THE POSITION OF VULNERABLE EMPLOYMENT IN SECTORAL GROWTH: CASE OF N11 COUNTRIES

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Abstract

The inclusion of vulnerable employment, which consists of self-employed and family workers, in the informal economy causes its effect on economic growth to disappear. Therefore, the protection of vulnerable employment is important in terms of preserving the income level of the country or moving to the next level. This study aims to examine the relationship between vulnerable employment and sectoral growth rates consisting of agriculture, industry and services in N11 (Bangladesh, Egypt, Indonesia, Iran, Korea, Mexico, Nigeria, Pakistan, Philippines, Turkey, Vietnam) countries. Within the scope of panel data analysis, the causality and cointegration relationship between the variables was tested and interpreted with the cointegration estimator. A bidirectional causality and cointegration relationship was found between vulnerable employment and sectoral growth rates. A positive relationship was found between growth in the agricultural sector and vulnerable employment, while a negative relationship was found with other sectors.

Keywords: Employment, Sectoral Growth, Panel Data Models

Jel Classification: E24, O41, C23

SEKTÖREL BÜYÜMEDE SAVUNMASIZ İSTİHDAMIN YERİ: N11 ÜLKELERİ ÖRNEĞİ

Öz

İstihdam türü olan serbest meslek sahipleri ve aile çalışanlarından oluşan savunmasız istihdamın kayıt dışı ekonomiye dahil edilmesi, ekonomik büyüme üzerindeki etkisinin kaybolmasına neden olmaktadır. Bu nedenle savunmasız istihdamın korunması, ülkenin gelir düzeyinin korunması veya bir üst düzeye geçilmesi açısından önemlidir. Bu çalışma, N11 (Bangladeş, Mısır, Endonezya, İran, Kore, Meksika, Nijerya, Pakistan, Filipinler, Türkiye, Vietnam) ülkelerindeki savunmasız istihdam ile tarım, sanayi ve hizmetlerden oluşan sektörel büyüme oranları arasındaki ilişkiyi incelemeyi amaçlamaktadır. Panel veri analizi kapsamında değişkenler arasındaki nedensellik ve eşbütünleşme ilişkisi test edilmiş ve eşbütünleşme tahmincisi ile yorum yapılmıştır. Savunmasız istihdam ile sektörel büyüme oranları arasında çift yönlü bir nedensellik ve eşbütünleşme ilişkisi bulunmuştur. Tarım sektöründeki büyüme ile savunmasız istihdam arasında pozitif bir ilişki, diğer sektörlerle ise negatif bir ilişki saptanmıştır.

Anahtar Kelimeler: İstihdam, Sektörel Büyüme, Panel Veri Modelleri

Jel Sınıflaması: E24, O41, C23

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Introduction

Sustainability in economic growth is one of the ultimate goals of countries even if they are developed. There are multiple macro factors in achieving these goals. Employment constitutes an important dimension of macro factors. Increasing the employment rate positively affects the income distribution justice in the country, the country's education level, access to health services, domestic and foreign trade volume and economic growth. By participating in the workforce, the personal income of the employed individual increases. The individual, whose personal income increases, turns to consumption as a conscious consumer and directs the remaining part of the income from consumption to savings and investment. He benefits from health services and, apart from sudden health conditions, also undergoes regular health check-ups depending on the increase in his income. This situation increases health expenditures in the country and contributes to growth by showing that health services are accessible. In addition, as the consumer increases consumption, increasing consumption in the country triggers production and enables the products produced to be sold in the domestic and foreign markets. Employment growth affects macroeconomic factors and is also affected by these factors. Increasing production, investment and trade support the emergence of new business areas. As the number of jobs increases, individuals' participation in the labor force and employment increases.

Among the macroeconomic factors affecting employment, increasing the country's income is effective in providing better services and education to the country's citizens. Individuals are healthy when there are no problems in access to education and health in the country. Every healthy individual contributes to the education of the country by continuing their education. However, there are individuals who cannot be employed due to the inability to provide these opportunities to every segment and every individual in the country, or because the living conditions of the individuals are not suitable for this, and because of the individuals' preferences. Among these individuals, there are family workers who constitute vulnerable employment, which is the sub-concept of employment, that is, they do their own work and contribute.

According to the International Classification of Employment Status (ICSE-18), workers are grouped as salaried employees, employers, self-employed workers, members of producer cooperatives, family workers and workers other than these. The first group of wage and salaried employees is called paid employment, and the other five groups are called self-employment. Regular wage and salaried employees are generally employees affiliated with an institution or organization. By working for a certain fee, he/she does not share in other income obtained by the institution or organization. Self-employed groups, named in the other five groups, earn all or a certain proportion of the income obtained from the goods and services produced. The vulnerable employment group, called contributing family workers in the self-employed group, are not even accepted as partners in some income because they are family businesses. (International Labor Organization [ILO]), 2024).

Vulnerable employment, consisting of self-employed, contributing family workers, constitutes the most vulnerable part of the self-employed group. This type of employment is a source of labor for the informal economy. They have the same rights as those employed in the vulnerable employment group. Although those who are employed vulnerable do not have social protection such as insurance, legal rights and legal opportunities given to workers, social status, and unionization status, their income levels also vary (Kaya, 2020: 95).

