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Does Getting a Degree Pay

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DOES GETTING A DEGREE PAY?

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DOES GETTING A DEGREE PAY?

Abstract

Since an increase in opportunities has resulted in the pool of degree holders in Singapore to significantly increase over the last few decades, a re-examination of the relationship between salary and highest education qualification is necessary. The purpose of this study is to ascertain whether receiving a degree rather than gaining work experience leads to higher earnings during this degree inflation era. In 2022, this will be the first study in Singapore to examine a person's wage in relation to their highest level of education. The existing literature tends to find higher returns for the university degree holders, although the impact of degrees varies depending on the university ranking and regions. We propose using both primary data collected through an online survey as well as secondary data obtained from data.gov, a government database, to conduct our studies. We will then use data analysis techniques like the T-Test, ANOVA, regression models, and correlation to examine the data. The preliminary data results revealed that a degree is still a crucial factor in Singaporeans earning more than their non-degree counterparts.

Keywords: Singapore, salary, degree, work experience, education

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Does Getting a Degree Pay?

Will work experience compensate for lack of a degree, or does a degree provide benefits that experience alone cannot? Is it true that one can readily compare one thing to another? This is far from a trivial issue. This simple decision can have a significant impact on one's financial well-being.

A university degree is a broad term that includes a variety of fields and educational levels, with varying levels of training and learning. It is logical to assume that as a person's education improves, so does their income. According to a new study by Shahor (2017), most countries have traditionally considered a degree to be of higher quality than work experience. A person with an academic degree is valued higher than someone with professional expertise in a specific field. On the other hand, this mentality has resulted in the majority of students pursuing a degree at all costs. As a result, the graduate degree has become the new normal, and credential inflation has resulted in an increase of degree-holder taxi drivers (Christian Science Monitor, 2013). According to research by Yi and McMurtrey (2013), attending college became a trendy option in South Korea during the 1980s as household income improved. In the late 1990s, as everyone went to college, a college education no longer ensured a good quality of life. This does not imply that obtaining a degree is not beneficial. Indeed, getting a high-paying job without a degree is demanding. However, could we all be mistaken about the future of work, with a shift toward skills and experiences instead?

The link between better education and increased incomes has been proven in studies across the world. Employers prefer liberally educated job candidates, according to research performed in the United Kingdom (UK) (Walker & Zhu, 2013). Between the 1970s and the

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end of the 1990s, numerous analyses revealed a link between schooling and future earning power (Shahor, 2017). Until this research, it was assumed that university graduates would earn more than non-university graduates. As a result, the goal of our study is to see if having a degree is beneficial in this new era of increased undergraduate enrolment in Singapore. In order to live comfortably, this study seeks to explain the discrepancies in the value of a degree and experience.

Literature Review

Past studies have been conducted in other countries looking into the various discussion of experience versus education, that affects the starting salary of new employees entering the workforce. Furthermore, some studies have explored other factors that can also affect an individual's income such as the ranking of the university one graduated from, the country the individual resides in and the gender of the individual. Hence, a wide selection of factors were considered which will allow us to find gaps in their research and questions to come to a more accurate conclusion.

Experience Versus Education

It is common to think that a degree is sufficient in today's job market, but following recent trends in the IT industry, a degree might not be enough to stand out from the thousands of other potential employees. In an article published in 2018, Networks Asia found that in the IT industry, employers were more motivated to award a higher starting salary to graduates who have a degree in the relevant field and sufficient work experience in the industry. This issue is also exacerbated by a phenomenon known as "Degree Inflation", defined as the rising trend for university degrees for jobs that did not require such levels of qualification (Fuller &

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Raman, 2017). This trend effectively devalues the degree itself, and as substantiated by the first report, employers also seek experience in addition to education.

However, employers would still prefer if a candidate for the job had at least a degree, “As well as most disciplines reviewed with the concept of higher education and employment and their relationship. Higher education predicts high and sufficient employment chances for students” (Carnoy, 1994; Grao & Mora, 2000; Lettmayr, 2012). These points contradict, but this is because neither study focused on either job with a higher barrier to entry in terms of qualifications or skilled jobs requiring more experience than qualifications. Therefore, the job requirements were not included in the survey. This is an area for us to refine our research to obtain a more accurate conclusion.

