THE DETERMINANTS OF SAVINGS IN INDONESIAN HOUSEHOLDS (USING IFLS DATA)

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ABSTRACT

Purpose : The growing concern among researchers and analysts with regard to the decline in savings amounts is not without intention, interest and purpose. As saving is a personal and individual matter, an approach in which people are urged to augment their savings cannot be taken for granted. Yet while everyone has their own unique set of needs, preferences, motives and habits, this research aims to identify the typical factors that determine household saving in Indonesia.

Design/Methodology/Approach : The model to test which factors are the most important is saving as a function of income, consumption, demographic status, psychological, institutional, and financial literacy. The respondents were derived from the Indonesian Family Life Survey (IFLS) from periods 2007 and 2014.

Findings : Using quantile regression, we found income to be the most significant factor for saving in 2007 followed by education attainment, employment status and past saving experience. In 2014, the most influential factors were income, risk preference, employment status, urban/rural location and disincentives for going to the bank. Access to finance may offer the potential to resolve the whole of the financial issue for both sides, the demanders and suppliers of microfinancing, both individually and institutionally.

Keywords : Demography, Household Saving, Life Cycle, Permanent Income

JEL Classification : D14, D91, D150

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INTRODUCTION

The decline in the personal saving rate worldwide has attracted the attention of analysts and policymakers (Garner 2006). It has the potential to lead to a continuing increase in the burden of one’s liabilities to finance their accumulation of assets, whether these are tangible or non-tangible, financial or non-financial. The liabilities side of a household’s balance sheet is likely to be brimming with expenditure items on housing, education, health and retirement savings. Also included here are auto loans. As a result, the ability to
undertake any form of saving, including one’s total savings, average propensity to save (APS) and marginal propensity to save (MPS), are eroded over time. As consumption begins to exceed income, households seek to access means of surplus spending. As a result, informal lending and borrowing practices have become the only option available for households to acquire access to finance. Microfinancing institutions still require a certain level of administrative tasks and duties, not to mention the backup provided by collateral that has some financial value. This effectively renders them out of the reach of most people in low- to middle-income societies. Yet financial exclusion also remains a big issue for a sizeable minority of people in even advanced economies such as the UK. Financial exclusion is a function of poverty (Kempson and Collard 2012). However, the real detriment endured by those in this stratum of society is not confined to monetary costs but rather is widened to incorporate the social and psychological costs of feeling excluded from mainstream society.

A new financial inclusion policy should seek to provide a range of solutions to enable people to overcome their state of over-indebtedness; that is, through the empowerment of households’ financial capability. The regular workarounds employed to enhance the financial capability of households are sought via the mechanisms of social security programmes, with the concept being known as income redistribution. The practice is carried out through government subsidies or transfers, with such programmes financed through government revenues, tax, net exports, the profit of SOE (Stated Owned Enterprises) and the issuance of debt securities. Some level of financial support and development is needed, which is achieved by the setting and establishing of Individual Development Accounts (IDAs). In Indonesia, IDAs manifest in the operationalisation of KJP and KJS for Jakarta-registered people, or KIP or KIS for nationwide coverage.¹ In terms of social security programmes, there are both free and paid versions available. The paid versions can take the form of Defined Contributions (DC) or Defined Benefits (DB).

During the Suharto era, particularly from 1969 up to the issuance of Pakto 1988, a large number of policies and political movements were developed with the aim of increasing the national saving level. Among the things on offer were various savings products such as the Tabungan Berhadiah (rewarded saving), Tabanas (national development saving), Taska (time deposit saving) and so on. With these government policies subsequently confined to and awarded to state-owned banks, many urged the government to sanction the participation of the private sector to help amass and channel the supply of money circulating within society into the banking sector. As such, Pakto 1988 was issued as a policy for liberalising the banking industry in Indonesia.

Nevertheless, the policies implemented with the goal of increasing the national saving level have thus far failed to achieve their aim. Indonesia has a savings-to-GDP ratio of around 31%, lower than the rates in Singapore (49%), the Philippines (46%) and China (49%) (Penn World Table Version 90). The country’s low savings culture is indicated by

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its falling MPS (desire to save) in the face of an increasing GDP per capita. According to World Bank Data (2014), Indonesians’ level of access to formal financial institutions is only 36.1%, which is below that of other ASEAN countries such as Thailand, Malaysia and Singapore. In addition, other recent political movements aimed at boosting the national saving level, either relatively or absolutely, have not been satisfactory. Various political slogans have been used, including catchy phrases such as “Gerakan Menabung Nasional”, “TabunganKu”, “Ayo Menabung” and “Gerakan Indonesia Menabung”.

Yet the fundamental basis for either saving or not saving is clear from both a personal and individual perspective. Each of us is unique, even twins, and we all have our own differences. Yet we can also be defined by our own needs and preferences. In his 1943 paper “A Theory of Human Motivation”, Maslow set out a hierarchy of human needs. Moving from the bottom to the top, i.e., starting with the most basic, these human needs are physiological, safety, love and belonging, esteem, and, at the top, self-actualisation. The attitude and behaviour to saving can be approached from demand and supply perspectives, that is (individual) savers as demanding consumers and saving institutions as suppliers. Heckman and Hanna (2015) mapped the individual and institutional factors, along with their respective proxies, that can affect saving behaviour.

