What's in a name: A study on gender and name discrimination by Singaporean Employers

by:

Daryl Ho Sheng Hui
Hong Yan Qing
Tan Jia Hui and
Chew Soon Beng

Abstract

We investigated the presence and extent of name and gender discrimination by Singaporean employers through an audit study, where we generated fictitious resumes of Western and Asian sounding names, with equal representation of male and female, high quality and low quality categories. This paper serves as the pioneer audit study on name and gender discrimination in Singapore, where only gender discrimination has been sparingly explored by previous researchers. A total of 2,200 resumes were sent out to nine occupations over three months, where employer callbacks were recorded. We conducted two Probit regressions and found that employers generally preferred Western name applicants to Asian name applicants. Overall, our results show that name and resume quality do affect the likelihood of callback, while the Average Marginal Effects (AMEs) of Grade Point Average (GPA) and relevant internship have the most significant effect on probability of callback for all resumes.

1. INTRODUCTION

"What's in a name? That which we call a rose by any other name would smell as sweet."

William Shakespeare

Names have been long regarded as the initial identity of an individual, possessing its own sacred status in society. However, different aspects of society have their own perceptions regarding the name of a person and may treat them differently, resulting in prejudice according to the inferred characteristics of the name. Notable instances of discrimination in today's society include workplace discrimination. In Singapore, would "Amanda" and "Nicholas" be more employable than "Hui Ting" and "Yong Xiang"? We are thus interested in investigating the presence and extent of name and gender discrimination by employers in Singapore's labour market.

Workplace discrimination has been extensively studied internationally, but this topic is relatively untouched within Singapore. While there has been no prior research done on name discrimination, a few earlier papers have dealt with issues in regards to gender discrimination (Chew, 1992; Lee, 1998). Our research is a new strand of literature that uncovers name and gender discrimination in Singapore. On this account, we wish to investigate the question that underlines the debate of whether name and gender discrimination is present in Singapore's labour market. To be specific, whether having a Western or Asian name, and being a male or female will affect the likelihood of receiving a callback from employers. However, we are not focusing on the contentious issue of racial discrimination and hence we do not factor in ethnicity[1] in our research.

To determine the presence and extent of discrimination by employers in their hiring practices, we conducted a resume audit study from January to March 2016 by randomly assigning names, genders and occupations to applicants. Fictitious resumes for each applicant were then created with varying resume characteristics and sent out a total of 2,200 applications through

---

[1] Chinese, Malay, Indian, Others

online job portals. Callbacks of each applicant were recorded as a measure of employer discrimination. In our research, responses from employers in the form of phone calls, text messages and emails are recorded as callbacks.

To investigate for name discrimination, callbacks of applicants with Western names were compared with Asian names. The latter consists solely of Chinese names i.e. Zhao An Ni, because it not only eliminates race as a variable but it is reflective of the majority of the population[2] (Singapore Department of Statistics, 2015).

Our results show that Western name applicants receive 62% more callbacks than Asian name applicants on average, where we reject the null hypothesis that Western name applicants and Asian name applicants receive the same number of callbacks at the 1% level of significance. Even after accounting for quality of resumes, we find that both high and low Western name applicants receive more callbacks than their equivalent Asian name counterparts, where this difference is also significant at the 1% level of significance. The extent of name discrimination is strongest among female applicants, with Western name applicants receiving more than twice the number of callbacks as Asian name applicants. Employers were however largely indifferent between male Western and Asian name applicants.

The presence of the Western name dummy variable increased the likelihood of callback by an average of 32 percentage points for all resumes, while an increase in 1 point of Grade Point Average (GPA) out of a maximum of 5 would increase the likelihood of callback by almost 75 percentage points for the same group. However, the presence of the relevant internship dummy variable actually reduces the likelihood of callback significantly, and runs counter to

---

[2] 74.3% of the Singapore population is Chinese

conventional theory that relevant internship experiences may be a credible signal of quality to employers. We elaborate more on these findings under our interpretation of results.

