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HIGH-EDUCATED WORKFORCE MIGRATION: CASE STUDY OF NEW ZEALAND

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Abstract

Research and education opportunities in New Zealand are very high. The country has educational institutions of international popularity with a wide variety of world-class programs. The appeal of New Zealand's education system is further enhanced by scholarships and funding options for overseas students. Highly educated individuals seeking to advance their academic and professional goals are invited to the stimulating research environment created by collaborative research initiatives, alliances with industry, and access to cutting-edge facilities and resources. Because of these attractive factors, New Zealand has become a desirable destination for highly educated workers. First of all, the country's high quality of life and work-life balance is a major attraction for professionals. New Zealand offers a unique lifestyle due to its stunning natural scenery, energetic cities and strong focus on leisure activities. The aim of this study is to examine the phenomenon of highly educated workers migrating, sometimes called brain gain or brain drain, in relation to New Zealand. It examines the pull factors from their home country, the pull factors that attract highly educated people to New Zealand, and the effects of this migration on both their homeland and New Zealand. The research also looks at the idea of brain gain through return migration and how overseas students impact the local labour market. Government actions and initiatives aimed at retaining highly educated workers and maximizing the advantages of migration are also covered. By assessing these factors, the research provides insight into the dynamics of highly educated worker migration in New Zealand.

Keywords: *Labor Migration, Wages, Economic Growth, Employment Opportunity Rate.*

YÜKSEK EĞİTİMLİ İŞGÜCÜ GÖÇÜ: YENİ ZELANDA ÖRNEK İNCELEMESİ

Öz

Yeni Zelanda'da araştırma ve eğitim olanakları çok yüksektir. Ülke, çok çeşitli dünya standartlarında programlara sahip uluslararası popülerlikte eğitim kurumlarına sahiptir. Yeni Zelanda'nın eğitim sisteminin cazibesi, denizaşırı

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öğrencilere yönelik burs ve finansman seçenekleriyle daha da artmaktadır. Akademik ve profesyonel hedeflerini ilerletmek isteyen yüksek eğitimli bireyler, iş birliğine dayalı araştırma girişimleri, sanayi ile ittifaklar ve son teknoloji tesis ve kaynaklara erişimin yarattığı teşvik edici araştırma ortamına davet edilmektedir. Bu cazip faktörler nedeniyle Yeni Zelanda, yüksek eğitimli çalışanlar için cazip bir yer haline gelmiştir. Her şeyden önce, ülkedeki yüksek yaşam kalitesi ve iş-yaşam dengesi profesyoneller için önemli bir cazibe merkezidir. Yeni Zelanda, çarpıcı doğal manzarası, enerjik şehirleri ve boş zaman faaliyetlerine güçlü bir şekilde odaklanması nedeniyle benzersiz bir yaşam tarzı sunmaktadır. Bu çalışmanın amacı, bazen kişilerin geri kazanımı veya beyin göçü olarak da adlandırılan yüksek eğitimli çalışanların göç etmesi olgusunu Yeni Zelanda bağlamında incelemektir. Araştırma, yüksek eğitimli kişileri Yeni Zelanda'ya çeken faktörleri ve bu göçün hem anavatanları hem de Yeni Zelanda üzerindeki etkilerini incelemektedir. Araştırma aynı zamanda geriye göç yoluyla kişilerin geri kazanımı fikrini ve denizaşırı öğrencilerin yerel işgücü piyasasını nasıl etkilediğini de incelemektedir. Yüksek eğitimli çalışanları elde tutmayı ve göçün avantajlarını en üst düzeye çıkarmayı amaçlayan hükümet eylemleri ve girişimleri de ele alınmaktadır. Araştırma, bu faktörleri değerlendirerek Yeni Zelanda'daki yüksek eğitimli işçi göçünün dinamikleri hakkında fikir vermektedir.

Anahtar Kelimeler: *Emek Göçü, Ücretler, Ekonomik Büyüme, İstihdam Fırsat Oranı*.