Vulnerable employment is not related to the level of development of countries. There may also be vulnerable employment in developed countries. When examined on a sectoral basis, such employment is seen in declining sectors such as agriculture and growing sectors such as market services. In fact, the share of employment in the agricultural sector in developing countries is more concentrated than in developed countries, and the informal economy is more common in developing countries. International Labour Organization - World Bank statistics on the subject also confirm this claim. Statistics on vulnerable employment provide valuable information about the quality of employment and provide information about the state of the labor market in developing and emerging countries (Chen, Huang, Cheng, Tang and Huang, 2023: 2-3).

Vulnerable employment in the agricultural sector has the worst access to all opportunities compared to other sectors. Education and health services remain limited in regions where agricultural activities are intensively used. People in rural areas are deprived of these two important services and have no other employment options other than agricultural activities. Most of the needs of people employed in the agricultural sector cannot be met due to general reasons such as distance to the city, lack of education, and increased health problems. (Lo Bue, Le, Santos Silva and Sen K, 2022: 5-6). Apart from the agricultural sector, there are also people who are self-employed or employed as family workers in the service and industry sectors. However, since these sectors are more developed than agriculture, employees are not victimized as much as employees in the agricultural sector.

The study, prepared in accordance with research and publication ethics, aimed to determine the impact of vulnerable employment on growth rates on a sectoral basis. Since the effects of vulnerable employment are also seen in growing and developing countries, data from the Next Eleven (Next 11 [N11]) countries, which are growing economies, were used. In the study covering the years 1994 to 2022, the relationship between vulnerable employment and the Gross Domestic Product percentage rates of the agriculture-industry-service sector in N11 countries was analyzed. In the study where panel data analysis was performed, unit root test was performed after checking the heterogeneity of the model and whether there was correlation. Then, the Dumitrescu-Hurlin causality test was applied to determine the causality between the variables. Finally, Westerlund panel cointegration test and Common Correlated Effects (CCE) Estimators were conducted to control the long-term effects of the variables. It is seen that the study on vulnerable employment in the literature is limited. While

the number of studies analyzing the relationship between vulnerable employment and economic growth is limited, no study has been found that includes all sectoral growth rates. It is thought that this study will contribute to the literature and lead the way.

1. Indicators of Variables Used in The Analysis of N11 Countries And Literature Review

Since variables belonging to N11 countries are included in the study, this part of the study includes the theoretical interpretation of selected variables of N11 countries. In addition, a literature review is also included before moving on to the analysis part.

1.1. Vulnerable Employment And Sectoral Growth Indicators of Next Eleven Countries

Grouping countries in the same group according to certain similar characteristics provides more systematic progress and analytical convenience in analyses. At the same time, it becomes easier to compare country groups within themselves or with other country groups. One of these groupings is the N11 countries, known as Next Eleven. The fact that N11 countries consist of growing and developing economies and have similar economic and demographic characteristics has enabled these countries to be grouped and named. N11 countries are developing countries that are estimated to surpass the Group of Seven (G7) countries in terms of economic growth in 2050 (Sandalcılar, Ayran Cihan and Colak, 2022: 63). One of the factors that affect the development of countries is employment. The subject of the analysis in this study is the impact of vulnerable employment on the sectoral growth of these countries, where economic growth rates are expected to be high.

It is observed that sectoral growth, consisting of vulnerable employment and agriculture-industry-service sectors, has increased and decreased at a certain pace in N11 countries since 1994. Since it was seen that there was no major change, indicators were included with four-year intervals from 1994 to 2022 (1994-1998-2002-2006-2010-2014-2018-2022). These indicators are found in tables 1, 2 and 3.

Table 1: Vulnerable Employment Rates for N11 Countries

Countries	1994	1998	2002	2006	2010	2014	2018	2022
Bangladesh	67,17	66,82	65,82	64,15	62,12	59,77	56,45	54,94
Egypt	26,85	24,22	22,36	24,81	23,05	25,45	18,90	23,93
Indonesia	64,88	65,40	60,82	58,27	57,29	49,72	48,40	50,28
Iran	43,14	43,00	42,44	41,91	39,81	39,80	41,84	39,42
Korea	32,73	30,90	28,86	26,12	22,83	20,53	18,97	18,59
Mexico	39,19	34,42	32,70	29,80	28,88	27,98	26,69	26,71
Nigeria	42,44	42,37	42,97	45,03	44,34	40,53	38,14	37,43
Pakistan	64,78	63,90	59,33	60,39	62,13	59,13	55,63	56,40
Philippines	44,84	44,94	45,73	44,93	41,98	39,26	32,90	33,28
Türkiye	48,67	47,21	44,69	35,41	33,78	29,41	27,55	25,19
Vietnam	82,22	78,74	79,02	68,94	62,73	62,25	53,91	51,95

Reference: The World Bank, 2024.

