

*Wage Premiums for Workers With Graduate Degrees:
A Comparative Study of Nine Asian Countries*

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Abstract

This study explores the changes in wage premiums of highly educated employees by gender in major Asian cities in 2019 and 2022. In 2022, the percentage of highly educated employees decreased in some countries amid the COVID-19 pandemic. Parts of the wage premium are explained by wage increases in large firms, managerial positions, and industries to which highly educated employees contribute. Further, the wages of highly educated female employees might have been more affected by the COVID-19 pandemic than those of male employees in 2022. India did not have a robust wage premium, especially in 2022.

Keywords: Highly Educated Employees, Wage Premium, Impact of the COVID-19 Pandemic, Asian Countries

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Introduction

The number of younger workers with higher educational qualifications in developing Asian countries has increased. Marouani and Nilsson (2016) emphasize a tendency toward higher educational attainment in Malaysia, and Kasahara et al. (2016) confirm the increase in higher educational attainment in Indonesia. Truong et al. (2021) mention that access to higher education is growing faster than the populations in Vietnam, Indonesia, and Thailand. Chi et al. (2011) indicate that as the proportion of educated workers increases, the mean income and dispersion of earnings should increase because educated workers tend to receive higher wages. The aforementioned studies discuss the popularization of higher education at a national level. However, it is important to examine earnings inequality in rural and urban settings separately, particularly in Asian countries (Chi et al., 2011), where highly educated workers tend to concentrate in metropolitan areas.

Based on this literature, we estimate the wage premiums of highly educated employees using data from major cities in nine Asian countries: Japan, China, South Korea, India, Thailand, Malaysia, Vietnam, the Philippines, and Indonesia. This is the first study to compare the wage premiums by gender in each country considering the impact of the COVID-19 pandemic between 2019 (before the COVID-19 pandemic) and 2022 (during the COVID-19 pandemic).

In Japan, Yasui (2019) shows that the wage premium for female Japanese postgraduates has been rising. Shimoyama and Murata (2019) show that the wage premium gap between university graduates and postgraduates for less educated employees in Japan varies across industries. Shiga et al. (2022) find that around 30% of the postgraduate wage premium in Japan can be explained by the type of undergraduate school, type and rank of the graduating university, cognitive ability indicators, and parents' education level.

Fleisher et al. (2011) indicate that the effect of schooling on productivity is the highest among foreign-invested firms in China. Chi et al. (2011) mention that Chinese urban employees changed substantially from 1987 to 2004, with a major shift in employment from state-owned enterprises to private, foreign, and joint venture companies. Rong and Wu (2022) find that the wage premium for professional jobs is higher among highly educated industrial employees in China than among those in non-professional jobs.

Warunsiri and McNown (2010) confirm that the return on education is higher for female employees than male employees, while unmarried employees show higher returns than married ones in Thailand. Tran and Van Vu (2020) find that humanities graduates earn higher earnings than graduates from scientific or business disciplines in Vietnam. Kenayathulla (2013) identifies private returns on years of schooling for male and female employees in Malaysia.

Research has also accumulated on gender differences in wage premiums. Mohanty (2021) finds that female employees with technical diplomas face a sticky floor effect, while women with technical degrees face both sticky floor and glass ceiling effects. Mohanty (2021) also indicates that lower attachment to the labor market, marriage, and the presence of children are key factors explaining women's lower labor market rewards compared to men. Deshpande et al. (2018) also find a gender wage gap among salaried employees in India.

Gustafsson and Wan (2020) mention that the gender wage gap widened rapidly between 1995 and 2007 in urban China. Tromp (2019) points out that reductions in Korean differences by gender in tenure, regular employee status, education, and occupation are associated with a fall

in the wage gap. However, these variables continue to play an important role in the 2016 wage gap. Suharyono and Digdowiseiso (2021) find that the strongest impact of education on wages by gender can be found at the college level and above in Indonesia.