2. LITERATURE REVIEW

Previous notable name discrimination studies include Bertrand and Mullainathan (2004), where they found out that resumes with Western names received more employer call-backs than that of African-American names and Kaas and Manger (2011), where they determined the presence of discrimination Turkish names compared to German names for internship positions.

For gender discrimination studies, Maurer-Fazio and Lei (2015) and Riach and Rich (2006) respectively and found out female bias for more female-dominated occupations (e.g. secretary) and gender-neutral occupations (e.g. accountant). In Singapore, Lee (1998) found out that women are generally less well-paid compared to men in the manufacturing sector implying the presence of gender discrimination. Lee hypothesises that males are expected to be the breadwinner of the family while females are expected to stay at home. Thus, females have less incentive to further their education and hence work in low paying jobs. Chew (1993) confirmed the presence of gender bias towards males for managerial positions in Information Technology sector in Singapore.

3. METHODOLOGY

We collated a pool of about 80 Western names and 40 Asian names for each gender. Gender-neutral names (E.g. Jamie, Min Hui) were avoided such that there is no gender ambiguity. Asian names will consist solely of Chinese names converted according to the Hanyu Pinyin system as it allows us to focus on identifying name and gender discrimination, instead of race

discrimination. Additionally, Asian Name applicants would have local dialectal (Hokkien, Teochew, Hainanese, Cantonese, Hakka) surnames, i.e. Tan, Lim, Lee, Ng (Statistics Singapore, 1997)

There are several variables that have to be controlled for in the resumes, including academic scores, work and internship experiences. The presence of mandatory military service also needs to be factored in for male applicants. We controlled the variable of nationality in our experiment, where all applicants are Singaporeans with local education and work experiences. This would allow us to evaluate employer discrimination towards Singaporeans only. Details such as residential address, date of birth and photo of applicant have been omitted in all resumes, however employers can still infer applicants' age from their work and education history listed on the resumes. Photographs of applicants and home address were not included in the resumes so that employer callbacks were not affected by the appearance of applicants and their location of residence.

Resumes are differentiated into high quality (HQ) and low quality (LQ) resumes, where high quality resumes have higher academic scores, leadership experience, more years of working experience and internship experience. The characteristic of resumes also differs slightly within the same group, i.e. GPA with a range of 4.5 to 5.0, three to five years of work experience, so as to ensure that resumes are not entirely identical to each other. The purpose of drawing a distinction between high quality and low quality resumes is to identify the presence of name and gender discrimination vis-à-vis the quality of resumes. Quality has to be controlled for in our experiment as Bertrand and Mullainathan (2004) found that high quality resumes received more callbacks on average as compared to low quality resumes.

The use of a resume randomiser software (Lahey, 2008) allows us to address the problem of experimenter bias. Resume characteristics were inputted into the web-based programmable interface, generating resume templates for the various occupations. We would then run the resume template into the resume generator programme where it will generate non-identical resumes.

Nine PMET occupations were selected for our experiment, as more than half of the resident workforce make up the PMET workforce in Singapore (Ministry of Manpower, 2015). They are auditor (accounting), civil engineer, corporate communications executive, electrical engineer, financial analyst, management executive, marketing executive, registered nurse and web developer. These occupations are ranked among the highest number of vacancies unfilled for at least six months in a report by Ministry of Manpower (2014)[3]. We selected a diverse range of occupations across various industries such as accounting, sales and engineering positions, in order to determine the presence of discrimination across a wider scope of employers.

The experiment was conducted between January and March 2016 over the period of three months. We applied to each individual job posting as a batch of eight applicants, with equal representation of names, genders and quality. We responded to an average of 27 job postings for each occupation via online job portals, including JobsDB.com, JobsCentral.com, JobStreet.com, for a total of 2,200 applications.

In the landmark audit study by Bertrand and Mullainathan (2004), they sent a combined total 5,000 resumes to job postings in Boston and Chicago, where the urban population is 4.48

---

[3]We used the 2015 MOM Report (refer to appendix) that was published in 2016 after our experiment to verify the selected nine occupations. These occupations are still ranked among the highest number of unfilled vacancies after one year.

million and 9.16 million respectively, compared to that of Singapore's (5.62 million) (Demographia, 2015). Furthermore, Bertrand and Mullainathan sent out their resumes over a total period of 16 months, compared to that of our experiment (three months). Thus the smaller job market in Singapore and shorter duration of our experiment would account for a smaller sample size.