Indicators of vulnerable employment for N11 countries are listed in table 1. It is also seen in the table that Pakistan has the highest employment rate among other N11 countries in 2022. Then come Bangladesh, Vietnam, Indonesia and Iran. Nigeria, Philippines, Mexico-Türkiye, Egypt-Korea follow this order. Over the years, Mexico, Turkey, Egypt and Korea are similar in terms of vulnerable employment rates. However, the fact that Korea, rather than Egypt, has the lowest rate in this type of employment indicates that it is turning to other employment areas.

Tables 2, 3 and 4 show the sectoral growth rates of the independent variables subject to analysis for N11 countries. Generally speaking, it can be seen that the agricultural sector is at the lowest level in N11 countries, while the service sector is at the top among sectors.

The change in sectoral growth rates in the agricultural sector of N11 countries over the years is shown in table 2. The countries where the agricultural sector, which is at a low level, contributes the least to growth are Korea and Mexico. It can be seen that the countries with the lowest level other than Korea are Türkiye and Iran. In the remaining countries, growth rates and changes in the agricultural sector in recent years have followed the same course. However, Pakistan is far ahead among the remaining countries.

Table 2: Agricultural Sector Growth Rates of N11 Countries

Countries	1994	1998	2002	2006	2010	2014	2018	2022
Bangladesh	26,73	22,59	20,58	18,03	17,00	15,35	12,48	11,22
Egypt	15,71	15,88	15,40	13,24	13,34	11,34	10,83	10,95
Indonesia	17,29	18,08	16,32	12,97	13,93	13,34	12,81	12,40
Iran	10,55	11,56	7,83	7,12	6,50	9,38	11,13	12,77
Korea	5,66	4,23	3,21	2,50	2,14	2,06	1,75	1,64
Mexico	4,36	3,91	3,11	2,94	3,09	3,03	3,30	4,03
Nigeria	19,02	19,19	16,43	15,90	16,98	16,71	15,32	16,78
Pakistan	22,75	25,30	22,70	20,42	22,69	23,49	21,65	22,35
Philippines	19,26	14,75	13,45	13,36	13,75	12,27	9,65	9,55
Türkiye	15,46	12,45	10,19	8,09	8,97	6,56	5,79	6,48
Vietnam	27,43	25,78	23,03	18,73	15,38	14,88	12,31	11,88

Reference: The World Bank, 2024.

The change in sectoral growth rates of the industrial sector of N11 countries over the years is shown in table 3. When we look at the sectoral growth rates of N11 countries, it is the industrial sector that is effective in growth after agriculture. Pakistan, which has the highest growth rate in the agricultural sector, has the lowest growth rate among the N11 countries in the industrial sector. After Pakistan, Nigeria, Philippines and Türkiye come. There are no major changes among the remaining countries, they show changes in the same band. The country with the highest growth in the industrial sector is Indonesia. This height can be seen in the table.

Table 3: Industrial Sector Growth Rates of N11 Countries

Countries	1994	1998	2002	2006	2010	2014	2018	2022
Bangladesh	23,47	22,66	22,84	24,10	24,96	26,31	31,98	33,92
Egypt	30,50	28,65	32,58	36,15	35,78	39,89	35,33	32,71
Indonesia	40,64	45,23	47,75	46,94	42,78	41,93	39,73	41,43
Iran	43,37	32,50	45,50	48,26	44,21	39,23	37,35	39,86
Korea	36,24	35,31	32,81	33,52	34,12	34,09	34,05	31,73
Mexico	32,57	34,16	32,86	34,39	32,54	31,92	32,04	33,55
Nigeria	19,76	19,23	21,46	20,87	21,97	25,10	24,99	25,99
Pakistan	22,37	22,05	17,16	20,20	20,97	20,87	18,59	20,42
Philippines	36,16	34,88	34,78	33,46	32,34	31,05	30,56	29,23
Türkiye	32,08	31,04	24,59	26,03	24,49	28,12	29,44	31,29
Vietnam	28,87	32,49	38,49	38,58	33,02	35,30	36,54	38,26

Reference: The World Bank, 2024.

The change in sectoral growth rates in the service sector of N11 countries over the years is shown in table 4. Looking at the service sector, Vietnam is the country with the lowest growth in this sector. Indonesia, Iran and Nigeria follow. However, all remaining countries show more than 50% growth in the service sector. It is seen that the Philippines is the country with the highest growth in the service sector, at 60%.

Table 4: Service Sector Growth Rates of N11 Countries

Countries	1994	1998	2002	2006	2010	2014	2018	2022
Bangladesh	46,28	49,83	51,57	52,74	53,50	53,64	50,89	51,04
Egypt	46,91	48,29	45,59	44,69	46,23	52,32	51,64	51,43
Indonesia	42,07	36,69	40,10	40,08	40,67	42,24	43,40	41,79
Iran	48,21	57,17	47,70	49,13	51,14	49,36	48,27	44,96
Korea	49,16	52,20	53,61	54,70	54,70	55,64	55,69	58,03
Mexico	58,66	57,26	59,12	59,07	60,48	60,08	59,27	57,60
Nigeria	50,35	48,79	50,45	53,76	51,74	48,55	51,01	46,27
Pakistan	44,69	45,30	54,84	54,22	52,60	51,56	52,93	52,19
Philippines	44,58	50,37	51,77	53,18	53,91	56,68	59,79	61,22
Türkiye	48,94	48,62	53,57	53,43	54,54	53,83	54,42	51,74
Vietnam	43,70	41,73	38,48	42,69	40,63	40,92	42,17	41,34

Reference: The World Bank, 2024.

