Investment in Health and Education Impact to Agriculture in Vietnam

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Abstract : This study examines the impact of the direction of the relationship of education and health development in Vietnam on agricultural development efforts in Vietnam. This study using vectors which are generally used in a-theory research so that human capital theory is used as a determinant of key factors, not as the basis for econometric equations. The results of the vectoring carried out in this study can be described through the estimation of the IRF (impulse response function) estimation. The next step is to forecast the influence of each variable in the form of a forecasting graph so that it can be seen clearly the combination of the direction of the relationship or the influence of each variable. We found that education investment has a positive relationship with agricultural performance which was driven by agricultural performance in the previous period and negatively related to employment in agriculture. However, from this it can be seen that productivity which is the result of developing human resources through education mechanisms is getting bigger. Where labor productivity increases over time. However, looking at the graph of labor absorption in the agricultural sector which continues to decline very sharply, it becomes a threat in itself in the future. Because there is a decline in performance in the future due to labor shortages and it is possible that the agricultural sector will be completely destroyed when there is a shortage of labor in this sector if the interest of the Vietnam youth in the agricultural sector is not invested.

Keywords: Human Capital, Agriculture, Employment in Agriculture, Vector Analysis

JEL Classification : C01,E24,J24, J43

1 INTRODUCTION

Just 70 years ago, President Ho Chi Minh signed a decree assigning the Ministry of Agriculture to play a role in promoting the country's agricultural and forestry development. From a poor agrarian country, Vietnam has now made remarkable progress in ensuring national food security. On the other hand, the Indochinese country has become one of the main exporters of the world sector (Sam,2021).

During the renewal period, Vietnamese agriculture has made remarkable achievements, especially in maintaining sustainable and stable growth, demonstrating Vietnam's superiority compared to other countries in the region and the world. The agricultural sector is truly a solid platform for the development of industry and services, helping to ensure the social stability of the country (Thanh et al,2021).

In particular, international integration will be a priority to implement agricultural restructuring and rural development, to make Vietnam a strong agricultural country in terms of performance, value, and export brand. Vietnam's National Assembly approved the Free Trade Agreement with the European Union (EVFTA) on 8 June 2020 with a majority vote in favor. With a strong commitment to reducing tariffs, this agreement provides a great opportunity for countries to boost exports to European markets, especially agricultural, forestry and aquaculture products. On the other hand, trading partners also demand that Vietnam be open to its products. In this regard, the agricultural sector of the Indochinese nation enjoys many opportunities, but at the same time faces major challenges on its journey towards global integration (Nguyen,2020).

Vietnam's growing and advancing agriculture cannot be separated from the role of education and health that continues to develop in the country, as well as the promotion of agriculture and employment in agriculture in Vietnamese schools for Vietnam dedicated to the development of agriculture in Vietnam. This study examines the impact of the direction of the relationship of education and health development in Vietnam on agricultural development efforts in Vietnam.

2 LITERATURE REVIEW

Education is the practical and methodological training given to a person in the process of development and growth. It is a process by which individuals are provided with essential tools and knowledge to put them into practice in daily life. A person's learning starts from his childhood when he enters an institution called a school or college where the person previously studied and educated will instill in the small identity, ethical and cultural values to make a person good in the future (Rusmingsih et al,2021).

The concept of education is defined as a process by which individuals acquire knowledge, be it skills, beliefs, values , or habits, from others who are responsible for transmitting it, using different methods, such as, for

example, through discussion, storytelling. , real-life examples, research, and training. In general, the educational process is led by a figure who has great authority, such as teachers, parents, school principals, and others (Subangun & Widarni,2021). During the necessary process, a set of values and skills is present that results in social, emotional, and intellectual change, within each individual. Depending on the level of consciousness that has been acquired, the values can last a lifetime or, failing that, for a period of time. When it comes to children, learning aims to promote the structural processes of thinking and the way children express themselves. Education contributes greatly to the process of maturation of the sensory-motor apparatus, as well as stimulates coexistence and group integration (Afriani,2021).

Targeted education plays an important role in the development of the country, including the development of an agrarian country such as Vietnam. Education has a major impact in developing the skills of the population and educating the community so that collectively in society it can encourage economic growth. Education also encourages agricultural performance in the economy.

Health is one of the transcendent concerns of modern society and perhaps one of the most valued by citizens. Health is an important social right, which is defended by politicians of all sides, even though they have always differed about what system is best to offer citizens. Our society dedicates significant resources to maintaining health (Maulana & Andriani, 2021).