Introduction

The best possible allocation or use of the resources available is essential to a nation's economic progress. Natural resources, capital assets (such as land, money, and equipment), and human capital assets are some of these resources (Stiglitz et al., 2018). Population migration behaviour in the context of human resource development (HRD) is motivated by strategies to overcome obstacles or a lack of necessary resources needed to advance knowledge and skills, which can then become assets to increase one's income potential and competitiveness in the job market (Diao et al., 2018). Additionally, there are two primary methods to raise a person's quality of living: by raising their educational level and by shifting their regional economic conditions through migration (Blunch and Laderchi, 2015). Urbanization, or the growing migration of people, especially from rural to urban regions, is a result of Indonesia's industrialisation and urban area growth. Urbanization, or the movement of people from rural areas to cities, is one kind of population migration that is motivated by the desire for a higher quality of life. Urbanization is a result of the social, economic, and living conditions in rural and urban regions that differ from one another, particularly in Indonesia's industrial zones.

Industrialization significantly impacts how the job structure has changed in the setting of activities (Ateş, 2008). Successful industrialisation can then drive the growth of urbanization. Rural industrialization is viewed as a transformation of the local economic structure defined by a movement in employment from the agriculture to the industrial sectors (Faggian and

McCann, 2009). Rural economic sectors are transformed into urban economic activity as a result of the industrialization of rural regions (Engbersen, G. and Okólski, 2012).

Individual migration decisions, according to Lee (1996), are influenced by both push and pull influences. Push factors are associated with regional disparities in economic development and infrastructure. For instance, relative to rising unemployment rates, income gaps across regions, deplorable economic conditions in the place of origin, and educational levels, high population density results in few work options. On the other hand, pull factors are linked to the migration of workers from areas with poor economic development to those with strong economic growth. This includes the existence of numerous amenities in the destination location that increase worker productivity, as well as the availability of more employment possibilities, higher earnings, good environmental conditions, and favourable environmental conditions. Therefore, the pull factors for those with higher education are things like work prospects, a decent infrastructure, earnings, and a higher standard of living.

The development of human resources and economic expansion in migration destination regions depend heavily on the accumulation of human capital contributed by highly educated migrant workers (Ciriaci, 2009). By giving the local people and economy more purchasing power, the presence of highly educated migrant workers promotes economic growth. Furthermore, the presence of highly educated migrants contributes to local population knowledge growth, human capital expansion, and improved availability and accessibility of social services (Goujon and Samir, 2008). Furthermore, an area with a high concentration of human capital may be better protected when it faces perilous economic circumstances (Corcoran et al., 2010).

The destination regions are negatively impacted by the flood of highly educated migrants. The downsides of the influx of highly educated migrants are less obvious than the upsides, but at least certain demographic groups in the destination regions might possibly lose out as a result of the highly educated migrants moving into their neighbourhoods. The entry of highly educated workers, which would increase the supply of labour and at the same time the demand for essential needs, could have negative effects on the local economy. These highly educated workers would increase the supply of labour and at the same time the demand for essential needs. Furthermore, the regional variety that, if not well handled, can result in disputes and mistrust between population groups will be impacted by the presence of highly educated migrant workers from different sociocultural backgrounds than the local population.

The appearance of migrants exhibits unpredictable migratory patterns, flexibility, and brief, circular, or repeated motions (Li et al., 2012). Migrations from highly educated or skilled backgrounds are directly related to such territorial movements. Migrants migrate with the intention of acquiring assets,

such as educational qualifications and a variety of job experiences, which improve their capacity to relocate to other places offering greater economic prospects.

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One such example is New Zealand. Historically a country that welcomed immigrants, it quickly shifted the emphasis of its immigration policy to a general- and/or occupational skills concept as the arguments for a growing need for "skilled" workers started to take shape. Despite worries about a "brain drain" caused by skilled workers leaving the country, the arguments frequently referred to the positive distributional effects of "skilled" immigration and the notion that people with in-demand skills adapt quickly to domestic labour market conditions and are more likely to significantly contribute to economic growth.

In the 20 years leading up to 2022, employment in New Zealand has grown by 50%. Two factors contributed to this: first, the working-age population increased by 36% (i.e., there were more people of working age); and second, a higher percentage of persons of working age were employed (69% vs. 63% in 2002). Population increase and labour force utilisation were both influenced by several reasons (Alimi et al., 2022).

