Pre-Analysis Plan:
Malaysia Correspondence Study

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1   Motivation

In this study we test for labor market discrimination in Malaysia by ethnicity (Malay, Chinese, Indian) and gender (male, female). In addition, we evaluate whether soft skill signals (leadership, teamwork, or none) are valued in the labor market, and their interaction with discriminatory behavior.

To assess labor market discrimination in Malaysia, we will utilize a correspondence study. Using this method, fictitious job applications are sent to employers that have advertised a job opening. The only meaningful differences between comparable applications is the name (and contact information) of the applicant, which signals ethnicity and/or gender, and a signal of soft skills. We perform this analysis for five different degree specializations: Accounting, Business Administration, Computer Science, Electrical Engineering and Mechanical Engineering. The degree of discrimination in hiring is quantified in two ways: by calculating the difference in the interview request rate between the various groups and by calculating the difference in the average number of profile views after applying to a job.

We use an online platform which creates some unique advantages relative to other studies. Specifically, we observe several characteristics of the firm and job that are not typically observable to researchers. In addition, we observe how many times employers view the application profiles and characteristics of the applicant pool. That is, how many applicants in the pool are more or less educated, and how many applicants have higher or lower expected salary. We know of no other correspondence study that has had access to this kind of information to study discrimination in any context.

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Our research questions are:

1. Is there ethnicity-based discrimination (Malay/Chinese/Indian) in the Malaysian labor market? If yes, what is the extent of the discrimination?

2. Is there gender-based discrimination (male/female) in the Malaysian labor market? If yes, what is the extent of the discrimination?

3. Does the labor market respond to signals of soft skills (leadership/teamwork/none)? If yes, what is the extent of the response?

4. Discrimination heterogeneity:

    (a) Does ethnicity-based discrimination vary by gender? If so, what is the extent?

    (b) Does signalling soft skills narrow or widen the ethnic and gender discrimination gap?

    (c) Does discrimination vary by job and company characteristics?

    (d) Does discrimination vary by the characteristics of other applicants in the pool?

2 Background on correspondence studies

Correspondence studies have been replicated in different contexts, testing for potential discrimination in race, gender, ethnicity, age, among others. Bertrand and Duflo (2017) review field experiments in discrimination literature, among these, correspondence studies. In their review, they state that most correspondence studies are replications of Bertrand and Mullainathan (2004), the seminal paper in the literature, applied to different populations or contexts. Such studies have been very useful in documenting discrimination across multiple dimensions (race, ethnicity, gender, etc.) in a large number of contexts across the globe.

Correspondence studies have some limitations. Most notably, the outcome variable is very coarse. Because human interaction would change the number of controllable factors, the correspondence study can only use call back rates for an interview as an outcome, rather than an actual job offer after a formal interview. A challenge in this literature is to match experimental findings to a theoretical framework of discrimination. Two known models in labor economics literature are statistical discrimination and taste-based discrimination. Statistical discrimination happens when employers fear that applicants

of certain minority group are deficient in some unobservable skill and decide not to hire. Taste-based discrimination happens when employers' utility depends negatively on the number of minority workers they employ (Lang and Lehmann, 2012).

Most studies that went beyond replication explored mechanisms associated with statistical discrimination. For instance, Bertrand and Duflo (2017) propose that employers can use quick heuristics by not going beyond the name while reading resumes. This hypothesis is consistent with Bertrand and Mullainathan (2004) findings, since they don't find difference in callback rates between good quality and bad quality resumes for blacks, but they find differences for whites. Kaas and Manger (2012) find that differences in callback rates seem to be removed when soft information is presented in additional reference letters. Other innovations in the literature are intended to test if employers choose different levels of attention for majority or minority groups when gathering additional information is not costly. Bartoš et al. (2016) test this by sending hyperlinks to fictitious personal websites to a subset of the applications. Then they observe differences in information gathering between majorities and minorities. In regards to gender, Bertrand and Duflo (2017) state that a topic of interest for future work would be to use correspondence studies to test potential bias against women with children, or against young women, who may face maternity in the future, a topic explored in Petit (2007). Further exploration of these and other mechanisms would provide an important contribution to the literature.

Contextually, Lee and Khalid (2016) is the most closely related paper to our study. They test for discrimination in Malaysia using a correspondence study and find that Malay profiles (Malaysia's majority group) are 18 percentage points less likely to receive calls for interviews than their non-Malay counterparts. They conduct this study using digital platforms with high-degree profiles. Our study departs from Lee and Khalid (2016) in three different ways: 1) We study the three largest ethnic groups in Malaysia: Malay, Chinese and Indian. Unlike them, we add the Indian ethnicity that represents 7% of the population in Malaysia. 2) We assess gender discrimination. More importantly, 3) We conduct a thorough heterogeneity analysis to understand how discrimination operates in the context of Malaysia. We assess three different dimensions of heterogeneity: how discrimination varies by job and firm characteristics, how discrimination varies by candidate characteristics, exploiting soft skill signals that are randomly assign to resumes, and how discrimination varies depending on the relative position of the applicant on the pool of ap-

plicants.[1] To the best of our knowledge, we are the first study to test the role soft skills in hiring decisions. Moreover, we can test if soft skills have a role attenuating or exacerbating discrimination.

