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Urban and Rural Household Saving Determinants in Indonesia (IFLS 2000–2014)

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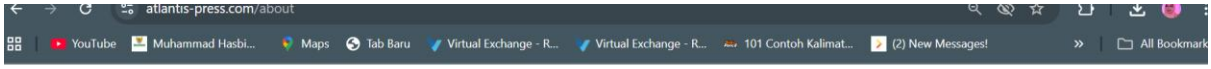

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Urban and Rural Household Saving Determinants in Indonesia (IFLS 2000-2014)

Syofriza Syofyan[1], Bahtiar Usman[1*], Harmaini Harmaini[1], and Litha Ardhiningrum[1]

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1 Introduction

Savings are one of the sources of investment funds that can accelerate economic growth. According to [4], the mobilization of savings to fund productive investments is one of the functions of the financial system, in addition to providing information on potential investment opportunities, monitoring companies and using corporate governance, increasing risk diversification, and sharing them with economic agents, and lowering the cost of gathering information, improving the execution of contractual agreements and transactions to increase productivity and economic growth.

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Savings in Indonesia for the past two decades decreased after the 1997 economic crisis. The average growth in national savings has experienced a downward trend from 1993 to 2019. The average savings growth in 1993-1999 reached 39%, while in 2000-2010 was only 13%, while in 2011-2019, it decreased to 12% (Penn World Table version 90). Indonesia's average savings-to-GDP ratio also experienced a downward trend from 1998 to 2019, where from 2005 to 2019, the savings-to-GDP ratio never exceeded 40% (SEKI). In 2016, Hadad[1] The average ratio of Indonesian household savings to total income is also low, only 8.5%. In other words, people only set aside 8.5% of their income for savings. Based on income level, the lowest-income households saved only 5.2% of their income. While the highest income group set aside 12.60% in savings

Household savings have a significant effect on increasing national income [34], and it is found that household savings have great potential to influence the formation of development funding sources. According to [3], in the case of developing countries, the most contributing factor to the decline in the amount of national savings is a decrease in household savings. Therefore, the issue of decreasing household savings rates in Indonesia is important to be researched. This research aims to analyze the determinants of household savings, both in rural and urban areas.

2 Literature Review

Theories about the determinants of savings can be grouped into 3 (three), namely neoclassical theory, psychological and social theory, and behavioral theory [5]. The two main theories in the neoclassical theory group are the life cycle hypothesis, popularized by [54], and the permanent income hypothesis, popularized by [23]. The neoclassical theory then developed into the precautionary motive or buffer stock saving model proposed by [11], [12], [19]. The neo-classical theory is a theory that explains the behavior of individuals or households in determining their consumption. Assuming that the income that is not consumed is the household's savings, this theory is also used to analyze the level of household savings.

Meanwhile, psychological and social theories were put forward by [24],[32], [40]. The behavioral theory was popularized by [37]. The last two theories developed to explain household saving behavior were not developed from the analysis of economics and by economists.

Based on theoretical and empirical studies, the determinants of household savings can be grouped based on the underlying theoretical group. In the Life Cycle Hypothesis theory, the determinants of savings are income from work, income from assets, socioeconomic conditions such as age, dependency level, the ratio of old age population, gender, education level, number of children, and marital status. In the Permanent Income

Hypothesis theory, the determinants of saving are the consumption rate, past average income, income growth rate, interest rate, and total wealth/assets. Meanwhile, according to the Buffer Stock (precautionary saving) theory, saving is influenced by income uncertainty. The effect of interest rate policy on savings is explained in the financial liberalization theory [28], [36]. In Psychological and Social theory, savings are influenced by aspects of the spouse, past experiences of saving, consumption patterns, beliefs about saving, and aspirations in saving. Another important factor is the institutional theory expressed by [5] and [6] that the saving behavior of low-income households is different from that of high-income households. So, there are additional variables that can explain the behavior of low-income households saving. These variables are institutional variables such as easy access to savings institutions, pension funds, providing financial education to households, attractive incentives for savers, subsidies for workers such as insurance or tax benefits, and facilities such as reduced registration fees for savers.

Much research on the determinants of household savings has been carried out from both a macro and micro perspective. On the macroeconomic side, according to [25], the determinants of household and personal savings rates are income, productivity growth, fiscal policy, real interest rates, Term of Trade, variable macroeconomic uncertainty, and financial deepening and the welfare effect (wealth effect). These factors sometimes have the same effect in different countries depending on the characteristics of each country. Econometric findings using macro data cannot provide clear evidence regarding the determinants of private saving rates because macro data cannot explain individual or household behavior [10].

Research on the determinants of savings using microeconomic data has also been carried out in many countries, and most of these studies use household survey data. These studies can be grouped into research that analyzes the determinants of savings by focusing on neoclassical theories such as those proposed by Keynes regarding the effect of current income on savings, supporting the life cycle hypothesis or permanent income hypothesis, or the precautionary saving theory. Not many studies support Keynes's theory, but the development of Keynes's theory is widely supported by empirical findings such as the proven life cycle hypothesis found by Brown and Taylor [9] and Brounen et al. [8]. Then, research that supports the precautionary hypothesis was found by [2], [70], [41], [14], [22].

The empirical findings at the household level above have studied the determinants of savings both in aggregate and individually. However, these findings still have limitations because they need to pay attention to heterogeneity, especially regional differences. According to [5], the determinants and patterns of savings differ between rural and urban areas. These factors include demographic and social characteristics, educational background, and variations in income levels. Meanwhile, in the case of Indonesia, the savings rate of rural and urban households in Indonesia has a relatively large difference. Using IFLS data, in 2000, 2007, and 2014, of the 7774 households that were the study sample, the percentage of households that had savings in the urban was always higher

than in the rural. The percentage of households having savings in rural in 2000 was 17.82%. In 2007 was 16.05%, and in 2014 was 19.59%. In contrast, in urban, the percentage of households with larger savings was 32.03% in 2000, then 30.37& in 2007, and 33.34% in 2014

Differences in access to financial institutions are also a factor affecting savings. Financial institutions less touch household members from low incomes and need more access to local bank branches [13]. As stated by [31], the screening process in banks, type of work, and income level determine whether a person will benefit from the existence of a savings institution. Most low-income individuals in rural areas need more access to institutions that facilitate savings.