Contrasting again with the composition of gender, Bertrand and Mullainathan (2004) sent out three times more female resumes than male resumes[4], we ensured equal representations of names (Western and Asian), gender (male and female) and quality (HQ and LQ) in our experiment. This allows for easy comparison and identification of discrimination between the three variables. Table 3 shows the summary statistics for all resume characteristics in our job applications.

---

[4] Bertrand and Mullainathan failed to justify the 3:1 female to male ratio in their research. we assume that the occupations chosen including cashier, clerical work and sales management are dominated by female.

TABLE 3: RESUME CHARACTERISTICS: SUMMARY STATISTICS

Sample:	All resumes	Western Names	Asian Names	Male	Female
Characteristic:					
Western Name (Y=1)	0.500 (0.500)	-	-	0.500 (0.500)	0.500 (0.500)
Male (Y=1)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)	-	-
Quality (Y=1)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)
University Graduate (Y=1)	0.888 (0.315)	0.878 (0.327)	0.898 (0.303)	0.878 (0.337)	0.898 (0.303)
First Class (Y=1)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)
Class of Honour (1/2/3/4/5)	2.01 (1.04)	2.02 (1.05)	2.00 (1.03)	1.96 (0.979)	2.07 (1.09)
GPA Score (Number/5)	4.21 (0.540)	4.22 (0.545)	4.19 (0.535)	4.22 (0.523)	4.19 (0.557)
Years of Experience	2.67 (1.19)	2.67 (1.20)	2.67 (1.19)	2.76 (1.23)	2.58 (1.15)
Relevant Internship (Y=1)	0.444 (0.500)	0.460 (0.499)	0.444 (0.504)	0.460 (0.499)	0.460 (0.499)
Internships Completed	1.32 (0.653)	1.31 (0.647)	1.34 (0.658)	1.33 (0.653)	1.32 (0.653)
Military Experience (Y=1)	0.500 (0.500)	0.500 (0.500)	0.500 (0.500)	1.00 (0.00)	-
Military Leadership (Y=1)	0.261 (0.439)	0.273 (0.446)	0.250 (0.439)	0.523 (0.500)	-
Sample size	2200	1100	1100	1100	1100

Note: The table denotes the Mean and Standard Deviations for the resume characteristics as listed on the left.

Table 4 illustrates the composition of resumes of each batch. Resumes were divided into Western or Asian names (denoted by W or A respectively). They were then further classified

as male or female applicants (denoted by M or F respectively). Finally, they were separated into high or low quality (denoted by HQ or LQ).

TABLE 4: COMPOSITION OF RESUMES IN EACH BATCH

1.W/M/HQ	2. W/M/LQ	3. W/F/HQ	4. W/F/LQ
5.A/M/HQ	6. A/M/LQ	7. A/F/HQ	8. A/F/LQ

*Legend: W= Western Name, A= Asian Name, M= Male, F= Female, HQ= High Quality Resume, LQ= Low Quality Resume

Job descriptions of advertised positions were thoroughly examined where we verified that high quality and low quality resumes met the relevant minimum qualifications, i.e. Bachelor degree in Electrical Engineer, or certifications, i.e. Electrical Engineer Licence or Class 3 Driving Licence. Job listings requiring more than three to five years of experience were filtered out to ensure that applicants of low quality were eligible to apply. We selected jobs advertised directly by the company itself or third party recruiters. Job openings that required further personal documents from applicants were not chosen as we are unable to produce them. Most government ministries and Multinational Companies (MNCs) require such personal documents (e.g. educational certificates and national service transcripts).

We also avoided re-sending to the same third-party recruitment agency for the same occupation to avoid raising any suspicion. We submitted resumes at different timings and order for each job opening. We sent most of the resumes on weekends so as to mimic the behaviour of ordinary working adults, who are usually working during the week and apply for jobs during the weekends. This helped to ensure that our repeated resume applications (in batches of eight) are less conspicuous.

