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Structural Equation Model Approach to National Health Insurance Participation in Disadvantaged Regions*

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Abstract

Kartu Indonesia Sehat is Indonesia's national health insurance program, which is a right for everyone. However, the distribution of the program is not evenly distributed, especially in disadvantaged, frontier, and outermost regions. This research examines the factors influencing participation rates in Indonesia's national health insurance, the Healthy Indonesia Card program, in disadvantaged, frontier, and outermost regions of South Sulawesi. There are seven variables to estimate these factors, including education, employment, income, knowledge, motivation, socialization and trust. Based on descriptive statistics and a Structural Equation Model Partial Least Squares analysis using bootstrap parameters, there are three influencing factors: occupation, motivation, and trust, with a goodness of fit model of 32.3568%.

Keywords: Kartu Indonesia Sehat; Partial Least Square; Structural Equation Model.

1. Introduction

Health is a crucial concern for both individuals and the government, particularly for its citizens. Citizens are required to participate in the national health insurance program, known as Jaminan Kesehatan Nasional Kartu Indonesia Sehat (JKN-KIS), administered by Badan Penyelenggara Jaminan Sosial (BPJS) Kesehatan, the responsible institution for this program (Sehat, 2022). The JKN-KIS program was presented to carry out the mandate of Law of the Republic of Indonesia Number 40 of 2004 regarding the National Social Security System (Azeri *et al*., 2025).

The JKN-KIS program is not evenly distributed, especially in disadvantaged, frontier, and outermost regions, where citizens have the same rights to participate in the JKN-KIS program as those in other areas (Sinaga *et al*., 2025). A region is categorised as disadvantaged when compared to other regions on a national scale;

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that region and its people are less developed. Six factors categorise an area as disadvantaged, frontier, or outermost, including community economy, human resources, facilities and infrastructure, regional financial capacity, accessibility, and regional characteristics (Aziza & Srimarchea, 2023). Based on Presidential Regulation Number 131 of 2015 on Determination of Disadvantaged Regions for 2015-2019, there are 122 regencies categorised as distributed in 24 provinces (Presidential Regulation, 2015). Jeneponto Regency is classified as a disadvantaged region in South Sulawesi, consisting of 11 sub-districts. Reporting from the official website of the Jeneponto Regency Government, Kelara District is one of the sub-districts in Jeneponto Regency, which consists of 5 villages and five urban villages, and all of the villages are disadvantaged. BPJS Kesehatan needs to identify factors contributing to the uneven distribution of the JKN-KIS program, particularly in disadvantaged, frontier, and outermost regions.

Research by (2025) identified factors that influence participation in the national health insurance program in Majalengka District, Majalengka Regency, including information, knowledge, trust, religiosity, education, and income. Research by Damayanti and Kismanto (2024) reveals a relationship between knowledge and public interest in the JKN-KIS program among general outpatients in the subdistrict of Polokarto, Sukoharjo Regency, Central Java.

Based on the description, the researcher aims to identify the factors that influence JKN-KIS participation as a national health insurance program in disadvantaged, frontier, and outermost regions in South Sulawesi. The analytical approach employed is descriptive statistics and Structural Equation Modelling (SEM), based on variance or Partial Least Squares (PLS) (Fauzi, 2022). Previous studies have successfully applied this method in various fields, including analysing satisfaction (Akalili, 2014), modelling risk status (Kastanja, 2014), and examining technology acceptance (Hidayah & Fernanda, 2021). Descriptive statistical methods are used to describe the characteristics of the respondents, including occupation, income, and gender. The SEM-PLS method is used to handle multiple response variables and explanatory variables simultaneously, making it possible to analyse variables that cannot be measured directly through the use of indicators (Nusrang & Fahmuddin, 2023).

2. Research Methodology

2.1 Object and Locations

The object in this research is the participation factor of JKN-KIS program membership in rural communities in Kelara District, Jeneponto Regency, South Sulawesi. Location determination is based on direct survey and through literature study.

2.2 Population and Sample

The population consists of 8,397 residents distributed across 5 villages. The sample used consists of 100 respondents, obtained through randomisation using a systematic random sampling method based on statistical principles (Walpole, 1997).

2.3 Research Instrument and Data Collection Techniques

The research instrument used a questionnaire and data collection was carried out

through direct interviews with respondents in Kelara District, Jeneponto Regency.

2.4 Variable

The research variables used consisted of seven exogenous latent variables (education, occupation, income, knowledge, motivation, socialization, trust) and one endogenous latent variable (community participation). The research variables are shown in Table 1.