Pan [33] stated the importance of analyzing the determinants of savings for rural and urban areas because there are often differences in government policies for households in rural and urban areas. Households in urban areas can enjoy several social benefits, such as insurance, health services, and pension funds, while households in rural areas do not. Pan [33] added that one of the factors that caused lower savings rates in rural was income inequality and the non-linear relationship between income and the tendency to save (MPS).

Based on the description above, households with low incomes generally have limited access to savings institutions compared to those with middle and high incomes, so households with low incomes will have lower savings rates. With the argument that households of rural areas can be analogized as people who have low incomes or have limited ability to save, and in developing economic theory, it is said that rural households have limited capacity to obtain sources of capital. Thus, the ability to increase income and earn money is low [27], [16]. The low ability to increase income will impact the low tendency to save. Whereas in Keynes' theory, it is stated that for someone whose income is low, the MPC (Marginal Propensity to Consume) is high, and consequently, the MPS (Marginal Propensity to Save) is low and on the other hand, the higher a person's income, the smaller the MPC and the larger the MPS

The analogy that the MPS of the population in rural areas is lower than that of urban areas is still a matter of debate and is only sometimes supported by statistical data[16], [3]. There are three groups of empirical findings regarding the comparison of MPS in rural and urban areas, namely Rural MPS > Urban MPS such as [1], [35], [15], [18]. Some empirical findings of Rural MPS < Urban MPS, such as [21]. There are also empirical findings of Rural MPS = Urban MPS, such as[17]

Saving behavior in rural and urban areas is an issue that needs to be investigated because there are quite significant differences between rural and urban households. Rural areas need to be industrialized and urbanized like urban areas. In addition to demographic differences, rural areas, in general, have a simple social life, have similarities in social status, have almost the same jobs, families have an important role in determining family member decisions, have limited formal employment opportunities, and others. Another difference is that government policies faced by urban and rural households will cause

differences in motivation and savings constraints. For example, urban households enjoy several social benefits, such as labor insurance, health insurance, and pensions, while rural households do not get these. Therefore, if the government wants to mobilize public funds through savings, it requires policies that are in accordance with the characteristics of rural and urban households.

3 Methods

The analysis units were all households recorded in the IFLS period 2000, 2007, and 2014. The data used in this study is secondary data in the form of longitudinal panel data. Supporting data can be taken from SUSENAS, IFLS, BPS, OJK, BI, and other publication institutions. This study used a quantitative method in the form of regression with the empirical model used as follows : [2]

$$Sav_{it} = \alpha + \beta\ Inc_{it} + \sum_{k=1}^{5} \varphi_k Inst_{kit} + \sum_{l=1}^{10} \gamma_l Dem_{lit} + \delta\ Tab1_{it} + \rho\ As_{it} + \mu\ Pens_{it} + \theta\ Cred_{it} + \varepsilon_{it} \quad (1)$$

Where:

Sav: ln_Asset (Household Asset Growth)

Inc: ln of per capita income

Inst: institutional factor (k=1,2,3,4)

- Amount of the nearest financial institutions (in a district)
- Average distance to the rural/regional financial institution

Dem : Demographic status (of household head) (l = 1, 2, 3, …..11)

- Age
- Value of age squared
- Dependency ratio
- Household size
- Dummy – education attained (SMP)
- Dummy – education attained (SMA)
- Dummy – education attained (S1)
- Dummy – sex type
- Dummy – marital status
- Dummy – employment status
- Dummy – rural/urban

Tab1: saving value, one year ago

As: the amount of insurance types covered

Pens: amount of pension value received

[2] This equation model follows the model of Liu and Hu (2013), which combines Keynes theory (Keynesian hypothesis), LCH, and Precautionary theory in a Saving equation in China.

Cred: Dummy – borrowing ownership
Ɛi: error term representing unaccounted variables in the model with an assumption of IID (Independently Identical Distributed)
i: individual, respondent, household head, from 1 to n observations, with seven sub-samples defined below:
- group of the whole samples
- group of working-age households (15-56 years old)
- group of retired age households (> 56 years old).

t: period, year of observation (2000, 2007, 2014)

A common measure of saving rate, which is the ratio between savings to income, is not used in this study. According to [26] and [10], the ratio of savings to income from survey results or methods is biased because the data values vary. The saving rate as the dependent variable used is the rate of household assets (ln assets). The asset rate measure (Ln_asset) is estimated to represent accumulated savings because of the nature of the data that is not sensitive to shocks from income and expenditure. The equation above estimates the significance of the variables (factors) that determine savings as measured by the asset rate value.

There is heterogeneity in society, such as differences in income levels, as criticized by [5] and [10], so the empirical model was developed by considering income aspects. The problem of geographical differences, such as rural and urban areas, as stated by [16] and [3], also causes differences in household behavior in saving. These differences need to be adopted into the empirical model used in this study. In regression analysis, the differences between rural and urban areas can be analyzed in two ways. Firstly, by using the dummy variable, and second, by making two separate regressions between the sub-sample of rural and urban households.

4 Results and Discussion

The research data was taken from IFLS in 2000, 2007, and 2014 with sample conditions showing that the amount of savings did not experience a significant increase, especially in rural. Meanwhile, income and consumption expenditure showed a significant increase between periods. The average number of family members is four people, and the education level of the head of the family is mostly elementary and high school. Most heads of households in the sample are male with married (married) status. The employment status of the head of the family is mostly working, and they work as entrepreneurs and private employees. By location, starting in 2007, more sample households were urban.