Considering the sectoral growth rates in general, it can be seen that Pakistan's agricultural activities are carried out correctly and its lands are suitable. It is understood that Indonesia is the most developing country in terms of industry and has high rates in the production and sales of industrial goods. It is seen that the Philippines, which has the highest share in the service sector that includes more than one field of activity, has made progress in areas such as banking and finance, insurance and stock exchange, and communications.

Since Pakistan is the most developing country in the agricultural sector in N11 countries, employment opportunities provided to individuals living in the country are increasing in the field of agricultural activities. The high level of vulnerable employment rate in the country shows that family workers and self-employed workers in the country have a strong connection with the agricultural sector. For this country, it is interpreted that the vulnerable employment rate and the agricultural sector growth rate are directly linked. Developing in the industrial sector, Indonesia ranks fourth in the last year in vulnerable employment accessible in terms of employment. In this case, it is seen that vulnerable people are concentrated in the industrial sector. The vulnerable employment rates of the Philippines, which is at the top of the growth rates of the service sector, are less effective than other employment rates in supporting this growth. Because the Philippines ranks seventh in vulnerable employment in the last year.

The impact of vulnerable employment on sectoral growth in Nigeria, Bangladesh, Turkey and Egypt is less than other countries. It can be said that vulnerable employment is effective in total growth. From another perspective, it is commented that other employment types and other sectors may have a greater impact on growth. In Mexico, Korea and Indonesia, growth is high in the agro-industrial sectors and low in services.

It is seen that Vietnam's industrial sector growth rate and vulnerable employment rate are at the same level, especially in the last year. In this country, the number of workers who qualify as vulnerable employment is high in the industrial sector. Finally, while the growth rate in Iran's service sector is low, it ranks second in industry and third in agriculture in the last year. However, the fact that it ranks fifth in the vulnerable employment list leads to the interpretation that the impact of vulnerable employment on the growth rates of the agricultural-industrial sectors is low.

1.2. Literature Review

Vulnerable employment studies are limited in the literature. No study has been found that analyzes vulnerable employment with sectoral growth, as in this study. However, there is a study by Yerrebati (2022) in which its relationship with economic growth is analyzed as a concept close to sectoral growth. Apart from this, there are a few studies in which the relationship between vulnerable employment and informal economy and urbanization is interpreted and vulnerable employment is included in the analysis by taking gender differences into account.

Yerrebati (2022) concludes that there is a relationship between fragile employment and economic growth. While the high level of this type of employment affects growth positively, the low level of this type of employment affects it negatively.

Eren (2023) analyzed the informal economy and per capita growth, globalization, foreign trade and vulnerable employment for 38 OECD countries. It has been found that vulnerable employment is not as effective as other variables on the informal economy, but its effect is increasing, albeit slightly. Baklouti and Boujelbene (2019), Luong, Minh and Nguyen (2020), Nguyen and Su (2021), Dell'Anno (2016) analyzed the relationship between the informal economy and vulnerable employment in their studies. A positive impact on vulnerable employment and the informal economy was found.

Chen, Huang, Cheng, Tang and Huang (2023) analyzed the relationship between urbanization and vulnerable employment and they found that the increase and decrease in urbanization caused changes in vulnerable employment rates.

Studies that quantitatively measure men and women in vulnerable employment are those of Mondragon-Velez and Pera (2010), Verick (2009), Gokhool, Kosseah and Tondrayon-Ragoobur (2018), Lo Bue, Le, Santos Silva and Sen (2022). Lo Bue, Le, Santos Silva and

Sen (2022), Mondragon-Velez and Pera (2010) found that women are more likely to be employed in vulnerable employment than men; Verick (2009), Gokhool, Kosseah and Tondrayon-Ragoobur (2018) found that men are more employed than women.

2. Econometric Analysis

2.1. Data Set and Method

Since panel data analysis includes both time and unit dimensions, it is possible to reach more units at the same time. It also allows the relationship between determined variables to be compared with different units. Since panel data analysis is more comprehensive, panel data analysis was conducted with the selected variables in this study (Hsiao, 2005: 144).