Table 1: Research Variables

Variable		Variable Name	
Y	Participations	Y_1	JKN-KIS program membership registered by the government
		Y_2	JKN-KIS program membership is not registered by the government
		Y_3	Number of babies receiving vitamin A supplementation
X_1	Knowledge	X_{11}	Knowledge about the definition of JKN KIS program
		X_{12}	Knowledge about management institutions of JKN-KIS program
		X_{13}	Knowledge about the right to JKN-KIS program participate
		X_{14}	Knowledge about PBI-JK and Not-PBI-JK
		X_{15}	Knowing the purpose of JKN-KIS program
		X_{16}	Knowing the benefits of JKN-KIS program
X_2	Education	X_{21}	Awareness of the importance of JKN-KIS program by education achieved
		X_{22}	Effect of education on willingness to participate in JKN-KIS program
X_3	Income	X_{31}	Decision to join JKN-KIS program based on income
		X_{32}	JKN-KIS program eases the economic burden of health risks
		X_{33}	Sufficient income to participate in JKN-KIS program
		X_{34}	JKN-KIS program does not interfere with financial spending
		X_{35}	JKN-KIS program reduces medical expenses
		X_{36}	JKN-KIS program helps financially
X_4	Occupation	X_{41}	Participating in JKN-KIS program considering occupation
		X_{42}	Obligation to participate in JKN-KIS program from work
		X_{43}	Participating in JKN-KIS program considering job risk
		X_{44}	Obligation to participate in the JKN-KIS program at work gives benefits
X_5	Socialization	X_{51}	Get socialization about JKN-KIS program from the government
		X_{52}	Most received JKN KIS program socialization from the government

Variable		Variable Name	
		X_{53}	Most received JKN KIS program socialization from the electronic media
		X_{54}	Most received JKN KIS program socialization from the electronic media print media
		X_{55}	Most received JKN KIS program socialization from the electronic media colleagues
		X_{56}	JKN-KIS program socialization from the government must be improved
X_6	Motivation	X_{61}	Participate JKN-KIS program because satisfied with the program
		X_{62}	Motivation to get free service
		X_{63}	Motivation to recommend JKN-KIS program to colleagues
		X_{64}	Motivation to participate JKN KIS program only when sick
		X_{65}	Motivation does not participate JKN KIS Program because it is burdensome in terms of cost
		X_{66}	Motivation does not participate JKN-KIS program because many procedures must be done
X_7	Trust	X_{71}	Trust JKN KIS program funds are managed properly
		X_{72}	Trust the JKN-KIS program benefits everyone
		X_{73}	Trust about benefits of the JKN-KIS program as health risk insurance
		X_{74}	Trust in third parties to help get JKN-KIS program membership

2.5 Partial Least Square

Data Analysis Method: The study utilises Partial Least Squares (PLS), which was originally developed by Wold (2013) as a variance-based structural equation modelling approach. Unlike covariance-based SEM, PLS is preferred for prediction-oriented research (Vinzi et al., 2010) and is often referred to as a "silver bullet" for handling complex models with non-normal data (Hair et al., 2011). Furthermore, this method is effective in handling nonlinear relations in social research (Sholihin & Ratmono, 2021). The determination of variables and econometric modelling in this study also draws on basic econometric principles (Gujarati, 2004).

3. Results and Discussion

3.1 Descriptive Statistics

Table 2: Number of Respondents by Gender

Gender	Total
Man	30
Woman	70

By gender, respondents distributed 70% of women and 30% to men. This shows there is a significant difference between the number of female and male respondents in Kelara Subdistrict, Jeneponto Regency (Government, 2021).

Table 3: Number of Respondents Based on Last Education Completed

Education	Total
Not in school	10
Elementary School/Equivalent	53
Junior High School/Equivalent	13
Senior High School/equivalent	20
College	4

Based on Table 3, the last education of respondents dominated by elementary school/ equivalent as much as 53% showed that the level of education of respondents was still relatively low. Respondents who had the last college education were classified as little, which is 4%.

Table 4: Number of Respondents by Income per Month

Income	Total
Less than Rp. 1,500,000	73
Rp. 1,500,000- Rp. 2,500,000	21
Rp. 2,500,001 – Rp 3,500,000	3
More than Rp. 3,500,000	3

BPS grouped the income of the population into 4, namely very high income groups (more than Rp 3,500.00 per month), high income groups (Rp2,500,000 - Rp3,500,000 per month), moderate income groups (Rp1,500,000 - Rp2,500,000 per month) and low-income groups (less than Rp1,500,000 per month) (Indonesian Central Statistics Agency, 2024). Based on Table 4 income per month respondents, distributing income shows most respondents in the five villages of Kelara Subdistrict, Jeneponto Regency has a low-income category.