Institutional factors indicate that the distance from home to the nearest financial institution is 4-5.5 km, with the transportation fee to the nearest financial institution being around Rp. 5000 in 2014. The average travel time was about 20 minutes in 2014.

4.1 Regression Result: Using Dummy Variables

The results of the regression can be seen in Table I. The results of this regression are statistically feasible to interpret because the values of Prob F-stat and Prob Chi2 are below the critical value (α=0.05). In this panel analysis, the value of R2, as measured by Pseudo R2, shows a value large enough for microdata processing, which is more than 42%. In this model, almost all factors significantly influence the rate of household savings. Past income and income have a positive effect. The current income coefficient is 0.67, which means that an increase in the household income rate will increase the savings rate by 67%. This effect is almost the same for the two groups of the head of household age (working and retirement age). Institutional factors, as measured by the availability of the closest formal financial institutions, positively affect savings rate, and the effect is greater in the household group whose head of household is in the working age group.

Almost all of the demographic factors have an effect in accordance with the theory, both for the entire sample group and the working age group. Meanwhile, in the retirement age group, the demographic variables that affect the savings rate are the ratio of dependency level, a higher education level (SMA), gender of the head of household, and location of the household. The coefficient of high school education level is 0.636, which means that the savings rate in this retirement age group of households head is 1.88 million rupiahs compared to others. The financial literacy factors that influence saving rates are insurance and loan ownership. Insurance encourages an increase in the savings rate, but loan ownership also has a negative effect on the savings rate.

Table 1. Panel regression results of saving determination.

Independent Variables	All	Working Age	Retired Age
	FEM	FEM	REM
Per capita income	0.670***	0.489***	0.555***
Saving a year ago	0.00372***	0.00376***	0.00284
Dummy, borrowing ownership	-0.106***	-0.128**	-0.0542
Amount of insurance types	0.143***	0.126***	0.00339
Pension received	0.00163	0.00163	-0.00376
Amount of rural/regional financial institutions	0.12719***	0.134***	0.100***
Distance	0.00696	0.00182	0.00981
Age	0.0947***	0.158***	-0.0236
Age, squared	-0.000701***	-0.00130***	0.000441

Dependency ratio	0.00187***	0.00116***	0.00139*
Household size	0.0516***	0.0719***	0.0171
Dummy, education attained (SMP)	0.248***	0.336***	0.209
Dummy, education attained (SMA)	0.445***	0.633***	0.636**
Dummy, education attained (S1)	0.397***	0.657***	0.274
Dummy, sex	-0.0305	-0.189**	-0.249*
Dummy, marital status	-0.501***	-0.911***	-0.603
Dummy, employment status	-0.275***	-0.169	-0.131
Dummy, rural/urban	0.503***	0.441***	0.576***
Constant	4.334***	4.035***	7.783***
N	6395	5446	2928
F-stat	392.44	247.2	
Prob F-stat	0.000	0.000	
R-Squared			
Wald Chi2			3041.87
Prob Chi2			0.000
R2 overall	0.4456	0.4278	0.4648
Prob Chow test	0.000	0.000	0.000
Prob Hausman test	0.000	0.000	0.1328
Note	* p<0.1, ** p<0.05, *** p<0.01		

4.2 Regression Result: Using Urban-Rural Sub Samples

Regression results of the rural and urban sub-sample are shown in Table II. The number of samples of household heads in the rural is 6,048 households, and in the urban is 5,478 households. Each regression result passed the classical assumption test and the goodness of fit test. The value of the adjusted R^2 of the two regression equations is more than 40%, indicating that the ability of the independent variable to explain changes in the savings variable for micro-scale data is quite large and feasible. The Marginal Propensity to Save for households in urban is higher than in rural. In the urban, the MPS is 0.6202, while in the Rural it is 0.5901. It means that the increase in savings due to increased income is higher in the urban than in the rural. One of the contributing factors is that the income level of the family head in the urban is higher than in the rural.

Table 2. Regression result with urban-rural sub sample.

Independent Variables	Rural	Urban
Per capita income	0.5901 ***	0.6202 ***
Saving a year ago	0.0056 ***	0.0053 ***
Dummy, borrowing ownership	-0.0841 **	-0.2327 ***
Amount of insurance types	-0.0136	0.0012

Pension received	-0.0045			0.0006	
Amount of rural/regional financial institutions	0.1346	***		0.1062	***
Distance	-0.0002			0.0147	***
Age	0.0767	***		0.1050	***
Age, squared	-0.0006	***		-0.0008	***
Dependency ratio	0.0005	*		0.0007	**
Household size	0.1155	***		0.1082	***
Dummy, education attained (SMP)	0.0947	*		0.2286	***
Dummy, education attained (SMA)	0.3460	***		0.4975	***
Dummy, education attained (S1)	0.6121	***		0.9061	***
Dummy, sex	0.0465			0.0442	
Dummy, marital status	-0.0784			0.0840	
Dummy, employment status	-0.3467	***		-0.2752	***
Dummy, rural/urban	5.3931	***		3.7134	***
N	6048			5478	
Prob F Stat	0.0000			0.0000	
Adj-R-squared	0.4813			0.4481	
Note	* p<0.1, ** p<0.05, *** p<0.01				

The influence of institutional factors, as measured by the number of financial institutions, is equally significant in the rural and the urban, but the coefficient is greater in the rural (0.1347). This means that adding the number of rural financial institutions will increase the savings of households in rural. The average distance to financial institutions only affects the urban, and the effect is positive. In this case, the researcher concludes that distance is not an obstacle to saving because digital technology is growing. To access financial institutions, there is no need to visit the office.

