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A Study on Factors Affecting the Youth Employment Rate: Focusing on Data from 31 Cities and Counties in Gyeonggi-Do, South Korea

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Abstract

In order to explore the recent youth unemployment crisis faced by many countries, this study conducted an empirical analysis on the factors affecting regional youth employment in South Korea. Using variables suggested by both foreign and domestic studies, a hierarchical regression analysis showed that indicators such as the budget for job creation, the rate of increase in the number of businesses, and the road pavement rate do not have a significant effect on youth employment. Conversely, economic and social indicators such as the natural population growth rate, increases in the number of workers, the number of businesses with more than five employees, per-capita labor cost in the wholesale and retail trade industry, residential life satisfaction, and the share of business funding from the issuance of debt have a significant effect. Accordingly, to increase youth employment, policymakers should strive to increase immigration as well as the share of business investment funds in debt utilization rather than investing in road pavement or job creation.

Keywords: Budget for Job Creation, Employment, Hierarchical Regression Analysis, Natural Population Growth Rate, Unemployment, Youth Employment

1. Introduction

According to Statistics South Korea data (www.kostat.go.kr), as of June 2014 the overall unemployment rate in South Korea was 3.5% while the employment rate stood 60.9%; however, among Korea's youth (defined as those 15–29 years old) the unemployment rate reached as high as 9.5% and the employment rate reached only 40.7%. As such, the youth unemployment rate was 2.7 times higher than the overall rate and the youth employment rate was only two-thirds of the overall rate, or rather, 20.2% lower. This phenomenon is not exclusive to Korea. In most countries, the youth unemployment rate is more than twice the overall rate[1].

Employment is an essential requirement in life as well as some people's greatest concern. As such, the problem of unemployment among young people, who are beginners just entering the workforce, should be a high priority for society. Different approaches and prescriptions are required to address the youth labor market, though, as

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the youth unemployment problem has characteristics that are different from those of the overall unemployment problem[2]. Rothe and Tinter[3] identified personal and social ripple effects caused by youth unemployment. The personal ripple effect is caused by the social and economic marginalization and psychosocial burden of unemployment and entails falling behind in economic activity in the long run. The social ripple effect equates to the losses suffered by the national economy from income reductions, labor shortages, and the added cost to the social security system. Consequently, the youth unemployment problem is of national importance and, as it is unique from the overall unemployment issue that is generally discussed, it is necessary to study it with special attention.

Based on the aforementioned issue, this study aims to first, examine only the young (rather than all age groups); second, focus on the employment rate (which is superior to the unemployment rate in expressing whether there is a lack of jobs as well as the rate of job creation); and third, conduct an empirical analysis by using economic and social indicators categorized by region rather than those on a national scale. That is, by setting the youth employment rate (all those between the ages of 15 and 29 who are employed) as the dependent variable, and selecting independent variables from various data series from 31 local governments in Gyeonggi-Do, Korea, this study aims to identify regional factors that affect the youth employment rate. To achieve this objective, this study uses both foreign and domestic studies (such as those by[4] and[5]) to design a hierarchical regression with economic and social indicators set as the independent variables; it then analyzes the subsequent model.

2. Theoretical Background

Although there are many studies on youth employment and unemployment, few studies explain the low youth employment rate while controlling for employment among the middle aged and elderly. As such, the literature has a limitation in providing clues for solving the youth employment problem[6]. This section first presents domestic and foreign studies on the concept of employment and unemployment rates, the characteristics of youth unemployment, and regional unemployment rates.

2.1 The Concept of Unemployment and Employment Rates

The unemployment rate and the employment rate are representative indicators of economic activity. When a person who has lost their job continues to look for employment, there is no change in the economically active population. Consequently, the numbers of unemployed and employed change such that the unemployment rate increases and the employment rate decreases. When economic situations, such as recessions, precipitate structural unemployment, some among the unemployed may become frustrated and cease looking for work. These people are excluded from the unemployment rate index, as they are no longer considered to be a part of the economically active population; this causes the statistical unemployment rate to be lower than the actual unemployment rate[7]. Due to this disparity, Ryu[8] and Son[9] claimed that in the first half of 2010, a quarter of the youth population was actually unemployed, while the perceived unemployment rate was only 23.0%.

