

Determinants of circular migration patterns to Badung regency



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ABSTRACT

The influence of migration causes the growth of the population in a region. Migration occurs due to imbalances in development, especially in the economic sector. Whereby people migrate to obtain employment due to high wages and job opportunities in the destination area. This research analyzes the factors influencing the population's decision to engage in circular migration to Badung Regency. The analytical tool used is logistic regression analysis, specifically Binary Logistic Regression. The sample consists of 123 respondents. The research results indicate that variables such as wage levels, number of family dependents, gender, activities in the area of origin, distance, age, and squared age collectively and significantly influence the decision of the population to engage in circular migration to Badung Regency. Partially, the research results show that the number of family dependents, gender, activities in the area of origin, and age significantly positively affect the decision of the population to engage in circular migration to Badung Regency. Meanwhile, wage levels, distance, and squared age significantly negatively affect the population's decision to engage in circular migration to Badung Regency.

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1. Introduction

The population issue is a social problem that can arise anytime and anywhere, including in Indonesia as one of the developing countries. Indonesia ranks fourth in the world in terms of population density after India, China, and the United States. This large population is certainly influenced by population issues, particularly population growth. The phenomenon of migration, unlike processes such as mortality and fertility, is much more complex because it is a multidimensional phenomenon and is explained by various causal factors, both economic and non-economic (Kwilinski et al., 2022). Social problems can make the economy worse, which undermines economic growth (Meilinda & Kurniawan, 2024). Kumar & Raj (2024) argued migration is any form of geographical movement between two or more geographical areas. Often, this involves relocating from one place to another. Primarily, individuals migrate for economic purposes, whether for agriculture or trade. People from various regions also migrate to major cities, bringing with them diverse social and cultural backgrounds. Research on migration, influenced by various factors including social, political, and economic factors, plays a crucial role in population studies. Thus, a large population distribution significantly influences the population density in a region (Martini & Sudibia, 2013).

Phenomenon of population growth frequently garners attention and necessitates careful consideration. Indonesia experiences rapid population growth primarily due to a lack of awareness within the community and a mindset towards government regulations (Mujiburrahmad et al., 2021). Additionally, population growth in a region, whether it be a province, district, or city, is also caused by the influence of migration from rural to urban areas, thus affecting uneven population distribution (Soebyakto & Saputra, 2015). Table 1 shows the number of residents are not matching with the

population ID cards in each province. These numbers indicate an increase from the results of the 2010 population census. Particularly in Bali Province, the number of residents not matching with ID card reaches 529.728 thousand people. This figure is considered very high considering the relatively small area of Bali Province.

Table 1. Trend of population in Indonesia 2023

Province	Based on ID Card	Not Based on ID Card	Total
Aceh	5.029.091	245.780	5.274.871
Sumatera Utara	13.818.159	981.202	14.799.361
Sumatera Barat	5.021.509	512.963	5.534.472
Riau	5.280.920	1.113.167	6.394.087
Jambi	3.186.855	361.373	3.548.228
Sumatera Selatan	7.853.392	614.040	8.467.432
Bengkulu	1.882.550	128.120	2.010.670
Lampung	8.012.119	995.729	9.007.848
Kep.Bangka Belitung	1.261.114	194.564	1.455.678
Kepulauan Riau	1.700.825	363.739	2.064.564
DKI Jakarta	9.294.394	1.267.694	10.562.088
Jawa Barat	44.286.803	3.987.359	48.274.162
Jawa Tengah	34.505.013	2.011.022	36.516.035
DI Yogyakarta	3.288.791	379.928	3.668.719
Jawa Timur	37.872.260	2.793.436	40.665.696
Banten	10.828.432	1.076.130	11.904.562
Bali	3.787.676	529.728	4.317.404
Nusa Tenggara Barat	4.897.609	422.483	5.320.092
Nusa Tenggara Timur	4.768.470	557.096	5.325.566
Kalimantan Barat	5.081.917	332.473	5.414.390
Kalimantan Tengah	2.357.163	312.806	2.669.969
Kalimantan Selatan	3.729.562	344.022	4.073.584
Kalimantan Timur	3.372.808	393.231	3.766.039
Kalimantan Utara	605.699	96.115	701.814
Sulawesi Utara	2.415.809	206.114	2.621.923
Sulawesi Tengah	2.688.225	297.509	2.985.734
Sulawesi Selatan	7.461.650	1.611.859	9.073.509
Sulawesi Tenggara	2.260.453	364.422	2.624.875
Gorontalo	1.096.819	74.862	1.171.681
Sulawesi Barat	1.297.560	121.669	1.419.229
Maluku	1.687.041	161.882	1.848.923
Maluku Utara	1.151.932	131.005	1.282.937
Papua Barat	958.892	175.176	1.134.068
Papua	3.995.212	308.495	4.303.707
Indonesia	246.736.724	23.467.193	270.203.917