The difference in access to financial institutions in the study is a factor that affects savings. It is in accordance with [13], where household members who come from low incomes will be less touched by financial institutions in the form of old-age insurance (pensions), and they will also have less access to local bank branches. As stated by [39], the screening process in banks, type of work, and income level determine whether a person will benefit from the existence of a savings institution. Low-income individuals need more access to mechanisms that facilitate saving. That is a pretty basic problem: The withholding income tax option is only available to employed individuals; salary deductions are only available in certain work settings; and the purchase of financed home mortgages is available only to those who meet the Eligibility Requirements.

With the argument that households in rural areas can be analogized to people who have low incomes or have limited ability to save, and in economic development theory, it is said that rural households have limited capacity to obtain sources of capital. Therefore, the ability to increase income is low, and results in the ability to earn money saving is also

low [27]. Several previous studies also found that rural MPS was lower than urban MPS, finding evidence that the MPS of farmers in rural areas during 1966-1992 in Pakistan, India, Taiwan, Japan, and Korea was greater than the savings rate national. [21] found the same result that the MPS in rural areas is lower than in urban areas because rural areas are not economically profitable, so the savings rate based on precautionary motives is not high. Additionally, [31] in India found that the savings pattern and determinants of savings in rural areas differed from urban ones, and the MPC of rural households was greater than their MPS.

Based on the results, the influence of demographic factors on savings is quite significant in rural and urban areas. The effect of age on savings is significant in rural and urban areas, but in urban, the effect is greater. The higher the age of a household head, the higher the savings, especially in urban. The negative squared age variable is significant both in the rural and the urban, showing proof of the life cycle theory where savings increase at the beginning of the age. There is a time when savings reach a maximum point and then decrease again according to age towards retirement (old age).

The dependency ratio has a significant positive effect both in the rural and the urban, with a slightly larger coefficient in the urban. An increase in the level of dependence in a household causes family heads to be more active in saving because the number of children under the age of 14 years and the number of older adults over 65 years does not generate income but requires a relatively higher cost of living for health care. The positive and significant influence is also from the number of family members. The more family members, the higher the household savings to anticipate the necessities of life.

The education level of the head of the household is a significant variable, with a higher coefficient in urban. Increasing the education level of the head of the household will increase household savings. The education of the head of the household also reflects his understanding of family financial management and financial literacy. Therefore, this is one of the variables that consistently affects savings. According to [5], the determinants and patterns of savings differ between rural and urban areas. These factors include demographic and social characteristics, educational background, and variations in income levels. They [5] analyzed the determinants of saving based on institutional and stated that financial education has a positive relationship with saving.

Head of household gender and marital status do not affect savings, while employment status, past savings, and loan ownership affect savings. Employment status, as measured by the dummy variable, shows a negative coefficient. It means that working household heads have lower savings than those who do not work. That is contrary to the theory that working household heads should have higher savings. It is possible because working status is also inseparable from increasing the need for consumer goods more than before, like houses, cars, and others, which causes an increase in debt. After all, general houses and cars are financed by the installment/credit method. It is in accordance with what has been expressed by [29], namely, households that have excess income throughout their life can pay debts and save for old age, and the credit market is perfect. In reality, the credit

market is imperfect, and future income is uncertain, so the ideal conditions for financing optimal consumption still need to be achieved. This result is supported by the effect of loan ownership on savings, which is significantly negative.

5 Conclusion

In the panel data regression model, it was found that almost all variables affected savings. Institutional factors also always affect the increase in the rate of household assets. When the regression was carried out based on the working and retirement age groups, the income variable positively affected the rate of household assets. On institutional factors, the number of closest formal financial services positively affects asset rates, especially in households whose KK is still of working age.

The above results are strengthened by performing regression using sub-samples for rural and urban. In this model, it is found that the MPS in the urban is higher than in the rural. This is because the income level of the head of household in the urban is higher than in the rural. As measured by the number of financial institutions, the influence of institutional factors is equally significant in rural and cities, but the coefficient is greater in rural. The average distance to financial institutions only has an effect in cities, and the effect is positive. In this case, the researcher concludes that distance is not an obstacle to saving because digital technology is growing. To access financial institutions, there is no need to visit the office. The influence of demographic factors on savings is quite significantly different in rural and urban areas. The effect of age on savings is significant in rural and urban areas, but in urban, the effect is greater. The dependency ratio has a significant positive effect both in the rural and the urban, with a slightly larger coefficient in the urban. The positive and significant influence is also from the number of family members. The education level of the head of the family is a significant variable, with a higher coefficient in Urban. Head of household gender and marital status do not affect savings, while employment status, past savings, and loan ownership affect savings. As measured by the dami variable, employment status shows a negative coefficient. This result is supported by the effect of loan ownership on savings, which is significantly negative.

5.1 Suggestions and Policy Implications

The regression results using the dami variable show that almost all of the variables used affect savings, so if the government wants to increase the amount of people's savings. It is necessary to implement policies to increase people's income, facilitate lending to MSMEs, improve public financial literacy, and make it easier for the community to access formal financial institutions. For instance, increasing the number and role of formal financial

institutions like BPRs and improving the internet network quality so that the entire community can enjoy digital financial institutions.

The regression results using the urban-rural sub-sample generally show that almost all factors affect savings, but there are some differences in the influence of the determinants of savings. In Cities, the impact of income, demographics, and ownership of credit is greater for households living in cities. So that savings in rural can also increase urban savings, the government needs to increase rural income so that they are included in formal financial institutions. In addition, the government also needs to make access and savings facilities in rural similar to conditions in urban.