As the unemployment rate does not accurately reflect employment circumstances, employment and labor force participation rates are used complementarily[10]. However, although the employment rate is more useful than the unemployment rate in terms of measuring the state of the workforce, it is limited in that it is resistant to change and as such, it is not suited for comparing different regions' employment performances[11]. Furthermore, it can overestimate labor as the labor force participation rate is calculated by dividing the economically active population by the working age population and multiplying that figure by 100, and therefore, it includes the unemployed.

Nevertheless, Park[7] claimed that the employment rate can solve the problem of underestimating unemployment (resulting from the recurrent unemployment of those who give up looking for a job or the frequent entry and exit from the labor market by others) since it, as a ratio of the employed to the working age population, represents a capability to generate substantial employment and includes the non-economically active population (unlike the unemployment rate). In addition, by studying labor variables with a correlation analysis, Kim and Chang[12] found that the employment rate best represents economic activity as it is a significant labor market information variable.

Hence, this study focuses on the employment rate,

which is relatively superior to the unemployment rate in showing the state of job creation and whether there is a lack of jobs, in its examination of the youth unemployment issue.

2.2 The Characteristics of Youth Unemployment

Although there are many factors affecting youth unemployment, studies on the subject have generally focused on three in particular; demographic trends, the overall macroeconomic environment, and labor market institutions and policies[13,14,2]. In particular, Ahn[2] argued that the effects of macroeconomic policy on youth (those 15~29) employment could not be the same as those on the rest of the adult labor force because of youth's own stylized facts. He first pointed out the sensitivity of youth unemployment to the economy; that is, although unemployment has increased all over the world since the economic crisis, the hardest hit group has been the youth population, which suffers more keenly in response to economic downturns than does the older population[15,16]. Second, D. S. Ahn stated that when youth become unemployed, they fall into a vicious cycle where they stay unemployed for an extended period of time, a situation that he termed fixation[15]. This fixation phenomenon depends on the collective nature of the youth population, though. Third, he claimed that the volatility of youth unemployment is greater than the volatility of adult unemployment. Greater volatility is related to job insecurity, which manifests itself in high turnover rates and less desirable shifts (such as frequent night shifts). Fourth, according to D. S. Ahn, there is asymmetry between the youth unemployment and employment rates. For example, Ryu[8] claimed that the youth unemployment rate in Korea appears relatively low compared to other OECD countries, not because the labor market situation is any more favorable, but because the youth employment rate in Korea is very low. Finally, the young tend to be the last to be employed (last-in) and first to be fired (first-out).

Due to the unique characteristics of youth unemployment, this study focuses on the young rather than on all age groups.

2.3 Previous Studies on Regional Unemployment Rates

Nistor[4] developed a multiple regression analysis model in order to study the causal relationship between the unemployment rate and human capital investment in 49 regions in the United States from 1990 to 2000. In this analysis, the regional unemployment rate was set as the dependent variable and eight indicators (the manufacturing employment share, the service sector employment share, human capital, wages, human capital investment, net migration rate, unemployment insurance, and an interaction term between human capital investment and the net migration rate) were used as independent variables. The results of the analysis showed that human capital, human capital investment, and human capital investment times the net migration rate have negative effects on the unemployment rate, while the manufacturing employment share, service sector employment share, wages, the net migration rate, and unemployment insurance have positive effects. In particular, human capital, human capital investment, the manufacturing employment share, wages, and unemployment insurance were found to have significant effects on regional unemployment rates. The results showed that an investment in human capital of $100 per person could decrease the regional unemployment rate by 0.63%, as long as the net migration rate was greater than –1.6% per year.

Additionally, while Spain's economy improved between 1987 and 1992, regional unemployment rates decreased. Bande et al[17] showed that the gap increased by region and explained how this effect was caused by variations in the wage setting mechanisms among the different industries and regions. Stolarick and Currid-Halkett[5] analyzed the creative class of human capital along with the service workers group and the physical labor group in order to examine of specialization, and the index of diversity as key employment indices while Blien et al[19] presented regional scale, firm size, regional wage, and industry the factors affecting regional unemployment rates in the United States from 2007 to 2011. However, they concluded that the influence of the creative group (which constitutes very skilled human capital) was insignificant compared to that of the other groups, though it was related to lower unemployment. In addition, Glaeser et al[f] presented the index of the economy, the index characteristics as influential factors. Wolfgang[20], in his study of regional German employment, presented the regionalization index and the cluster index as key indices.