1. HIGH-EDUCATED WORKERS' PULL FACTORS FOR NEW ZEALAND

Due to a number of strong pull factors, New Zealand has become a desirable location for highly educated employees. First off, the great quality of life and work-life balance in the nation are a major draw for professionals. New Zealand provides an unmatched lifestyle because of its stunning natural scenery, energetic cities, and a strong focus on leisure time activities. Initiatives for work-life balance, such as flexible scheduling and friendly culture, also help to better integrate personal and professional lives.

Second, there are numerous job prospects in important industries thanks to New Zealand's vibrant and varied economy. One of the main industries that draw highly educated employees is the healthcare and medical sector, followed by engineering and technology, information technology and digital innovation, education and academics, and research and development. For

professionals looking for employment opportunities, New Zealand is a desirable location since these industries not only provide exciting and fulfilling careers but also opportunities for growth and progress.

The chances for research and education in New Zealand are very well-rated. Internationally famous educational institutions with a wide range of top-notch programs are located in the nation. The attraction of New Zealand's educational system is further increased by scholarships and funding options for overseas students. High-educated people seeking to advance their academic and professional goals are drawn to the stimulating research environment created by collaborative research initiatives, alliances with industry, and access to state-of-the-art facilities and resources.

High-educated employees find New Zealand attractive because of its well-known reputation for having a kind and inclusive culture. The nation encourages multiculturalism and variety, creating a setting that encourages cooperation, innovation, and creativity. New Zealand is an appealing option for professionals looking for stability and a good level of life because of the robust social welfare system, universal healthcare, and safety that all contribute to a sense of security and well-being for both people and their families.

2. COMPREHENSIVE ANALYSIS OF THE SIGNIFICANCE AND INNOVATIONS IN THE IMPACT OF AN EDUCATED WORKFORCE ON ECONOMIC GROWTH

The different ways in which education promotes economic prosperity have been thoroughly examined in relation to the effect of a well-educated workforce on economic growth. Education is a key factor in economic growth because it gives people the opportunity to pursue high-paying careers and raise worker productivity as a whole (Borjas, 2015). An educated workforce has positive effects on both people and companies as well as the economy as a whole. Studies have demonstrated that investing in education has financial benefits since greater levels of education are linked to better salaries for people (Sjaastad, 1962; Borjas, 2015). Furthermore, a highly educated workforce fosters innovation in the work industry, resulting in higher productivity and economic expansion. Businesses understand the value of having educated employees and may decide to move to places where the workforce is more educated, highlighting the economic relevance of education (Farooq and Bakhadirov, 2022). Because education leads to higher gross domestic product and better productivity, states with a larger percentage of educated employees are more likely to enjoy economic growth (Hewitt and Wield,1992, Mithas and Krishnan, 2008). The relationship between education and income shows that states may grow their economies over time by hiring more educated employees, underscoring the need to prioritize education spending to boost economic competitiveness (Kruk et al., 2018).

A well-educated workforce is vital for economic growth and development since spending on education boosts state economies and draws high-wage firms. The idea that education is essential for promoting economic success at both the individual and social levels is supported by a thorough review of how an educated workforce affects economic growth (Blundell et al., 1999; Raghupathi and Raghupathi, 2020).

Researchers employed a quantitative approach as their research strategy. Explanatory research, also known as descriptive or hypothesis-based research, is the method used in this study. The information gathered for this study was obtained from the Central Statistics Agency and includes information on the movement of a highly educated workforce into 57 industrial districts and municipality regions in New Zealand. The same source also provided information on issues including minimum salaries, economic growth, and employment rates that influence the movement of highly qualified workers to industrial districts and municipal regions.

Cross-sectional and time-series data are combined to form panel data. Using repeated observations on a certain issue across a variety of time periods, this panel data is utilized to uncover key factors. This approach is used to comprehend how a factor, such as migration, the minimum wage, economic development, and so on, periodically affects a particular issue. Multiple linear regression is a development of panel data regression. The parameters of a regression model can be predicted using either technique.