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Urban and Rural Household Saving Determinants in Indonesia (IFLS 2000-2014)

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Abstract. The government's ability to mobilize public savings is one of the financial system functions that should work well. The literature on economic growth theory suggests that changes in the saving rate will cause an acceleration (deceleration) of capital accumulation, increasing (decreasing) economic growth. National saving in Indonesia for the past two decades has stayed the same. Indonesia's average savings-to-GDP ratio has also experienced a downward trend from 1998 to 2019. Differences in demographic and social characteristics, as well as differences in access to financial institutions in rural and urban areas, make this research necessary. This study aims to analyze the determinants of household savings in rural and urban areas. The data are from the 2000, 2007, and 2014 IFLS (Indonesian Family Life Survey) surveys. The OLS regression method is used by using dami variables and also conducting sub-samples. The results of this study indicate that the saving rate and amount of saving of households living in urban areas is always higher than those living in rural areas. The impact of income, demographics, and credit ownership is greater for households in an urban area. The availability of facilities or access to savings in urban areas should also be developed in rural areas to make access easier and the savings increase.

Keywords: Household Saving, Saving Access, Saving Mobilization, Urban-Rural

1 Introduction

Savings are one of the sources of investment funds that can accelerate economic growth. According to [4], the mobilization of savings to fund productive investments is one of the functions of the financial system, in addition to providing information on potential investment opportunities, monitoring companies and using corporate governance, increasing risk diversification, and sharing them with economic agents, and lowering the cost of gathering information, improving the execution of contractual agreements and transactions to increase productivity and economic growth.

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Savings in Indonesia for the past two decades decreased after the 1997 economic crisis. The average growth in national savings has experienced a downward trend from 1993 to 2019. The average savings growth in 1993-1999 reached 39%, while in 2000-2010 was only 13%, while in 2011-2019, it decreased to 12% (Penn World Table version 90). Indonesia's average savings-to-GDP ratio also experienced a downward trend from 1998 to 2019, where from 2005 to 2019, the savings-to-GDP ratio never exceeded 40% (SEKI). In 2016, Hadad[1] The average ratio of Indonesian household savings to total income is also low, only 8.5%. In other words, people only set aside 8.5% of their income for savings. Based on income level, the lowest-income households saved only 5.2% of their income. While the highest income group set aside 12.60% in savings

Household savings have a significant effect on increasing national income [34], and it is found that household savings have great potential to influence the formation of development funding sources. According to [3], in the case of developing countries, the most contributing factor to the decline in the amount of national savings is a decrease in household savings. Therefore, the issue of decreasing household savings rates in Indonesia is important to be researched. This research aims to analyze the determinants of household savings, both in rural and urban areas.

2 Literature Review

Theories about the determinants of savings can be grouped into 3 (three), namely neoclassical theory, psychological and social theory, and behavioral theory [5]. The two main theories in the neoclassical theory group are the life cycle hypothesis, popularized by [54], and the permanent income hypothesis, popularized by [23]. The neoclassical theory then developed into the precautionary motive or buffer stock saving model proposed by [11], [12], [19]. The neo-classical theory is a theory that explains the behavior of individuals or households in determining their consumption. Assuming that the income that is not consumed is the household's savings, this theory is also used to analyze the level of household savings.

Meanwhile, psychological and social theories were put forward by [24],[32], [40]. The behavioral theory was popularized by [37]. The last two theories developed to explain household saving behavior were not developed from the analysis of economics and by economists.

Based on theoretical and empirical studies, the determinants of household savings can be grouped based on the underlying theoretical group. In the Life Cycle Hypothesis theory, the determinants of savings are income from work, income from assets, socioeconomic conditions such as age, dependency level, the ratio of old age population, gender, education level, number of children, and marital status. In the Permanent Income

Hypothesis theory, the determinants of saving are the consumption rate, past average income, income growth rate, interest rate, and total wealth/assets. Meanwhile, according to the Buffer Stock (precautionary saving) theory, saving is influenced by income uncertainty. The effect of interest rate policy on savings is explained in the financial liberalization theory [28], [36]. In Psychological and Social theory, savings are influenced by aspects of the spouse, past experiences of saving, consumption patterns, beliefs about saving, and aspirations in saving. Another important factor is the institutional theory expressed by [5] and [6] that the saving behavior of low-income households is different from that of high-income households. So, there are additional variables that can explain the behavior of low-income households saving. These variables are institutional variables such as easy access to savings institutions, pension funds, providing financial education to households, attractive incentives for savers, subsidies for workers such as insurance or tax benefits, and facilities such as reduced registration fees for savers.

Much research on the determinants of household savings has been carried out from both a macro and micro perspective. On the macroeconomic side, according to [25], the determinants of household and personal savings rates are income, productivity growth, fiscal policy, real interest rates, Term of Trade, variable macroeconomic uncertainty, and financial deepening and the welfare effect (wealth effect). These factors sometimes have the same effect in different countries depending on the characteristics of each country. Econometric findings using macro data cannot provide clear evidence regarding the determinants of private saving rates because macro data cannot explain individual or household behavior [10].

Research on the determinants of savings using microeconomic data has also been carried out in many countries, and most of these studies use household survey data. These studies can be grouped into research that analyzes the determinants of savings by focusing on neoclassical theories such as those proposed by Keynes regarding the effect of current income on savings, supporting the life cycle hypothesis or permanent income hypothesis, or the precautionary saving theory. Not many studies support Keynes's theory, but the development of Keynes's theory is widely supported by empirical findings such as the proven life cycle hypothesis found by Brown and Taylor [9] and Brounen et al. [8]. Then, research that supports the precautionary hypothesis was found by [2], [70], [41], [14], [22].