Source: Badan Pusat Statistik (2023)

The population growth rate of Bali Province continues to increase from year to year. It cannot be denied that population growth in Bali Province is influenced by three demographic components: fertility, mortality, and migration (Mantra, 2015). The drastic increase in population growth cannot be denied due to migration issues (Marhaeni & Yuliarmi, 2018). Figure 1 shows Buleleng Regency holds the highest population in Bali Province, while Klungkung Regency has the smallest population. Badung Regency, on the other hand, boasts a population of 548.19 thousand people, with 439.85 thousand residing according to their household registration (KK) and 108.33 thousand residing without proper registration. This suggests that approximately 20% of Badung Regency's total population consists of individuals from outside the regency. This influx of migrants from other areas

into Badung Regency contributes significantly to its population growth, thereby resulting in an unequal distribution of population across regencies and cities within Bali Province.

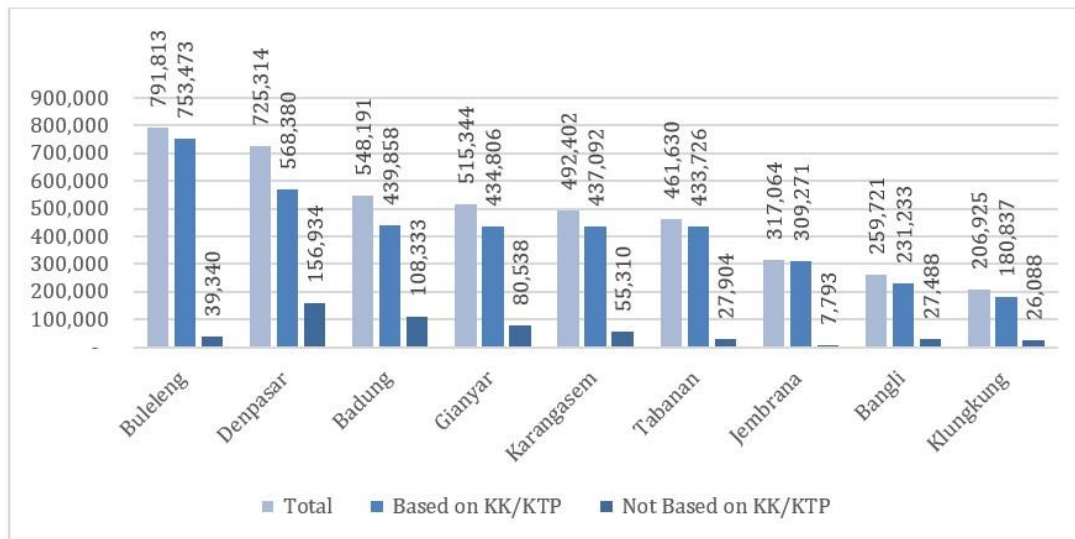


Figure 1. Population by Regency/City in Bali Province from Census

Based on the results of the 2010 and 2020 population censuses, as well as the 2015 intercensal population survey, the overall trend of inbound migration to Badung Regency indicates an increase. **Figure 2** shows the trend of inbound migration to Badung Regency, showing an upward trajectory from 2010 to 2020. Despite a decline in figures in 2020, attributed to the Covid-19 pandemic prompting migrants to return to their places of origin, the statistical trendline indicates overall growth. This suggests that migration to Badung Regency increases annually, thereby indirectly impacting the local population dynamics.