Furthermore, some studies have been published examining the impact of the COVID-19 pandemic. Putra et al. (2023) find that income loss and job loss are prominent among male, younger, and less educated people as well as among self-employed and part-time non-agricultural workers in India. Dang et al. (2023) find post-pandemic increases in unemployment and temporary layoff rates alongside decreases in employment quality in Vietnam. They also find that monthly wages decline even as the proportion of workers receiving below-minimum wages substantially increases, contributing to sharply rising wage inequality. Furthermore, Dang et al. (2021) point out that the gender difference in the effects of the COVID-19 pandemic on job loss is larger in China than in Japan and South Korea. Ardiyono (2022) finds that labor reduction is slower in Indonesia than Vietnam.

Based on the results of these previous studies, our unique contribution is to focus on highly educated employees in major cities in nine Asian countries and to compare the wage premiums of university graduates and postgraduates using the latest dataset and considering the impact of the COVID-19 pandemic on these wage premiums.

Data and Method

The data used for the analysis are individual data from the 2019 APAC Employment Status and Growth Attitudes Survey and the 2022 Global Employment Status and Growth Attitudes Survey, conducted by the Japanese think tank, Parsons Research Institute. The data are provided by the Center for Social Research and Data Archives, Institute of Social Science, The University of Tokyo. These surveys were conducted in February 2019–March 2019 and February 2022–March 2022, respectively, covering workers in the nine countries of Japan, China, South Korea, India, Thailand, Malaysia, Vietnam, the Philippines, and Indonesia. There are 15 major cities included: Tokyo, Osaka, and Aichi (Japan); Beijing, Shanghai, and Guangzhou (China); Seoul (South Korea); New Delhi and Mumbai (India); Bangkok (Thailand); Kuala Lumpur (Malaysia); Hanoi and Ho Chi Minh City (Vietnam); Manila (the Philippines); and Jakarta (Indonesia).

The survey was conducted among men and women aged 20–69 years. In each country, 500 male and 500 female samples were collected with equal allocation by gender and age as well as a gradual allocation to avoid income bias.

The analysis target is employed individuals (including directors, civil servants, and professionals) aged under 55 years who had graduated with their highest qualification, considering the retirement age in each country. We used an ordinary least squares analysis, in which the dependent variable is the logarithm of annual earnings converted into US dollars using the exchange rate at the time of the survey. Using data from 2019 and 2022, this study provides a comparative analysis, by country and gender, of how the premium for highly educated individuals changed during the COVID-19 pandemic.

In this study, we estimate the equations for Models 1–5 with log annual earnings as the dependent variable, adding explanatory variables sequentially in each model and examining how the coefficients of the dummy variables of university and postgraduate degrees change. This method is also used by Shiga et al. (2022). Model 1 is a basic analysis with explanatory

variables including university degree dummy, postgraduate degree dummy, age, age squared, months of tenure, and months of tenure squared. Model 2 adds dummies as explanatory variables for regular employees, managers, directors, civil servants, and professionals. Model 3 adds a foreign-affiliated dummy and large company dummy as explanatory variables. Model 4 adds 20 industrial classification dummies. Model 5 adds a married dummy and number of children as explanatory variables. Our analysis examines the characteristics of the wage premium for highly educated employees in major Asian cities by comparing changes in the coefficients from Models 1–5 across the two-year points and by gender.

The estimating equations for each model are as follows: $university_i$ is the university dummy and $postgraduates_i$ is the graduate school dummy. We focus on the changes in the two coefficients of β_1 and β_2 . The explanatory variables W_i in Model 2, X_i in Model 3, Y_i in Model 4, and Z_i in Model 5 are the set of variables to be added. α is the intercept, and ε_i is the residual in each equation.

Model 1

$$\log earnings_i = \alpha + \beta_1 university_i + \beta_2 postgraduates_i + \beta_3 age_i + \beta_4 age_i^2 + \beta_5 tenure_i + \beta_6 tenure_i^2 + \varepsilon_i$$

Model 2

$$\log earnings_i = \alpha + \beta_1 university_i + \beta_2 postgraduates_i + \beta_3 age_i + \beta_4 age_i^2 + \beta_5 tenure_i + \beta_6 tenure_i^2 + \beta_7 W_i + \varepsilon_i$$

Model 3

$$\log earnings_i = \alpha + \beta_1 university_i + \beta_2 postgraduates_i + \beta_3 age_i + \beta_4 age_i^2 + \beta_5 tenure_i + \beta_6 tenure_i^2 + \beta_7 W_i + \beta_8 X_i + \varepsilon_i$$