The empirical findings at the household level above have studied the determinants of savings both in aggregate and individually. However, these findings still have limitations because they need to pay attention to heterogeneity, especially regional differences. According to [5], the determinants and patterns of savings differ between rural and urban areas. These factors include demographic and social characteristics, education background, and variations in income levels. Meanwhile, in the case of Indonesia, the savings rate of rural and urban households in Indonesia has a relatively large difference. Using IFLS data, in 2000, 2007, and 2014, of the 7774 households that were the study sample, the percentage of households that had savings in the urban was always higher

than in the rural. The percentage of households having savings in rural in 2000 was 17.82%. In 2007 was 16.05%, and in 2014 was 19.59%. In contrast, in urban, the percentage of households with larger savings was 32.03% in 2000, then 30.37& in 2007, and 33.34% in 2014

Differences in access to financial institutions are also a factor affecting savings. Financial institutions less touch household members from low incomes and need more access to local bank branches [13]. As stated by [31], the screening process in banks, type of work, and income level determine whether a person will benefit from the existence of a savings institution. Most low-income individuals in rural areas need more access to institutions that facilitate savings.

Pan [33] stated the importance of analyzing the determinants of savings for rural and urban areas because there are often differences in government policies for households in rural and urban areas. Households in urban areas can enjoy several social benefits, such as insurance, health services, and pension funds, while households in rural areas do not. Pan [33] added that one of the factors that caused lower savings rates in rural was income inequality and the non-linear relationship between income and the tendency to save (MPS).

Based on the description above, households with low incomes generally have limited access to savings institutions compared to those with middle and high incomes, so households with low incomes will have lower savings rates. With the argument that households of rural areas can be analogized as people who have low incomes or have limited ability to save, and in developing economic theory, it is said that rural households have limited capacity to obtain sources of capital. Thus, the ability to increase income and earn money is low [27], [16]. The low ability to increase income will impact the low tendency to save. In urban areas in Keynes' theory, it is stated that for someone whose income is low, the MPC (Marginal Propensity to Consume) is high, and consequently, the MPS (Marginal Propensity to Save) is low and on the other hand, the higher a person's income, the smaller the MPC and the larger the MPS

The analogy that the MPS of the population in rural areas is lower than that of urban areas is still a matter of debate and is only sometimes supported by statistical data[16], [3]. There are three groups of empirical findings regarding the comparison of MPS in rural and urban areas, namely Rural MPS > Urban MPS such as [1], [35], [15], [18]. Some empirical findings of Rural MPS < Urban MPS, such as [21]. There are also empirical findings of Rural MPS = Urban MPS, such as[17]

Saving behavior in rural and urban areas is an issue that needs to be investigated because there are quite significant differences between rural and urban households. Rural areas need to be industrialized and urbanized like urban areas. In addition to demographic differences, rural areas, in general, have a simple social life, have similarities in social status, have almost the same jobs, families have an important role in determining family member decisions, have limited formal employment opportunities, and others. Another difference is that government policies faced by urban and rural households will cause

differences in motivation and savings constraints. For example, urban households enjoy several social benefits, such as labor insurance, health insurance, and pensions, while rural households do not get these. Therefore, if the government wants to mobilize public funds through savings, it requires policies that are in accordance with the characteristics of rural and urban households.

3 Methods

The analysis units were all households recorded in the IFLS period 2000, 2007, and 2014. The data used in this study is secondary data in the form of longitudinal panel data. Supporting data can be taken from SUSENAS, IFLS, BPS, OJK, BI, and other publication institutions. This study used a quantitative method in the form of regression with the empirical model used as follows : [2]

$$Sav_{it} = \alpha + \beta\, Inc_{it} + \sum_{k=1}^{5} \varphi_k Inst_{kit} + \sum_{l=1}^{10} \gamma_l Dem_{lit} + \delta\, Tab1_{it} + \rho\, As_{it} + \mu\, Pens_{it} + \theta\, Cred_{it} + \varepsilon_{it} \quad (1)$$

Where:

Sav: ln_Asset (Household Asset Growth)
Inc: ln of per capita income
Inst: institutional factor (k=1,2,3,4)
- Amount of the nearest financial institutions (in a district)
- Average distance to the rural/regional financial institution

Dem : Demographic status (of household head) (l = 1, 2, 3, …..11)
- Age
- Value of age squared
- Dependency ratio
- Household size
- Dummy – education attained (SMP)
- Dummy – education attained (SMA)
- Dummy – education attained (S1)
- Dummy – sex type
- Dummy – marital status
- Dummy – employment status
- Dummy – rural/urban

Tab1 : saving value, one year ago
As: the amount of insurance types covered
Pens: amount of pension value received

[2] This equation model follows the model of Liu and Hu (2013), which combines Keynes theory (Keynesian hypothesis), LCH, and Precautionary theory in a Saving equation in China.

Cred: Dummy – borrowing ownership
Ɛi: error term representing unaccounted variables in the model with an assumption of IID (Independently Identical Distributed)
i: individual, respondent, household head, from 1 to n observations, with seven sub-samples defined below:
- group of the whole samples
- group of working-age households (15-56 years old)
- group of retired age households (> 56 years old).

t: period, year of observation (2000, 2007, 2014)

A common measure of saving rate, which is the ratio between savings to income, is not used in this study. According to [26] and [10], the ratio of saving to income from survey results or methods is biased because the data values vary. The saving rate as the dependent variable used is the rate of household assets (ln assets). The asset rate measure (Ln_asset) is estimated to represent accumulated savings because of the nature of the data that is not sensitive to shocks from income and expenditure. The equation above estimates the significance of the variables (factors) that determine savings as measured by the asset rate value.

There is heterogeneity in society, such as differences in income levels, as criticized by [5] and [10], so the empirical model was developed by considering income aspects. The problem of geographical differences, such as rural and urban areas, as stated by [16] and [3], also causes differences in household behavior in saving. These differences need to be adopted into the empirical model used in this study. In regression analysis, the differences between rural and urban areas can be analyzed in two ways. Firstly, by using the dummy variable, and second, by making two separate regressions between the sub-sample of rural and urban households.