The following describes the form of the regression model to be utilized in this investigation, which is based on a generic model modified with several simplifications (Gujarati,2004).

$$HSM_{it} = \beta_0 + \beta_1 MWC_{it} + \beta_2 EG_{it} + \beta_3 EOR_{it} + e_{it} \qquad (1)$$

Data transformation using the natural logarithm will be carried out because the data in this study have different units, including the high-skilled labour migration (HSM) measured in individuals, the Minimum Wage of Cities (MWC) measured in New Zealand Dollars, the Economic Growth (EG) measured in percentage (%), and the Employment Opportunity Rate (EOR) measured in percentage (%). To prevent bias in the logarithmic transformation, this is done. The following describes the logarithmic model applied in this study:

$$In(HSM)_{it} = \beta_0 + \beta_1 In(MWC)_{it} + \beta_2 EG_{it} + \beta_3 EOR_{it} + e_{it} \qquad (2)$$

The panel data regression model is estimated using the following method:

1. First, the Common Effect Model (CEM)

Combining time series with cross-sectional data is the easiest way to use the panel data model. This methodology may estimate the panel data model using the Ordinary Least Square (OLS) strategy or the least squares

method. To model panel data, a linear model with the following general form can be used:

$$HSM_{it} = \beta_0 + \beta_1 MWC_{it} + \beta_2 EG_{it} + \beta_3 EOR_{it} + e_{it} \quad (3)$$

2. FEM, or Fixed Effect Model

A fixed effect model is a method for estimating panel data by capturing intercept differences using dummy variables. The Fixed Effect Model (FEM) is represented in the following way:

Random Effect Model (REM)

$$HSM_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \ldots + \alpha_n D_{ni} + \beta_1 MWC_{it} + \beta_2 EG_{it} + \beta_3 EOR_{it} + e_{it} \quad (4)$$

3. Random Effect Model (REM)

The distinctive effects of every person are taken into account as part of the error component, which is random and independent of the observed independent variables, in contrast to the Fixed Effect Model (FEM). The Random Effects Model's (REM) equation is as follows:

$$HSM_{it} = \beta_0 + \beta_1 MWC_{it} + \beta_2 EG_{it} + \beta_3 EOR_{it} + e_{it} \quad (5)$$

Conducting descriptive statistics comes before any data processing. Descriptive statistics can be used to learn more about the characteristics of each independent variable, including migration values and all other independent variables that are thought to significantly affect changes in the migration of highly skilled workers to industrial districts in New Zealand from 2018 to 2022. The following table shows the descriptive statistics utilized, which include the maximum, minimum, mean, and standard deviation of each variable:

Table 1. Descriptive Statistics For The Variables (Based On Log Values)

Variables	Observations	Mean	Std. Dev	Min	Max
LogHSM	168	6,823	1,491	5,42	13,4897
LogMWC	168	17,619	0,348	13,74801	10,1974
EG	168	3,157	11,054	-9,42	178,54
EOR	168	83,514	2,617	67,24	67,81

Examine the data to see if they fit a normal distribution. For this, the mean and standard deviation of the data were calculated. The calculated value of 57 industrial areas and municipal districts is 83.514, and the calculated value of standard deviation is 2.617. The Shapiro-Wilk test was used to

confirm normality assumptions. The Shapiro-Wilk statistic is 0.99, and since p=0.192>0.05, the data are observed to be normally distributed.

Auckland is the most popular destination for immigrants, whereas Nelson is the least popular. The highest real salaries in 2020 and 2021 will be $87,022 and $89,799, respectively. From 2018 to 2021, the lowest real salaries were $68,183 and $70,838 per year, respectively. Since the 1970s, the percentage of New Zealanders who are working age who are in the labour force has climbed to about 66 percent. This surge is mostly attributable to significant increases in both the proportion of women working and the number of part-time employments. High labour force growth will undoubtedly boost production if those who join the workforce do so and find employment. The topic of whether labor force expansion boosts output per capita is more debatable. On the one hand, extra labour may experience diminishing returns when added to a base of finite other productive resources, lowering the average level of production per person. However, a bigger labor force could boost production per capita through economies of scale or by allowing workers to "learn by doing" while they are employed. Overall, the most important factor affecting the impact on productivity per person is likely the additional labourers' workplace abilities.