Table 5: Number of Respondents based on Work

Occupation	Total
Farmer	36
Housewifes	40
Self employed	8
Student	5
Not working	4
Others	7

Based on Table 5, it is known that respondents are dominated by farmers by 36% and housewives by 40%.

Table 6: Number of Respondents Based on JKN-KIS Program Knowledge

Know the JKN-KIS program	Total
Already	87
Do not	13

Based on Table 6, most respondents are aware of the JKN-KIS program, while 13% are not. This shows that the majority of respondents, at 87%, have known about the JKN-KIS program.

Table 7: Number of Respondents Based on Participation in JKN -KIS Program

JKN-KIS Participants	Total
Already	55
Do not	45

Based on Table 7, respondents who have become members of JKN-KIS by 55%, while 45% have not been members or have not participated. This percentage is still insufficient, considering that it is hoped that everyone will participate in the JKN-KIS program. 87% of respondents have known about the JKN-KIS program, but only 55% participated, meaning that there are respondents who have known about the JKN-KIS program but did not participate in the JKN-KIS program due to several factors studied in this study such as occupation, motivation and trust to follow the JKN-KIS program.

Table 8: Number of Respondents Based on JKN-KIS Program Socialization

Ever Get Socialization about JKN-KIS	Total
Already	57
Do not	43

Based on Table 8, it is known that 57% of respondents have received socialisation regarding the JKN-KIS program from the government, while 43% have not received such socialisation. There are respondents who have never received socialization about JKN-KIS, this shows that socialization of the JKN-KIS program has not reached all levels of society.

Table 9: Number of Respondents Based on Interest in JKN-KIS Program

Interest in continuing/Following JKN-KIS	Total
Already	89
Do not	11

Based on Table 9, 89% of respondents expressed interest in joining the JKN-KIS program or continuing their JKN-KIS membership, while 11% did not. The percentage of respondents interested in the JKN-KIS program is higher than the percentage of respondents who are familiar with the JKN-KIS program and have become participants. This indicates that respondents have a high interest in the JKN-KIS program, including those who are unfamiliar with and participate in the program. This is certainly a great opportunity to flatten the distribution of JKN-KIS. However, the number of respondents who are not interested in continuing or participating in the JKN-KIS program should also be a great concern, especially for JKN-KIS management institutions, as they evaluate the implementation of JKN-KIS.

3.2 Structural Equation Modelling-Partial Least Square (SEM-PLS)

Figure 1 shows the model diagram obtained after eliminating indicators with a loading factor value of less than 0.5 It can be seen that the latent variable, endogenous community participation, is able to explain both indicators, namely Y1 and Y3, to more than 90%. Latent variables of knowledge, income, occupation, socialisation, and motivation have been able to explain the indicators by more than 60%. Education variables are able to explain the indicators by more than 50%, and latent variables of confidence have been able to explain the indicators by more than 90%.

Table 10 shows that the assumption of convergent validity is met if the indicator loading factor value is greater than 0.5. The results of the assumption test indicate that the loading factor values of the indicators for the seven variables exceed 0.5, confirming that the assumption of convergent validity is met.

