

AGRICULTURAL LABOR PRODUCTIVITY: THE KEY TO ECONOMIC GROWTH, CHANGES IN STRUCTURE OF INDUSTRY AND PEASANTS' INCOME

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Agricultural labor productivity (ALP) is a factor that affects the economic growth, changes in structure of industry and peasants' income. In the past, however, ALP was low and slow to improve. Identifying scientifically effects of ALP and factors influencing ALP is a challenge to researchers and policy makers in Vietnam. This research employs data about the years 1991 – 2009 and regression model to identify nature of these relations. We note that the ALP has a significant and forward effect on economic growth, agricultural development and changes in the structure of industry. Authors also suggest five groups of measures to improve the ALP, namely: (1) encouraging changes in the structure of industry to land yield; (2) increasing the supply of credit to peasants; (3) helping peasants improve their agricultural knowledge; (4) encouraging cooperation in producing and distributing farm products; and (5) developing the infrastructure and non-farming businesses in rural areas.

Keywords: ALP, key, growth, changes in structure of industry, peasants' income.

1. Introduction

The ALP is a factor that can lead to changes in economic growth, structure of industry and peasants' income. Moreover, in the post-WTO period, ALP is also a decisive factor in improvement in peasants' competitiveness. Many studies have examined the ALP but full attention has not been paid to effects of the ALP on economic growth, changes in structure of industry and peasants' income, and these effects have not been quantified properly. That is why identifying scientifically effects of ALP and factors influencing ALP is a challenge to researchers and policy makers in Vietnam. This paper focuses on three major issues: (1) effects of ALP on economic growth, changes in structure of industry and peasants' income; (2) factors affecting ALP; and (3) Policy implications that aim at improvement in ALP in Vietnam.

2. Economics of ALP

Lewis (1955) [2] observes a labor surplus in the agricultural sector and considers it as a cause of

low productivity in the sector. Moving part of idle labor to manufacturing sector will help enhance the productivity in the agricultural sector and increase the output in the manufacturing one, thereby increasing the economic growth rate.

Torado (1990) [2] notes that during the agricultural development, diversified and specialized farming replaces the monoculture based on comparative advantages. Similarly, a change from extensification to intensification based on increases in labor productivity takes place to achieve agricultural growth.

According to Park S.S (1992) [2], on the way to development, agricultural growth comes from improvement in the productivity of agricultural production, and this growth enhances peasants' income.

Figure 1 shows increased capital makes the productivity get higher, and reduces the labor force in the agricultural sector and enhance the income accordingly.

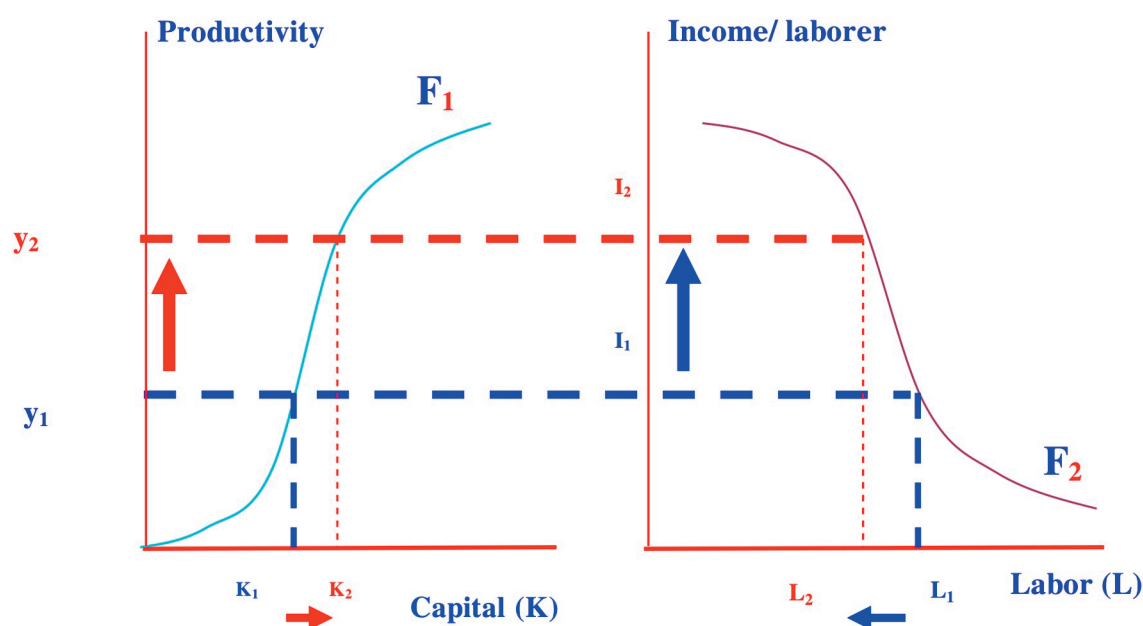


Figure 1: Productivity and income of an agricultural laborer

Thus, economic theories maintain that the labor productivity in the agriculture produces effects on economic growth, changes in structure of industry and income of agricultural laborers.