The study, which covers the years 1994 to 2022, uses data on vulnerable employment and agriculture, industry and services. These data from N11 countries aim to determine the place of vulnerable employment in sectoral growth. For this reason, vulnerable employment was chosen as the dependent variable and other indicators were chosen as the independent variable. The first letters of the variables are given. Sectoral employment indicators include forestry and fishing in the agricultural sector and construction in the industrial sector. In the variables taken from The World Bank website, vulnerable employment is a percentage of total employment, and agriculture, industry and service sectors, stated as sectoral growth rates, are a percentage of Gross Domestic Product. Stata program was used to perform the analysis. Since the variables are percentages and values close to each other, logarithms of the variables were not taken. For this reason, a linear regression model was designed. The model established in the study was built to specify the dependent-independent variables. It is a model created to indicate that the first dependent variable selected during analysis in the Stata program is vulnerable employment. At the same time, another purpose of determining this model is to show that the relationship between vulnerable employment, which is the dependent variable, and sectoral growth rates is analyzed. The relationship between the independent variables has not been determined. The model is as follows;

$$VEMP_{it} = \beta_0 + \beta_1 AGR_{it} + \beta_2 IND_{it} + \beta_3 SER_{it} + \mu it \tag{1}$$

In equation 1, VEMP refers to vulnerable employment, which is the dependent variable of the model. AGR indicates growth rates in the agricultural sector, IND in the industrial sector, and SER in the service sector. i in the subscripts of the expressions contains the unit and t contains the time. The symbol at the end of the equation shows that the established model also includes error terms (Turgut and Ucan, 2021: 1379).

There are hypotheses regarding the tests used in the analysis. The hypothesis called the null or null hypothesis indicates the absence of the proposition in the content of the test, while

the hypothesis called the first or alternative hypothesis states, on the contrary, the existence of the proposition. In interpretations, the propositions in these hypotheses and their connection with the level of significance are used. Generally, a significance level of 0.05 is used. The probability value resulting from the test is compared with this significance level. If the resulting value is less than 0.05, it indicates that the alternative hypothesis is accepted. If it is greater, it indicates the acceptance of the null hypothesis.

The first decision to be made in panel analysis is whether the model is homogeneous or not. There are multiple homogeneity tests for this. Among them, Pesaran Yamagata (2008) homogeneity test does not take into account which unit and time effect is greater or whether the panel is balanced or unbalanced. The hypotheses of this test, which can be used in all situations, are as follows (Pesaran and Yamagata, 2008: 55).

H_0: All slopes are homogeneous.

H_1: All slopes are heterogeneous.

The second thing to determine in panel data analysis is whether there is correlation in the model. The number of units and time in the study are used in the selection of the correlation test. If time is greater than unit, it is appropriate to use the Breusch Pagan LM test. Hypotheses (Breusch and Pagan, 1980: 241);

H_0: There is no correlation.

H_1: There is correlation.

The first two tests performed in panel data analysis provide guidance in determining the unit root, causality and cointegration tests to be carried out later in the analysis. If it is concluded that there is correlation in the model and that it is a heterogeneous model, second generation unit root tests are used. After a certain year has passed in the analysis, a unit root test must be performed in the panels called macro panels. This test provides information about the stationarity of variables. Analysis performed with variables that are not stationary or whose stationarity is not determined does not give healthy results. Each variable that is not stationary must be made stationary by the difference method. This method continues to be applied until the variables become stationary. The hypothesis of the Horizontal Section Extended Im, Pesaran and Shin (CIPS) test, which is one of the second generation unit root tests, is as follows (Yerdelen Tatoglu, 2018: 180).

H_0: The series is not stationary.

H_1: The series is stationary.

With the unit root test, cointegration test is performed as a result of the variables being stationary at the level. At the same time, the stationarity of each at the first level enables the Dumitrescu-Hurlin causality test to be performed. The causality test can be used to measure

the existence of a relationship and effect between variables and, if any, to measure its direction. Hypotheses (Dumitrescu and Hurlin, 2012: 1455);

H_0: There is no causality.

H_1: There is causality.

The fact that all variables used in the model are stationary at the first level allows cointegration testing to be performed. If model heterogeneity and correlation are detected, second generation cointegration tests are used. Second generation cointegration tests include the Westerlund Panel Cointegration Test. There are four statistics in this test: Ga, Gt, Pa, Pt. While Pa and Pb are cointegration statistics, Ga and Gt are statistics expressing that the parameter changes between units (Kocak, 2024: 659). Hypotheses (Westerlund, 2008: 16);

H_0: There is no cointegration.

H_1: There is cointegration.

When the existence of a cointegration relationship between variables is detected, estimators are used to estimate the cointegration coefficients. In the selection of these estimators, the presence of homogeneity, heterogeneity and correlation is taken into account. Second generation estimators are used in heterogeneous models where correlation exists. Common Correlated Effects (CCE) Estimators proposed by Pesaran (2006) were used in this study. The advantage of the estimator is that it gives results regarding both the panel whole and the units (Yerdelen Tatoglu, 2018: 299).

2.2. Findings

In the study, firstly, the homogeneity-heterogeneity status of the model was determined. The results of the Pesaran Yamagata (2008) test are shown in table 5. Since the probability values of this test were less than the 0.05 significance level, it was decided that the model was heterogeneous.

Table 5: Homogeneity Test

Statistical Value	Probability Value
15.738	0.000
17.300	0.000

Since the second test required in panel data analysis is to determine the existence of correlation, the Breusch-Pagan LM test was performed. Table 6 shows the results where there is correlation in the model.

Table 6: Correlation Test

Statistical Value	Probability Value
Chi2(55)=297.576	0.0000

As a result of correlation and heterogeneity, second generation unit root CIPS was made. The results are in table 7. In the first stage, the differences of the variables were taken since they were not stationary from their level values. The letter D has been added to the subscripts to indicate that the difference has been taken. Then, they became stable at their first level.