2.1. Model Analysis

The empirical approach is panel data analysis. It is possible to conduct analysis using a data collection that combines cross-sectional and time-series data using panel data analysis (Baltagi, 2005). It is suitable to employ the panel data analysis approach for the analysis since the study's data come in both cross-section and time-series form. Due to its benefits, panel data analysis is quite helpful. First, a significant number of observation values will be available in the cross-section and time-series data forms. The estimations will therefore be more trustworthy. Additionally, the cross-section and size of independent variables vary. As a result, multicollinearity issues are less likely.

$$LNHSM_{it} = \beta_0 + \beta_1 \Delta LN\text{MWC}_{it} + \beta_2 \Delta LNEG_{it} + \beta_3 \Delta LNEOR_{uit} + u_{it} \quad (6)$$

$$u_{it} = \mu_i + v_{it} \quad (7)$$

The econometric model utilized for panel regression estimation is shown in Equation (6). I stands for nations in equation (6), and t stands for time. High-skilled labor migration is represented by the dependent variable (LNHSM). The independent variables included in the analysis are (LNMWC) the Minimum Wage of Cities, (LEG) the Economic Growth, and (LEOR) the Employment Opportunity Rate, which is an independent variable that affects the migration of highly trained workers. In equation (7), $_{it}$ stands for the error terms, while u_{it} represents the unobservable individual impact. I define specific effects that are not time-dependent and are not taken into account in regression (Baltagi, 2005). Equation (6) is calculated using a fixed-effects, random-effects, or pooled regression technique. To choose amongst these techniques, the Hausman, Breusch-Pagan, and F tests are run. Finally,

diagnostic tests including heteroscedasticity, autocorrelation, and multicollinearity are carried out. These statistical issues allow for the employment of robust estimators.

Aside from the migrant stock, three variables thought to influence high-skilled labour migration were investigated in this study. The research is based on 57 industrial districts and municipality areas in New Zealand with varying income levels, where these factors better safeguard their social and economic assets and may provide migrants with a more viable job market with a higher educational level. As a result, higher education is also in the spotlight in terms of wealth, pay, and work opportunities. As a result, New Zealand's economic expansion is predicted to have a beneficial impact on high-skilled labour migration flows. All data utilized is from the years 2018-2022. High-skilled labour migrant statistics for these time periods and on a yearly basis are available in the United Nations and World Bank statistical databases.

Regression that is spurious is the result of analyzing non-stationary series. Thus, the series has to be stable for the studies to produce meaningful and trustworthy conclusions in terms of both economics and statistics. The stationarity of the series that will be utilized to make the model estimates is examined before beginning. In choosing the unit root test for the investigation of the series' stationarity, the cross-section dependence problem of the series is taken into consideration. In the panel data analysis, the cross-sectional dependence—where all units in the same cross-section are correlated—is a key issue (Baltagi, 2005). The second-generation unit root test is utilized when a cross-sectional dependence issue exists in the series. Table 2 shows the outcomes of the Pesaran CD test, which examines the cross-sectional dependence problem, and the CADF (Cross Sectionally Augmented Dickey-Fuller) and CIPS (Cross-Sectionally Augmented IPS) unit root test, which examines the stationary of series. Numerous tests are used to examine cross-sectional dependence, including the Breusch-Pagan LM, Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD test (Pesaran, 2007). When the panel data set is N>T, Pesaran CD test produces accurate findings. All variables have a cross-section dependence issue, as shown by the Pesaran CD test findings. In order to identify stationary of series, Pesaran's (2007) CADF unit root test and the CIPS unit root test are utilized. The LNHRS is stationary at level, according to the findings of the CADF test, whereas the other variables are stationary at the first difference. Taking the difference has resulted in the series becoming stagnant.