3 Research protocol

In this section we describe the research protocol for implementation and data collection, which includes the following steps: profile creation (section 3.1), job search and classification (section 3.2), randomized assignment and job applications (section 3.3), and monitoring applications (section 3.4).

3.1 Profile creation

The first step is to create similar candidate profiles, each including a resume, that differ only by name (signaling both ethnicity and gender), gender, and multiple signals of a particular soft skill.

We focus on two soft skills: leadership and teamwork, which are compared to a relatively neutral counterfactual. Soft skills are signalled via an executive statement (on applications and in the resume), a list of personal skills on a resume, and through career-relevant industry-specific experience (an internship experience), non-professional work experience (barista experience), and extracurricular activities (hobbies or clubs). In this way, soft skills and experience are linked.

Each candidate profile is tailored to one of five degrees: accounting/ accountancy, business administration, computer science, electrical engineering, and mechanical engineering. These degree-based specializations were selected after initially characterizing job advertisements posted between April 11-17, 2022 on the job portal. 671 scraped jobs at that time met the following criteria: full time, entry level, bachelor's degree required, 0-1 years of experience. These jobs were then categorized into the following five degrees. The remaining 15% of total jobs were determined to be too specialized and those kinds of jobs will be excluded from the study. Table 1 shows the distribution of jobs by degree-based specialization using four week's of web scraping in April 2023.

In total, 90 candidate profiles will be created (3 ethnicities x 2 genders x 3 soft skills x 5 industries = 90 profiles). Each degree will have 18 unique

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[1] We also depart from Lee and Khalid (2016) methodologically, while in their study they send multiple applications per job ad, we just send one. We use different fields of specialization and the creation of profiles follows different practices.

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candidate profiles allowing for all possible combinations of ethnicity, gender, and emphasized soft skill. For example, 6 of the 18 mechanical engineering applicant profiles will be Chinese, 6 will be Malay, and 6 will be Indian. For a given ethnicity, half of those will be female, and the other half will be male. Among the 3 Chinese female applicants within a degree, each will be uniquely assigned one of the three soft skills traits to be emphasized (leadership, teamwork, or none), and similarly for Chinese male candidates, and for the Malay and Indian male and female candidates. This allocation is described for a given degree in figure 1 where L denotes leadership skills, T denotes teamwork skills, and C denotes control.

Each of the 90 profiles has a unique name which reflects an individual's ethnicity and gender (see table 2, profiles also directly specify the gender), unique phone number, and unique email address corresponding to the name. Table 2 includes a complete list of names used for profile creation, disaggregated by ethnicity and gender. Names were carefully selected to avoid any signal of wealth or other possible correlates (Gaddis 2017). Additional profile information takes one of three forms:

1. Information that is consistent across all profiles

2. Information that is consistent across all profiles within a specialization

3. Information that is consistent across all profiles assigned to a specific soft skill

Each profile also has an associated resume. Resumes were generated using a template available online using the same information used to create the profiles. All resumes use the same template. Each resume includes name, basic contact information, gender, executive summary, technical skills, personal skills, educational background, pre-professional experience, activities/hobbies[2], language, and a statement that references are available upon request. Example resumes are provided in Appendix A.

3.2 Job search and classification

On Fridays, we scrape job ads posted within the previous seven days from the job portal. Jobs must meet the following criteria: full time, require a bachelor's degree or equivalent degree, entry level position or requiring at most

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[2]Hobbies are selected based on observations from the website: https://www.postjobfree.com/l/Malaysia/resumes

1 year of experience. Relevant jobs are then classified into one of the five degree-based specializations (as described in table 1). Each job is assigned a degree-based specialization using the area of specialization reported in the ad. For the accounting degree we use job ads classified as "Accounting/Finance". For the business administration degree we use job ads with specializations: 'Admin/Human Resources', 'Sales/Marketing', 'Customer Service' or 'Logistics/Supply Chain'. For the computer science degree we use the specializations: 'Tech & Helpdesk Support' or 'Computer/Information Technology'. For electrical engineering we use specializations that are related to 'Electronical', 'Electronics' or 'Other engineering'. If the position has the word 'engineer' and the industry of the company is related to Electronical or Electronics, we also classify the ad into the electrical engineering degree. Finally, for mechanical engineering we use specializations related to mechanical, industrial or chemical engineering and specializations related to oil and gas. In addition, we classify a job into the mechanical engineering degree if the position has the word 'engineer' and the industry of the company is related to heavy industrial machinery or manufacturing production. If jobs are not relevant for one of the degree-based specializations, the job is removed from the sample.

To avoid the risk of detection, we keep only one job posting per company giving priority to jobs in STEM fields (for the duration of the study). That is, if a company posts two positions in the same week, one for engineering and another for business, we keep the engineering position. We eliminate all job ads that belong to companies for which applications have been made in previous weeks. The final result of this filtering process results in our sample.