Table 7: Unit Root Test

I (0)		
Variables	Statistical Value	Probability Value
VEMP	0.085	0.534
AGR	-0.936	0.175
IND	2.318	0.990
SER	-0.397	0.346
I (1)		
Variables	Statistical Value	Probability Value
$VEMP_D$	-4.055	0.000
AGR_D	-9.009	0.000
IND_D	-6.765	0.000
SER_D	-5.499	0.000

The results of this test, which indicates a causality relationship between the variables and its direction, are shown in Table 8. Considering the two results of this test; It was below the 0.05 significance level.

Table 8: Causality Test

First Variable	Direction of Causation	Second Variable		Statistical Value	Probability Value
VEMP	⟶	AGR	z-bar	13.4875	0.0000
			z-bar tilde	3.9305	0.0001
VEMP	⟶	IND	z-bar	7.2365	0.0000
			z-bar tilde	2.6980	0.0395
VEMP	⟶	SER	z-bar	8.3687	0.0000
			z-bar tilde	2.1024	0.0355
AGR	⟶	VEMP	z-bar	10.8771	0.0000
			z-bar tilde	2.9983	0.0027
IND	⟶	VEMP	z-bar	11.5833	0.0000
			z-bar tilde	3.2505	0.0012
SER	⟶	VEMP	z-bar	15.0366	0.0000
			z-bar tilde	4.4838	0.0000

AGR, IND and SER from VEMP variable; It has been determined that there is a one-way causality relationship in at least one unit from the AGR, IND and SER variables to the VEMP variable.

Then, the Westerlund Cointegration test was used to determine long-run relationships. The results are in table 9. As mentioned in the method of the study, if all 4 statistics resulting from the selected cointegration test are less than the probability value, a cointegration relationship is mentioned. As can be seen in Table 9, the probability values of 4 statistics were lower than the significance level. It was concluded that there is a long-term relationship between vulnerable employment and sectoral growth rates.

Table 9: Cointegration Test

		VEMP-AGR	VEMP-IND	VEMP-SER
Gt	Statistical Value	-4.105	-3.854	-4.155
	Probability Value	0.000	0.000	0.000
Ga	Statistical Value	-20.835	-20.155	-21.030
	Probability Value	0.000	0.000	0.000
Pt	Statistical Value	-19.420	-19.399	-19.082
	Probability Value	0.000	0.000	0.000
Pa	Statistical Value	-27.665	-29.557	-28.459
	Probability Value	0.000	0.000	0.000

After causality and cointegration, positivity and negativity in the coefficients of the long-term relationship were determined. The results of the CCE panel cointegration estimator selected for this determination are given in tables 10 and 11. In Table 10, which contains the estimator results of the entire panel, the general effect of agricultural sector growth-vulnerable employment is positive, while the growth of industry-service sectors is negative. The results show that the growth variable in the agricultural sector, which is below the 0.05 significance level, is statistically significant, while the growth variables in the service - industry sectors are not significant.

Table 10: CCE Panel Cointegration Coefficients (Long-Term Coefficients of the Entire Panel)

	Coefficients	Statistical Value	Probability Value
AGR	0.2510	1.73	0.048
IND	-0.0322	-0.24	0.812
SER	-0.0021	-0.02	0.986

Table 11, showing the coefficient relationships of the units, shows that the countries where growth in the agricultural sector is associated with fragile employment are positive: Mexico, Nigeria, Turkey and Vietnam. In countries other than these countries, the relationship was negative. The countries where the relationship between growth in the industrial sector and vulnerable employment is positive are the Philippines, Egypt, Pakistan and Vietnam. In the remaining countries, the increase in the industrial sector growth rate has a reducing effect on vulnerable employment. The countries where the relationship between growth rates in the service sector and vulnerable employment is negative are Indonesia, Mexico, Nigeria, Vietnam and Iran. It is concluded that service sector growth rate and vulnerable employment are positively related in other N11 countries. When Table 11 is evaluated statistically, Indonesia's AGR, IND, SER; Mexican IND, SER; SER of Egypt; Pakistan's AGR, IND; SER of Vietnam and AGR of Iran variables were statistically significant.

Table 11: CCE Panel Cointegration Coefficients (Long-Term Coefficients of Units)

Countries	Variables	Coefficients	Statistical Value	Probability Value
Bangladeş	AGR	0.1248	0.78	0.436
	IND	-0.1026	-0.72	0.471
	SER	0.0914	0.56	0.579
Endonezya	AGR	2.5481	3.98	0.007
	IND	-0.9134	-2.70	0.000
	SER	-0.4191	-3.02	0.003
Filipinler	AGR	0.4644	1.10	0.272
	IND	0.4582	2.15	0.246
	SER	0.0760	0.18	0.855
Kore	AGR	0.3955	0.72	0.475
	IND	-0.1915	-1.19	0.232
	SER	0.0313	0.16	0.869
Meksika	AGR	-0.3139	-0.29	0.769
	IND	-0.8800	-2.34	0.019
	SER	-0.7235	-1.52	0.029
Mısır	AGR	1.3882	1.17	0.244
	IND	0.2902	0.72	0.471
	SER	0.6383	1.79	0.043