Meanwhile, Korean studies on regional employment, such as that of Lee et al[11], examined the number of those

employed, the employment share, and the rate of increase in employment. Lee and Yoon[21] conducted a study by using the number of those employed and the commuting intensity as key indices. Recently, Park[22] used the existing regional employment index to develop a new quantitative index for evaluating employment competitiveness.

3. Research Model

In order to find the factors that affect the regional youth employment rate (based on the theoretical background and previous studies mentioned in Section 2) this study extracted data on 87 variables, such as the unemployment rate, the employment rate, the youth unemployment rate, and the youth employment rate, for 31 cities and counties in Gyeonggi-Do South Korea from 2010 to 2013. As shown in the following Table 1, the factors that were most likely to affect the youth employment rate were divided into 4 categories, each with 5 key indicators, such that 20 potential variables were ultimately defined.

Table 1. Key indicators and content by characteristic for variable selection

Category	Main Indicator	Content	Previous Studies
Supply characteristic	Aging index	(Population over 65 years old/population below 14 years old)*100(%)	[4];[23]; [24];[25]; [26]; [22]
	Dependency ratio	((Population between 1–14 years old + population over 65 years old)/ population between 15–64 years old)*100	
	Natural population growth rate	Births over last year's rate of decrease in population due to death (%)	
	Net migration rate	(Moved-in opulation/population in previous year)*100	
	Rate of increase in the number of workers	Increase in number of employees from 2010 to 2011 (%)	
Demand characteristic	Business growth rate	Increase in number of businesses from 2010 to 2011 (%)	[4]; [27]; [26];[28]; [11]; [22]; [5]
	Number of businesses with more than five employees	Number of businesses with more than five employees	
	Per-capita labor cost in manufacturing industry	Total labor cost in manufacturing industry /number of workers	
	Per-capita labor cost in wholesale and retail trade industry	Total labor cost in wholesale and retail trade industry/ number of workers	
	Average number of workers	Total number of employees/total number of businesses	
Regional characteristic	Budget for job creation	Local government's job creation budget	[4];[29]; [22];[25]; [30];[31]; [32];[33]; [34]
	Satisfaction with residential life	Likert five-point scale (Survey by Gyeongin Regional Statistics Office)	
	Satisfaction with child's school	Likert five-point scale (Survey by Gyeongin Regional Statistics Office)	
	Road pavement rate	Local government's road pavement rate (%)	
	Satisfaction with transportation convenience	Likert five-point scale (Survey by Gyeongin Regional Statistics Office)	
Other	Share of business funding from issuance of debt	Share of business funding from debt issuance	[11];[30]; [35];[21]; [33]; [5]
	Household debt ratio	Share of households with debt	
	Share of participation in lifelong education	Share of working age population who have participated or are participating in lifelong education	
	Share of employees with monthly incomes of less than one million KRW	Share of employees with monthly incomes of less than one million KRW	
	Job satisfaction index	Likert five-point scale (Survey by Gyeongin Regional Statistics Office)	

*Source: Korea Gyeonggi Do, Gyeonggi Statistical Information Service DB

To select appropriate independent variables and design a research model, this study conducted a hierarchical regression analysis by continuously adding and removing variables hypothesized to influence the youth employment rate using SPSS 19.0 (see Table 2).

Table 2. Results of hierarchical regression analysis by model

Independent variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Aging index	.102				.025*	.025*	
Natural population growth rate	032*	.106	.023*	.013*	.002*	.001*	.001*
Rate of increase in the number of workers	.096	.180	.060	.006*	.001*	.014*	.017*
Per-capita labor cost in manufacturing industry	.873						
Per-capita labor cost in wholesale and retail trade industry	.065	.148	.013*	.014*	.009*	.005*	.007*
Satisfaction with residential life	.042	.058	.011*	.003*	.003*	.003*	.006*
Dependency ratio		.837					
Number of businesses with more than five employees			.039*	.112			.017*
Average number of employees							
Budget for job creation					.580	.969	.151
Business funding from debt issuance						.086	.043*
Rate of increase in the number of businesses				.038*	.003*	.003*	.053
Road pavement rate							.144
R^2	.532	.477	.560	.634	.685	.725	.740
R^2_{adj}			.472	.542	.589	.625	.629
F	4.555	4.558	6.354	6.917	7.142	7.260	6.653
p-value	.003	.004	.001	.000	.000	.000	.000