University Ranking

Another significant factor that we must consider is the ranking and standing of the university from which our subjects have graduated. Data collected, both internationally and locally, have shown that the ranking and standing of the university also has had a significant impact on the salaries of workers. For example, data retrieved from the Department of Education in the US have shown that Ivy League graduates earn more than twice as much as their non-Ivy League peers. It was found that the median annual earnings for an Ivy League graduate were \$70,000 a year after working for ten years as compared to the \$34,000 a year of their non-Ivy League peers (Ingraham, 2015). These findings are consistent with that of local survey findings here in Singapore. In the *Economic Survey of Singapore 2017* done by the Ministry of Trade and Industry Singapore, it was found out that Autonomous University (AU) graduates enjoy wage premiums, earning 28 percent higher starting wages than private education institution (PEI) graduates (Poh et al., 2017).

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Both international and local surveys have shown that the ranking of the university and its status, whether an AU or a PEI, has a substantial impact on the salaries of its graduates, highlighting the importance of education. The issue with using University Ranking as a determining factor is that some industries do not require a degree, but rather, work experience. We could refine our research by focusing on industries that require a degree as opposed to other industries which require more experience. This is like the sub-header regarding experience, where we can refine our research to come to a more accurate conclusion.

Country

Indeed, employers' perception of education varies in different countries. Although some countries are tied to the same education standards and exams, such as in Singapore and the UK, employers' perception of hiring differs in many countries. Recently, the industry trend of Singapore employers is to hire those who have the right "skills" for the job. A survey conducted by LinkedIn resulted in almost 40% of companies in Singapore looking for employees with technical skills (Tan, 2021). For those hopping from job to job, 31% of companies seek transferable skills (Tan, 2021). These statistics highlight that the traditional hiring method in most countries, which takes into account both education and work experience, has reduced drastically. Employers are now looking at the relevant skills and individual poses.

Singapore is always at the forefront of new techniques to consistently sustain a thriving workforce. The economy has transitioned from the work-experienced workforce to the educational level workforce and now to the highly sought-after skill-based workforce. Although the economy is heading towards a skill-based workforce, academic degrees provide

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an edge for workers during the hiring process. Companies presume that a degree-holder can adapt and learn new skills quicker than a non-degree holder (Tan, 2021).

In contrast, in the UK, employers still hire and favour workers based on their educational merit. The data collected was from the British Household Panel Survey (BPHS) from 1991-2005 (Bognanno & Melero, 2016). The survey is administered annually and proceeds with interviews of each adult member of a nationally representative sample of more than 5,000 households (Bognanno & Melero, 2016). The survey obtains job-related information, occupation, and the main employer characteristics, such as educational background, wages, and recent promotions. The data shows only a small disparity of hiring higher-educated than lower-educated workers. However, higher-educated workers tend to receive a more significant starting wage than lower-skilled workers. Additionally, higher-educated workers tend to have a better career progression with more frequent promotions and a more considerable wage increase than lower-educated workers (Bognanno & Melero, 2016). Moreover, lower-educated workers tend to take up non-managerial promotions, reinforcing the perception that less-educated workers do not have the necessary skills to take on higher positions (Bognanno & Melero, 2016).

Although the comparison only portrays the differences between the two countries, the impact of job opportunities based on educational levels and work experience may differ in other countries. Additionally, some industries are very niche and require extensive work experience for workers to be hired. However, in the modern era, especially in developed countries, education merits matter, and the degree will provide an edge for workers in their career progressions. Certainly, the survey conducted was beneficial and the variables used

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are extremely related to our research topic. However, as the survey was only conducted only in the UK, portraying that different countries have different hiring methods based on education merit, and work experience, we intend to further develop the study by obtaining similar data to identify if the job hiring trends and career progressions are similar in Singapore. This research will subsequently assist us to refine the accuracy of our results like the sub-headers of experience, university ranking, and gender.

Gender

Gender and its effects on income have been a hot topic for a multitude of studies around the globe. Studies have significantly shown a stark contrast in income between males and females. To measure this inequality, the gender pay gap is a commonly used figure that captures how much fewer women earn compared to their male counterparts. For example, Wiler et al. (2021) found that male physicians earn \$20,000 more annually than their female counterparts in the medical field. In addition, female pay was found to have a lower starting point and did not catch up to males with a progression in their careers. In addition, despite holding the same roles as males, it was observed that females work significantly longer hours compared to males. The results held even after adjusting for a multitude of different variables such as specialty, age, faculty, and rank. Further studies have shown that these pay inequalities can negatively affect workers, such as reduced satisfaction, organizational commitment, and productivity, which are detrimental to an organization (Hamidullah et al., 2021).