For each job posting that is part of the study, the following information will be recorded (from the scraping):

1. Company name

2. Location

3. Company size

4. Job title

5. Specialization (as categorized on the website)

6. Industry

7. Salary range

8. Average processing time

9. Date of the job posting

10. Text from the job description and company overview

Table 3 presents descriptive statistics of jobs scraped on April 7th, 14th, 21st, and 28th that satisfy our inclusion criteria. All statistics are presented by degree of specialization. Column 1 is for Accounting, column 2 for Business Administration, column 3 for Computer Science, column 4 for Electrical Engineering and, column 5 for Mechanical Engineering. Out of the 2,117 relevant job ads, 60.8% are concentrated in the Business Administration degree. There are far fewer job ads in the Technology and Engineering specializations. Almost 60% of the companies are located in the metropolitan area of Kuala Lumpur. 45% of the job ads are posted by small companies, defined as a company with no more than 50 employees.[3] Each degree-based specialization is represented by jobs in every industry.

On average a company takes 16 days to process applications. Almost 50% of them take more than 20 days. Finally, we show the monthly salary offered in the job ads. This number is obtained by taking the average of the range of salary posted on the ad. More than 50% of the jobs offer up to 1,000 US dollars per month. However, for the degrees of computer science, electrical engineering and mechanical engineering more than 50% of the jobs offer more than 1,500 US dollars. On average, the monthly salary is 771 US dollars using an exchange rate of 0.23.[4]

In addition to the variables described in table 3, each job advertisement contains text information describing the job and the company. These descriptions vary widely from company to company. Often times, this text contains information of required language skills, benefits offered by the company, dress code, and other things. All text will be saved for potential text analysis.

3.3   Randomized assignment and job applications

Each week we will randomly select 300 job ads from the sample of ads meeting our inclusion criteria. Among these 300 ads, each job ad will be randomly assigned to a single applicant profile. Job ads will be stratified to ensure that our treatment and comparison units are balanced on key variables. We use

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[3]In the data we observe brackets of company size by number of employees: 1-50, 51-200, 201-500, 501-1000, 1001-2000, 2001-5000, and more than 5000.

[4]To convert Malaysian ringgit to US dollars we use the April average exchange rate published by the Central Bank of Malaysia https://www.bnm.gov.my/exchange-rates.

two variables for our strata: company size and company location. Company size is a dummy variable that takes the value of 1 if the company has up to 50 employees, and takes the value of 0 if companies have 51 or more employees. Company location is a dummy variable that takes the value of 1 if the company is located in the metropolitan area of Kuala Lumpur, and 0 otherwise. Our stratified randomization procedure guarantees balance in the assignment of job profiles to specific characteristics of companies.

The application process must be carried out manually. At the beginning of each week, a research assistant will be given a list of randomly assigned jobs for each applicant profile. Applications will be completed on Mondays, Wednesdays, and Fridays of every week (with day of the week randomly assigned). Applications are to be submitted during the same time span each of these days (8am-12pm CT).[5] The order of applications (grouped by profile) each day will also be randomized.

3.4   Monitoring job applications

Job applications will be monitored using a web scraping algorithm. For each job application, the following data will be scraped from the website every Tuesday, Thursday, and Saturday (between 8am-12pm CT):

1. Number of times the profile was viewed by the employer

2. Number of applicants to the job posting

3. Number of applicants with higher education (or lower)

4. Number of applicants with higher expected salary (or lower)

5. Number of job applicants ahead of the candidate (Approximate order in the application line)

6. Status of the search (Options include the following: employers are actively processing applications, employers have stopped processing applications, employers declare a candidate not suitable, employers offer an interview or they are not actively processing applications)

7. Number of days between application submission and a candidate is offered an interview (if applicable)

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[5]If the website is under maintenance, which is common, applications will be delayed until the website is available.

8. Number of days between application submission and a candidate is declared 'not suitable' (if applicable)

Any interview request received will be manually declined as soon as we observe and record an offer for interview through the web scraping on Tuesdays, Thursdays or Saturdays. Interviews will typically be declined within 0-48 hours. However, it is possible that interview requests made on Saturdays would not be declined for up to 72 hours. We expect interview requests made on Saturdays will be rare. After declining the interview, the application will be withdrawn. In some cases, last-minute interview requests will be made and we will be unable to decline the interview prior to the time of interview. We expect these instances to be rare, and the application will be withdrawn as soon as possible. Any interview offer received directly through email will be recorded and the invitation will be declined using the standard reply message: 'Hi, thank you for reaching out. I am no longer interested in the position. I apologize for any inconvenience I might have caused. Thank you for considering my application.', the application will also be withdrawn.

4   Power Calculations

We perform a power calculation analysis to determine the proper sample size in our experimental setting. To this end, we need to fix the parameters: Type-I error (α) and type-II error (β). As it is standard in the literature, α is set to a level of 0.05. The power is defined as (1-β), that is the probability of rejecting the null hypothesis when it is false, usually set to be 0.8. Figure 2 plots the relation between the required sample size on the y-axis and the expected effect, in our case, difference in contact rate on the x-axis. The solid line uses the stated parameters, while the dashed-line uses a more conservative power of 0.9. For instance, if we expect to find a difference in contact rates between two groups (e.g. Chinese and Malay) of 10 percentage points, we will need a sample of 1,000 observations for a power of 0.8 and around 1,300 observations for a power of 0.9. It is important to note that as the expected difference in the effect (contact rates) increases the sample size requirement decreases.