Model 4

$$\log earnings_i = \alpha + \beta_1 university_i + \beta_2 postgraduates_i + \beta_3 age_i + \beta_4 age_i^2 + \beta_5 tenure_i + \beta_6 tenure_i^2 + \beta_7 W_i + \beta_8 X_i + \beta_9 Y_i + \varepsilon_i$$

Model 5

$$\log earnings_i = \alpha + \beta_1 university_i + \beta_2 postgraduates_i + \beta_3 age_i + \beta_4 age_i^2 + \beta_5 tenure_i + \beta_6 tenure_i^2 + \beta_7 W_i + \beta_8 X_i + \beta_9 Y_i + \beta_{10} Z_i + \varepsilon_i$$

Descriptive Statistics

Table 1 shows the percentage of respondents by gender with a higher education qualification (university, postgraduate degree, and total) as their highest education level for the nine countries. Table 1 reveals the following characteristics. First, India has the highest ratio of postgraduates, while the Philippines had the highest ratio of university graduates for both genders during both years. Second, India had the highest ratio of highly educated employees overall, while Japan had the lowest, especially in 2019. In India, more than 80% of employees were highly educated in both 2019 and 2022, and the proportion of female postgraduates was

higher than that of male postgraduates. Third, the proportion of women with higher education was lower than that of men in Japan and South Korea in 2019 and 2022.

Table 1 also shows that the total percentage of men and women with higher education decreased in China, India, Thailand, and Indonesia. Unemployment among highly educated young adults is a problem in these countries. Katayama (2023) indicates that in China, in 2022, the unemployment rate for young people (ages 16–24 years) exceeded 15%, and the problem was more serious for those with higher education. She indicates that the COVID-19 pandemic further increased the desire among young Chinese individuals to work for state-owned enterprises and government agencies, which offer greater stability, amid intensified competition among jobseekers. According to International Labor Organization (ILO) statistics published by Global Note (2024), in 2022, China’s unemployment rate for young people (15–24 years) was 15.9%, India’s was 17.5%, and Indonesia’s was 14.4%. The unemployment rate for young people in each of these three countries was relatively high. In 2019, Thailand’s unemployment rate for young people was 3.5%, which is lower than that of China, India, and Indonesia, although it increased slightly to 3.9% in 2022. The increase in the number of highly educated people is inferred to have caused serious unemployment problems due to job mismatches during the COVID-19 pandemic in these countries.

Table 1: Percentage of Highly Educated Employees in 2019 (top) and 2022 (bottom)

Sex	Degree	Japan	China	Korea	India	Thailand	Malaysia	Vietnam	Philippines	Indonesia
Men	University	55.034	71.818	71.233	40.972	65.000	48.857	72.183	78.641	60.000
	Graduate	11.409	8.788	16.438	52.431	10.625	21.429	13.028	8.414	6.032
	Total	66.443	80.606	87.671	93.403	75.625	70.286	85.211	87.055	66.032
Women	University	45.806	72.222	69.831	28.912	72.455	49.558	74.315	78.077	75.667
	Graduate	4.516	14.327	11.525	69.048	11.677	20.649	8.904	6.923	7.667
	Total	50.323	86.550	81.356	97.959	84.132	70.206	83.219	85.000	83.333

Sex	Degree	Japan	China	Korea	India	Thailand	Malaysia	Vietnam	Philippines	Indonesia
Men	University	59.498	65.217	72.165	39.085	57.328	50.530	66.429	77.912	51.639
	Graduate	9.319	6.522	14.089	42.254	12.931	12.721	11.786	3.213	7.787
	Total	68.817	71.739	86.254	81.338	70.259	63.251	78.214	81.125	59.426
Women	University	58.228	54.110	67.491	40.976	63.273	58.917	79.048	82.222	62.295
	Graduate	5.063	5.479	8.834	53.171	8.000	17.834	6.349	3.889	10.656
	Total	63.291	59.589	76.325	94.146	71.273	76.752	85.397	86.111	72.951

