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Research Article

Vicious Circle on Smoking Households in Rural Areas in an Effort to Efficiently Spend on Human Resource Investment

Henny Oktavianti* and Ambariyanto

Department of Economics, Faculty of Economics and Business, Universitas Trunojoyo Madura, Indonesia

ORCID
Henny Oktavianti: https://orcid.org/0009-0004-1457-6577

Abstract.
This study aims to examine family welfare in the context of a vicious circle between investment in human resources and cigarette consumption. Parents' decision to allocate their consumption between smoking and investment in human resources will have an effect on the next generation and if this continues, a vicious circle of smoking families will form. Human resources are projected into education and health. The data cited are sourced from IFLS in 1993 and 2014. The method of analysis, the first step, is to apply the simultaneous equation model in the context of the quadratic engle curve by using the 1997 and 2014 IFLS data, we find that cigarette consumption significantly reduces the share of education and health spending. The model also includes the head of the household's education level. The results show that parent households in rural areas significantly increased spending on education investment when their spending on cigarettes was lower. The condition has a similar pattern with their children's household. The conclusion is that parents behavior on cigarette spending patterns have a similar effect on the investment in their children's human resources. So the vicious circle of household smoker continuously happened, especially those who live in rural areas.

Keywords: consumption, human resources, intergeneration

Corresponding Author: Henny Oktavianti; email: henny.oktavianti@trunojoyo.ac.id

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1. Introduction

Ciggarettes are a very easy commodity to find in Indonesia. Altough some tobacco control policies have been rolled out, it seems that cigarettes are still in demand by the public (1). The proportion of the population consuming tobacco in Indonesia has reached 33.8 percent (2). Thhe data consist of the smoking prevanence among men and women aged 15 years and older. The smoking prevalence among men is 62.9 percent, while among women it is 4.8 percent. Furthermore, in the ASEAN region, the number of active smokers in Indonesia is the highest in the world after China dan India (3).

Based on the result of research by Office od Surgeon General 2004, various diseases such as: cancer of the mouth, pharynx, larynx, esophagus, stomach, pancreas, bladder, kidney, cervix, and stomach; stroke; coronary heart disease; chronic obstructive pulmonary disease; asthma; and low birth weight (4). The findings reinforce previous findings that smokeless tobacco (SLT) has a risk: oral cancer, tooth loss, and oral lesions (5). The risks arising from cigarette consumption seem to be widely known by cigarette consumers and stakeholders. However, it seems that the actual cigarette control policy, for example through taxes with the ultimate goal of minimizing negative impacts, has not been carried out optimally (6). The results of the study entitled "*The Economics of Consumer Knowledge*" show that knowledge is one of the things that can affect consumption behavior, where high knowledge will make consumption efficient in the future (7).

The relationship between cigarette consumption (expenditure on buying cigarettes) and its consequences on the portion of expenditure on human capital investment has been previously researched. Several studies say that the large consumption of *human capital* investment now (for children) will have a greater impact on the investment output (child development) in the future (8). In addition, another study found that the expenditure on cigarettes in poor households can eliminate expenditure on human resource investment (9). Berdasarkan pertimbangan-pertimbangan tersebut maka menarik untuk meneliti kaitan alokasi investasi sumber daya manusia pada rumah tangga perokok di perdesaan yang kental akan budaya meniru. Therefore, this study also uses intergenerational observation to find out the similarities or differences in income allocation patterns for investment in human resources and cigarettes between parent households and their offspring households.

2. Methods

This study uses the second and fifth waves of the Indonesian Family Life Survey (IFLS). We identified spending on cigarettes and human capital investment in 1997 and 2014. The number of observations was 1,134 households of smokers living in rural areas in Indonesia in 1997 and also 1,134 households of smokers in 2014 . The variables used in this study are:

a. Human resource investment, namely the share of education and health costs to total household expenditure. Tuition fees include: tuition, allowance, school

uniforms, school supplies, registration fees. While health costs include: medical treatment costs including hospitalization costs, clinic fees, doctor fees, shamanic fees, medicines and the like. The total cost incurred for human capital investment is accumulated over the course of one month.

b. Total cigarette distribution is the amount of costs incurred to buy cigarettes by households within a period of one month.

c. Income is a sum of money earned by a household within a period of one month.

d. The level of education of the head of the household is the length of school taken by the head of the household in units of years.

This paper observes two households, namely the parent's household (1997) and the offspring household (2014). The observed household characteristics are households in 1997 having children who have been married in 2014. The second characteristic is that there are household members who smoke actively. Each household has children/descendants.

The analysis model in this paper aims to identify the effect of household expenditure on cigarettes on human resource investment for children in smoking households. First, income model (Y) is the total expenditure on human resource investment (E_{inv}) and other expenses (E_a) including cigarette production, depicted in the following equation:

$$Y = E_{inv} + E_a (1)$$

Where,

$$E_{inv} = f\left(lcg,\ lcg^2,\ educ\right) + \alpha\hat{Y} (2)$$

$$E_a = f\left(lcg,\ lcg^2,\ \ educ\right) + \beta\hat{Y} (3)$$

Then, the equation 2 and 3 transform to reduce form so that Y becomes an exogenous variable:

$$Y = f\left(lcg,\ lcg^2,\ educ,\ \hat{Y}\right) (4)$$

$$E_{inv} = f\left(exogenous\ variables\right)\ (5)$$

$$E_a = f\left(exogenous\ variables\right) (6)$$

So that if the model is expressed in each household based on the observed generation, the following equation will be obtained:

$$inv_{i97} = \alpha_{10} + \alpha_{11} lcg_i + \alpha_{12} lcg_i^2 + \alpha_{13} income + \alpha_{14} educ + \mu_{1i} (7)$$

Equations are a model of equations in parental households in 1997

$$inv_{i2014} = \alpha_{20} + \alpha_{21} lcg_i + \alpha_{22} lcg_i^2 + \alpha_{23} income + \alpha_{24} educ + \mu_{1i} (8)$$

Equation 8 is a model of equations in children's households in 2014

The equation model 7 and 8 is a model that describes the hypothesis that the dependent variable, namely the portion of expenditure for human resource investment, is allegedly influenced by independent variables consisting of: logarithm of cigarette spending, quadratic logarithm of cigarette spending, income, and education level. Equations 7 and 8 are estimated using *simultaneous equation models* through the two-stage least square mechanism.