However, the gender pay gap is narrowing. The United States (US) has established a consistently narrowing gender pay gap over the last two decades. The US Congress has restored a requirement for equal pay for equal work by instilling a new act. With this, the

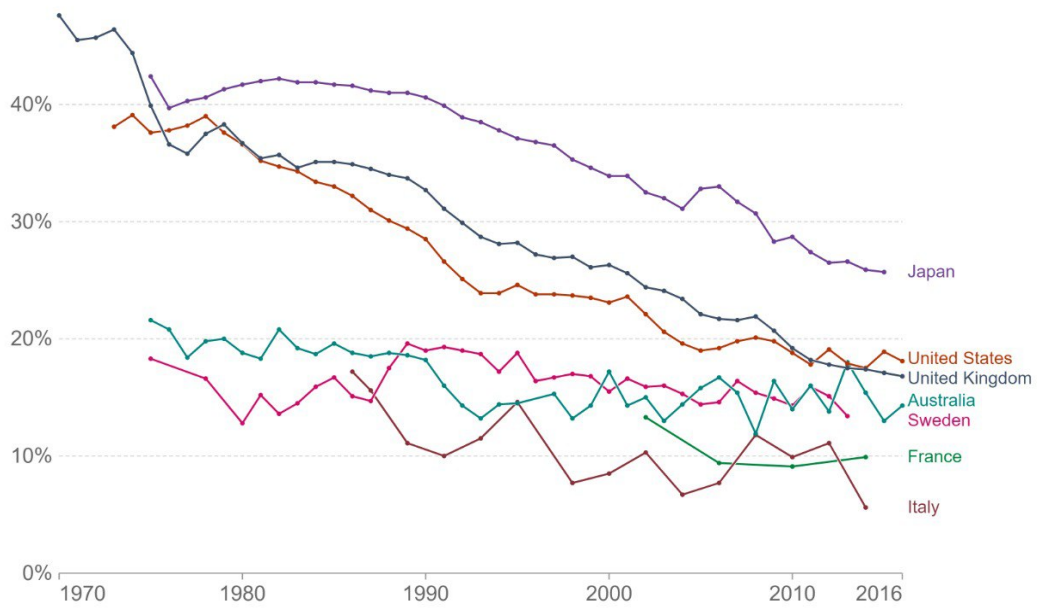
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earnings ratio between males and females has increased from 60% before the 1980s to 79% by 2014. Countries like the UK and Denmark have also instilled similar policies and interventions, which have also been shown to reduce the gap (Chen et al., 2021). This is consistent with the data in a research done by Ortiz-Ospina and Roser (2018), referring to figure 1 below titled “Unadjusted Gender Gap in Median Earnings, 1970 to 2016” constant decrease in the gender wage gap from the various countries through the decades. Besides policies and interventions, the narrowing can be due to the increasing levels of education and experience and an increasing number of females entering occupations that males once dominated due to technological and social changes that have allowed females to enter a broad spectrum of fields (Chen et al., 2021). Gender as a variable and its impact on income are explored in depth in these studies. Although gender bias has decreased dramatically over the previous few decades, it is present and has the potential to influence the outcomes of our research significantly. Additionally, we see that although the study is predominantly focused on the gender pay gap, it suggests that the reduction in the pay gap may be attributed to an increase in education levels, suggesting that having a higher educational level would result in a higher salary.

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Unadjusted gender gap in median earnings, 1970 to 2016

The gender wage gap is unadjusted and is defined as the difference between median earnings of men and women relative to median earnings of men. Estimates refer to full-time employees and to self-employed.



Source: OECD, Gender Wage Gap (2017)

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Figure 1. The unadjusted gender gap in median earnings (Ortiz-Ospina & Roser, 2018)

Study Design

The purpose of this study is to understand the correlation between education level and starting salaries in the Singaporean job market. One generally held belief is that obtaining a university degree would lead to better job opportunities and subsequently, higher pay. However, with the increased opportunities to pursue higher education, the pool of degree holders in Singapore has significantly increased, as addressed in this literature. Does tertiary education have the greatest influence on starting income, or will work experience shape the future of work? We seek to uncover the key factors that have the greatest positive influence on starting salary. Therefore, this paper will be surveying Singaporeans in the workforce on their highest educational qualification in relation to their salary. The survey will also find out if the degree holders have benefited from attaining their university degree and if the non-degree holders would have preferred attaining a university degree instead of gaining industrial experience. This study will utilize cross-sectional data from at least 1400 people in the workforce. It will be collated through mass distribution of surveys via the LinkedIn platform. Following the data collection, the raw dataset will be extracted into Excel, where it will be cleaned and analyzed using descriptive statistics, ANOVA tests, T-test, and regression analysis. In addition, this paper will also utilize secondary data from data.gov on a sample of Singaporeans' highest qualifications attained and their income.

The null hypothesis in the study would be that having a university degree in Singapore does not lead to higher earnings or decrease earnings. The alternative hypothesis is that having a degree in Singapore will increase one's earnings. We have chosen a one-tailed hypothesis because we would like to examine if there is a positive correlation between prioritizing university education over work experience and its impact on earnings.