Table 2. Pesaran CD, CADF and CIPS Unit Root Test Results

	Pesaran CD Test		CADF Test		CIPS Test	
	Stat.	Prob.	Level	First difference	Level	First difference
LNHRS	18,6891	0.000	-2,173**	-3.014**	-2.571**	-4.167***

LNMWC	18,59127	0.000	-1,915	-2.197***	-1.950	-3.059***
LNEG	26, 8395	0.000	-2.201	-2.243***	-1.742	-2.168***
LNEOR	23;0187	0.000	-1.278	-2.185***	-2.291	-1.617***

** and *** show that the series are stationary at the 5% and 1% significance level, respectively.

The findings of the diagnostic tests are displayed in Table 3. First, it is determined if the model to be estimated is appropriate for the fixed effect, random effect, and pooled regression models. First, the Hausman test was successful. The alternative hypothesis in this test is that there is a connection between the unique mistakes and the model's regressors, contrary to the null hypothesis, which states that there is no link. The null hypothesis is disproven using the Hausman test. So, instead of using the random-effects model, use the fixed-effects model instead. The F test results contradict the null hypothesis. The fixed-effects model is thus recommended over the pooled regression approach.

Table 3. Diagnostic Tests

	Stat.	Prob.
Hausman Test	20.57	0.0003
Breusch-Pagan LM Test	1034.87	0.0000
F Test	28.19	0.0000
Modified Wald Test for Groupwise Heteroskedasticity	3479.04	0.0000
Pesaran Cross-Section Dependency Test	15.24	0.0000
Friedman Cross-Section Dependency Test	39.13	0.0187
Modified Bhargava Durbin-Watson Test	0.3761	
Baltagi-Wu LBI Test	0.7205	

As a consequence, the econometric model in equation (6) was estimated while taking into consideration the fixed effects. To identify statistical issues with estimates, certain tests have been run. The findings of the Pesaran CD and Friedman R tests show that cross-section dependence is a concern in estimates. The Modified Wald test indicates that the model's estimations are heteroskedastic. The statistical values for the modified Bhargava Durbin-Watson and Baltagi-Wu LBI tests are computed as 0.46 and 0.68, respectively. It has been determined that there is an autocorrelation issue with the estimations as the statistical values are less than two.

Table 4. The Variables Used in The Regression Analysis and Data Sources

Variables	Abbreviation	Source
Dependent variable		
High-skilled labour migration	HSM	World Bank, United Nations
Explanatory variables		
Minimum Wage of Cities	MWC	World Bank, United Nations
Economic Growth	EG	World Bank, United Nations
Employment Opportunity Rate	EOR	World Bank, United Nations

Aside from the migrant stock, three variables thought to influence high-skilled labor migration were investigated in this study. The research is based on 57 industrial districts and municipality areas in New Zealand with varying income levels, where these factors better safeguard their social and economic assets and may provide migrants a more viable job market with a higher educational level. As a result, higher education is also in the spotlight in terms of wealth, pay, and work opportunities. As a result, New Zealand's economic expansion is predicted to have a beneficial impact on high-skilled labor migration flows.

Eviews is used to do panel data regression analysis on the independent and dependent variables. The estimation results of the above three different models are shown in Table 4. It can be seen that in Model II, except EOR, one of the variables has a statistically significant effect (5% level) on the number of high-skilled migrant workers, and the AIC value indicates the applicability of the Model II specification, which is included together with EOR in MWC and In EG. The signs of the parameter estimates are as expected. Diagnostic metrics indicate that the error terms for all models are not autocorrelated and have constant variance. According to the results obtained, it can be said that the higher the urban minimum wage, the higher the economic growth rate, and the higher the employment opportunity rate, the more highly skilled migrant workers will come to the countryside. It turns out that variables representing institutional quality and stability have parallel effects on expectations and the existing theoretical and empirical literature. As expected, based on New Zealand's higher economic growth, the country appears likely to attract more highly skilled migrant workers. It can also be concluded that increased democratization, demand for more workers in the labor market, and improved living standards will lead to more high-quality migrant workers entering the country. Considering that the regression equation is more sensitive to its components, the immigration variables in different specification models generally retain a significant positive effect, which can be interpreted as an indicator of the robustness of the relationship between education and

immigration. Following is the equation for the Common Effect Model (CEM) method's regression result on the panel data:

$$LOGHSM_{it} = 16.1425 + 0.4278MWC_{it} + 0.00647EG_{it} - 0.2105EOR_{it} + e_{it} \quad (8)$$

For panel data utilizing the Fixed Effect Model (FEM) approach, the regression result equation is as follows:

$$LOGHSM_{it} = 0.10247 + 0.51736MWC_{it} + 0.00541EG_{it} + 0.00841EOR_{it} + e_{it} \quad (9)$$

Using the Random Effect Model (REM) approach, the following equation represents the regression result:

$$LOGHSM_{it} = 4.4879 + 0.5107MWC_{it} + 0.00412EG_{it} - 0.02871EOR_{it} + e_{it} \quad (10)$$

The next stage is to run tests to choose one of these three models after studying the three different sorts of models.