3. Role of ALP in economic growth, changes in structure of industry and peasants' income

a. Relation between ALP and structure of industry:

ing sector was 82.9%. This structure reflects existence of a modern economy that is based on manufacturing and service sectors. Structure of labor force, however, is still backward and inappropriate to a modern economy. The share of agriculture in GDP in 2009 was only 17.1% but this sector employed 51.9% of working population. Moving quickly and safely part of agricultural labor force

Table 1: Structure of industry in 1991-2009

Year	As % of GDP			As % of working population (%)	
	Agriculture	Manufacturing	Service	Agriculture	Manufacturing-Service
1991	39.0	23.1	37.9	72.6	27.4
1995	26.2	29.9	43.8	71.7	28.3
2009	17.1	41.6	41.4	51.9	48.1

Source: GSO (1995 - 2010) [7] and authors' calculations

Note: GDP is based on comparative price of 1994.

The structure of industry has experienced radical changes since 1991 moving from an agricultural economy to a modern one. A turning point appeared in 1995 when the share of manufacturing sector got bigger than that of the agriculture – 29.9% compared with 26.2%. In 2009, the share of agriculture fell to 17.1% while that of non-farm-

to manufacturing and service sectors is no easy task in the process of changing the structure of industry.

Reduction in agricultural labor force depends greatly on ALP, or agricultural output per agricultural laborer. Figures 2 and 3 show that in the years 1991-2009 [7], ALP increased while the

agricultural labor force contracted. In 1991, ALP was worth VND2.432 million (in 1994 comparative price) while the agricultural labor force represented 72.65% of the working population. Those two figures in 2009 were VND3.557 million and 51.92% respectively.

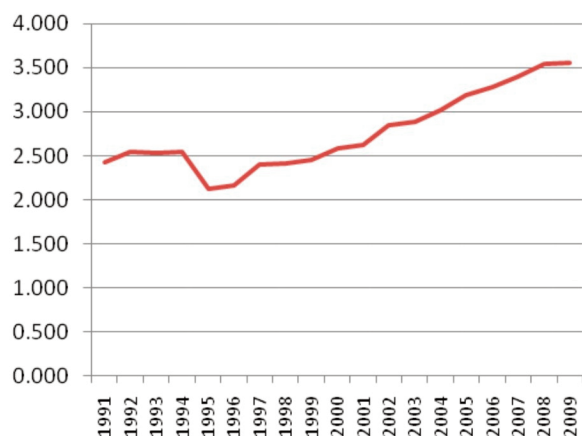


Figure 2: ALP in 1991-2009 (1994 comparative price)

Source: GSO (1995 - 2010) [7] and authors' calculations

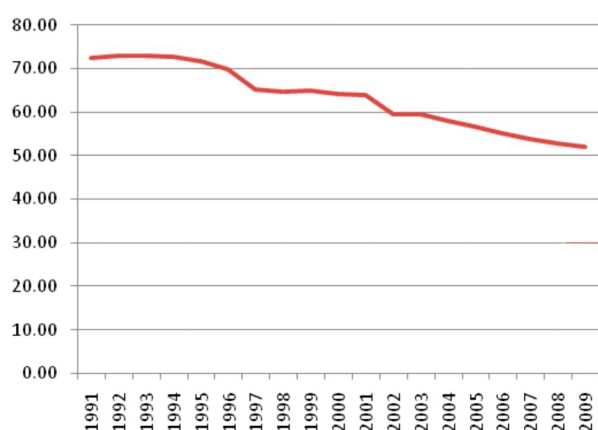


Figure 3: Agricultural labor force as % of working population in 1991-2009

Source: GSO (1995 - 2010) [7] and authors' calculations

Figure 4 below shows that the trendline of relation between ALP and proportion of agricultural labor force (PLA) is very steep reflecting a negative relation in which ALP increases while the share of agricultural labor force decreases over time.