To put the sample size calculation in context we add the sample size and difference in contact rates of related studies (in red). In Malaysia, Lee and Khalid (2016) find a difference of 18 percentage points in contact rates with a sample of 3,012 resumes. This study finds particularly high rates of discrimination in relation to others and provides a close approximation to the expected difference in contact rates in our study. If we expect to find a similar differential effect, a sample of roughly 500 observations would be sufficient.

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However, we allow for the possibility of a lower differential effect, which would be consistent with Kaas and Manger (2012) that estimate 9 percentage point differences in contact rates between German and Turkish sounding names in German labor market with a sample of 1,056 resumes (under power), Galarza and Yamada (2014) that find 7 percentage point differences in contact between white and indigenous in Peru using a sample of 4,820 resumes, and Bertrand and Mullainathan (2004) that document a 4 percentage point difference in contact rates between white and black sounding names, with a sample of 4,890 resumes. Our targeted sample size will be 3,000 observations and should be sufficient to detect a 7 percentage point difference in contact rates, which is more conservative than the 18 percentage point difference found in the most closely related study.

5   Main Analysis

We split our main analysis in thee parts: Ethnic-based discrimination, gender-based discrimination, and employers' response to soft skills.

5.1   Ethnic-based discrimination

Our first research question is, "Is there ethnicity-based discrimination (Malay/ Chinese/ Indian) in the Malaysian labor market (and to what extent)?" To answer this questions, we estimate the specification 1:

$$y_i = \delta_0 + \sum_{j=1}^{2} \delta_j E_{ij} + \varepsilon_i \tag{1}$$

Where y_i is the outcome of interest. In our main analysis y_i is a dummy variable that takes the value of 1 if the company (employer) i offered an interview to the candidate (contact). Alternatively, y_i is a dummy variable that takes the value of 1 if the employer i viewed the profile of the candidate, and finally, y_i is the number of times employer i viewed the profile of the candidate.[6] E_j is the ethnicity variable, where $j = \{0, 1, 2\}$. That is, E_j is a dummy variable that takes the value of 1 for ethnicity j and 0 for other ethnicities. ε_i is the error term. The parameter δ_1 is the mean difference in y_i, contact for interview in

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[6]For contacted profiles, we can compare the average number of days between application submission and interview offer by ethnicity and gender. We can perform a similar analysis for profiles that were declared not suitable.

our main analysis, between ethnicities E_1 and E_0. Similarly, δ_2 captures the mean difference in contact for interview between ethnicities E_2 and E_0. If we find statistically significant results for δ_1 and/or δ_2 we can claim that there is ethnic-based discrimination.

5.2 Gender-based discrimination

Our second research question is, "Is there gender-based discrimination (male/ female) in the Malaysian labor market? If yes, what is the extent of the discrimination?" To answer this questions, we estimate the specification 2:

$$y_i = \beta_0 + \beta_1 F_i + \varepsilon_i \tag{2}$$

The outcome y_i and error term ε_i are defined as in specification 1. F_i is a dummy variable that takes the value of 1 if company i received an application of a female candidate, and 0 if they received an application of a male candidate. The parameter β_1 is the mean difference in y_i, between male and female. That is, if we find a statistically significant value for β_1 we can claim there is gender-based discrimination.

5.3 Response to soft skills

Our third research question is, "Does the labor market respond to signals of soft skills (leadership/ teamwork/ neither)? If yes, what is the extent of the response?" To answer this question, we use the soft skill signal that we randomly assigned to each profile. We can test if soft skills are differentially relevant in the labor market using specification 3:

$$y_i = \theta_0 + \sum_{k=1}^{2} \theta_k S_{ik} + \varepsilon_i \tag{3}$$

Again, the outcome y_i and error term ε_i are defined as in specification 1. The soft skills we want to test are leadership and teamwork, in comparison to a control soft skill that we call 'neither'. S_k is the soft skills variable, where $k = \{0, 1, 2\}$. That is, S_k is a dummy variable that takes the value of 1 for soft skill k (e.g. leadership) and 0 for other soft skills (e.g. teamwork and our counterfactual soft skill). The parameter θ_1 is the mean difference in y_i for candidates with soft skills S_1 and S_0. That is, the mean difference between candidates with leadership soft skill signal and our counterfactual soft skill. Likewise, θ_2 captures the mean difference in contact for interview between teamwork soft skill and our counterfactual soft skill. If we don't

find difference in mean contact rates for workers signaling soft skills, they might not be relevant to the employer at the time to decide to offer a job interview. On the other hand, if we find statistically significant results for θ_1 and/or θ_2 we can claim that employers value the soft skills we included in the application (leadership and teamwork, respectively) when they decide to offer job interviews.

