.0248567

### 5. Pooled Quantile Regression

Table 3 depicts the results of bootstrapped quantile regression in 2009 whilst Table 4 discusses the results in 2012. Age variable is positively related with log earnings in both years. It indicates older employees earned higher earnings as compared to younger employees in both years. Age squared which signifies the proxy for experience is negatively related with log earnings in both years as well. Subsequently, the education coefficient which is positive indicates that the higher the level of education, the higher will be the earnings for the employees in both 2009 and 2012. Since the education variable is based on ranking, it denotes those employees who had completed tertiary level are likely to earn more than employees with no formal schooling in both years. Meanwhile, for the marital status, the married employees gained higher earnings as compared to the non-married employees for both years. Besides, employees at the urban area also earned more than employees at the rural area in both years. For the occupation which is based on the ranking based on MASCO 2008, the highest position which refers to chief executives, senior officials and legislators earned higher earnings as compared to

the employees at the lowest position which refers to the refuse workers and other elementary workers in 2012. In 2009, the legislators and senior officials earned higher earnings as compared to labourers and related workers. Furthermore, the coefficient reflects that the differences in earning between the occupations are statistically meaningful. From sectoral basis, the industry coefficient portrays significant differences in earnings, except at 90<sup>th</sup> percentile in 2009. In addition, differences in earnings exist across different industries in 2012 and the results for the coefficient are insignificant across most quantiles except at 25<sup>th</sup> and 50<sup>th</sup> quantile.

This indicates that the industry is not an important determinant in affecting the log earnings in 2012. Finally, the gender dummy indicates that female is at disadvantage level as compared to their male counterpart in terms of receiving lower earnings across quantiles for both years. The results indicate that widest earnings gap is found at the bottom of the earnings distribution with the value of -0.3695493 in 2012. It signifies sticky floor effect as defined in Arulampalam et al. (2007). Concurrently, between the 75<sup>th</sup> percentile and 90<sup>th</sup> percentile the gap further enlarge which denotes that glass ceiling also exist in 2012.

Table 3. Bootstrapped Pooled Quantile Regression Estimates in 2009

Variables	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>
Age	0.1357402*** (0.0043307)	0.1148129*** (0.0024717)	0.1000155*** (0.0019238)	0.0888471*** (0.0018309)	0.0845223*** (0.0030424)
Age squared	-0.0015657*** (0.0000552)	-0.0012876*** (0.0000316)	-0.0010781*** (0.0000247)	-0.0009172*** (0.0000237)	-0.0008407*** (0.0000391)
Education	0.4284007*** (0.0104173)	0.4154937*** (0.0063008)	0.3891092*** (0.0057576)	0.3620141*** (0.0053958)	0.3422317*** (0.0079777)
Marital Status	0.0395693*** (0.0086576)	0.026502*** (0.0064629)	0.0171983* (0.0067439)	0.0177541** (0.0064516)	0.0274583*** (0.0078185)
Location	0.2760989*** (0.0121265)	0.2217974*** (0.0073972)	0.1820099*** (0.0057683)	0.1635834*** (0.004832)	0.1760496*** (0.0064958)
Occupation	-0.0119393*** (0.0002799)	-0.011422*** (0.0001835)	-0.0106296*** (0.0001409)	-0.010629*** (0.0001459)	-0.0112377*** (0.0001812)
Industry	0.0098351*** (0.0014987)	0.0131856*** (0.0010455)	0.0140494*** (0.0007871)	0.0072243*** (0.0007899)	0.0017443 (0.0009537)
Gender	-0.4119086*** (0.012777)	-0.2976349*** (0.0076078)	-0.2529174*** (0.005453)	-0.2473548*** (0.0052156)	-0.2553669*** (0.008336)
Constant	3.462359*** (0.0771761)	4.20994*** (0.0458397)	4.85256*** (0.0380326)	5.479121*** (0.0343372)	5.941491*** (0.0552114)
Pseudo-R <sup>2</sup>	0.2222	0.2716	0.3132	0.3265	0.3210
Sample Size	50791	50791	50791	50791	50791

Notes:

(a)\*\*\*, \*\* and \* denote statistical significance at the 1 per cent, 5 per cent and 10 per cent level respectively based on two-tailed tests.

(b)Standard errors are in parentheses. The quantile regression model estimates are based on bootstrapping with 100 replications.

Similar to 2012, the gender dummy in this model which refers to female is largely underpaid at the 10<sup>th</sup> percentile with the value of -0.4119086 as compared to other percentiles in 2009. This signifies the existence of sticky floor effect in the Malaysian labour market in 2009. Furthermore, at the higher percentile which refers to 90<sup>th</sup> percentile with the value of -0.2553669 also experience larger gap as compared to 75<sup>th</sup> percentile. Following the definition by Arulampalam et al. (2007), it indicates the existence of glass ceiling.