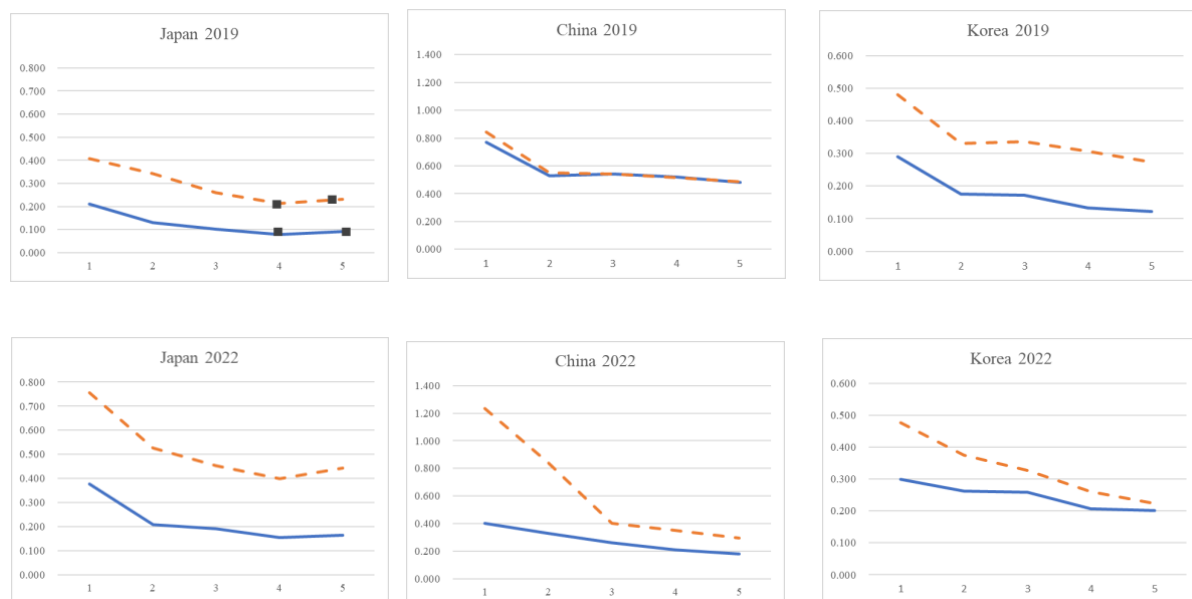
Analysis Results

The next step is to capture the changes in the coefficients resulting from a graph analysis. Figures 1 and 2 show the coefficients for the university dummy (solid line) and graduate school dummy (dashed line) in Models 1–5 by gender. These graphs are arranged vertically by country, to compare the coefficient changes between 2019 and 2022. Squares (■) on the lines indicate that the coefficients are not significant at the 10% significant level. Most graphs exhibit a downward-right curve. This indicates that the effects of university and graduate degree dummies are weakened by adding explanatory variables to each model. In other words, some of the effects (magnitudes of the coefficients) of the university and graduate degree dummies in Model 1 shifted to the effects of the variables added from Models 2–5, resulting in decreases of the coefficients of the two-degree dummies.

First, to confirm the extent of the decline in the slope of the coefficients for men in Figure 1, the coefficients decline significantly from Models 1 to 2 or 3, with the clear exception of India (except for the 2019 postgraduates), Vietnam, and the 2022 university graduates of Philippines. In other words, the wage (annual earnings) premium for the university and postgraduate graduates is largely explained by attribution to the variables of regular employees, managers, executives, civil servants, and professionals that we add in Model 2 and foreign-affiliated firms and large firms in Model 3. However, the industries added in Model 4 and the marital status and number of children added in Model 5 have little to do with university and graduate school premiums.

By contrast, for women in Figure 2, except for India (excluding graduate school in 2022), Vietnam (excluding 2019), and the Philippines (excluding 2019), the coefficients decline from Models 1 to 2 or 3, so that for men, the variables added in Models 2 and 3 can partially explain the premiums of highly educated employees in the nine countries.

Next, by comparing the change in coefficients between 2019 and 2022 for males in Figure 1, the following two features can be observed. First, both the university and the graduate school premiums are robust during the COVID-19 pandemic in five countries: Japan, China, Thailand, Malaysia, and the Philippines. Second, the postgraduate advantage declines remarkably in Vietnam in 2022, when all coefficients are no longer significant and have a negative sign. India no longer shows differences in the coefficients between university and graduate school, and Indonesia is no longer significant in the last model estimate.