Employers' details and job titles were recorded with reference to the dates of application. Each applicant's name, gender and quality characteristics were also documented. We recorded the status of job applications as 'Sent' for positions applied, and edited it as 'Sent / Responded' for applications that received callbacks.

4. CALLBACK DISTRIBUTIONS

Our group investigates the presence of name and gender discrimination by comparing the percentage difference in callbacks received between Western and Asian name applicants in Table 6a, and the percentage difference in callbacks received between Male and Female applicants in Table 6b. Western name applicants have higher callback rates than Asian name applicants, even after accounting for differences in quality. They receive 1.62 times more callbacks than Asian name applicants on average, where this difference is statistically significant at the 1% level of significance. After differentiating resumes according to quality, our data shows that employers favour high quality Western name applicants compared to equivalent Asian name applicants by a ratio of 1.51 (p-value = 0.0005), and low quality Western name applicants by 1.78 times more than low quality Asian name applicants (p-value = 0.0001).

For females applicants, employers strongly preferred Western names applicants over Asian name applicants with a ratio of 2.31 (p-value = 0.000), but were largely indifferent between male Western and Asian name applicants. In Table 6b, employers were found to favour female Western name applicants considerably more than male Western name applicants, with female applicants receiving 9.5% more callbacks on average.

TABLE 6a: MEAN CALLBACK RATES BY SOUNDINGNESS OF NAMES
(WESTERN & ASIAN NAMES)

Sample:	Percent callback for Western names	Percent callback for Asian names	Ratio	Percent difference (p-value)
All sent resumes	22.5% (248/1100)	13.9% (153/1100)	1.62	0.000***
Male	17.8% (98/550)	16.0% (88/550)	1.11	0.422
Female	27.3% (150/550)	11.8% (65/550)	2.31	0.000***
High Quality	25.3% (139/550)	16.7% (92/550)	1.51	0.0005***
Low Quality	19.8% (109/550)	11.1% (61/550)	1.78	0.0001***
Auditor (Accounting)	27.0% (27/100)	19.0% (19/100)	1.42	0.181
Civil Engineer	35.2% (38/108)	25.9% (28/108)	1.36	0.141
Corporate Communications Executive	8.13% (13/160)	0.625% (1/160)	13.0	0.001***
Electrical Engineer	25.5% (51/200)	15.0% (30/200)	1.70	0.0089***
Financial Analyst	15.4% (16/104)	15.4% (16/104)	1.00	1.00
Management Executive/Associate	9.09% (8/88)	5.68% (5/88)	1.60	0.390
Marketing & Sales Representative	19.9% (27/136)	6.62% (9/136)	3.01	0.00012***
Registered Nurse	54.5% (48/88)	42.0% (37/88)	1.30	0.0981*
Software/Web Developer	17.2% (20/116)	6.90% (8/116)	2.49	0.0155***

Note: The values of Column 1 and 2 are the percentage of callbacks for the respective group, while the absolute figure of callback received relative to the total number of resumes sent are listed in the brackets. Column 3 refers to the ratios between the percentage of callback for Western and Asian names. Column 4 reports the p-value from the test of difference in means between the two groups, where we test the null hypothesis that callback rates are equal between Western and Asian name applicants.

Significance at the 10% level is represented by *, at the 5% level by ** and at the 1% level by ***.

This difference is statistically significant at the 1% level (p-value = 0.0002). However when it came to Asian names, employers favoured male applicants more than female applicants by a ratio of 1.36, which is statistically significant at the 5% level (p-value = 0.0451).