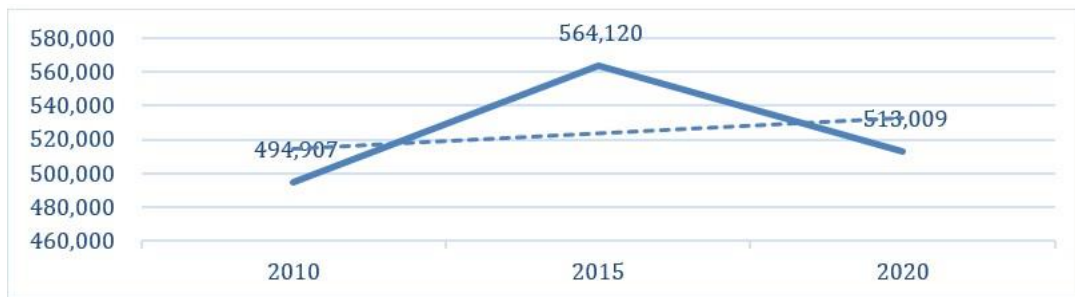


Figure 2. Population aged five years and over in Badung Regency, by gender and migration status, based on the 2010 and 2020 Population Censuses and the 2015 Intercensal Population Survey

The occurrence of migration to Badung Regency is partly due to the imbalance in development among regions in Bali Province. Disparities in development among regions are a common aspect in the economic activities of an area (Selod & Shilpi, 2021). Regional inequalities have consequences for the welfare levels of communities in various areas. Differences in development advancement among different regencies, coupled with the correlation between development and the flow of population migration, lead to increased population mobility (Pangaribuan & Handayani, 2013). Anwar et al (2016) states population mobility has an impact on the development process due to the close relationship between population mobility and development. Migration is typically undertaken by individuals with low economic status in their place of origin, moving to destinations with higher economic prospects. Todaro & Smith (2015) argue in "A Theory of Migration" The main reason for people moving is typically economic, spurred by economic gaps between regions. Consequently, there is a trend of population shifting towards urban areas with better economic opportunities, as they are anticipated to better fulfill their economic goals. A positive economic environment undoubtedly influences the wages of individuals working in destination regions. The income earned in rural areas might not guarantee the well-being of migrants and their families (Rustariyuni, 2013). The wage disparity between rural and urban areas motivates people to migrate to urban centers to meet increasingly diverse needs (Trendyari & Yasa, 2014).

The annual increase in the Badung Regency's Minimum Wage has been consistent over the years. This is a significant factor driving migration to Badung Regency from residents outside the area, owing to its favorable economic conditions compared to other regions. Additionally, social and cultural factors, such as diverse employment opportunities, healthcare facilities, educational institutions, transportation options, entertainment venues, and other amenities, also contribute to Badung Regency's appeal to residents from neighboring areas (Maulida, 2013). Strobl & Walsh (2016) argued that increases in inward net migration are associated with a proportionately greater increase in workers employed at the minimum wage relative to non-compliance. The current economic growth is supported by sectors that continue to develop and show improvements in generating income or foreign exchange for the country, one of which is the tourism sector (Hidayah et al., 2024).

The tourism sector has evolved into one of the largest industries for economic growth in Indonesia (Ammar et al., 2017), not only as the largest industries but tourism sector has plays important role for labor absorption (Khasanah & Kurniawan, 2024). Tourism in Bali Province is predominantly led by Badung Regency, with the highest number of foreign tourist visits compared to other cities or regencies, reaching 2.837.291 people in 2022. This factor additionally attracts individuals from areas beyond Badung Regency to relocate there, as the prospects and employment opportunities within the tourism industry can enhance the economic incentives for the populace. This is with the aspiration of fostering prosperity within the community through increased employment opportunities. Circular migration tends to occur due to barriers to permanent migration. These obstacles stem from the strong emotional ties individuals maintain with their families, friends, and hometowns (Jesline et al., 2021). Migration choices should not merely focus on wage considerations but should also take into account amenities and living expenses simultaneously. The phenomenon of migration from rural to urban areas, especially in Badung Regency, presents an intriguing subject for examination to gauge the impact of various factors on individuals' decisions to engage in circular migration.