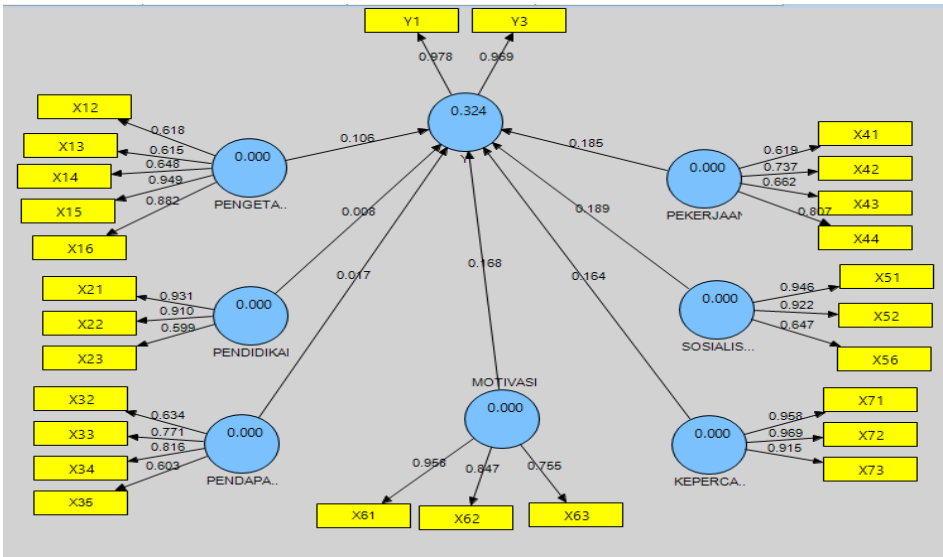

Figure 1: Diagram of Inner Model and Outer Model

Table 10: Loading Factor Value

	X1	X2	X3	X4	X5	X6	X7	Y
X12	0.6184							
X13	0.6153							
X14	0.6484							
X15	0.9488							
X16	0.8816							
X21		0.9310						
X22		0.9097						
X23		0.5995						
X32			0.6341					
X33			0.7711					
X35			0.6034					
X41				0.6193				
X42				0.7366				

	X1	X2	X3	X4	X5	X6	X7	Y
X43				0.6622				
X44				0.8074				
X51					0.9462			
X52					0.9222			
X56					0.6472			
X61						0.9581		
X62						0.8466		
X63						0.7549		
X72							0.9694	
X73							0.9153	
Y1								0.9783
Y3								0.9690

Tables 11, 12, and 13 demonstrate that the assumption of discriminant validity is met if the AVE value is greater than the latent variable correlations or cross-loading values of 0.5 or more for each indicator. The results of the assumption test showed that the AVE value of all indicators was greater than the latent value of variable correlations, as well as the cross-loading value of all indicators more than 0.5 so that it can be concluded that the validity assumption is met.

Table 11: AVE value

Variable	AVE	Variable	AVE
X7	0.8986	X2	0.6846
X6	0.7348	X1	0.5718
X4	0.5042	X5	0.7215
X3	0.5066	Y	0.9481

Table 12: *Latent Variable Correlations*

	X7	X6	X4	X3	X2	X1	X5	Y
X7	1.0000							
X6	0.1846	1.0000						
X4	0.3676	0.1428	1.0000					
X3	0.2178	0.2874	0.2155	1.0000				
X2	0.2118	0.1074	0.5990	0.1544	1.0000			
X1	0.5334	0.4132	0.2608	0.2622	0.2758	1.0000		
X5	0.5056	0.1760	0.4551	0.2017	0.4224	0.4429	1.000	
Y	0.4201	0.3071	0.3908	0.2078	0.2826	0.4010	0.439	1.000

Table 13: *Cross Loadings Value*

	X7	X6	X4	X3	X2	X1	X5	Y
X12	0.183	0.248	0.212	0.314	0.389	0.618	0.354	0.139
X13	0.407	0.087	0.172	0.040	0.225	0.615	0.294	0.280
X14	0.375	0.182	0.180	0.311	0.205	0.648	0.351	0.238
X15	0.475	0.403	0.276	0.219	0.241	0.949	0.425	0.392

	X7	X6	X4	X3	X2	X1	X5	Y
X16	0.480	0.536	0.164	0.267	0.125	0.882	0.299	0.372
X21	0.213	0.030	0.627	0.124	0.931	0.231	0.361	0.238
X22	0.211	0.026	0.640	0.059	0.910	0.209	0.397	0.244
X23	0.088	0.285	0.172	0.209	0.600	0.243	0.275	0.212
X32	0.122	0.594	0.034	0.634	-0.014	0.231	0.067	0.169
X33	0.171	0.101	0.272	0.771	0.196	0.161	0.179	0.140
X35	0.140	0.564	0.080	0.604	0.080	0.304	0.112	0.091
X41	0.170	0.307	0.619	0.304	0.380	0.151	0.222	0.252
X42	0.294	0.123	0.737	0.088	0.455	0.207	0.338	0.225
X43	0.185	0.423	0.662	0.171	0.252	0.223	0.225	0.225
X44	0.358	0.095	0.807	0.084	0.558	0.178	0.454	0.368
X51	0.459	0.109	0.439	0.216	0.434	0.405	0.946	0.442
X52	0.400	0.162	0.401	0.139	0.390	0.413	0.922	0.392
X56	0.461	0.214	0.308	0.158	0.214	0.303	0.647	0.258
X61	0.264	0.958	0.209	0.282	0.180	0.451	0.243	0.365
X62	0.019	0.847	0.019	0.237	-0.036	0.232	0.032	0.187
X63	0.062	0.755	0.018	0.201	0.027	0.338	0.067	0.080
X71	0.958	0.104	0.376	0.234	0.219	0.460	0.449	0.428
X72	0.969	0.155	0.359	0.170	0.189	0.536	0.511	0.398
X73	0.915	0.280	0.306	0.214	0.193	0.527	0.482	0.365
Y1	0.426	0.304	0.469	0.238	0.302	0.414	0.438	0.978
Y3	0.389	0.294	0.275	0.160	0.243	0.363	0.415	0.969

Table 14 shows the assumption that reliability will be fulfilled if the Composite Reliability or Cronbach's Alpha value is more than 0.6 for each variable. From the test results, it was found that all variables have a Composite Reliability or Cronbach's Alpha value of more than 0.6, thus meeting the assumption of reliability.