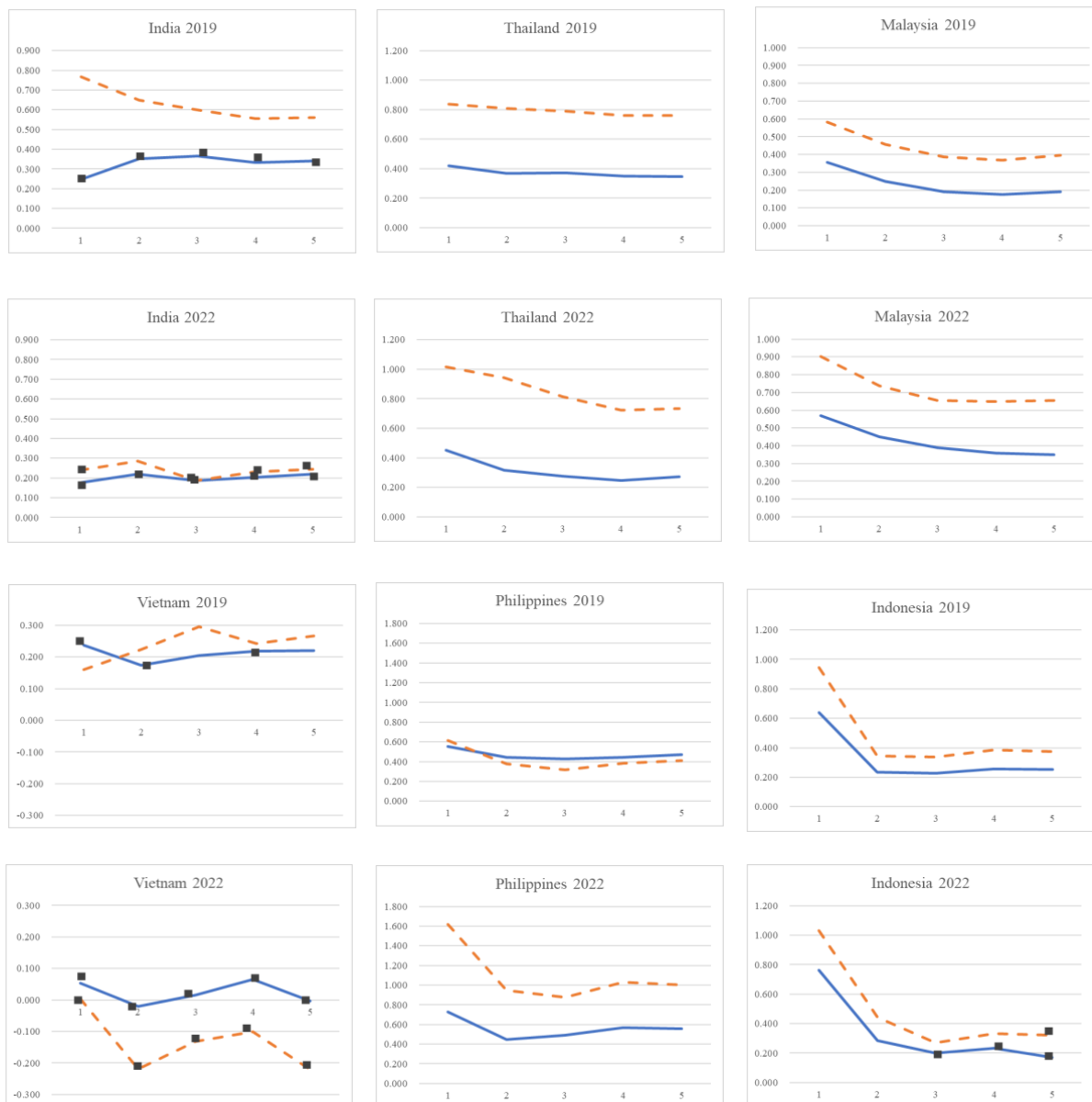


Figure 1: Wage premium for highly educated male employees (The vertical scale shows the magnitude of the coefficients and the horizontal scale shows the model number)

Note: ■ means the coefficient is not significant at the 10% level.