On the whole, in 2009, the determinants are age, age squared, education, location and occupation. Meanwhile, marital status and industry are not factors to explain the glass ceiling and sticky floor effects. Finally, in 2012, the industry is not considered as a factor in determining the log earnings across the earnings distribution. The factors are attributed to the age, age squared, education, marital status, location and occupation. In addition, it is noted that the extent of sticky floor effect had reduced across the period. Earnings gap at the 10<sup>th</sup> percentile exist in 2009 with the coefficient value of -0.4119086 whilst the earnings gap had been reduced to -0.3695493 in 2012. This may due to government commitment to focus on the policy of minimum wage which had finally been implemented in 2013. Meanwhile, for the glass ceiling effect, it is denoted that the coefficient value at the 90<sup>th</sup> percentile had increased across the period. In 2009, the coefficient value is -0.2553669 which further increased to -0.2827302 in 2012. It shows the policy of the 30 percent of female participation at the decision making level had not been able to address the glass ceiling issue in Malaysia during the period. One reason could be due to only the public sector had achieved the targeted level of the policy in 2012 whilst the private sector had yet to achieve it.

Table 4. Bootstrapped Pooled Quantile Regression Estimates in 2012

Variables	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>
Age	0.0603977*** (0.0106174)	0.0633772*** (0.0062918)	0.0626762*** (0.0045006)	0.0537908*** (0.0042491)	0.0433788*** (0.006326)
Age squared	-0.0007512*** (0.001371)	-0.0007571*** (0.0000815)	-0.0007216*** (0.0000568)	-0.0005779*** (0.0000574)	-0.0004376*** (0.0000833)
Education	0.4275621*** (0.0301131)	0.4314829*** (0.0143958)	0.4169322*** (0.0114112)	0.3822028*** (0.0135386)	0.390815*** (0.0194421)
Marital Status	0.3668971*** (0.0309893)	0.2842889*** (0.0214403)	0.24286*** (0.0163997)	0.2390577*** (0.0162088)	0.2288392*** (0.0214162)
Location	0.4072928*** (0.0310148)	0.366656*** (0.0231204)	0.3158885*** (0.0209622)	0.2681461*** (0.0169487)	0.2672274*** (0.0245338)
Occupation	-0.0077953*** (0.0007389)	-0.0091329*** (0.0003999)	-0.0091355*** (0.0004216)	-0.00959*** (0.0003937)	-0.0100363*** (0.0004977)
Industry	0.007016 (0.0037364)	0.0070757*** (0.0020836)	0.0070561*** (0.0013742)	0.0030137 (0.0015168)	0.0001575 (0.0021397)
Gender	-0.3695493*** (0.0321229)	-0.2721592*** (0.0168072)	-0.2606552*** (0.0134786)	-0.2424695*** (0.0167655)	-0.2827302*** (0.0221165)
Constant	4.259704*** (0.2282375)	4.665524*** (0.1193599)	5.109203*** (0.1121856)	5.772849*** (0.0898796)	6.308721*** (0.1258023)
Pseudo-R <sup>2</sup>	0.2085	0.2671	0.3010	0.2965	0.2822
Sample Size	8065	8065	8065	8065	8065

Notes:

(a) \*\*\*, \*\* and \* denote statistical significance at the 1 per cent, 5 per cent and 10 per cent level respectively based on two-tailed tests.

(b) Standard errors are in parentheses. The quantile regression model estimates are based on bootstrapping with 100 replications.

In sum, the findings of this study concurs with other Malaysian studies from management perspective such as Norma et al. (1991), Koshal et al. (1998) and Zubaidah et al. (2009) which stated that glass ceiling exists in the Malaysian labour market. However, their investigations were limited to firm's perspective per se. Therefore, this study contributes further by providing evidence of glass ceiling from nationwide perspective. From another perspective, there is an absence of previous Malaysian studies on glass ceiling from economics perspective. Thus,

this study contributes by providing evidence of glass ceiling from economics perspective. It contributes further by providing evidence of sticky floor to also co-exist along with the glass ceiling across the earnings distribution in Malaysia within the period of 2009 and 2012.

## 6. Conclusion

The objective of this paper is to evaluate the extent of gender earnings differentials across the earnings distribution in 2009 and 2012, whether the glass ceiling or sticky floor exists in the labour market in Malaysia. Based on the pooled regression model, glass ceiling and sticky floor exists in the Malaysian labour market in 2009 and 2012. However, it is noted that the impact of sticky floor is greater than glass ceiling. The log earnings is used as dependent variable whilst age, age squared which is proxy for experience, education, location, occupation and industry are the dependent variables in the pooled model. Within the period, industry is not considered as a factor to determine the glass ceiling and sticky floor. It is observed that the extent of sticky floor effect had been reduced within the period. In contrast, the glass ceiling effect increased across time. Reasons could be due to government commitment to concentrate on minimum wage policy which had been implemented in 2013. As far as the glass ceiling is concerned, the policy of 30 per cent female decision making had been achieved in the public sector in 2012 whilst in the private sector, their participation level is still below targeted level. Henceforth, it is proposed that the level of percentage of female decision making should be enhanced further to reduce the extent of glass ceiling in Malaysia. Concurrently, a standardized salary scale in the private sector should be implemented to ensure the female at the low income position will not be deprived from getting similar return as male.

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