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Population and Sample

We decided to use both primary data, collected via surveys distributed on LinkedIn, and secondary data retrieved from online databases.

Primary

For our primary data, the population for the study will be Singaporeans in the workforce. As of 2021, there are 3,643,000 individuals employed here in Singapore (Trading Economics, n.d.). A survey will be disseminated via virtual network sampling on LinkedIn to an ideal sample size of 385 working individuals.

Secondary

For our secondary data, the sample size will be 72 Singaporeans in the workforce. Various statistical tests will be performed on the data to derive our findings. The secondary data, however, also present certain limitations. Firstly, the data may face certain recency issues. Secondly, the data may not factor in certain variables and control measures that we have designed for our study. Comparing both primary and secondary data will serve to help us compare and substantiate our findings.

Variables and Measures

Key Independent Variables

Education Level

Our first key independent variable is the education level attained by Singaporeans. In our research, we are mainly comparing university graduates against non-university graduates. University graduates have emerged above the non-university graduates in the modern world. Especially in the US, there has been a strong demand for more educated students since the

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1980s. With a relative shortage of their supply in the past, the sharp increase in the wage premium of university degrees ensued (Roksa et al., 2010). Hence, the climate of opinion is that possessing a university degree will set one on a sound path without fail for the rest of one's life while not obtaining a university degree symbolizes failure. This mentality is very present amongst Singaporeans where we dive deeper to uncover the truth behind this way of thinking. The education level of Singaporeans was measured on an ordinal scale of options, namely, no education, Primary School Education, Secondary School Education, Tertiary Education, and University or higher education on a scale of 0 to 4 correspondingly. Refer to Appendix B for further information.

Work Experience

Another key independent variable would be the number of years of work experience attained. In this study, we are also comparing an individual's years of work experience to those of an individual with no experience but a university degree. When hiring new candidates in Hong Kong, IT businesses search for applicants with particular sector expertise and project-based experience, and they are ready to pay higher starting rates for these candidates rather than those with a university degree and no experience. (Networks Asia, 2018). Hence, the years of working experience is an important variable in this research. As shown in appendix E, the years of work experience of the participants in the survey was measured on the number of years ranging from 1 ("No working experience"), 2 ("0-2 years"), 3 ("2 - 4years") and 4 (> 4 years).

Control Variables

As discussed in the literature review, we opted to have age, gender, autonomous versus non-autonomous universities, and the working industry as our control variables since

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we want to strictly look at the correlation between education level and starting salaries. Including these four variables as control variables will eliminate the bias of a country's economic development and individuals' social status in society, increasing the pool of degree holders and making degree inflation more prominent. We measured age data with an open-ended question instead of a range of numbers as we wanted an accurate description of our surveyors, to gauge for career progressions, which can, in turn, affect their salary. For both gender and autonomous versus non-autonomous universities, options are split into two: male or female, and autonomous or non-autonomous respectively. The inclusion of industry as a control variable is because certain industries impose higher barriers to entry when it comes to educational certifications. The different industries where the participants worked were measured based on the six economic clusters in Singapore. They are manufacturing, built environment, trade & connectivity, essential domestic services, modern services, and lifestyle. For our primary data, these are the options listed in our survey. Refer to appendix F for further understanding of what these six industry clusters are about.

Dependent Variable

The dependent variable of the research is an individual's salary. In the research paper, the salary of a university graduate is compared to a non-university degree holder. Fresh graduates generally have a higher starting salary than those who do not have a degree as mentioned in the literature review. Salary will be measured on a numerical scale of Singapore Dollars (SGD). As referred to in appendix B to C, an open-ended question was presented in order to obtain the most precise salary of Singaporeans surveyed for use in our data analysis.

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Data Collection Methods

The data collection methods in the study will be separated between secondary and primary data. Secondary data will be retrieved from Data.gov.sg where there are publicly available datasets from over 70 public agencies (*Data.Gov.Sg*, 2022). Primary data will be collected through a survey that will be distributed through the platform LinkedIn.

Secondary

Firstly, secondary data will be collected from Data.gov.sg (*Average Monthly Household Income by Highest Qualification Attained of Main Income Earner and Type of Dwelling*, 2018). The website is the government's one-stop policy to its publicly accessible datasets. The website provides data visualization aids that allow us to quickly detect trends and draw conclusions from the large amounts of freely available data. Hence, we will utilize a sample of 72 Singaporeans' where their salary and highest qualification achieved were collected. Secondary data will help us determine whether there is a substantial difference between the trend observed in primary data. While secondary data will not be able to cover all elements of our research, the highest level of qualification and salary of 72 Singaporeans can help to solidify further the trends discovered in the primary data.