TABLE 6b: MEAN CALLBACK RATES BY SOUNDINGNESS OF NAMES (MALE & FEMALE)

Sample:	Percent callback for Male applicants	Percent callback for Female applicants	Ratio	Percent difference (p-value)
All sent resumes	16.9% (186/1100)	19.5% (215/1100)	0.867	0.109
Western Names	17.8% (98/550)	27.3% (150/550)	0.652	0.0002***
Asian Names	16.0% (88/550)	11.8% (65/550)	1.36	0.0451**
High Quality	18.7% (103/550)	23.3% (128/550)	0.803	0.0643*
Low Quality	15.1% (83/550)	15.8% (87/550)	0.956	0.739
Auditor (Accounting)	25.0% (25/100)	21.0% (21/100)	1.19	0.504
Civil Engineer	25.0% (27/108)	36.1% (39/108)	0.693	0.0769*
Corporate Communications Executive	0.625% (1/160)	8.13% (13/160)	0.0769	0.001***
Electrical Engineer	21.0% (42/200)	19.5% (39/200)	1.08	0.710
Financial Analyst	14.4% (15/104)	16.3% (17/104)	0.883	0.702
Management Executive/Associate	5.68% (5/88)	9.09% (8/88)	0.625	0.390
Marketing & Sales Representative	13.2% (18/136)	13.2% (18/136)	1.00	1.00
Registered Nurse	42.0% (37/88)	54.5% (48/88)	0.771	0.0981*
Software/Web Developer	13.8% (16/116)	10.3% (12/116)	1.34	0.422

Note: The values of Column 1 and 2 are the percentage of callbacks for the respective group, while the absolute figure of callback received relative to the total number of resumes sent are listed in the brackets. Column 3 refers to the ratios between the percentage of callback for male and female. Column 4 reports the p-value from the test of difference in means between the two groups, where we test the null hypothesis that callback rates are equal between male and female applicants.

Significance at the 10% level is represented by *, at the 5% level by ** and at the 1% level by ***.

TABLE 7a: DISTRIBUTION OF CALLBACKS BY ALL EMPLOYERS (WESTERN NAMES & ASIAN NAMES)

Equal Treatment	No Callback	1 W + 1 A	2 W + 2 A	3 W + 3 A	Complete Callback	Total
	58.9%	3.27%	3.64%	2.55%	2.18%	70.6%
	[162]	[9]	[10]	[7]	[6]	[194]
Western names favoured (WF)	W - A = 1	W - A = 2	W - A = 3	Completely no A		
	12.4%	9.81%	2.18%	0.36%		24.7%
	[34]	[27]	[6]	[1]		[68]
Asian names favoured (AF)	A - W = 1	A - W = 2	A - W = 3	Completely no W callback		
	4.36%	0.00%	0.360%	0.00%		4.72%
	[12]	[0]	[1]	[0]		[13]

H_0: WF = AF

p-value = 0.000

Note: The absolute figure of callback is denoted in the brackets. "No Callback" refers to all resume batches where all job applicants did not receive any callbacks, while "Complete Callback" refers to resume batches where all job applicants received a callback. "1 W + 1 A" refers to job listings where we received callbacks for exactly one Western and one Asian name applicant in that batch and so on for all corresponding combinations. We define "Equal Treatment" as the sum of "No Callback", "Total Callback" and all combinations where callbacks for Western and Asian names are equal. For "W – A = 1", it refers to resume batches where we received one more callback for a Western name applicant in the particular batch and so on for the other instances. For "Completely no A", it refers to resume batches where we receive all four callbacks for Western name applicants and none for Asian name applicants. Conversely, "A – W = 1" would be resume batches where we received one more callback for an Asian name applicant instead and so on for the other combinations. For "Completely no W", it refers to resume batches where we receive no callbacks for Western name applicants and all four callbacks for Asian name applicants.

Our group explores the extent of name discrimination in Table 7a by evaluating the distribution of callbacks by employers. Equal treatment towards both Western and Asian names occurs for 70.6% of all job applications, where the occurrence of "No Callback" makes up the bulk of the result. However, Western name applicants are favoured by almost 25% of employers, with a majority of employers calling one or two more Western name applicants within our batch of eight resumes. A test for symmetry in callbacks was carried out, where the null hypothesis of Western name applicants being equally favoured as Asian name applicants (H_0: WF = AF) is rejected with a p-value of 0.000.