6 Heterogeneity Analysis

Discrimination may depend on a number of factors, including characteristics of the candidate, characteristics of the job and company, and characteristics of the pool of applicants. The richness of the data collected on the online job portal accommodates a unique heterogeneity analysis to explore how the decision of employers vary depending on these factors.

6.1 Ethnicity and Gender

First, we want to understand the interaction between gender and ethnicity. We want to answer the following question: "Does ethnicity-based discrimination vary by gender? If so, what is the extent?" To do so, we use specification 4:

$$y_i = \alpha_0 + \beta_1 F_i + \sum_{j=1}^{2} \delta_j E_{ij} + \sum_{j=1}^{2} \gamma_j (E_{ij} \times F_i) + \varepsilon_i \tag{4}$$

Specification 4 adds to specification 1 a gender dummy and its interaction with the ethnicity variable.

6.2 Soft skills, Ethnicity and Gender

Then, we want to answer the following question: "Does signalling soft skills narrow or widen the discrimination gap?" For this purpose, we have specifications 5 and 6. Specification 5 is based on specification 1 with the addition of the soft skills variables and its interaction with the ethnicity variable.

$$y_i = \delta_0 + \sum_{j=1}^{2} \delta_j E_{ij} + \sum_{k=1}^{2} \theta_k S_{ik} + \sum_{k=1}^{2} \sum_{j=1}^{2} \nu_{kj} (E_{ij} \times S_{ik}) + \varepsilon_i \tag{5}$$

Specification 6 is based on specification 2 with the addition of the soft skills variables and its interaction with the ethnicity variable.

$$y_i = \beta_0 + \beta_1 F_i + \sum_{k=1}^{2} \theta_k S_{ik} + \sum_{k=1}^{2} \nu_k (F_i \times S_{ik}) + \varepsilon_i \tag{6}$$

6.3   Job and Company Characteristics

Next, we ask "Does discrimination vary by job and company characteristics?" Again, we use specifications 1 and 2 as the basis for ethnic-based and gender-based discrimination, respectively. We add to both specifications a variable x_{il} that reflects one of the job or company characteristics: degree-based specialization, company size, location, industry, average processing time, average salary, and company/job specialization. We interact this job or company characteristic with the ethnicity and gender variable in specifications 7 and 8 respectively.[7]

$$y_i = \delta_0 + \sum_{j=1}^{2} \delta_j E_{ij} + \psi_l x_{il} + \sum_{j=1}^{2} \psi_{jl}(E_{ij} \times x_{il}) + \varepsilon_i \qquad (7)$$

$$y_i = \beta_0 + \beta_1 F_i + \psi_l x_{il} + \psi_{il}(F_i \times x_{il}) + \varepsilon_i \qquad (8)$$

6.4   Applicant Pool

Finally, we want to answer the question: "Does discrimination vary by the characteristics of other applicants in the pool?" When applying to a job we observe the number of applicants for the job position, the number of applicants with higher education (or lower) and the number of applicants with higher expected salary (or lower).[8] This give us the opportunity to understand how competition affects the employers decision differently for various demographic groups. Competition can be measured in two ways: 1) the number of candidates that applied for the job position, 2) the relative position of the candidate in the distribution of education and expected salary. Specifications 9 and 10 use a variable z_{il} characterizing the pool of applicants and its interaction with the ethnicity and gender variable. [9]

$$y_i = \delta_0 + \sum_{j=1}^{2} \delta_j E_{ij} + \tau_l z_{il} + \sum_{j=1}^{2} \tau_{jl}(E_{ij} \times z_{il}) + \varepsilon_i \qquad (9)$$

$$y_i = \beta_0 + \beta_1 F_i + \tau_l z_{il} + \tau_{il}(F_i \times z_{il}) + \varepsilon_i \qquad (10)$$

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[7]A similar specification can be used to analyze if response to soft skills vary with job and company characteristics.

[8]We also observe the number of job applicants ahead of the candidate. That is, an approximate order in the application line.

[9]A similar specification can be used to analyze if response to soft skills vary with characteristics of other applicants in the pool.

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A   Tables and Figures

Table 1: Percentage of Job Street postings by applicant's degree

	Degree	Percentage
1	Accounting/Accountancy	18.0%
2	Business Administration	60.8%
3	Computer Science	10.9%
4	Electrical Engineering	4.4%
5	Mechanical Engineering	5.9%
	Total	100%

Note: The percentages by specialization is calculated over a total of 2,117 job postings scraped during the month of April 2023.

Figure 1: Description of profiles for a given degree
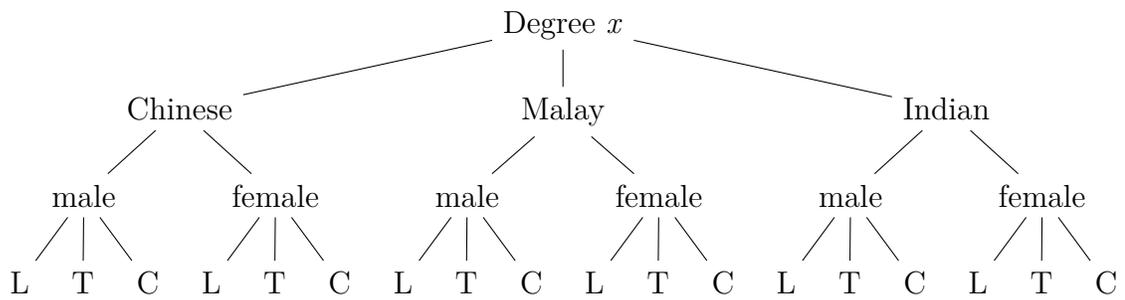
Note: There are five areas of specialization x – accounting/finance, admin/sales/service, technology, mechanical engineering, and electrical engineering. Each specialization has 15 profiles, as described in this figure. The last row depicts soft skills, where L denotes leadership, T denotes teamwork, and C denotes control.