Primary

The primary data for the study will be gathered from our targeted sample via a Qualtrics survey questionnaire as shown in Appendix A-E, distributed on LinkedIn via virtual network sampling. The surveying period will last three months to allow the team to collect sufficient quality responses to hit the targeted sample size of 385 working individuals. To conduct the virtual network sampling, we will first build a list of potential respondents belonging to the population of employed Singaporeans in the workforce. Contact invitations,

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as well as justification for the invitation, will be sent to connect with the targeted individuals. Lastly, an invitation to participate in the study will be issued. The results will be collected automatically on Qualtrics before being exported to Excel and R, where it will be cleaned and analyzed.

We chose to employ virtual network sampling via LinkedIn for a number of reasons. Firstly the relatively low or even no costs would help us tremendously, considering our small team size. We are able to target the specific type of individuals that we want to survey by utilizing the information given to us on their profiles. Using LinkedIn would also allow us the convenience of collecting the samples from the confines of our workspace rather than having to travel around the country to employ our methods. Lastly, LinkedIn allows us to personalise our messages, making the communication with the subjects much more intimate, thereby building trust, confidence and legitimacy to our study. However, there are certain limitations with using LinkedIn and conducting our survey. Our sample collected would only be restricted to LinkedIn users. Privacy concerns will be an issue as the data we wish to collect contains sensitive information that individuals may not wish to disclose, resulting in a potentially high refusal rate. Therefore, we will be comparing the collected primary data along with pre-existing secondary data to provide a comparison (Kozłowski et al., 2021).

In the event that we are unable to collect the full response size of 1400 participants via LinkedIn due to complications or other constraints, we have printed QR codes onto flyers as shown in appendix G to be given out to working Singaporeans physically via voluntary response sampling. The team will be giving out these flyers in targeted areas around the Central Business District (CBD) where there is a high amount of traffic, for example, train stations or mall entrances. Printed on the flyers is the purpose of the survey, instructions on

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how to access the link as well as possible vouchers that can be won when they participate in the survey. This allows us to expand our avenues of data collection rather than limiting it just to LinkedIn users.

Data Analysis Methods

In order to estimate the impact of education level on salary, we decided to use a cross-sectional dataset that studied a proposed sample of 1400 individuals extrapolated from a portion of the Singaporean workforce. The panel dataset would have allowed us to minimize the margin for estimation biases that possibly could have emerged from compiling groups of data into a single time frame. We conducted three statistical analyses for the study, presented below. Our team however faced certain limitations with the primary data collected. Due to time and logistical constraints, we were unable to retrieve the ideal sample size of 1400 individuals in the workforce. Despite this setback, we were able to collect responses from 36 individuals' data which allowed us to conduct some preliminary testing and results.

Preliminary Results

The initial survey was conducted back in January 2022. The sample collected contained 36 respondents, which was obtained via virtual network sampling on LinkedIn. This section discusses the preliminary results of the survey using the proposed data analysis methods: T-Test, ANOVA, Regression, and Collinearity analysis. Our findings will be contrasted with our secondary data to explore their various findings.

TABLE 1
DESCRIPTIVE STATISTICS

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Salary (SG\$)	36	3562.92	1237.23	2000	6830
Gender ^a	36	0.5	0.51	0	1
Age	36	30.08	8.32	21	40
UA vs Non-UA ^b	36	0.75	0.84	0	2
Highest Education Attained ^c	36	3.25	0.91	1	4
Years of Experience	36	3.06	1.31	0	4

NOTE. - ^aGender is on a scale of 1 to 0. Where 1 represents male and 0 represents female.

^bUA vs Non-UA is graded on a scale of 0 to 2. Where 0 represents non-uni graduate, 1 represents Non-UA graduate and 2 represents UA graduate.

^cHighest Education Attained is graded on a scale of 0 to 4. Where 0 represents no education, 1 represents Primary School Education, 2 represents Secondary School Education, 3 represents Tertiary Education and 4 represents University or higher Education

T-Test

The T-test analysis method was used to determine if there are significant differences in the salary between the two groups, individuals with University degrees and no University degrees but have experience in the field. Since we would be comparing two groups, a t-test analysis will be a more appropriate method for us to compare and examine if there are any differences in the null and alternative hypothesis, that is, not having a university degree and having a University degree respectively, and if there are any positive influences on salary. Seeing as we have an equal number of University graduates and non-University graduates, we would need to employ a non-paired sample t-test. Given that the variance in salary

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between University and non-University graduates are unequal, we would expand our t-test to include the assumption of unequal variance. Our findings are as follows.