TABLE 7b: DISTRIBUTION OF CALLBACKS BY ALL EMPLOYERS (MALE & FEMALE)

Equal Treatment	No Callback	1 M + 1 F	2 M + 2 F	3 M + 3 F	Complete Callback	Total
	58.9%	1.09	4.73	1.45	2.18	68.4
	[162]	[3]	[13]	[4]	[6]	[188]
Male Favoured (MF)	M - F = 1	M - F = 2	M - F = 3	Completely no F callback		
	9.09	3.27	0.360	0.720		13.5
	[25]	[9]	[1]	[2]		[37]
Female Favoured (FF)	F - M = 1	F - M = 2	F - M = 3	Completely no M callback		
	8.36	8.00	1.45	0.360		18.2
	[23]	[22]	[4]	[1]		[50]

H_0: WF = AF

p-value = 0.109

Note: The absolute figure of callback is denoted in the brackets. "No Callback" refers to all resume batches where all job applicants did not receive any callbacks, while "Complete Callback" refers to resume batches where all job applicants received a callback. "1 M + 1 F" refers to job listings where we received callbacks for exactly one male and one female applicant in that batch and so on for all corresponding combinations. We define "Equal Treatment" as the sum of "No Callback", "Total Callback" and all combinations where callbacks for male and female are equal. For "M – F = 1", it refers to resume batches where we received one more callback for a male applicant in the particular batch and so on for the other instances. For "Completely no F", it refers to resume batches where we receive all four callbacks for male applicants and none for female applicants. Conversely, "F – M = 1" would be resume batches where we received one more callback for female applicant instead and so on for the other combinations. For "Completely no M", it refers to resume batches where we receive no callbacks for male applicants and all four callbacks for female applicants.

In Table 7b, we investigate the extent of gender discrimination by employers and find that equal treatment for both genders occurs for 68.4% of all applications, where the occurrence of "No Callback" again makes up the bulk of the result. However, female applicants are slightly favoured by employers than male applicants by 5% more. In our test for symmetry in callbacks, we cannot reject the null hypothesis that male applicants are equally favoured as female applicants (p-value = 0.109).

TABLE 8: EFFECT OF RESUME CHARACTERISTICS ON LIKELIHOOD OF CALLBACKS

Dependent Variable = Callbacks	All Resumes	All Resumes	Male	Male	Female	Female
English name (Y=1)	0.331** (0.000)	0.317** (0.000)	0.0734 (0.414)	0.0768 (0.398)	0.586** (0.000)	0.556** (0.000)
Male (Y=1)	-0.0912 (0.146)	-0.126** (0.047)	-	-	-	-
Quality (Y=1)	0.215** (0.001)	-	0.145 (0.106)	-	0.285** (0.001)	-
GPA	-	0.746** (0.000)	-	0.811** (0.001)	-	0.638** (0.002)
Experience	-	0.0538 (0.198)	-	.059866 (0.295)	-	0.0440** (0.468)
Internship Relevance (Y=1)	-	-0.788** (0.000)	-	-0.862** (0.000)	-	-0.661** (0.012)
Military Leadership (Y=1)	-	-	-	-0.000919 (0.997)	-	-
Ho: Resume characteristics effects are all zero (p-value)	39.8 (0.0000)	62.2 (0.0000)	3.33 (0.189)	21.5 (0.0007)	51.2 (0.0000)	54.2 (0.0000)
Standard deviation of predicted callback	0.0632	0.544	0.0792	0.985	0.0858	0.805
Sample size	2200	2200	1100	1100	1100	1100
Log pseudolikelihood	-1023	-1012	-498	-489	-517	-516
Pseudo R2	0.0199	0.0315	0.0033	0.0217	0.0488	0.0514

Table 8 shows that a Western name increases the likelihood of callback by 33.1 percentage points, keeping all other variables constant, where this result is significant at the 1% level of significance. A high quality resume increases the likelihood of callback by 21.5 percentage points, at 1% level of significance.

Specific resume characteristic variables were introduced in column 2, where the results show that a Western name increases the likelihood of callback by 31.7 percentage points (p-value = 0.000). Interestingly, females have an increased likelihood of callback of 12.6 percentage points compared to males, and relevant internship(s) actually reduces the likelihood of

callback by 78.8 percentage points. For every point increase in the GPA, the likelihood of callback increases by 74.6 percentage points.