Table 11: CCE Panel Cointegration Coefficients (Long-Term Coefficients of Units) (Continue)

Countries	Variables	Coefficients	Statistical Value	Probability Value
Nijerya	AGR	-0.1618	-0.77	0.439
	IND	-0.3062	-1.42	0.155
	SER	-0.0865	-0.62	0.533
Pakistan	AGR	0.6490	0.75	0.041
	IND	1.0000	2.54	0.045
	SER	0.6762	1.24	0.216
Türkiye	AGR	-0.1403	-0.46	0.644
	IND	-0.0288	-0.10	0.924
	SER	0.1882	0.79	0.432
Vietnam	AGR	-0.1111	-0.26	0.797
	IND	0.0412	0.14	0.887
	SER	-0.3611	-1.75	0.041
İran	AGR	0.2085	1.93	0.043
	IND	-0.0531	-0.54	0.590
	SER	-0.1354	-1.30	0.194

Conclusion

Employment is the increase in the labor factor in the country and the increase in personal and national income. Thus, increase the job opportunities provided to individuals. For this reason, employment is important for countries that are influential in the course of the economy, and increasing employment is among the obvious goals. The concept of vulnerable employment, one of the sub-concepts of employment, has been developing in recent years. This type of employment includes those who work for their own business and in family businesses. Since employees in this type of employment are not registered, vulnerable employees increase the negative impact of the informal economy. These employees cannot get full efficiency regarding their rights and laws and are victimized. In terms of income, they earn a low level of income and cannot save and invest. Since the income they earn is sufficient for their consumption, they do not contribute to the increase in savings and investment, which are major factors in the economic growth of the country.

Vulnerable employed people directly affect the informal economy and indirectly affect economic growth. Low income levels cause the inability to receive qualified health and education services and their generations to be victimized by these services. When this situation is evaluated on a sectoral basis, additional problems such as the lack of urbanization and the delay in services provided to rural areas due to the geopolitical location of the sector are added to the problems experienced by employees in the vulnerable employment group in

rural areas where agricultural activities are frequently carried out. However, people who work alongside their families or are self-employed in the industrial and service sectors face fewer problems than those in the agricultural sector.

The study, the relationship between vulnerable employment and the sectors involved in economic growth was analyzed. The analysis, the relationship between vulnerable employment and agriculture-industry-service sector growth rates of Next Eleven (Next 11 [N11]) countries, which have similar economic characteristics and are constantly developing, was analyzed. After performing the homogeneity, correlation and unit root tests required by panel data analysis, causality and cointegration tests were applied. As a result of the Dumitrescu-Hurlin causality test, it was concluded that vulnerable employment was the cause of sectoral growth. Vulnerable employment affects and is affected by sectoral growth. In studies where the variables were cointegrated, CCE Panel Cointegration estimator was used to determine the positive and negative relationship.

Theoretically, it can be seen that the sectoral growth rates of N11 countries, from highest to lowest, are in the service, industry and agriculture sectors. In addition, sectoral effects on vulnerable employment rates occur in different sectors within macroeconomic factors such as the location of the countries, their underground and surface wealth, population, other types of employment, and national income levels. A causal relationship was found in the research and is theoretically supported. At the same time, the causality relationship in the study also supports the result of the Yerrebati (2022) study. It is also important in which direction the dependent and independent variables, which are caused by each other, affect each other. From a theoretical perspective, Pakistan ranks first in terms of vulnerable employment and growth rate in the agricultural sector. The general result of the predictive test conducted in the analysis that the growth in the agricultural sector positively affects vulnerable employment also supported the theoretical result. Although vulnerable employment seems like a state of being employed, it represents victimization for individuals and the country. It is inevitable that this number of employment will be high in Pakistan, which has the largest growth in the agricultural sector. However, it is recommended that Pakistan policy makers focus on the service and industry sectors and encourage individuals to these sectors. In order to make progress in the agricultural sector, the country's soil must be suitable. Apart from the geopolitical position, the support provided by country policy makers to agricultural workers needs to increase. In this case, agricultural employment increases and individuals are not victimized as in vulnerable employment. Theoretically, this result of the The Philippines, which has a high growth rate in the service sector among N11 countries, is similar to the result obtained after determining unit-specific coefficients. In the Philippines, where the service sector is developed, increasing services causes an increase in vulnerable employment. The service sector is not as affected by external factors as the agricultural sector. As services develop, their reflection in terms of income becomes greater than in agriculture. This is

especially true in today's economies. Therefore, development in the industrial-service sectors rather than agriculture positively affects national income and personal income. In this case, vulnerable employment is in the positive part of employment.

In general, it is recommended that policy makers in all N11 countries first reduce the informal economy and produce new policies to ensure that individuals working in the lower segments of this economy are employed in different employment areas. Because every registered business field ensures the provision of opportunities to employees and also reveals the necessity of paying taxes, which is a civic duty. The increase in taxes causes a qualitative and quantitative increase in public services, considering the public benefit. Regardless of the sector in which individuals benefit from these services, their life comfort improves positively and the labor factor is transferred effectively. In the literature, Baklouti and Boujelbene (2019), Luong, Nguyen and Nguyen (2020), Nguyen and Su (2021), Dell'Anno (2016) claimed in their studies that the relationship between vulnerable employment and the informal economy is positive. The suggestion that every registered employment will cause higher changes in individuals' income is also supported by these studies.