TABLE 2

T-TEST: NON-PAIRED TWO SAMPLE FOR MEANS ASSUMING UNEQUAL VARIANCES

	University Graduate	Non-University Graduate
Mean	3953.611	3172.222
Variance	1839611.193	988677.124
Observations	18	18
Degrees of Freedom	17	

One-Tailed P Value	0.02
Two-Tailed P Value	0.04

NOTE. - All monetary values are in SG\$

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A T-test is performed and recorded in Table 2 as shown above. The P-value for the one-tailed t-test is lesser than the significance value ($0.02 < 0.05$). Hence, we reject the null hypothesis that having a University degree has no impact on salaries. Hence, we conclude that there is a difference in the respondent's salary between degree and non-degree holders.

ANOVA

We chose a two-way ANOVA with replication to compare the Singaporeans in our survey's salary; whether a person has a degree and years of experience to see if there is an impact on salary. We used a sample of 24 Singaporeans from the preliminary results to be used in ANOVA: two-factor without replication.

TABLE 3**ANOVA: TWO-FACTOR WITH REPLICATION**

SUMMARY	Degree holders	Non degree holders	Total			
<i>0 - 4 years</i>						
Count	6	6	12			
Sum	18355	14500	32855			
Average	3059.166667	2416.666667	2737.916667			
Variance	70004.16667	169666.6667	221524.8106			
<i>> 4 years</i>						
Count	6	6	12			
Sum	24300	20410	44710			
Average	4050	3401.666667	3725.833333			
Variance	1607000	920416.6667	1263462.879			
<i>Total</i>						
Count	12	12				
Sum	42655	34910				
Average	3554.583333	2909.166667				
Variance	1030024.811	760099.2424				
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Sample	5855876.042	1	5855876.042	8.465039203	0.008668664	4.351243503
Columns	2499376.042	1	2499376.042	3.613006154	0.071839365	4.351243503
Interaction	51.04166667	1	51.04166667	7.3784E-05	0.993231553	4.351243503
Within	13835437.5	20	691771.875			
Total	22190740.63	23				

NOTE. - values in SG\$

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After performing a Two-way ANOVA with replication, the P-value of the sample that represents all the respondents' salaries in the sample is 0.008668664, lower than the significant value of 0.05. As the P-value is statistically significant, we reject the null hypothesis that having a University degree in Singapore does not lead to higher earnings. We can conclude that there are differences between the salaries among the different levels of experience. The results were not surprising. This is supported by the literature the paper had covered.

The P-value calculated for columns that represent the respondents: degree holders and non-degree holder's salary between the two levels of experiences is 0.071839365 is higher than the significant value of 0.05. Hence, the P-value is statistically insignificant, we do not reject the null hypothesis. We conclude that there is no difference in the respondents' salaries between the levels of experience. This result is unexpected and we attribute the results to the limitations of having a small sample size that could affect the reliability of the data.

As the P-value of interactions is 0.993231553, higher than the significant value of 0.05. The P-value is statistically insignificant, we do not reject the null hypothesis. We conclude that there is no difference between the amount of work experience in terms of how they influence respondents' salaries. This result is surprising as it contradicts the previous result. We attribute this result to the different rates of career progressions and pay raise scales between the different industries in Singapore.

Regression

Regression analysis will be used to examine the correlation between the means of variables against each other. The data produced will allow us to analyze the best fit line

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which will make evident the effect of the independent and control variables based upon their coefficients. We can estimate the regression of the model by the following equation:

$$y = \beta_0 + \beta_1 \mathbf{x}_1 + \beta_2 \mathbf{x}_2 + \varepsilon$$

y denotes the salary of the workers. β_0 denotes the intercept. \mathbf{X}_1 denotes the vector of the key independent variable, highest education attained. \mathbf{X}_2 denotes the vector of control independent variables, namely; age, gender, autonomous or non-autonomous university graduate, and the employees' years of experience. " ε " is known as a random error component.