Western names are largely inconsequential for males but not for females, where they have a significant increase in the likelihood of callback. Interestingly, relevant internship(s) by the male applicant would actually decrease the likelihood of callback by 86.2 percentage points. Military leadership is largely insignificant in affecting the likelihood of callback for males.

In Table 9, we report the Average Marginal Effect (AME)[5] for independent variables on the probability of callback. For dummy variables like the name, gender, internship relevance and military leadership, a change from a value of zero to one change the probability of callback to a value of one by the respective percentage points accordingly to the coefficient listed. For continuous variables like GPA score and years of work experience, an infinitesimal change converts the probability of callbacks to a value of one by the respective percentage accordingly to the coefficient.

GPA and relevant internship were the only constant marginal effects that affected the probability of callback, where Asian name applicants received a greater percentage increase in the probability of callback taking a value of one as compared to Western name applicants. This also applies for male applicants, who also received a greater percentage increase in the probability of callback as compared to female applicants for an equal increase in GPA.

---

[5] This is different from the calculation of the Marginal Effect at the Mean (MEM), where it lists the marginal effects for the mean values of the independent variables. By using MEM, the marginal effects recorded would be according to the mean values for the name and gender variables (0.5) and hence would be highly misleading. Thus our group chose AME instead of MEM due to the clear distinction between Western names and Asian names, and also between male and females. Coefficients from the output of a Probit regression cannot be interpreted in the same manner as a linear regression model, where we can infer the magnitude and extent of marginal effects of independent variables directly. Marginal effects in a Probit model are not just dependent on the specific independent variable, but also all other independent variables. Also marginal effects within a Probit model are not constant as compared to linear regression marginal effects.

TABLE 9: AVERAGE MARGINAL EFFECT (AME) OF RESUME CHARACTERISTICS ON PROBABILITY OF CALLBACK

Dependent Variable Callbacks	All Resumes	Western Names	Asian Names	Male	Female
English name (Y=1)	0.0816** (0.000)	-	-	0.0189 (0.398)	0.146** (0.000)
Male (Y=1)	-0.0323** (0.047)	-0.0945** (0.000)	0.0245 (0.242)	-	-
GPA	0.191** (0.000)	0.157** (0.003)	0.207** (0.000)	0.200** (0.001)	0.167** (0.001)
Experience	0.0138** (0.198)	-0.00371 (0.819)	0.0276** (0.043)	0.0148 (0.295)	0.0115 (0.468)
Internship Relevance (Y=1)	-0.202** (0.000)	-0.149** (0.033)	-0.233** (0.000)	-0.213** (0.000)	-0.173** (0.011)
Military Leadership (Y=1)	-	-	-	-0.000227 (0.997)	-

Interestingly, the marginal effect of having a relevant internship was consistently negative and extremely significant across all categories. A Western name would increase the probability of callback taking a value of one for all resumes by 8.16% and for females by 14.6%, while having no significant effect for males. The marginal effect of years of experience was only significant for Asian names as compared to Western names, and insignificant for both genders.

5. INTERPRETATION OF RESULTS

From our results, we can see that Western names do affect the likelihood and probability of employer callbacks, especially for female applicants, even after controlling for resume

quality. Resume quality indeed affects the likelihood and probability of callback, where employers focus more on the academic GPA more as a signal of quality, rather than the years of working experience within the relevant occupation, with GPA being a significant variable for all categories (All resumes, Western, Asian, male and female).

We find it interesting that having a relevant internship would actually reduce the likelihood and probability of callback. This goes against conventional thinking that doing relevant internship(s) would strongly signal to employers that the applicant has prior working experience related to the job, and is more likely to be motivated and passionate about the job itself. Upon further analysis of the job listings that we applied to, we hypothesise that certain employers may anticipate the rejection of job offer by candidates with relevant internship experiences. As we ensured high quality job applicants tend to have relevant internship experiences within MNCs, Small and Medium Enterprises (SMEs) may believe that these applicants would not seriously consider their offer or employers may not able to afford their relatively higher wages. Thus employers may not even attempt to shortlist them for interviews and focus instead on identifying other candidates who may be a better fit. This would result in the negative relationship of relevant internship and employer callbacks.