2. Method

This research is located in Badung Regency, which dominates the tourism sector in Bali Province. The types of data used in this study are quantitative and qualitative (Hardani et al., 2020). The sources from both primary and secondary data. To determine the influence of variables such as wage levels, number of family dependents, gender, activities in the area of origin, distance, age, and squared age on the decision of the population to engage in circular migration to Badung Regency, the Binary Logistic Regression analysis technique is employed. The testing of Binary Logistic Regression is conducted through stages of model adequacy testing and hypothesis testing, to obtain the expected research results. The rationale for using this model is that the dependent variable (Y) in this study includes dummy variables. According to Wang et al (2024) for the equation of binary logistic regression as follows:

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \beta_6x_6 + \beta_7x_7 \quad (1)$$

Where x_1 is the wage level, x_2 is the number of family, x_3 is gender x_4 is the activities in the area of origin, x_5 is distance, x_6 is the age, x_7 is the squared of age and y is the decision for circular migration or the notation for dependent variables is $\left(\frac{p}{1-p}\right)$.

3. Results and Discussion

Descriptive statistics is a statistical method used to describe the data collected in research. Descriptive statistics provide an overview of research data in terms of its mean, standard deviation, variance, maximum and minimum values, sum, range, kurtosis, and skewness (distribution asymmetry). Table 2 shows The circular migration decision variable (Y) spans from 0.00 to 1, with an average of 0.512. For the wage levels variable (X_1) ranges from 600.000 to 20.000.000, with an average of 4.638.211. The number of family dependents variable (X_2) ranges from 0.00 to 6.00, with an average of 2.31. The Gender variable (X_3) spans from 0 to 1, with an average of 0.577. Activities in the area of origin variable (X_4) range from 0 to 1, with an average of 0.512. The distance variable (X_5) ranges from 3.00 to 100, with an average of 38.610. The age variable (X_6) spans from 19.00 to 57.00, with an average of 34.333. All the data used in this study, the value of means is higher than standar deviation, means that all variables is highly heterogenous. For the y , x_3 and x_4 are the dummy variables.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Circular migration decision (Y)	123	0.00	1.00	0.5121	0.5018
Wage levels (X ₁)	123	600.000	20.000.000	4.638.211	2.965.133
Number of family (X ₂)	123	0.00	6.00	2.3089	1.4493
Gender (X ₃)	123	0.00	1.00	0.5772	0.4960
Activities in the area of origin (X ₄)	123	0.00	1.00	0.5121	0.5018
Distance (X ₅)	123	3.00	100.00	38.6097	24.3730
Age (X ₆)	123	19.00	57.00	34.3333	12.9086
Age Squared (X ₇)	123	361.00	3249.00	1344.057	939.8414

Source: data processed

Multicollinearity is a statistical concept where several independent variables in a model are correlated (Gujarati, 2004). If correlation coefficient value is less than 0.80, it is said that there is no multicollinearity (Rahmawati et al., 2024). Table 3 shows all independent variables in this study, it is found that there is no multicollinearity issue between any pair of variables. This is indicated by correlation coefficient values being less than 0.80 and means there is no multicollinearity in the model.

Table 3. Correlation of The Variables

	Y	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆
Y	1	0.0197	0.6596	0.0538	0.5119	-0.4793	0.0290
X ₁	0.0197	1	0.3209	0.2000	0.1324	-0.0368	0.2214
X ₂	0.6596	0.3209	1	0.0691	0.4229	-0.2873	0.2384
X ₃	0.0538	0.2000	0.0691	1	0.0867	0.0872	0.3281
X ₄	0.5119	0.1324	0.4229	0.0867	1	-0.2562	0.1897
X ₅	-0.4793	-0.0368	-0.2873	0.0872	-0.2562	1	0.0533
X ₆	0.0290	0.2214	0.2384	0.3281	0.1897	0.0533	1

Source: data processed

The null hypothesis that the empirical data is suitable or appropriate to the model is obtained when the significance of Hosmer and Lemeshow's goodness of fit test statistics $> \alpha = 0.05$ (Ghozali, 2014). Table 4 shows the results that the significant value of Hosmer and Lemeshow's goodness of fit is $0.7127 > \alpha = 0.05$. This suggests that there is no significant difference between the model and the empirical data analyzed, thus indicating the model's feasibility.