Table 14: Composite Reliability and Cronbach's Alpha

Variable	*Composite Reliability*	*Cronbach's Alpha*
X1	0.8655	0.8064
X2	0.8629	0.7454
X4	0.8010	0.6734
X3	0.8017	0.6721
X5	0.8834	0.7982
X6	0.8917	0.8418
X7	0.9637	0.9434
Y	0.9734	0.9457

Table 15 shows that the coefficient of determination (R^2) is obtained by 0.3236, which means the model can explain JKN-KIS participation by 32.36%, while other variables outside the proposed model explain the remaining 67.64%.

Table 15: Coefficient of Determination Value

Variable	R^2
Y	0.3236

Significance tests on SEM models with PLS aim to determine the inner model (the effect of exogenous variables on endogenous variables) and outer models (the influence of indicators on latent variables). Hypothesis testing with SEM-PLS method is done by bootstrapping. The T-table value for a 90% confidence level is 1.64. The null hypothesis of the inner model will be rejected if the T-statistics value > the T-table.

Table 16: Inner coefficient values of models and *T-Statistics*

	Coefficient	*T-Statistics*	Decision
X7 -> Y	0.1640	1.7239	Rejected
X6 -> Y	0.1677	2.1391	Rejected
X4 -> Y	0.1848	1.8254	Rejected
X3 -> Y	0.0171	0.1778	Accepted
X2 -> Y	0.0076	0.0744	Accepted
X1 -> Y	0.1059	1.1292	Accepted
X5 -> Y	0.1887	1.5683	Accepted

Based on Table 16, the variables that affect the participation variables are motivation (X6), occupation (X4) and trust (X7). This means that public motivation, occupation, and trust affect the level of community participation in the participation of the JKN-KIS program significantly with a 90% confidence level.

Furthermore, for the outer model test, the null hypothesis will be rejected if the T-statistics value > the T-table.

Table 17: Outer model coefficient values and T-Statistics

	Coefficient	T-Statistics	Decision
X41 <- Occupation	0.3280	3.2993	Rejected
X42 <- Occupation	0.2933	3.8749	Rejected
X43 <- Occupation	0.2928	2.7705	Rejected
X44 <- Occupation	0.4792	5.2787	Rejected
X61 <- Motivation	0.6421	4.4178	Rejected
X62 <- Motivation	0.3295	2.9726	Rejected
X63 <- Motivation	0.1402	0.8305	Accepted
X71 <- Trust	0.3788	17.3110	Rejected
X72 <- Trust	0.3520	17.7038	Rejected
X73 <- Trust	0.3232	13.9795	Rejected

Based on Table 17, for latent variables of motivation, influential indicators are motivation following because it is satisfied with the JKN-KIS program (X61) and motivation to get free medical services (X62). For job variables, two indicators are

influential with indicators, namely the help of the community from the obligation to follow JKN-KIS at work (X44), decisions to follow JKN-KIS based on occupation (X41), Obligation to follow JKN-KIS from occupation (X42) and decisions to follow JKN-KIS based on job risk (X43). Next is the confidence indicator. Those that affect community participation include the Trust indicator that funds are well managed (X71), the trust that the program benefits everyone (X72) and the trust of the benefits of the program for health risk assurance (X73).

4. Conclusion

From research conducted on 7 factors that influence community decisions following the JKN-KIS program in the Kelara District, Jeneponto Regency, it was found that certain factors significantly affect occupation, motivation, and public confidence in the JKN-KIS program. These three factors have a positive effect, with coefficients of 0.1677, 0.1848, and 0.1640, respectively, at a 90% confidence level. One of the six factors in an area classified as a disadvantaged, leading, and outermost area is the community's economy, with occupation being one of the factors that affect it. The occupation significantly affects the decision of the community to follow the JKN-KIS program, so it can be concluded that the status of disadvantaged, leading, and outermost areas influences the level of community participation in the JKN-KIS program

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