Many people believe that the health of the planet on which we live is in danger, due to pollution and the infamous greenhouse effect. We always claim that someone (usually a politician) has to do something. However, we don't think that our bad habits threaten our health or life. If something has to be done to save planet Earth, maybe we should do something else to live a healthier life, and we should be doing it. For the sick, the disease is often associated with feelings of hardship or bad luck and is complicated by moral, psychological, and social dimensions. The body goes through changes every day, but there is something that makes those changes feel like illness (Huang et al,2020).

The importance of health can be seen from different points of view, but in general, when we talk about health, we must understand that it is not only about a healthy body, but also about mental health. Good health can be described in a few words as a condition in which our body and mind work well. Health and performance are related when someone is healthy, that person can work optimally. Vice versa when someone is sick, the performance of that person is also disturbed. Health services are vital in maintaining performance because good health services ensure a person can recover faster when experiencing illness. Health is an important capital for everyone to stay productive. With good health, a person can maximize their human capital so that they can work more optimally. This is certainly very important in improving work performance .

Health is an important factor in work productivity. When a person is unwell or sick, his productivity will be disrupted due to the illness he suffers. Performance in agriculture has the potential to increase when people who work in agriculture are healthier and smarter. This can happen when health and education continue to be developed (Drean & Bawono,2021).

3 RESEARCH OBJECTIVE AND METHODOLOGY

We derive an econometric model with a Vector Autoregressive approach that focuses on phenomena with the assumption that the autoregressive vector model does not differentiate between exogenous and endogenous variables. Therefore, one variable can be an independent variable in an equation and can also be a dependent variable in another equation. The basis for taking the key variables is the theory of human capital which becomes education as a mechanism in developing human capital. Where human capital has an impact on human work performance itself (Widarni & Bawono, 2021). This study using vectors which are generally used in a-theory research so that human capital theory is used as a determinant of key factors, not as the basis for econometric equations. The results of the vectoring carried out in this study can be described through the estimation of the IRF (impulse response function) estimation. The next step is to forecast the influence of each variable in the form of a forecasting graph so that it can be seen clearly the combination of the direction of the relationship or the influence of each variable.

4 RESULTS AND DISCUSSION

The table below presents a summary of descriptive statistics of several variables used in this study during the period 2000 to 2019 in Vietnam.

Table 1. Descriptive statistics of agricultural performance in USD value in January 2021, education (investment in education in USD value in January 2021), and employment in agriculture (total working population).

	AGRICULTURE_PERFORMANCE	EDUCATION	EMPLOYMENT_IN_AGRICULTURE	HEALTH
Mean	21800000000.0000	596000000.00	24904649.00	713000000.00
Median	20800000000.0000	553000000.00	25031238.00	626000000.00
	36600000000.0000	1120000	27500184.00	1550000

Maximum		0000.00		0000.00
Minimum	7600000000.0000	1490000000.00	21329897.00	1510000000.00
Std. Dev.	11000000000.0000	3520000000.00	1749498.00	4700000000.00

Based on Table 1. above, it appears that from the period 2000 to 2019, the average agricultural performance (Agriculture Value Added) in Vietnam is very high at around 21.8 billion USD which can be seen from the mean value in table 1. with a high level of volatility at 11 billion USD. With an average number of workers 24.9 million people with an average educational investment value of 5.96 billion USD and Health investment 7.13 billion USD . However, this statistical descriptive analysis table is not sufficient to provide a general description of human capital investment through educational mechanisms on agricultural performance as seen from the productivity of workers in Vietnam.

Estimation using the VAR model requires all variables to be stationary at the level, if the variable is not stationary at the level, the estimation is carried out using the VECM model on the condition that all variables formed are cointegrated with each other where the results are shown in table 2. below:

table 2. stationarity test

Method			Statistic	Prob.**
ADF - Fisher Chi-square			46.27	0.00
ADF - Choi Z-stat			(5.39)	0.00
Series	Prob.	Lag	Max Lag	Obs
D(AGRICULTURE_PERFORMANCE,2)	0.0002	1.00	3.00	16.00
D(EDUCATION,2)	0.0138	3.00	3.00	14.00
D(EMPLOYMENT_IN_AGRICULTURE,2)	0.0020	1.00	3.00	16.00
D(HEALTH,2)	0.0143	3.00	3.00	14.00

From the results of stationarity testing with Augmented Dickey-Fuller, it can be seen that at the 2nd level the difference is stationary and vector estimation uses Vector Autoregressive. It can be seen that the probability is less than 0.05 in each tested variable. After doing the stationarity test, a cointegration test was conducted to see the long-term integration between variables. If there is cointegration between variables, the estimation is made using the Panel Vector Error Correction Model (VECM) method, but if there is no cointegration, the estimation is made using the Vector Autoregressive method. Cointegration test results are shown in table 3.