TABLE 4
COLLINEARITY TEST

	<i>Gender</i>	<i>Age**</i>	<i>Autonomous vs Non-Autonomous Graduate**</i>	<i>Highest Education</i>	<i>Years of Working Experience</i>	Manuf-acturing	Built Environ-ment	Trade & Connectivit-y	Essential Domestic Services	Modern Services	Lifestyl-e
Gender	1										
Age	-0.226865915	1									
Autonom-ous vs Non-Aut-onomous Graduate	-0.3015113446	-0.001020935031	1								
Highest Educatio-n	-0.09325048082	0.08430567107	0.7591341021	1							
Years of Working Experi-ence	-0.3015113446	0.7057578022	-0.1168831169	-0.1325472242	1						
Manufact-uring	0.1490711985	-0.3134583129	0.0449466575	0.1251086484	-0.2504170918	1					
Built Environ-ment	0.1690308509	-0.1871579066	-0.1528941574	-0.4255796194	-0.1383328091	-0.0755928946	1				

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Trade & Connectivity	0	0.3878 47942 9	0.02634316849	0.073325 99104	0.1091359 837	-0.2735 126328	-0.103378 0581	1			
Essential Domestic Services	-0.100503781 5	0.0826 95737 52	0.2121212121	-0.084348 23357	0.0649350 6494	-0.1348 399725	-0.050964 71914	-0.18440217 94	1		
Modern Services	0.0701862406 3	-0.133 32429 34	0.06348584335	0.176712 3185	0.1420873 637	-0.2197 176872	-0.083045 47985	-0.30047781 55	-0.14813 36345	1	
Lifestyle	-0.100503781 5	0.0826 95737 52	-0.0303030303	0.028116 07786	0.0649350 6494	-0.1348 399725	-0.050964 71914	-0.18440217 94	-0.09090 909091	-0.1481 336345	1

NOTE. - The table reports the collinearity between variables. The highlighted values signify a high level of collinearity.

TABLE 5
REGRESSION RESULTS

	Model 1	Model 2
	Salary	Salary
Gender(Male)	-59.69 (273.58)	14.83 (288.56)
Age	83.843** (25.694)	
Autonomous vs Non-Autonomous Graduate	-5.62 (265.01)	
Highest Education	537.54** (258.85)	746.27** (158.92)
Years of Working	58.05	456.30**

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Experience	(151.85)	(112.69)
Industry		
Manufacturing	-641.20	-1111.46
	(613.70)	(669.86)
Trade & Connectivity	192.28	245.60
	(549.99)	(631.40)
Essential Domestic Services	-559.54	-705.15
	(633.438)	(734.28)
Modern Services	-895.89	-1589.05**
	(633.89)	(668.23)
Lifestyle	-529.15	-978.18
	(642.38)	(690.21)
N	36	36
adj. R ²	0.72	0.62
F	11.73	8.12
Sargan test (p-value)	1.574e-06	1.553E-05

NOTE. - The table reports the effects of whether having a degree is linked to a higher salary

All monetary values are in SG\$

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Following the regression table, we conducted a collinearity test to determine if any of the variables demonstrate a high level of collinearity with each other. Referring to Table 5, it was found that Age and Years of Working Experience demonstrate a high level of collinearity at a value of 0.71. The variables Autonomous vs Non-Autonomous Graduates and Highest Education demonstrate an even higher level of collinearity at 0.75. Leaving these two variables in our regression would cause inaccuracies in the interpretation of data. As such, we are opting to include a separate model in regression that omits the variables Age and Autonomous vs Non-Autonomous Graduates.

For Age, we can observe that an increase of age by 1 year would result in an increase of SG\$83.84. Certainly, this observation is expected as with age comes experience and older employees tend to be holding higher positions in their respective companies. However, we have identified that age and years of experience showcase a high level of collinearity - thus it was removed from our second model.

For Highest Education attained, for every tier increased in education, a worker can expect to earn SG\$537.54 more. This is in line with model 2. However, in model 2, when not accounting for Age and Autonomous vs Non-Autonomous Graduate, the amount is increased to SG\$746.27. This relationship is expected as generally, higher-paying jobs are awarded to persons with higher qualifications as shown in our literature review. The findings from both models are statistically significant indicating that it is a strong indicator of higher salary earnings.

As for years of working experience, it is found that with every year increased, a worker can expect to earn SG\$58.05 more. This trend is similar across both model 2 as well. In model 2, the salary increased from one year of additional working experience is found to

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increase to SG\$746.27. Since model 2 accounts for collinearity, the value obtained should be closer to expected. The data for this variable is also found to be statistically significant in both models indicating that it is a strong indicator of higher salary earnings.

Secondary data

Secondary data was retrieved from Data.gov.sg where a sample of 72 Singaporeans' salaries and highest qualification was attained. We cleansed the data by categorizing the highest qualification variable into two groups: 0 represents respondents with no degree and 1 represents respondents with degrees. This section discusses the preliminary results of the secondary data using the proposed data analysis methods: T-Test and correlation. As aforementioned, we would be comparing our primary results with the findings of the secondary results.