3. Result and Discussions

Income is a limit in the household in making choices. An effective choice is one that can maximize utility from a sacrifice. The discussion of the pattern of investment in human resources in rural households is an interesting issue to discuss. Village households that are synonymous with lower levels of education and income compared to urban areas tend to have unusual decision-making patterns. Personal or shared utilities may not be the basis for making choices or priorities. Based on the economic family theory, utilities in the household can be enjoyed if the number of public goods is more than private goods (10). In this study, the application of the concept of the 2 goods can be observed through cigarette shopping as a private good and human resource investment spending as a public good. In fact, expenditure on cigarettes is greater than expenditure on human resource investment. This happens both in the households of parents and their offsprings.

The observation results show that an increase in cigarette spending can reduce human resource investment in the long term. Income plays an important role in this discussion. The results of the estimate show that income has a significant influence on changes in the allocation of human resource investment. At a time when income is

declining, household expenditure on human resource investment also decreases. This result means that when cigarette spending is reduced, there will be a portion of the income that can be allocated to public matters in the household. Instead of being used for private goods that have adverse effects on health (such as cigarettes), this allocation can be used to finance public goods (such as human capital investment) that have a positive impact.

Table 1: Estimation Result of Models.

	(1)	(2)
VARIABLES	Human resource investment on parent household (1997)	Human resource investment on offspring households (2014)
Spending of cigarette	0.3149346***	0.2394874***
	(0.0537491)	(0.692796)
Quadratic of cigarette spending	- 0.0199684***	-0.0135303***
	(0.0029505)	(0.0029802)
Income	0.2379896***	0.2549095***
	(0.0191388)	(0.0172764)
Education level	-0.0051567***	-0.0050257***
	(0.0014286)	(0.001439)
Constant	-4.082334***	-4.59253***
	(0.3932288)	(0.4967377)
Observations	1134	1134

Standard errors in parentheses
*** p<0.01

In the short term, when spending on cigarettes increases, spending on human resource investment also increases. However, when cigarette consumption is carried out continuously in the long term and the trend continues to rise, then at a certain point it will significantly reduce the ratio of human resource investment expenditure. This indicates that parents' decision to consume cigarettes in the long term in a household life will increase the utility of individual smokers but at the expense of the interests of other individuals in the household, namely the education and health of their children.

The number of smokers in the village is greater than in the city. This strengthens literacy and intergenerational legacy that smoking is a very natural thing regardless of what they sacrifice for this action. Individuals will smoke as long as they can afford the pleasure of smoking and pay less for the negative risks of smoking (3).

Based on the second wave of IFLS data (1997), the average household cigarette expenditure in rural areas is IDR 26,380 per month. Meanwhile, the average investment expenditure for human resources is IDR 22,181 per month. In rural households surveyed in 2014, the average cigarette expenditure was IDR 285,773 per month. Meanwhile, the average expenditure on human resource investment is IDR 274,669. In the income variable, the average household income in rural areas (1997) was IDR 401,000 per month. Meanwhile, the offsprings households have an average income of IDR 3,628,100 per month. When compared between the average cigarette expenditure and human resource investment, cigarette expenditure is greater than human resource investment expenditure. In parental households, cigarettes have an allocation of 6.6 percent of total income, while human resource investment has an allocation of 5.5 percent. Meanwhile, in the offspring households, cigarette expenditure has an allocation of 7.9 percent and human resource investment expenditure has an allocation of 7.6 percent of total income. The data shows the same pattern between the two generations.

The perception of smoking households in villages towards human resource investment is largely determined by their perspective in determining priorities or choices. This is strengthened by the level of education which has a significant effect on changes in the allocation of human resource investment. However, the high level of education is only in line with high income, but not in human capital investment. This condition can occur because there are many free school programs and public health insurance, so they do not have to spend a lot of money on education and health. Minimal facilities in rural areas support the choice of village people to remain in their condition.

Meanwhile, the position of cigarettes as the second largest commodity consumption after food indicates that the dependence on cigarettes is very large. Cigarettes have addictive properties. This results in cigarette spending that cannot be suppressed, so the option available to households is to increase income. This is necessary because households must continue to allocate their income for cigarettes and other expenses.

An increase in income in rural households will increase expenditure on human resource investment, but the increase is not greater than the increase in expenditure on cigarettes. Based on the results of intergenerational observations, this pattern occurs in the households of parents and their descendants. The repetitive pattern indicates the existence of a vicious circle in scavenger households in rural areas. High income does not make human capital investment higher compared to cigarette spending.

4. Conclutions

The increase in cigarette expenditure has led to a decrease in the ratio of human resource investment expenditure in rural smoker households. Increased income can increase human capital investment but get a smaller portion than cigarette spending. The households of parents and their descendants have the same pattern which indicates the existence of vicious circles in households of smokers in rural areas.

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