Policy makers of N11 countries need to reach vulnerable employed family workers and self-employed people and ensure their removal from the informal economy, as well as increase the insurance, income, social status, legal rights and opportunities of the employed. In this case, it increases the personal income in the country and increases the main macroeconomic factors such as consumption, production, employment, education, investment, savings, imports and exports. All these macroeconomic increases increase the country's national income and increase the country's economy.

References

BAKLOUTI, Nedra and Younes BOUJELBENE; (2019), "The economic growth–inflation–shadow economy trilogy: Developed versus developing countries", International Economic Journal, 33(4), pp. 679-695.

BREUSCH, T.S and A.R. PAGAN; (1980), "The lagrange multiplier test and ıts applications to model specification tests in econometrics", Review of Economic Studies, 47(1), pp. 239-53.

CHEN, Mingxing, Xinrong HUANG, Jiafan CHENG, Zhipeng TANG and Gengzhi HUANG; (2023), "Urbanization and vulnerable employment: Empirical evidence from 163 countries in 1991–2019", Cities, 135(104208). pp 1-15.

DELL'ANNO, Roberto; (2016), "Analyzing the determinants of the shadow economy with a "separate approach". An application of the relationship between inequality and the shadow economy", World Development, 84, pp. 342-356.

DUMITRESCU, Elena Ivona and Christophe HURLIN; (2012), "Testing for granger non-causality in heterogeneous panels", Economic Modelling, 29(4), pp. 1450-1460.

EREN, Murat; (2023), "OECD The role of globalization on the informal economy in OECD countries: Evidence from the quantile of moments regression method", Eskisehir Osmangazi University Journal of Economics and Administrative Sciences, 18(1), pp. 104-128.

GOKHOOL, Suneila, Harshana KASSEEAH and Verena TANDRAYEN-RAGOOBUR; (2018), "Vulnerable employment in mauritius: Experience of an upper-middle-ıncome country", International Journal of Development Issues, 17(2), pp. 187-204.

HSIAO, Cheng; (2005), "Why panel data?", The Singapore Economic Review, 50(2), pp. 143–154.

International Labour Organizartion (2023), https://ilostat.ilo.org/resources/concepts-and-definitions/classification-status-at-work/

KAYA, Sefa; (2020), "Decent work deficit: An assessment in terms of working poverty", Journal of Social Policy Conferences, 79, pp. 55-106.

KOCAK, Elif; (2024). "Cevresel Kuznets Egrisi Hipotezi Gecerli Mi? AB Ülkelerinden Kanıtlar", Gaziantep University Journal of Social Sciences, 23(2), pp. 654-666.

LO BUE Maria, Tu Thi Ngoc LE, Manuel Santos SILVA and Kunal SEN; (2022), "Gender and vulnerable employment in the developing world: Evidence from global microdata", World Development, 159(106010).

LUONG, Thi Thuy Huong, Tho Nguyen MINH and Thi Anh Nhu NGUYEN; (2020), "Rule of law, economic growth and shadow economy in transition countries. The Journal of Asian Finance", Economics and Business, 7(4), pp. 145-154.

MONDRAGON-VELEZ, Camilo and Ximena Pena; (2008), Business Ownership and Self-Employment in Developing Economies: The Colombian Case Documento CEDE No. 2008-03.

NGUYEN Canh Phuc and Thanh Dinh SU; (2021), "When 'uncertainty' becomes 'unknown': Influences of economic uncertainty on the shadow economy", Annals of Public and Cooperative Economics. 93(3), pp. 677-716.

PESARAN, M.Hashem and Takashi YAMAGATA; (2008), "Testing slope homogeneity in large panels", Journal of Econometrics. 142(1), pp. 50-93.

SANDALCILAR, Ali Rıza, Kezban AYRAN CIHAN, and Yusuf COLAK; (2022), "Determinants of turkey's foreign trade with N11 countries: the gravity model approach," International Journal of Economics Business and Politics, 6(1), pp. 59-78.

The World Bank (2024), https://www.worldbank.org/en/home.

TURGUT, Ecem and Oktay UCAN; (2021), "Foreign trade and growth relationship: Evidence from developed countries", Journal of Omer Halisdemir University Faculty of Economics and Administrative Sciences, 14(4), pp. 1372-1387.

VERICK, Sher; (2009), "Who is hit hardest during a financial crisis? The vulnerability of young men andwomen to unemployment in an economic downturn: international labour organization", IZA Discussion, Paper No. 4359

YERDELEN TATOĞLU, Ferda; (2018). Panel Time Series Analysis Stata Applied, Beta Publications, Istanbul.

YERRABATI, Sridevi; (2022). Vulnerable employment and economic growth, Journal of Economic and Administrative Sciences, Vol. ahead-of-print No. ahead-of-print.