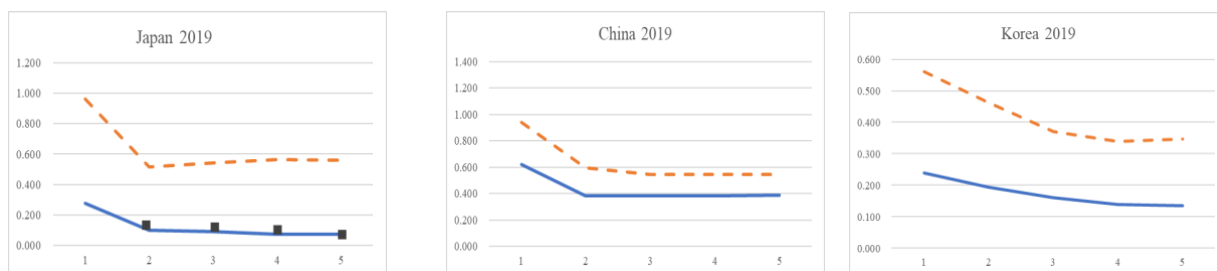




Figure 2: Wage premium for highly educated female employees (The vertical scale shows the magnitude of the coefficients and the horizontal scale shows the model number)
 Note: ■ means the coefficient is not significant at the 10% level.

Based on the above results, we confirm the characteristics of female employees, as shown in Figure 2. First, for Japan and Korea, the advantage of a postgraduate degree declines slightly,

but the premiums for university and postgraduate degrees are relatively robust in these two countries as well as China and Malaysia. Second, in Vietnam, like the case for men, the coefficients for undergraduates and postgraduates decrease and are no longer significant by 2022. Third, some of the coefficients are no longer significant for India, Thailand, the Philippines, and Indonesia, with Thailand showing a large drop in the coefficient for postgraduates in 2022.

Conclusion

This study compares the wage premiums of highly educated employees using data from major cities in nine Asian countries: Japan, China, South Korea, India, Thailand, Malaysia, Vietnam, the Philippines, and Indonesia. This is the first attempt to compare the wage premiums by gender in each country considering the impact of the COVID-19 pandemic in 2019 (before the COVID-19 pandemic) and 2022 (during the COVID-19 pandemic).

First, we reveal that the total percentage of male and female employees with higher education decreased in China, India, Thailand, and Indonesia. Unemployment among highly educated young adults is a major problem in these four countries. The increase in highly educated people is inferred to cause serious unemployment problems due to job mismatches during the COVID-19 pandemic in these countries.

Second, the analysis shows that some wage premiums can be explained by differences in employee attributes, such as regular employees, managers, foreign-affiliated companies, and large companies. However, the advantage of graduate degrees over university degrees decreased in some countries during the COVID-19 pandemic in 2022.

Third, India and Vietnam showed an increase in the non-significant coefficients for the effects of university and postgraduate dummies for men and women. In both countries, we confirm that the difference in mean annual earnings by education level narrowed in 2022, suggesting that the decline in the coefficients of several firm attributes led to lower wage premiums for highly educated employees. We also confirm that university graduates were more affected by the COVID-19 pandemic in 2022 than postgraduates, and female employees were more affected than male employees.

Only three countries—Japan, Korea, and Malaysia—maintained significant postgraduate wage premiums for both genders in 2019 and 2022 and four countries—China, Korea, Thailand, and Malaysia—have significant university graduate wage premiums for both genders in 2019 and 2022. Our analysis reveals that the growing number of highly educated Asian employees do not establish stable position for employment and wages enough to withstand economic shocks during emergencies such as the COVID-19 pandemic. In other words, it is a critical policy challenge to ensure stable and sufficient employment and wages for the growing number of highly educated workers.

Our study contributes to the literature by using the most recent data to examine the wage premiums of highly educated employees in urban areas in nine Asian countries, including the impact of the COVID-19 pandemic. Our results show that the percentage of highly educated employees and their attributes vary widely in Asian countries and possibly are a factor behind

the different changes of wage premiums during the COVID-19 pandemic in these countries. The results of this study should be verified in detail in future studies. Further work should also include securing sufficient samples and incorporating covariates, which this study does not address.

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