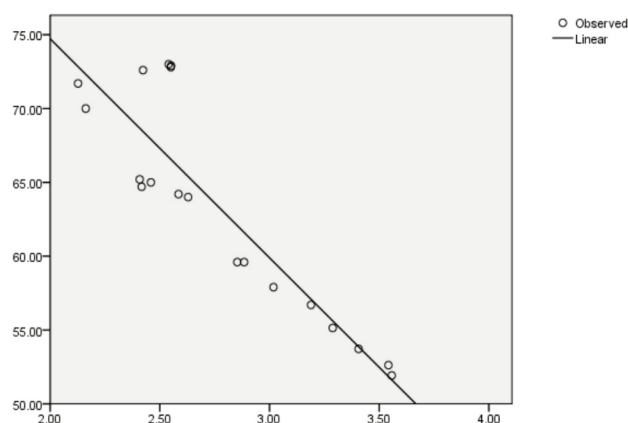


Figure 4: Relation between ALP and proportion of agricultural labor force

Source: GSO (1995 - 2010) [7] and authors' calculations

Results of linear regression model are as follows.

Table 2: Regression results of the model

	Unstandardized coefficient	Sig.
(Constant)	104.380	.000
ALP	-14.831	.000
Adjusted R ² : 0.789	ANOVA: F value: 68.256; Sig. : 0.0000	

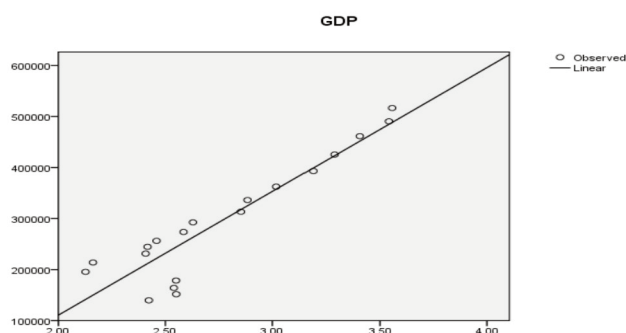
Dependent variable: proportion of agricultural labor force (PLA , %); observations in 1991 – 2009.

Regression equation: $PLA = 104.38 - 14.831 ALP$ (DPH1-2011)

The regression model affirms that ALP has a significantly negative relation with proportion of agricultural labor force. The regression coefficient is -14.831. This means that when ALP increases by one unit (VND1 million), proportion of agricultural labor force decreases by 14.831 units (%).

b. Relation between ALP with economic growth:

Effects of ALP may change the proportion of agricultural labor force, thereby changing the GDP.



**Figure 5: Line of relation between ALP and GDP
(VND million, 1994 comparative price)**

Figure 5 shows an upward steep line of relation. This means that ALP has a positive relation with GDP in the years 1991-2009.

Results of linear regression model are as follows.

Table 3: Regression results of the model

	Unstandardized coefficient	Sig.
(Constant)	17.237	.000
ALP	2.182	.000
Adjusted R ² : 0.789	ANOVA: F value: 45.8; Sig.: 0.0000	

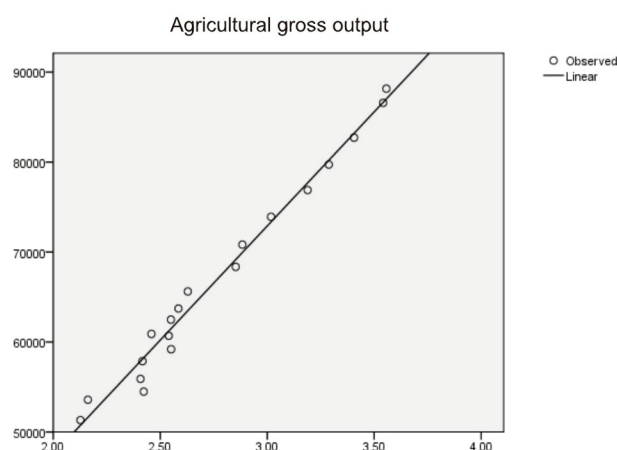
Dependent variable: LnGDP (VND million, 1994 comparative price); observations in 1991 – 2009.

Regression equation:

$$\text{LnGDP} = 17.237 + 2.182 \text{ LnALP (DPH2-2011)}$$

The regression model affirms that ALP has a significantly positive relation with the GDP. The regression coefficient is 2.182. This means that when ALP increases by 1%, GDP increases by 2.182%.

ALP may cause changes in the agricultural gross output (agricultural growth).



**Figure 6: Line of relation between ALP and agricultural gross output
(VND million, 1994 comparative price)**

Figure 6 shows an upward line of relation. This means that ALP has a positive relation with agricultural gross output in the years 1991-2009.