*Dependent variable is the youth employment rate and the numerical values represent the p-values ($p<0.05$ is marked *)

Model 7 in Table 2 which features a combination of nine independent variables, was found to have the largest coefficient of determination (R^2) and the largest adjusted coefficient of determination (R^2adj). Detailed operational definitions and data collection years for the variables in Model 7 are shown in Table 3.

Table 3. Selected independent variables (Xi) and dependent variable (Y)

Variable	Operational Definition	Year
Natural population growth rate (X_1)	Births over last year's rate of population decrease due to death (%)	2011
Rate of increase in the number of workers (X_2)	Increase in number of employees from 2010 to 2011 (%)	
Rate of increase in the number of businesses (X_3)	Increase in the number of businesses from 2010 to 2011 (%)	
Number of businesses with more than five employees (X_4)	Number of businesses with more than five employees	End of 2011
Per-capita labor cost in wholesale and retail trade industry (X_5)	Total labor cost in wholesale and retail trade industry /number of workers	2010
Budget for job creation (X_6)	Local government's budget for job creation	2011
Satisfaction with residential life (X_7)	Likert five-point scale (Survey by Gyeongin Regional Statistics Office)	2011
Road pavement rate (X_8)	Local government's road pavement rate (%)	End of 2011
Business funding from debt issuance (X_9)	Share of business funding from debt issuance	End of 2011
Youth employment rate (Y)	(Employed 15–29 year olds /population of 15–29 year olds)*100(%)	End of June 2013

*The listed year represents the final year of data collection, and there is no significant change for 1–2 years when the actual period of the survey is considered.

4. Empirical Analysis

The independence of the dependent variable was confirmed through an ex-ante analysis (Durbin–Watson index: 2.410) that showed that there was no autocorrelation. Additionally, the independent variable did not suffer from a multi-collinearity problem (VIF: 1.533~4.394) and there was no outlier effect on the research model. Accordingly, it was determined that there would be no problem in running the regression analysis. Out of multiple regression estimation methods, a simultaneous input method was used; the subsequent results are shown in Table 4.

Table 4. Results of the regression analysis

Category	B	SE	β	t	P	VIF
(Constant)	43.729	11.407		3.833	.001	
Natural population growth rate (X_1)	1.310	.335	.911	3.909	.001	4.394
Rate of increase in the number of workers (X_2)	.644	.249	.473	2.585	.017	2.708
Rate of increase in the number of businesses (X_3)	-.738	.360	-.383	-2.052	.053	2.824
Number of businesses with more than five employees (X_4)	-.640	.246	-.529	-2.596	.017	3.354
Per-capita labor cost in wholesale and retail trade industry (X_5)	.790	.263	.593	2.997	.007	3.163
Budget for job creation (X_6)	-.357	.240	-.216	-1.489	.151	1.697
Satisfaction with residential life(X_7)	-6.947	2.291	-.418	-3.033	.006	1.533
Road pavement rate (X_8)	.086	.056	.256	1.517	.144	2.297
Business funding from debt issuance (X_9)	.283	.131	.477	2.156	.043	3.963
R^2=.740, R^2_{adj}=.629, F=6.653(P=.000)						
Kolmogorov–Smirnov test Z=.549(P=.924>.10),						
Durbin–Watson test d=2.410(du=1.816)						

First, the results showed that the F statistic was F = 6.653 (P<.001), this implies that there are independent variables that have a significant effect on the dependent variable. Accordingly, as shown in Table 3, the variables that are significant at the 5% level are X_1(the natural population growth rate), X_2 (the rate of increase in the number of workers), X_4 (the number of businesses with more than five employees), X_5 (per-capita labor cost in the wholesale and retail trade industry), X_7 (satisfaction with residential life), and X_9 (business funding from debt issuance). On the other hand, the rate of increase in the number of businesses (X_3), the budget for job creation (X_6), and the road pavement rate (X_8) were shown not to affect the dependent variable. Together the nine independent variables (X_i) explained 74% (coefficient of determination, R^2) of the variation in the dependent variable (Y) and the model had an adjusted R^2 of 63%.