Table 3. Cointegration test results

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.9146	70.70	47.86	0.00
At most 1	0.6041	26.40	29.80	0.12
At most 2	0.4159	9.72	15.49	0.30
At most 3	0.0023	0.04	3.84	0.84

From the cointegration results, the critical value is smaller than the Trace Statistics value and the Max-Eigen Statistics value which indicates that there is a have cointegration relationship in the variable equation so that the next method that can be used to determine long-term and short-term relationships is the Vector error correction model (VECM) method.

Optimum lag test is used to determine the time period of the influence of a variable on other variables which will give optimal results. This is because changes in the movement of a variable are not directly responded to by changes in other variables, but there is still a certain grace period. Therefore it is important to know the lag length. The optimum lag test can be seen in table 4.

Table 4. Optimum lag test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1.49E+03	NA	2.44E+67	1.67E+02	1.67E+02	1.67E+02
1	-1.43E+03	9.84E+01	7.91E+64	1.61E+02	1.62E+02	1.61E+02
2	-1.39E+03	35.14085*	1.32e+64*	158.5985*	160.3792*	158.8440*

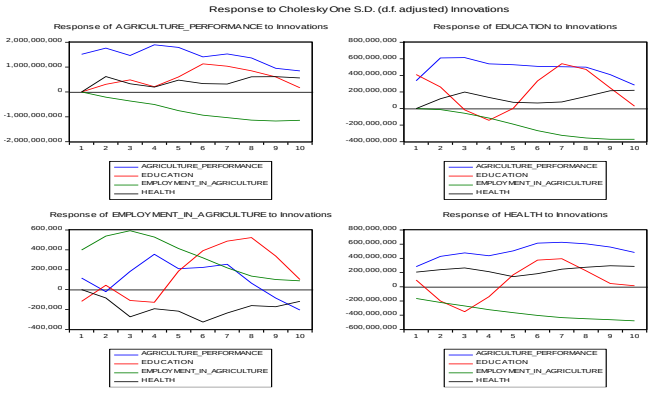
From the results of the Optimum lag test, it can be seen that the optimum lag is found in lag 2. The results of the Vector error correction model estimation are shown in table 5.

Table 5. The results of the Vector error correction model estimation

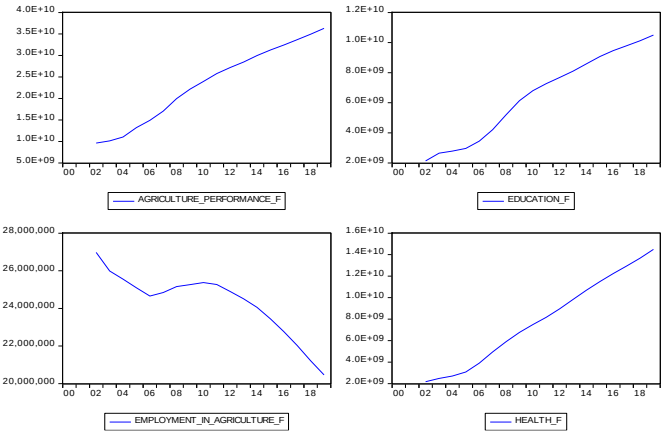
	AGRICULTURE_PERFORMANCE	EDUCATION	EMPLOYMENT_IN_AGRICULTURE	HEALTH
AGRICULTURE_PERFORMANCE(-1)	4.85E-01*	1.56E-01*	-1.49E-04*	2.42E-01*
	-3.41E-01	-1.19E-01	-9.70E-05	-8.96E-02
	[1.42453]	[1.31198]	[-1.54022]	[2.70205]
AGRICULTURE_PERFORMANCE(-2)	-3.74E-01*	-2.46E-02*	4.90E-04*	5.90E-02*
	-4.45E-01	-1.56E-01	-1.30E-04	-1.17E-01
	[-0.83915]	[-0.15782]	[3.86763]	[0.50352]
EDUCATION(-1)	2.65E-01*	5.60E-01*	5.42E-04*	-7.81E-01*
	-9.43E-01	-3.30E-01	-2.70E-04	-2.48E-01
	[0.28134]	[1.69867]	[2.01982]	[-3.14964]
EDUCATION(-2)	2.42E+00	-2.08E-01*	-9.09E-04*	1.32E-01*
	-1.42E+00	-4.96E-01	-4.00E-04	-3.73E-01
	[1.70636]	[-0.41840]	[-2.25075]	[0.35222]
EMPLOYMENT_IN_AGRICULTURE(-1)	7.14E+02*	2.02E+02*	1.19E+00*	-7.44E+01
	-5.82E+02	-2.03E+02	-1.66E-01	-1.53E+02
	[1.22505]	[0.99360]	[7.15702]	[-0.48570]
EMPLOYMENT_IN_AGRICULTURE(-2)	-1.28E+03*	-1.68E+02	-4.98E-01*	1.40E+01
	-6.27E+02	-2.19E+02	-1.78E-01	-1.65E+02
	[-2.03655]	[-0.76910]	[-2.79000]	[0.08478]