Results of linear regression model are as follows.

Table 4: Regression results of the model

	Unstandardized coefficient	Sig.
(Constant)	16.95615	.000
LnALP	1.04	.000
Adjusted R ² : 0.713	ANOVA: F value: 69.8; Sig.: 0.0000	

Dependent variable: LnGDPnôngnghiệp (VND million, 1994 comparative price); observations in 1991 – 2009.

Regression equation: $\text{LnGDPnôngnghiệp} = 16.956 + 1.04 \text{ LnALP (DPH3-2011)}$

The regression model affirms that ALP has a significantly positive relation with the GDP-nôngnghiệp (agricultural gross output). The regression coefficient is 1.04. This means that when ALP increases by 1%, GDPnôngnghiệp increases by 1.04%.

c. Relation between ALP and peasants' income:

ALP may cause changes in the peasants' income (agricultural gross output per rural resident).

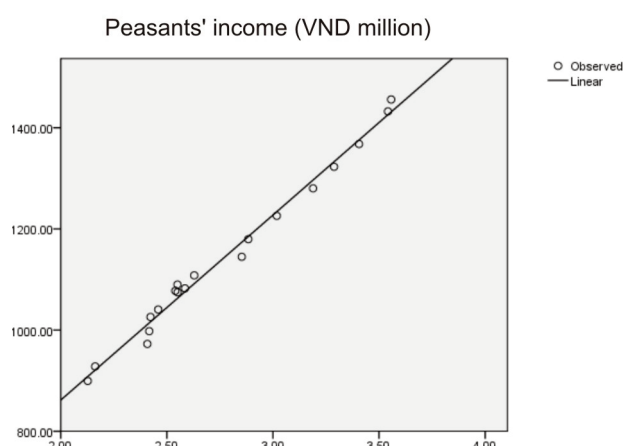


Figure 7: Line of relation between ALP and peasants' income (VND million, 1994 comparative price)

Figure 7 shows an upward line of relation. This means that ALP has a positive relation with peasants' income in the years 1991-2009.

Results of linear regression model are as follows.

Table 5: Regression results of the model

	Unstandardized coefficient	Sig.
(Constant)	6.114	.000
LnALP	0.886	.000
Adjusted R ² : 0.98	ANOVA: F value: 128; Sig. : 0,0000	

Dependent variable: LnTNNDAN (VND million, 1994 comparative price); observations in 1991 – 2009.

Regression equation: $\text{LnTNNDAN} = 6.114 + 0.886 \text{ LnALP}$ (DPH4-2011)

The regression model affirms that ALP has a significantly positive relation with the peasants' income. The regression coefficient is 0.886. This means that when ALP increases by 1%, GDP-nôngnghiệp increases by 0.886%.

In short, ALP may cause changes in proportion of agricultural labor force (structure of industry), GDP (economic growth), agricultural gross output (agricultural growth), and peasants' income, therefore it can be considered as the key to economic growth, changes in structure of industry and peasants' income.

4. Factors affecting the Vietnam's ALP

a. Vietnam's ALP:

- The Vietnam's ALP is low in comparison with other countries. Table 6 shows that the Vietnam's labor productivity is equal to 1.6% of American one (the highest level in the Table 6). Of six ASEAN countries in Table, Singapore gains the highest position. Compared with them, the Vietnam's ALP is very low, equaling 2.35% of the Singaporean ALP; 63.7% of the Indonesian one; 28.7% of the Thai one; 44% of the Philippine one; and 10.95% of the Malaysian one.

Table 6: ALP of some countries in 2005

Country	Productivity (US\$)	Comparison (%)	
		Others	Vietnam
The US	77,346	100	1.6
Singapore	52,426	100	2.35
Malaysia	11,300	100	10.95
Thailand	4,305	100	28.73
Philippines	2,807	100	44.07
Indonesia	1,952	100	63.37
Vietnam	1,237		

Compared with other manufacturing and service sectors, the productivity of the agricultural sector in 2009 [7] was very low, equaling 32.87% of the national average and 19% of the average productivity of manufacturing and service sectors.

ALP growth rate in the years 1991-2009 [7] was also poor (2.15%), and lower than growth rate of agricultural gross output (2.7%).

Thus, ALP has become a challenge to agricultural development in Vietnam.

b. Factors affecting the ALP:

Our researches in Vietnam show that the ALP is affected by the following factors: (1) Size of investment; (2) Size of farming land; (3) Way of diversifying agricultural production; (4) Mechanization; (5) Agricultural knowledge; and (6) Cooperation in distributing farm products.