Eviews is used to do panel data regression analysis on the independent and dependent variables. These are the outcomes for each model. Following is the equation for the Common Effect Model (CEM) method's regression result on the panel data:

$$LOGHSM_{it} = 16.1425 + 0.4278MWC_{it} + 0.00647EG_{it} - 0.2105EOR_{it} + e_{it} \quad (11)$$

For panel data utilizing the Fixed Effect Model (FEM) approach, the regression result equation is as follows:

$$LOGHSM_{it} = 0.10247 + 0.51736MWC_{it} + 0.00541EG_{it} + 0.00841EOR_{it} + e_{it} \quad (12)$$

Using the Random Effect Model (REM) approach, the following equation represents the regression result:

$$LOGHSM_{it} = 4.4879 + 0.5107MWC_{it} + 0.00412EG_{it} - 0.02871EOR_{it} + e_{it} \quad (13)$$

The next stage is to run tests to choose one of these three models after studying the three different sorts of models.

2.2. Selecting a Model

The following assumptions are tested using the Chow Test to evaluate whether the common effect model or the fixed effect model is more suitable:

H_0 = OLS pooled common effect model

H_1= LSDV fixed effect model

grounds for decision

If the probability > (α = 0,05), H=0 is acceptable.

H=1 is true if the probability is (α = 0.05).

The null hypothesis is rejected since both the cross-section F and cross-section Chi-Square probability are 0.0000, which is less than $\alpha = 0.05$. As a result, it suggests that the Fixed Effect Model (FEM), which is the best model, is relevant in assessing the panel data.

In order to choose between a random effect and a fixed effect model, the following hypotheses are tested using the Hausman test:

H_0 = The model error does not depend on any of the independent variables.

(Fixed Effect Model) H_1 = The model error and one or more independent variables are related.

rationale for the decision

If the probability>α, which denotes that a random effect model was utilized, H_0 is acceptable.

If the probability <α, suggesting that a random effect model was utilized, then H_1 is acceptable.

The P-value is less than $\alpha = 0.05$ because the probability value for Cross-Section Random is 0.0049, supporting the null hypothesis. Therefore, it shows that the Fixed Effect Model (FEM) is the optimal model to utilize for the research.

2.3. Determining the Best Panel Regression Model's Interpretation

Fixed Effect Model (FEM) is the top panel regression model (Gujarati, 2004). The constant has a positive value of 0.10247, as shown by the linear regression findings on the panel data above. Accordingly, if the Minimum Wage of Cities, Economic Growth, and Employment Opportunity Rate remain unchanged, the inflow migration of highly educated workers to industrial locations in Cities will grow by 0.10247 percent.

Minimum Wage City Coefficient (MWC) is 0.51736. Accordingly, if all other variables remain constant, a 1 percent rise in the minimum wage in a district or city will result in a roughly 0.51736 percent increase in the average inflow of highly educated personnel to such places. The economic growth coefficient (EG) is 0.00541. This suggests that, assuming all other factors remain constant, a 1 percent rise in economic growth will result in an increase in the average inflow of highly educated workers to industrial regions and cities of around 0.00541 percent. The Employment Opportunity Rate (EOR) coefficient is equal to 0.00841.