TABLE 6
DESCRIPTIVE STATISTICS

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Degree ^a	16	10702.75	7915.05	1025	29482
No Degree ^b	56	8119.18	6261.54	1389	27523

NOTE. - All monetary values are in SG\$

^aDegree refers to an individual possessing a university degree

^bNo Degree refers to an individual not possessing a university degree

T-Test

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The T-test analysis method was used to determine if there are any significant differences in salary between the two groups in the secondary data, respondents with university degrees and respondents with no university degrees. Our findings are as follows:

TABLE 7

T-TEST: TWO-SAMPLE ASSUMING UNEQUAL VARIANCES

	No Degree	Degree
Mean	7352.43	13386.38
Variance	32122235.16	63957226.38
Observations	56	16
Degrees of Freedom	20	

One-Tailed P-Value	0.005265	
Two-Tailed P-Value	0.01052513	

NOTE. - All monetary values are in SG\$

The T-test analysis method was used to determine if there are significant differences in the salaries between the two groups, individuals with University degrees and no University

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degrees. The p-value calculated stands at 0.005265, which is lower than the significant value of 0.05. Thus, we reject the null hypothesis that having a university degree has no impact on individuals' salaries. Hence, we conclude that there is a difference in salary between individuals with no degrees and individuals with degrees. This result was not surprising as it aligned with the literature analysis.

Correlation

We conducted a correlation test between the two variables: salary and whether the respondents have a degree or do not have a degree. The correlation will help understand the extent to which the two variables are related and the direction of the relationship.

TABLE 8
CORRELATION

	Salary	Degree ^a or no degree ^b
Salary	1	
Degree ^a or no degree ^b	0.377513661162116	1

NOTE. - ^aDegree refers to an individual possessing a university degree

^bNo degree refers to an individual not possessing a university degree

The correlation value of 0.37752 indicates a positive relationship. Hence, as the level of education improves from not having a university degree to attaining a university degree, salary will increase.

Conclusion

Both the primary and secondary data suggest that attaining a university degree does lead to higher education. There is a significant difference in salary increase when one upgrades their education level versus the rise in years of experience in the workforce. However, we encourage companies to increase the salary for non-university degree holders as they possess expertise that a fresh graduate does not. Contrary to all our other results, the 2-way ANOVA test results showed that attaining a university degree does not increase one's monthly salary. This could be due to the lack of diversity in our sample. Hence, we would be leaving this portion to future studies where we can collect a greater, diversified sample to reanalyze the data via ANOVA test. To conclude, our analysis lends strong support to reject the null hypothesis that a university degree does not lead to higher earnings. This suggests that despite the growing issue of degree inflation in Singapore, a university degree is still an investment for higher earnings compared to their non-degree counterparts.

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Appendix A: Survey Questionnaire Page 1**University Degree vs Work Experience Questionnaire**

A group of Embry-Riddle Aeronautical University students wishing to gain an insight on the importance of a University Degree during the present day.

What is your biological gender?

 Male Female

What is your age?

Marital Status

 Single Married Widowed Divorced

What is your ethnicity?

 Chinese Malay Indian Eurasian Others

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Appendix B: Survey Questionnaire Page 2

What is your highest educational qualification?

No Education

Primary School Leaving Examination (PSLE)

Secondary School

Tertiary Education (Diploma / 'A' Levels)

University Degree

Did you graduate from an autonomous or non-autonomous University? (If Applicable)

Autonomous

Non-Autonomous

Is your study of degree relevant to your field of work? (If Applicable)

Yes

No

What is/was your starting salary?

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Appendix C: Survey Questionnaire Page 3

Which industry did you start your career in?

Manufacturing

Built environment

Trade & Connectivity

Essential Domestic Services

Modern Services

Lifestyle

What is your current salary (if different from starting salary)

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Appendix D: Survey Questionnaire Page 4

Which industry do you currently work in? (If Applicable)

Manufacturing

Built environment

Trade & Connectivity

Essential Domestic Services

Modern Services

Lifestyle

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Appendix E: Survey Questionnaire Page 5

How many years of working experience do you have?

No Working Experience

0 - 2 Years

2 - 4 Years

> 4 Years

Do you have other sources of income?

No

Yes (Please Specify)

Has your University degree paid off? (For University degree holders)

Yes

No

If you had to start all over again, would you have prioritised attaining a University degree instead of work experience? (For non-University degree holders)

Yes

No

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Appendix F



Appendix G

GOT A MINUTE?

COMPLETE A
QUICK
SURVEY

AND STAND A CHANCE TO WIN

→ **A GIFT CARD!**

**UNIVERSITY DEGREE VS
WORK EXPERIENCE**

A group of Embry-Riddle
Aeronautical University students
wishing to gain an insight on the
importance of a university
degree during the present day



for more information visit the link