Thus, the ALP is affected considerably not by a single policy but a system of policies. As a WTO member, policies adopted by the Vietnamese government should be compliant with WTO rules.

5. Policy implications

Considering green box subsidies for agriculture allowed by the WTO and factors affecting ALP in Vietnam, we see that full attention must be paid

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Table 7: Regression result of the model of ALP and peasants' income

	Regression coefficient	Sig.	ANOVA	Locality/ Size of sample/ Source
Independent variables				
Size of investment	0.765	0.0000	Adj. R ² = 0.78; Sig.: .000	Cần Thơ; 2,300 peasant households; [4]
Size of farming land	0.374	0.0001	Adj. R ² = 0.65; Sig.: .000	Bến Tre; 210 peasant households; [5]
Way of diversifying the production	0.734	0.0000	Adj. R ² = 0.3; Sig.: .000	Phú Thọ; 200 peasant households; [6]
Mechanization (LnX4)	0.161	0.0001	Adj. R ² = 0.3; Sig.: .000	Phú Thọ; 200 peasant households; [6]
Cooperation in distributing farm products	0.283	0.000	Adj. R ² = 0.78; Sig.: .000	Cần Thơ; 2,300 peasant households; [4]
Agricultural knowledge	0.291	0.0000	Adj. R ² = 0.73; Sig.: .000	Bình Dương; 180 farms; [7]
Dependent variable: Labor productivity / household income				

to the following five groups of policies: (1) encouraging changes in the structure of industry to land yield; (2) increasing the supply of credit to peasants; (3) helping peasants improve their agricultural knowledge; (4) encouraging cooperation in producing and distributing farm products; and (5) developing the infrastructure and non-farming businesses in rural areas.

(1) To accelerate changes in the structure of industry with a view to enhancing yield of crops, it is necessary to (i) developing high-tech agricultural zones in order to attract foreign investors with new agricultural technologies; (ii) forming management boards with representatives from local authorities, peasants, businesspersons (suppliers of farming materials, services and credits, etc.) and scientists specializing in application of agricultural techniques to run programs to change the structure of agricultural products in provinces that produce farm products in large quantities. These programs can help concentrate and allocate resources reasonably to transfer new techniques to peasants.

(2) To increase the supply of credit to peasants, banking institutions can offer loans of market rate of interest whose maturity is appropriate to cycles of agricultural production or local comparative advantages; and facilitate the supply of credit by adopting simple procedures for repaying debts free from local red tape and helping peasants legalize

their assets.

(3) The following measures can help improve agricultural knowledge of peasants and distribute farm products:

- More public investments must be put in agricultural extension service with a view to improving competence of officials in this service and employing mass media to disseminate new knowledge among peasants.

- New policies must be adopted to encourage implementation of contracts to transfer new technologies and distribute farm products, especially the ones that can be exported to developed countries.

- Incentives could be given to R&D projects, supply of fiduciary loans, and training programs for companies that enter into contracts with peasants or farmers.

(4) While many countries develop their agriculture by encouraging large-scale farms, Vietnam has failed to do so and it will meet with disadvantages in its efforts to compete against imports and improve peasants' income. To make farm development a breakthrough in agricultural development, policies should deal with the following issues:

- Income tax and other taxes imposed on farms should ensure reasonable profits for farmers to encourage them to mobilize more resources for agricultural production.

- Incentives in terms of low-interest loans, and long- and medium-term loans from formal sources can be given to farms with plans to produce high-quality farm products for export.

- Encouragement in form of tax and credit incentives should be given to cooperation between farms and traders of agricultural materials and farm products in transferring new technologies, supplying materials and marketing farm products.

- A Fund for farm development could be formed to provide farms with necessary credit, training materials and programs (in management, brand building, and trade promotion, etc.), and Internet services.

(5) Objectives of future policy to develop the infrastructure and non-farming businesses in rural areas are to move part of rural labor from agricultural sector, and improve income and quality of rural human resource. The government had better:

- When allocating sources of finance from foreign entities, such as ODA, WB, IMF, ADB and NGOs, give priority to programs to develop the infrastructure in rural areas (road, power supply, clean water, telecommunications, and environmental protection), encourage small- and medium-sized enterprises in light and labor-intensive industries, and train teachers, health care workers, and rural development officials.

- Offer specially preferential treatment to local and foreign organizations that carry out plans to create jobs in rural areas, and develop community activities, especially among ethnic minorities■

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