2.4. Results

Based on the results of the studies, it has been concluded that the minimum wage of cities has a beneficial and significant influence on the migration of highly educated people to industrial areas in Indonesia. This

result is supported by Everett S. Lee's migration theory, which holds that one of the factors luring individuals to move is the presence of higher salaries at the destinations. This supports Ricardo's wage theory, according to which highly skilled workers are less affected by minimum wages because of their in-demand skills. They could prefer seeking for work in locations with higher minimum pay if their country of origin has lower minimum wages, in particular. A positive relationship between worker salaries and education level was discovered by the Central Statistics Agency (BPS). With higher levels of schooling comes higher incomes. Higher education degree holders often make more money than other types of workers. Conversely, those with merely a high school graduation or fewer frequently earn less money. The typical worker's monthly salary decreased slightly from around NZD 2.76 million in 2020 to NZD 2.74 million in 2021. But when salaries are compared according to education level, those with more advanced degrees frequently make more money, amounting to NZD 3.99 million per month. It was also less than the previous year, 2020, when it was over NZD 4.1 million each month. The lowest wage, or almost NZD 1.65 million per month, was still provided to persons with only a primary education. This is unchanged from the prior year. For individuals with a high school certificate or a vocational degree, the average monthly pay varies from NZD 2.62 million to NZD 2.69 million. The complete populace should make an attempt to locate honorable careers with higher pay. In this regard, the involvement of the government is essential. This is consistent with the International Labor Organization's (ILO) mission to advance just working conditions for individuals to sustain their families.

The trials' findings indicate that economic growth has a positive and significant impact on highly educated people's decisions to relocate to industrial areas in Indonesia. This result is supported by Lee's migration theory, which contends that fast economic expansion attracts highly educated workers to a location, particularly cities or neighborhoods with industrial zones. The idea holds that a region's robust economic development promotes the construction of businesses and industries that require highly educated workers, such as engineers, doctors, and lawyers, among others. This research's findings are further supported by the Ravenstein theory, which holds that a new location's quick economic development stimulates the migration of highly educated workers there. This is so because the wages and career prospects there are more attractive. This agrees with the "Spillover Effect" justifications put out by Vernon Ruttan, Michael Porter, and Paul Romer. This theory holds that having educated residents may increase local output and innovation, which can indirectly have a positive impact on the local economy. The spillover effect can manifest itself in the economic environment in a number of different ways, including in relation to technology, innovation, knowledge, skills, and social impact.

For example, firms close by can benefit from the technology and knowledge developed by a region's cutting-edge and thriving sector. This can

increase the productivity and caliber of local workers and encourage the growth of related economic sectors. Strong economic growth is strongly tied to the influx of highly educated migrant workers, which raises the quality of the labor force and increases productivity and efficiency in sectors that require highly educated employees. Foreign companies looking for highly educated workers are increasingly preferring to invest in countries with a large pool of labor.

The Wellington region has continued to provide the largest contributions to the growth of New Zealand's gross domestic product (GDP) in terms of manufacturing. Sometimes immigrants from locations with more advanced technology bring with them more advanced knowledge and technology. In the aforementioned areas or territories, this can help to increase innovation and productivity in certain industries. It supports the growth of higher-quality human resources there and produces spillover effects, which can increase output and economic growth.

This is also in line with the idea of virtuous cycles, which holds that a developing industrial sector may be able to create a virtuous cycle in which job possibilities and economic advancement have a mutually beneficial relationship. Strong economic expansion may attract investment and create new jobs, which in turn raises the population's purchasing power and accelerates economic growth.

Conclusion

In light of the research findings using panel data regression on the factors influencing the migration of highly educated workers to industrial areas in New Zeland:

1. High-skilled workers in New Zealand frequently move to industrial areas where the minimum wage is greater.

2. It has been demonstrated that economic growth attracts highly educated employees to New Zealand's industrial zones.

3. Due to Indonesia's employment rate, high-skilled workers do not seem to be moving to the country's industrial areas.

In order to give more detailed findings, the researcher suggests many areas for more investigation, including: Involving industry, labor unions, municipal governments, and research institutions as decision-making stakeholders is the first step. Constructive discussions and exchanges can help to clarify the viewpoints of various parties about minimum wage increases and help to establish a balance between worker protection and company sustainability. The second phase is to include sustainability principles in the design of industrial zones to ensure sustainable economic growth. Ecosystem protection, natural resource management, and consideration of environmental implications may be useful in maintaining a balance between economic growth and environmental sustainability.

Third, expanding employment opportunities outside of urban centers and industrial areas to deter people from relocating. Increasing investment in non-manufacturing sectors including tourism, agriculture, fishing, and other service industries as well as the unorganized sector and improving infrastructure and accessibility may all help achieve this.

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