This could also partially explain why years of working experience was not as significant a factor as anticipated, where employers may find high quality applicants with more years of work experience to be overqualified. As we applied to all available job listings by direct employers or third-party HR firms, we assume that the following results could be due to the relatively high number of job openings listed by SMEs, which we are not able to ascertain as some job listings omitted the identity of the company.

6. CONCLUSION

This paper has investigated the presence and extent of name and gender discrimination through the analysis of callbacks by employers, where we utilised a random resume audit study. We find that employers tend to favour Western name applicants more than Asian name applicants, particularly for female applicants. Having a Western name increases the likelihood of callback, and quality does indeed affect the likelihood of callback, where higher quality resumes have a higher likelihood of callback. Relevant internship experience(s) may reduce the likelihood of callback where employers may anticipate the rejection of job offers by overqualified applicants and hence do not call such applicants at all. GPA and relevant internship also greatly affect the probability of callback. Thus job applicants should obtain a Western name if possible to increase their callback responses.

BIBLIOGRAPHY

Bertrand, Marianne and Mullainathan, Sendhil, 2004, "Are Emily and Greg More Employable Than Lakisha and Jamal?", *American Economic Review,* 94, pp. 991-1013.

Chew, Rosalind, 1993, "The Measurement of Gender Earnings Differentials for Foreign-Trained and Local-Trained IT Professionals: The Case of Singapore." *Computational Economics*, 6(2), pp. 95-106.

Demographia. Demographia World Urban Areas: 11th Annual Edition, 2015.

Google Careers, n.d., "How We Hire", Retrieved March 28, 2016, from http://www.google.com/about/careers/lifeatgoogle/hiringprocess/

Heckman, James J., 1998, "Detecting Discrimination", *Journal of Economic Perspectives*, (12)2, pp. 101-116.

Kaas, Leo and Manger, Christian, 2012, "Ethnic Discrimination in Germany's Labour Market: A Field Experiment", *German Economic Review*, 13(1), pp. 1-20

Lahey, Joanna N., 2008, "Age, Women, and Hiring: An Experimental Study", *The Journal of Human Resources*, 43(l), pp. 30-56.

Lazear, Edward P., 2009, "Firm-Specific Human Capital: A Skill-Weights Approach", *Journal of Political Economy*, 117(5), 914-940.

Lee, William K.M., 1998, "Gender Inequality and Discrimination in Singapore", *Journal of Contemporary Asia,* 28(4), pp. 484-497.

Maurer-Fazio, Margaret, and Lei, Lei, 2015, "As Rare as a Panda: How Facial Attractiveness, Gender, and Occupation Affect Interview Callbacks at Chinese Firms." *International Journal of Manpower*, 36(1), pp. 68-85.

Ministry of Manpower. Employed Residents Aged Fifteen Years and Over by Occupation, Industry and Sex, 2015 (Singapore: MOM).

Ministry of Manpower. Job Vacancies 2014, 2015 (Singapore: MOM).

Ministry of Manpower. Job Vacancies 2015, 2016 (Singapore: MOM).

Ministry of Manpower. Labour Force in Singapore 2015, 2015 (Singapore: MOM).

Riach, Peter A. and Rich, Judith, 2006, "An Experimental Investigation of Sexual Discrimination in Hiring in the English Labor Market", *B.E. Journal of Economic Analysis & Policy: Advances in Economic Analysis & Policy*, 6(2), pp. 1-20.

Singapore Department of Statistics. Population Trends 2015, 2015 (Singapore: SingStat).

Tafep, 2014, "Fair Employment Practices", Retrieved March 28, 2016, from *https://www.tafep.sg/fair-employment-practices*

Turner, Margery A., Fix, Michael and Struyk Raymond J., 1991, Opportunities Denied, Opportunities Diminished: Racial Discrimination in Hiring. Washington DC: The Urban Institute Press.