4 Results and Discussion

The research data was taken from IFLS in 2000, 2007, and 2014 with sample conditions showing that the amount of savings did not experience a significant increase, especially in rural. Meanwhile, income and consumption expenditure showed a significant increase between periods. The average number of family members is four people, and the education level of the head of the family is mostly elementary and high school. Most heads of households in the sample are male with married (married) status. The employment status of the head of the family is mostly working, and they work as entrepreneurs and private employees. By location, starting in 2007, more sample households were urban.

Institutional factors indicate that the distance from home to the nearest financial institution is 4-5.5 km, with the transportation fee to the nearest financial institution being around Rp. 5000 in 2014. The average travel time was about 20 minutes in 2014.

4.1 Regression Result: Using Dummy Variables

The results of the regression can be seen in Table I. The results of this regression are statistically feasible to interpret because the values of Prob F-stat and Prob Chi2 are below the critical value (α=0.05). In this panel analysis, the value of R2, as measured by Pseudo R2, shows a value large enough for microdata processing, which is more than 42%. In this model, almost all factors significantly influence the rate of household savings. Past income and income have a positive effect. The current income coefficient is 0.67, which means that an increase in the household income rate will increase the savings rate by 67%. This effect is almost the same for the two groups of the head of household age (working and retirement age). Institutional factors, as measured by the availability of the closest formal financial institutions, positively affect savings rate, and the effect is greater in the household group whose head of household is in the working age group.

Almost all of the demographic factors have an effect in accordance with the theory, both for the entire sample group and the working age group. Meanwhile, in the retirement age group, the demographic variables that affect the savings rate are the ratio of dependency level, a higher education level (SMA), gender of the head of household, and location of the household. The coefficient of high school education level is 0.636, which means that the savings rate in this retirement age group of households head is 1.88 million rupiahs compared to others. The financial literacy factors that influence saving rates are insurance and loan ownership. Insurance encourages an increase in the savings rate, but loan ownership also has a negative effect on the savings rate.

Table 1. Panel regression results of saving determination.

Independent Variables	All	Working Age	Retired Age
	FEM	FEM	REM
Per capita income	0.670***	0.489***	0.555***
Saving a year ago	0.00372***	0.00376***	0.00284
Dummy, borrowing ownership	-0.106***	-0.128**	-0.0542
Amount of insurance types	0.143***	0.126***	0.00339
Pension received	0.00163	0.00163	-0.00376
Amount of rural/regional financial institutions	0.12719***	0.134***	0.100***
Distance	0.00696	0.00182	0.00981
Age	0.0947***	0.158***	-0.0236
Age, squared	-0.000701***	-0.00130***	0.000441

Dependency ratio	0.00187***	0.00116***	0.00139*
Household size	0.0516***	0.0719***	0.0171
Dummy, education attained (SMP)	0.248***	0.336***	0.209
Dummy, education attained (SMA)	0.445***	0.633***	0.636**
Dummy, education attained (S1)	0.397***	0.657***	0.274
Dummy, sex	-0.0305	-0.189**	-0.249*
Dummy, marital status	-0.501***	-0.911***	-0.603
Dummy, employment status	-0.275***	-0.169	-0.131
Dummy, rural/urban	0.503***	0.441***	0.576***
Constant	4.334***	4.035***	7.783***
N	6395	5446	2928
F-stat	392.44	247.2	
Prob F-stat	0.000	0.000	
R-Squared			
Wald Chi2			3041.87
Prob Chi2			0.000
R2 overall	0.4456	0.4278	0.4648
Prob Chow test	0.000	0.000	0.000
Prob Hausman test	0.000	0.000	0.1328
Note		* p<0.1, ** p<0.05, *** p<0.01	

4.2 Regression Result: Using Urban-Rural Sub Samples

Regression results of the rural and urban sub-sample are shown in Table II. The number of samples of household heads in the rural is 6,048 households, and the urban is 5,478 households. Each regression result passed the classical assumption test and the goodness of fit test. The value of the adjusted R^2 of the two regression equations is more than 40%, indicating that the ability of the independent variable to explain changes in the savings variable for micro-scale data is quite large and feasible. The Marginal Propensity to Save for households in urban is higher than in rural. In the urban, the MPS is 0.6202, while the Rural it is 0.5901. It means that the increase in savings due to increased income is higher in the urban than in the rural. One of the contributing factors is that the income level of the family head in the urban is higher than in the rural.

Table 2. Regression result with urban-rural sub sample.

Independent Variables	Rural		Urban	
Per capita income	0.5901	***	0.6202	***
Saving a year ago	0.0056	***	0.0053	***
Dummy, borrowing ownership	-0.0841	**	-0.2327	***
Amount of insurance types	-0.0136		0.0012	

Pension received	-0.0045		0.0006	
Amount of rural/regional financial institutions	0.1346	***	0.1062	***
Distance	-0.0002		0.0147	***
Age	0.0767	***	0.1050	***
Age, squared	-0.0006	***	-0.0008	***
Dependency ratio	0.0005	*	0.0007	**
Household size	0.1155	***	0.1082	***
Dummy, education attained (SMP)	0.0947	*	0.2286	***
Dummy, education attained (SMA)	0.3460	***	0.4975	***
Dummy, education attained (S1)	0.6121	***	0.9061	***
Dummy, sex	0.0465		0.0442	
Dummy, marital status	-0.0784		0.0840	
Dummy, employment status	-0.3467	***	-0.2752	***
Dummy, rural/urban	5.3931	***	3.7134	***
N	6144		5478	
Prob F Stat	0.0000		0.0000	
Adj R-squared	0.4813		0.4481	
Note	* p<0.1, ** p<0.05, *** p<0.01			

The influence of institutional factors, as measured by the number of financial institutions, is equally significant in the rural and the urban, but the coefficient is greater in the rural (0.1347). This means that adding the number of rural financial institutions will increase the savings of households in rural. The average distance to financial institutions only affects the urban, and the effect is positive. In this case, the researcher concludes that distance is not an obstacle to saving because digital technology is growing. To access financial institutions, there is no need to visit the office.