In addition, the effects of the independent variables on the dependent variable can be confirmed by the sign on their non-standardized regression coefficients (B). Four of the variables (the natural population growth rate, the rate of increase in the number of workers, per-capita labor cost in the wholesale and retail trade industry, and business funding from debt issuance) had a positive effect on the youth employment rate (Y), whereas two variables (the number of businesses with more than five employees and satisfaction with residential life) had a negative effect.

Moreover, the ranking of the six significant variables' influence on the dependent variable can be determined by the magnitude of the absolute value of the standardized regression coefficients (β). The absolute value of β_1 was 0.911, and thus the natural population growth rate had the greatest effect on the youth employment rate (Y). Next came β_5 (the coefficient on per-capita labor cost in wholesale and retail trade) with an absolute value of 0.593, β_4 (the coefficient on the number of businesses with more than five employees) with 0.529, β_9 (business funding from debt issuance) with 0.477, and then β_2 (rate of increase in the number of workers) with an absolute value of 0.473. β_7 (satisfaction with residential life) was found to have the least effect on the youth employment rate with an absolute value of 0.418. It should also be noted that the model's goodness-of-fit test confirmed the normality and homoscedasticity of the residual. Accordingly, the

multiple regression model designed for this study was confirmed to be appropriate.

5. Conclusion

To explore the problem of youth unemployment (which is not only a domestic concern, but also a global issue) this study analyzed a multiple regression equation research model that featured various economic and social indicators from 31 local governments in Gyeonggi-Do, South Korea. The results showed that the natural population growth rate, the rate of increase in the number of workers, per-capita labor cost in the wholesale and retail trade industry, and business funding from debt issuance positively affect the youth employment rate, whereas the number of businesses with more than five employees and satisfaction with residential life negatively affect it. The ranking of the variables' influence on the youth employment rate (from greatest to least) is as follows: the natural population growth rate, per-capita labor cost in the wholesale and retail trade industry, the number of businesses with more than five employees, business funding from debt issuance, the rate of increase in the number of workers, and satisfaction with residential life.

The results of the analysis have the following implications:

First, regions with relatively high natural population growth rates have the potential to increase the youth employment rate, and thus, they can actively carry out youth unemployment measures or policies.

Second, the popular belief that the number of jobs for the young will increase along with the number of businesses is incorrect.

Third, when selecting a sector for work, the young prefer jobs in the wholesale and retail trade industry, which are relatively easier than manufacturing industry jobs.

Fourth, as many youth work for small businesses with less than five employees (rather than working for larger businesses or being self-employed), it is more difficult for them to find work than it is for the middle aged and the elderly.

Fifth, it is generally known that increases in youth unemployment lead to more instances of self-employment, which thereby increases household debt. This implies business loans increase in accordance with the self-employment of youth, and consequently, the youth employment rate also increases. This is similar to the phenomenon where the youth employment rate decreases when the number of businesses with more than five employees increases.

Sixth, contrary to what would be expected, local government's budget for job creation is ineffective in raising the youth employment rate.

Seventh, although regional road pavement and commuting convenience can be important criteria for young people in selecting work, the road pavement rate was not shown to be a significant factor in determining the youth employment rate. This is in line with the fact that satisfaction with residential life has a negative effect on the youth employment rate.

Lastly, of the factors that enhance the youth employment rate, six were found to be significant. As mentioned earlier, the most positively influential factors in determining the youth unemployment rate (in descending order) are the natural population growth rate, per-capita labor cost in the wholesale and retail trade industry, business funding from debt issuance, and the rate of increase in the number of workers. Conversely, the number of businesses with more than five employees had the greatest negative effect while satisfaction with residential life had the next greatest negative effect. These economic and social indicators can be regularly encountered in statistical databases, and thus, when establishing youth employment policies, they must receive greater attention from local governments and consulting agencies.

Although this study drew significant conclusions, its findings are limited in their generality as it targeted only the specific region of Gyeonggi-Do, South Korea. Accordingly, future studies should target more diverse regions in order to acquire more useful implications for increasing youth employment.

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