Table 2: List of names use for profile creation by ethnicity and gender

(a) Female names

|	Chinese	Malay	Tamil (Indian)
1	Lim Yi Nuo	Siti Nur Alya binti Jamal	Preetha Nair Gopal
2	Goh Zi Han	Amira Shafeeqa binti Johan	Aishawarya Tanay
3	Yang Yu Tong	Siti Farhana binti Muhammad Arif	Shamilla Prakesh
4	Chong Xin Yi	Shafikah Najwa binti Jafri	Divya A/P Anbuselvan
5	Ng Ruo Xi	Siti Alissa Ibrahim	Kavitha Rajkumar
6	Tee Xiu Qi	Sarah Atiqah binti Kamaluddin	Vidhya Maniam
7	Tong Mei Eng	Nurul Hannah Khalid	Theebalakshmi Kumar
8	Yap Kim Lan	Zulaika Shamsuddin	Ishita Paramasivam
9	Yip Jia Xin	Syahirah Qistina binti Wan Amir	Priya A/P Sathasivam
10	Tai Li Sa	Fatin Afeeqah binti Khairul	Nalini Ponnusamy
11	Wong Min Min	Amalina Hanna Farhan	Tamia Thuraisingam
12	Xu Ya Yi	Farah Alya binti Baharuddin	Anisha A/P Suveer
13	Liew Xiu Mei	Raisah Nabilah binti Ahmad	Sumita A/P Mahalingam
14	Lee Fang Xin	Nur Elina Najwa Ilyas	Shanta A/P Ranbir
15	Liu Xin Yan	Nurul Sabrina binti Fauzan	Nitisha Ragunathan

(b) Male names

	Chinese	Malay	Tamil (Indian)
1	Wang Tian Seng	Adnan Fazli Hishammuddin	Satish Rajkumar
2	Lee Kok Chai	Nazmi Mohd Johari	Vinesh Raj Kanapathy
3	Zhang Jia Hua	Najmi Aqmar bin Baharuddin	Vishnu Sudhir
4	Liu Fu Cheng	Khalid bin Shamsuddin	Vinod A/L Vinayagar
5	Chen Jian Hua	Isa Kamil	Naveen Menon
6	Zhou You Xing	Afiq Jamal bin Amir	Dhileep Sahir
7	Quek Jing Tian	Muhammad Jamil bin Izad	Santhu Krishnan
8	Chua Yong Yi	Farhan bin Mohd Jasmi	Surein A/L Subramaniam
9	Tan Mu Chen	Azwad Faris bin Hisham	Navin Kumar A/L Balasingham
10	Khoo Yu Ze	Firdaus Fazli bin Safwan	Vikram Raghav
11	Koh Hao Ran	Muhammad Kamal Hasnol	Nageswaran A/L Suppiah
12	Yang Yu Xuan	Kamil Mustapha	Darshan Sharan
13	Ng Wei Liang	Alif Faizal bin Johan	Gopinath A/L Muthusamy
14	Pang Guo Tong	Wan Arif bin Wan Abdul	Kishen Rayappan
15	Wu Jian Yu	Izzat Safwan bin Abdullah	Dheeraj Jaiyush