The difference in access to financial institutions in the study is a factor that affects savings. It is in accordance with [13], where household members who come from low incomes will be less touched by financial institutions in the form of old-age insurance (pensions), and they will also have less access to local bank branches. As stated by [39], the screening process in banks, type of work, and income level determine whether a person will benefit from the existence of a savings institution. Low-income individuals need more access to mechanisms that facilitate saving. That is a pretty basic problem: The withholding income tax option is only available to employed individuals; salary deductions are only available in certain work settings; and the purchase of financed home mortgages is available only to those who meet the Eligibility Requirements.

With the argument that households in rural areas can be analogized to people who have low incomes or have limited ability to save, and in economic development theory, it is said that rural households have limited capacity to obtain sources of capital. Therefore, the ability to increase income is low, and results in the ability to earn money saving is also

low [27]. Several previous studies also found that rural MPS was lower than urban MPS, finding evidence that the MPS of farmers in rural areas during 1966-1992 in Pakistan, India, Taiwan, Japan, and Korea was greater than the savings rate national. [21] found the same result that the MPS in rural areas is lower than in urban areas because rural areas are not economically profitable, so the savings rate based on precautionary motives is not high. Additionally, [31] in India found that the savings pattern and determinants of savings in rural areas differed from urban ones, and the MPC of rural households was greater than their MPS.

Based on the results, the influence of demographic factors on savings is quite significant in rural and urban areas. The effect of age on savings is significant in rural and urban areas, but in urban, the effect is greater. The higher the age of a household head, the higher the savings, especially in urban. The negative squared age variable is significant both in the rural and the urban, showing proof of the life cycle theory where savings increase at the beginning of the age. There is a time when savings reach a maximum point and then decrease again according to age towards retirement (old age).

The dependency ratio has a significant positive effect both in the rural and the urban, with a slightly larger coefficient in the urban. An increase in the level of dependence in a household causes family heads to be more active in saving because the number of children under the age of 14 years and the number of older adults over 65 years does not generate income but requires a relatively high cost of living for health care. The positive and significant influence is also from the number of family members. The more family members, the higher the household savings to anticipate the necessities of life.

The education level of the head of the household is a significant variable, with a higher coefficient in urban. Increasing the education level of the head of the household will increase household savings. The education of the head of the household also reflects his understanding of family financial management and financial literacy. Therefore, this is one of the variables that consistently affects savings. According to [5], the determinants and patterns of savings differ between rural and urban areas. These factors include demographic and social characteristics, educational background, and variations in income levels. They [5] analyzed the determinants of saving based on institutional and stated that financial education has a positive relationship with saving.

Head of household gender and marital status do not affect savings, while employment status, past savings, and loan ownership affect savings. Employment status, as measured by the dummy variable, shows a negative coefficient. It means that working household heads have lower savings than those who do not work. That is contrary to the theory that working household heads should have higher savings. It is possible because working status is also inseparable from increasing the need for consumer goods more than before, like houses, cars, and others, which causes an increase in debt. After all, general houses and cars are financed by the installment/credit method. It is in accordance with what has been expressed by [29], namely, households that have excess income throughout their life can pay debts and save for old age, and the credit market is perfect. In reality, the credit

market is imperfect, and future income is uncertain, so the ideal conditions for financing optimal consumption still need to be achieved. This result is supported by the effect of loan ownership on savings, which is significantly negative.

5 Conclusion

In the panel data regression model, it was found that almost all variables affected savings. Institutional factors also always affect the increase in the rate of household assets. When the regression was carried out based on the working and retirement age groups, the income variable positively affected the rate of household assets. On institutional factors, the number of closest formal financial services positively affects asset rates, especially in households whose KK is still of working age.

The above results are strengthened by performing regression using sub-samples for rural and urban. In this model, it found that the MPS in the urban is higher than in the rural. This is because the income level of the head of household in the urban is higher than in the rural. As measured by the number of financial institutions, the influence of institutional factors is equally significant in rural and cities, but the coefficient is greater in rural. The average distance to financial institutions only has an effect in cities, and the effect is positive. In this case, the researcher concludes that distance is not an obstacle to saving because digital technology is growing. To access financial institutions, there is no need to visit the office. The influence of demographic factors on savings is quite significantly different in rural and urban areas. The effect of age on savings is significant in rural and urban areas, but in urban, the effect is greater. The dependency ratio has a significant positive effect both in the rural and the urban, with a slightly larger coefficient in the urban. The positive and significant influence is also from the number of family members. The education level of the head of the family is a significant variable, with a higher coefficient in Urban. Head of household gender and marital status do not affect savings, while employment status, past savings, and loan ownership affect savings. As measured by the dami variable, employment status shows a negative coefficient. This result is supported by the effect of loan ownership on savings, which is significantly negative.

5.1 Suggestions and Policy Implications

The regression results using the dami variable show that almost all of the variables used affect savings, so if the government wants to increase the amount of people's savings. It is necessary to implement policies to increase people's income, facilitate lending to MSMEs, improve public financial literacy, and make it easier for the community to access formal financial institutions. For instance, increasing the number and role of formal financial

institutions like BPRs and improving the internet network quality so that the entire community can enjoy digital financial institutions.

The regression results using the urban-rural sub-sample generally show that almost all factors affect savings, but there are some differences in the influence of the determinants of savings. In Cities, the impact of income, demographics, and ownership of credit is greater for households living in cities. So that savings in rural can also increase urban savings, the government needs to increase rural income so that they are included in formal financial institutions. In addition, the government also needs to make access and savings facilities in rural similar to conditions in urban.

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