Table 4. Hosmer and Lemeshow's Goodness of Fit Test

H-L statistic	Prob Chi-square
5.4126	0.7127

Source: data processed

Table 5 shows the regression coefficient value for the wage level variable (β_1) is -0.000000437, meaning that when the wage level increases by Rp 1 the probability of the population engaging in circular migration decreases by 0.50 percent (calculated from $1/1+e-(-0.000000437)$) compared to staying. It means that if people already have a high income, they tend to settle in their destination area to improve work efficiency and save on operational costs. This finding is supported by previous studies conducted by Anggraini & Fafurida (2018), Sundari et al (2020) and Gnip (2023) state that wage levels have a negative and significant effect on the decision of the population to engage in circular migration. The coefficient value for the number of family variable (β_2) is 2.186804, meaning that the number of dependents in a population increases by 1 person, it increases the probability of the population engaging in circular migration by 0.90 percent (calculated from $1/1+e-(2.186804)$). This finding is supported by studies conducted by Rozi et al (2019) that the number of dependents has a positive and significant effect on migration.

The regression coefficient value for the gender variable (β_3) is 1.695312, meaning that the probability of circular migration for males is higher by 0.91 percent (calculated from $1/1+e-(1.695312)$) compared to females. This implies that the probability of circular migration among males is higher by 0.91 percent. This finding in line with the previous studies conducted by Kanwal et al

(2015), Putra & Satrianto (2019) and Hussain et al (2024) argued that the gender variable has a positive and significant effect on the likelihood of labor migration. Based on Table 5 shows the regression coefficient value for the area of origin activities variable (β_4) is 2.271154, meaning that the probability of circular migration is dominated by individuals who have activities in their area of origin by 0.84 percent (calculated from $1/1+e^{-(1,695312)}$) compared to those who do not have activities. This indicates that the probability of circular migration is predominantly influenced by individuals who have activities in their area of origin by 0.84 percent. This result is supported by Nandiswari & Rustariyuni (2016) and Anuar et al (2021) states activities in the area of origin can influence individuals to engage in circular mobility or migration.

Table 5. Result of Binary Logit Regression

Variables	Coefficient	z-stat
C	-12.08279	-2.217484**
Wage levels (X_1)	-0.000000437	-2.489979**
Number of family (X_2)	2.186804	4.541072***
Gender (X_3)	1.695312	1.992441**
Activities in the area of origin (X_4)	2.271154	2.877710***
Distance (X_5)	-0.083730	-3.646780***
Age (X_6)	0.718107	2.062372**
Age Squared (X_7)	-0.010780	-2.246799**

Source: data processed

The regression coefficient value for the distance variable (β_5) is -0,083730, meaning that when the distance traveled by the population increases by 1 km, the probability of the population deciding to engage in circular migration decreases by 0.48 percent. This finding in line with the previous studies conducted by Sundari et al (2020) and Zhao (2021) that distance has a negative and significant effect on the decision to engage in circular migration. Table 5 for the regression coefficient value for the age variable (β_6) is 0.718107, meaning that when the age of the population increases by 1 year, the probability of the population deciding to engage in circular migration increases by 0.67 percent and for the the squared age variable (β_7), which serves as a control variable for age, shows a significant negative coefficient. This indicates that when the age of individuals increases by 1 year, the probability of their decision to engage in circular migration increases by 0.67 percent. However, the squared age variable, which serves as a control variable for age, shows a significant negative coefficient. This means that at the age of 33.31 years (the result of calculating the age parabola), the probability of individuals engaging in circular migration will decrease. This finding is supported by Gebre (2020) and Mustika et al (2022) that individuals in the productive age range of 20-45 years tend to migrate, and at a certain age, the probability of migration decreases with increasing age.

4. Conclusion

Many people are migrating to Badung Regency, primarily due to its better economic prospects compared to their places of origin. Therefore, special attention is needed from the government, especially the Provincial Government of Bali, to direct and encourage district governments across Bali Province to revitalize their economies so that people can work in their hometowns. Based on the analysis and discussion of the results of the research conducted; b). conclusions were obtained as follows: a) Wage levels, number of family dependents, gender, activities in area of origin, distance, age and age squared simultaneously influence the population's decision to undertake circular migration to Badung Regency; c) Number of family dependents, gender, activities in the area of origin and age have a significant positive effect on the population's decision to undertake circular migration to Badung Regency. Meanwhile, wage levels, distance and age squared have a significant negative effect on the population's decision to undertake circular migration to Badung Regency. The implication of this research is that it is expected to be used as a study by the government or relevant parties in formulating population policies, so that the population growth rate can be controlled and population distribution can be more even.

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