Table 3: Company and Job Descriptive Statistics

	Degree					
	(1)	(2)	(3)	(4)	(5)	(6)
	Account.	Business	Comp. Sci.	Elec. Eng.	Mec. Eng.	Total
Location						
Kuala Lumpur	64.9	57.7	67.8	39.4	29.0	57.6
Rest of Malaysia	35.1	42.3	32.2	60.6	71.0	42.4
Company Size						
Up to 50 employees	52.1	45.5	46.5	34.0	21.0	44.9
51 employees or more	47.9	54.5	53.5	66.0	79.0	55.1
Specialization						
Accounting/Finance	100.0	0.0	0.0	0.0	0.0	18.0
Admin/Human Res.	0.0	28.3	0.0	0.0	0.0	17.2
Information Tech.	0.0	0.0	91.3	0.0	0.0	9.9
Construc./Manufact.	0.0	0.0	0.0	1.1	18.5	1.1
Engineering	0.0	0.0	0.0	98.9	81.5	9.2
Sales/Marketing	0.0	54.5	0.0	0.0	0.0	33.1
Services	0.0	17.2	8.7	0.0	0.0	11.4
Industry						
Primary sector	3.2	2.2	0.4	0.0	4.0	2.2
Manufact./Industry	18.4	24.7	11.2	68.5	74.2	27.0
Healthcare	3.5	6.8	2.7	4.3	2.4	5.4
Real Estate, legal	6.9	5.8	1.3	3.3	0.0	5.0
Professional services	48.7	22.2	64.3	9.8	12.1	30.5
Retail	7.4	18.1	6.7	6.5	3.2	13.5
Transp./Telecomm.	4.0	5.0	4.9	2.2	0.0	4.3
Services	5.3	7.6	5.8	1.1	1.6	6.3
Others	2.7	7.6	2.7	4.3	2.4	5.7
Processing Time						
1-5 days	18.8	17.2	21.3	13.8	8.9	17.3
6-10 days	9.2	12.6	14.3	6.4	13.7	12.0
11-15 days	11.3	11.3	10.4	8.5	12.1	11.1
16-20 days	12.0	13.3	13.0	13.8	18.5	13.4
More than 20 days	48.7	45.5	40.9	57.4	46.8	46.2
Salary						
Less than 500	5.2	9.8	0.9	8.5	5.6	7.7
500-700	27.5	24.0	10.9	16.0	11.3	22.1
700-1000	24.9	25.3	20.0	17.0	25.0	24.2
1000-1500	2.6	8.0	19.1	6.4	3.2	7.9
More than 1500	39.8	32.9	49.1	52.1	54.8	38.1
Total	18.0	60.8	10.9	4.4	5.9	100.0

Note: Descriptive statistics for April 2023 for a total of 2,117 job ads that satisfy our inclusion criteria. All statistics are presented by degree of specialization. Column 1 is for Accounting, column 2 for Business Administration, column 3 for Computer Science, column 4 for Electrical Engineering, column 5 for Mechanical Engineering and, column 6 for all of them. Descriptive statistics for location, company size, specialization, industry, average time to process applications, average monthly salary offered per job in US dollars. To convert Malaysian ringgit to US dollars we use the April average exhange rate published by the Central Bank of Malaysia https://www.bnm.gov.my/exchange-rates. That is, a exchange rate of 0.23.

Figure 2: Power calculations
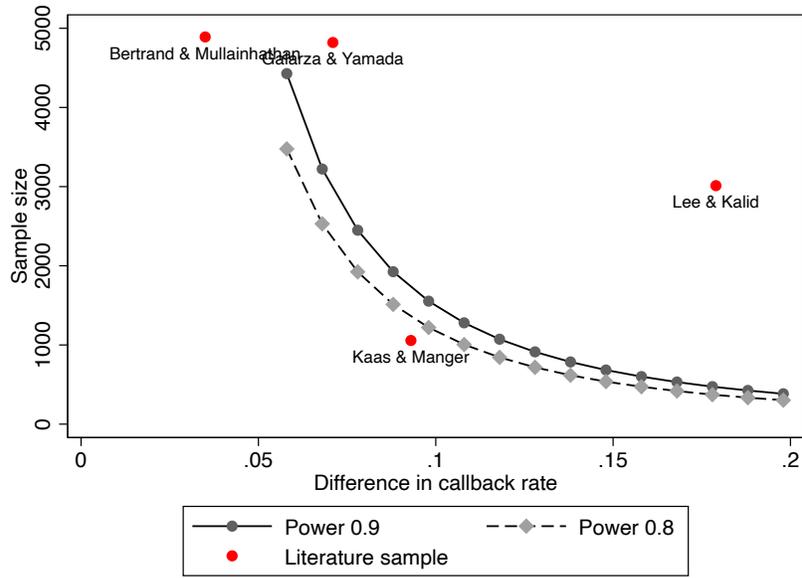
B   Sample resumes

Figure 3: Resume: Malay, male, accounting, teamwork skill

Kamil Mustapha

Phone: +60 12 7877 1795   **Gender:** Male

Email: kamil.mustapha@outlook.com

EXECUTIVE SUMMARY
Fresh Bachelor of Accounting graduate with previous internship experience in PwC Malaysia. Currently pursuing Chartered Financial Analyst (CFA) Level I Certification. Demonstrated ability to contribute to teams.

TECHNICAL SKILLS	● Microsoft Visual Basic ● QuickBooks ● SQL
PERSONAL SKILLS	● Teamwork ● Collaboration ● Communication
EDUCATION	**Bachelor of Accounting (2022)** University of Malaya Kuala Lumpur
PRE-PROFESSIONAL EXPERIENCE	**Intern** PwC Malaysia (Jul 2022 – Sep 2022) *Compile and analyze financial statements. Create a budget aligned with company financial goals. Collaborate as part of a team to prepare relevant internal report.* **Barista** Starbucks Malaysia (Oct 2021 – Jul 2022) *Serve customer with variety of beverages and meals. Greet customers, take orders, and complete customer transactions on the cash register. Work collaboratively with other employees.*
ACHIEVEMENTS / RESPONSIBILITIES	● Book Club ● Photography Club ● Running ● Baking
LANGUAGES	English, Bahasa Melayu, Mandarin
REFERENCES	Available upon request.