HEALTH(-1)	3.01E+00	5.73E-01*	-4.05E-04*	1.17E+00*
	-1.44E+00	-5.03E-01	-4.10E-04	-3.78E-01
	[2.08791]	[1.13880]	[-0.98886]	[3.09099]
HEALTH(-2)	-3.24E+00	-4.13E-01*	-2.35E-04*	-3.90E-01*
	-1.49E+00	-5.20E-01	-4.20E-04	-3.91E-01
	[-2.18045]	[-0.79463]	[-0.55614]	[-0.99604]
C	1.93E+10	-8.32E+08	6.99E+06	9.74E+08
	-1.10E+10	-3.90E+09	-3.21E+06	-3.00E+09
	[1.71457]	[-0.21125]	[2.17747]	[0.32839]
R-squared	9.89E-01	9.87E-01	9.62E-01	9.96E-01
Adj. R-squared	9.79E-01	9.75E-01	9.28E-01	9.92E-01
Sum sq. resids	2.07E+19	2.53E+18	1.67E+12	1.43E+18
S.E. equation	1.52E+09	5.30E+08	4.31E+05	3.99E+08
F-statistic	9.90E+01	8.40E+01	2.84E+01	2.77E+02
Log likelihood	-4.00E+02	-3.81E+02	-2.53E+02	-3.76E+02
Akaike AIC	4.54E+01	4.33E+01	2.91E+01	4.28E+01
Schwarz SC	4.59E+01	4.38E+01	2.95E+01	4.32E+01
Mean dependent	2.33E+10	6.46E+09	2.46E+07	7.73E+09
S.D. dependent	1.04E+10	3.35E+09	1.61E+06	4.56E+09

Based on the results of the estimated output, it can be indicated the direction of the relationship, and the significance of each variable and each period. Negatively related variables are marked (-). Significant relationships are marked with a sign (*). The value of the coefficient of determination (Adj. R-Square) shows the degree of truth of the estimate of 0.989. This means 99% accuracy of the calculation rate of the vector error correction model. Impulse Response Function (IRF) describes the response of an endogenous variable to shock that occurs in other variables in a dynamic VAR system. IRF can be used to see the effect of fluctuations or shocks from one variable on the value of another variable either now or in the future. The results of the Impulse Response Function (IRF) of the Infrastructure variable against other variables are shown by the following Impulse Response graph:



Based on the response and impulse graphs, it can be seen that each variable responds to each other since the first time period with a lag of 2. This shows that in Vietnam the three variables influence each other. To see the direction of influence can be seen in the following forecasting chart:



From the forecasting results, it can be seen that education investment has a positive relationship with agricultural performance which was driven by agricultural performance in the previous period and negatively related to employment in agriculture. However, from this it can be seen that productivity which is the result of developing human resources through education mechanisms is getting bigger. Where labor productivity increases over time. However, looking at the graph of labor absorption in the agricultural sector which continues to decline very sharply, it becomes a threat in itself in the future. Because there is a decline in performance in the future due to labor shortages and it is possible that the agricultural sector will be completely destroyed when there is a shortage of labor in this sector if the interest of the Vietnam youth in the agricultural sector is not invested.

5 CONCLUSION

Education investment has a positive relationship with agricultural performance which was driven by agricultural performance in the previous period and negatively related to employment in agriculture. However, from this it can be seen that productivity which is the result of developing human resources through education mechanisms is getting bigger. Where labor productivity increases over time. However, looking at the graph of labor absorption in the agricultural sector which continues to decline very sharply, it becomes a threat in itself in the future. Because there is a decline in performance in the future due to labor shortages and it is possible that the agricultural sector will be completely destroyed when there is a shortage of labor in this sector if the interest of the Vietnam youth in the agricultural sector is not invested.

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