Figure 4: Resume: Chinese, female, computer science, leadership skill

Tai Li Sa

Phone: +60 12 2026 2191 **Gender:** Female

Email: tai.li.sa@outlook.com

EXECUTIVE SUMMARY
Recent Bachelor of Computer Science graduate with prior internship experience in ExxonMobil. Demonstrated ability to lead teams.

TECHNICAL SKILLS
- SQL Server
- MySQL
- C++
- Java

PERSONAL SKILLS
- Leadership
- Management
- Communication

EDUCATION
Bachelor of Computer Science (Software Engineering) (2022)
University of Malaya
Kuala Lumpur

PRE-PROFESSIONAL EXPERIENCE
Intern
ExxonMobil (Jul 2022 – Sep 2022)
Provide support and handle troubleshooting. Monitor and deployment of IT equipment. Lead team in preparation of relevant internal report.

Lead barista
Starbucks Malaysia (Oct 2021 – Jul 2022)
Serve customer with variety of beverages and meals. Greet customers, take orders, and complete customer transactions on the cash register. Train and supervise new employees.

ACTIVITIES / HOBBIES
- Book Club, Organizer
- Photography Club, Social Media Director
- Running
- Baking

LANGUAGES
English, Bahasa Melayu, Mandarin

REFERENCES
Available upon request.

Figure 5: Resume: Tamil, female, mechanical engineering, independent

Aishawarya Tanay

Phone: +60 12 2260 5029   **Gender:** Female

Email: Aishawarya.tanay@outlook.com

EXECUTIVE SUMMARY
Recent Bachelor of Mechanical Engineering graduate with previous internship experience in Sunway Berhad. Demonstrated ability to work independently.

TECHNICAL SKILLS
- C++
- Matlab
- Python
- Maple
- AutoCAD

PERSONAL SKILLS
- Independence
- Motivation
- Communication

EDUCATION
Bachelor of Mechanical Engineering (2022)
University of Malaya
Kuala Lumpur

PRE-PROFESSIONAL EXPERIENCE
Intern
Sunway Berhad (Jul 2022 – Sep 2022)
Support engineering division in development-related operations. Produce detail technical drawings. Work to prepare relevant internal report.

Barista
Starbucks Malaysia (Oct 2021 – Jul 2022)
Serve customer with variety of beverages and meals. Greet customers, take orders, and complete customer transactions on the cash register. Complete assigned tasks.

ACTIVITIES / HOBBIES
- Book Club
- Photography Club
- Running
- Baking

LANGUAGES
English, Bahasa Melayu, Mandarin, Tamil

REFERENCES
Available upon request.

Figure 6: Resume: Tamil, female, business administration, independent

Nalini Ponnusamy

Phone: +60 12 6250 4022   **Gender:** Female

Email: nalini.ponnusamy@outlook.com

EXECUTIVE SUMMARY
Recent Bachelor of Business Administration graduate with prior internship experience in Allianz. Demonstrated ability to work independently.

TECHNICAL SKILLS	• Microsoft Visual Basic • QuickBooks • HTML web design
PERSONAL SKILLS	• Independence • Motivation • Communication
EDUCATION	**Bachelor of Business Administration (2022)** University of Malaya Kuala Lumpur
PRE-PROFESSIONAL EXPERIENCE	**Intern** Allianz (Jul 2022 – Sep 2022) *Support manager on a spectrum of marketing duties. Tailored customized financial services and products. Work to prepare relevant internal report.* **Barista** Starbucks Malaysia (Oct 2021 – Jul 2022) *Serve customer with variety of beverages and meals. Greet customers, take orders, and complete customer transactions on the cash register. Complete assigned tasks.*
ACTIVITIES / HOBBIES	• Book Club • Photography Club • Running • Baking
LANGUAGES	English, Bahasa Melayu, Mandarin, Tamil
REFERENCES	Available upon request.

Figure 7: Resume: Malay, male, electrical engineering, teamwork skill

Isa Kamil

Phone: +60 12 8996 8383   **Gender:** Male

Email: Isa.kamil3@outlook.com

EXECUTIVE SUMMARY
Recent Bachelor of Electrical Engineering graduate with prior internship experience in Astro Malaysia Holdings. Demonstrated ability to contribute to teams.

TECHNICAL SKILLS
- Matlab
- Code blocks
- ENVI
- AutoCAD

PERSONAL SKILLS
- Teamwork
- Collaboration
- Communication

EDUCATION

Bachelor of Electrical Engineering (2022)
University of Malaya
Kuala Lumpur

PRE-PROFESSIONAL EXPERIENCE

Intern
Astro Malaysia Holdings (Jul 2022 – Sep 2022)
Assist in the development of cost-effective design products. Design electronic parts for products. Collaborate as part of a team to prepare relevant internal report.

Barista
Starbucks Malaysia (Oct 2021 – Jul 2022)
Serve customer with variety of beverages and meals. Greet customers, take orders, and complete customer transactions on the cash register. Work collaboratively with other employees.

ACTIVITIES / HOBBIES
- Book Club
- Photography Club
- Running
- Baking

LANGUAGES
English, Bahasa Melayu, Mandarin

REFERENCES
Available upon request.