The individual factors and their respective proxies are economic with life cycle variables; social network with a professional advisor; psychological with reason to save, and financial literacy with knowledge. The institutional factors and their respective proxies, meanwhile, are access with no credit access and the number of financial institutions; incentives with welfare receipt, and facilitation, with an employer-provided retirement plan.

According to Beverly et al. (2008), the three classes of theories on saving determinants are Neo classical Economic Theory, Psychological and Sociological Theory, Behavioural Economic Theory. These theories or perspectives function via the setting of assumptions and constructs (or variables) in order to explain events such as low saving and asset accumulation. For simplicity and in total, saving is treated as an accumulation of assets. This libertarian principle assumes that individuals have both perfect knowledge and access to perfect markets and that they are rational and predictable in response to anything that is beneficial to themselves. An individual’s consumption preferences are assumed to be stable, exogenous and unaffected by opportunities and constraints. The benefits or incentives are the objectives of one’s consumption function. Such objectives may take the form of wealth, welfare, happiness, satisfaction or something else. Savings are treated as a residual (income-consumption) in relation to the principal objectives; as such, whatever is not consumed is saved. Consumption is assumed to be steady and fixed, while lifetime resources comprise fluctuating levels of income and saving.

Income and saving fluctuate in line with an individual’s age, that is, in line with one’s own life cycle, which lays the foundation for the life-cycle hypothesis (LCH). The best way of mitigating the dynamic nature of one’s own lifetime resources is seen as deferring consumption today in favour of a commitment to save. In short, saving offers a way of
smoothing out and securing consumption, thus ensuring the ability to engage in long-term consumption in the face of income fluctuations, that is the expected future income.

Choices are opportunities. Thus, individuals face the choice of whether to consume less, more or not at all. Every option presents and has its own opportunities and while some opportunities are blatantly clear, others are not. What is obvious is that times of dis-saving or negative saving are possible and typically occur in the early and old ages, while in between, people are at a productive age. This sets the basis for the permanent income hypothesis (PIH), which is linked to societies having regular and fixed flows of income, such as those earned by public servants or the employees of private firms. Lifestyle boundaries, as the lines that define living standards and class in society, may become blurred when it comes to consumption preferences, let alone when precedents, events, time, place and other factors are also considered.

A future liquidity preference refers to when people are attracted to making precautionary savings for a bequest and establishes the foundation of the buffer-stock models and hypotheses (BSH). From this theoretical standpoint, one is expected to accumulate small stocks of assets (buffer stocks) for the purpose of smoothing out consumption in the face of short-term income fluctuations and liquidity constraints.

The LCH model is further augmented with the addition of the public policy variable to the equation. One may regard the policy in question as a potential pathway to accumulate wealth and/or precautionary savings. To summarise, then, the constructs that make up neoclassical economic theory with regard to saving are income, consumption, incentives, age, expectations, motives and preferences.

The foci of neoclassical economic theory are those aspects or elements that are embedded within an individual. The psychological and sociological theory covers an individual’s psyche and social surroundings; as such, it runs both ways. While it begins with the values, norms and characteristics in regard to saving and consumption, it also includes personal motives, aspirations, goals and expectations.

The personal interests comprise social and cultural norms, peer and family influences and, most of all, the supports and demands of the social network. Financially literate children are more inclined and tend to have sophisticated financial savings (Chiteji and Stafford 1999; Cohen 1994). For some individuals, past savings experience shapes their belief in their ability to save in the future (Furnham 1985; Katona 1975).

The behavioural economic theory of saving differs from the neoclassical economic theory in terms of logic, rational and perfect knowledge. Many of the foundations and principles are based on the negativity of an individual, the deficiencies, to say the least. Suffice it to say, this theory attempts to accentuate the inconsistent behaviour of an individual in maximising their long-term consumption.

Deviation in priorities can manifest in terms of a lack of self-control (such as overspending on current needs), limited cognitive abilities (avoiding making the same mistakes, being given too many choices), inertia (being slow to change, being stuck on
their current path), the tendency to interpret default options (that is, as advice, or the best option available) and the tendency to use mental accounting techniques.

It is considered that most people’s regular current salary is fully consumed, while any extra or irregular income is considered as treat money or (unexpected, bonus) savings. Assumptions can be changed in the form of precommitment constraints, such as the setting up of direct deposits to savings and investment vehicles.

Instead, in order to focus on an individual’s behaviour, public policy analysts have proposed otherwise, that is, to shift the focus onto institutions as a means of encouraging savings and asset accumulation, or even to take advantage of individual tendencies. An institutions-focused approach is the conceptual framework proposed by Beverly et al. (2008).

Of the variously available macroeconomic and monetary variables and indicators, which are the most influential and act as the principal determinants of saving behaviour? This includes any factors that support and inhibit the accumulation of savings in the Indonesian banking system.

**Analytical Framework**

The analytical framework set out by Heckman and Hanna (2015) was based on the model developed by Beverly et al. (2008) for analysing the determinants of asset building amongst the poor, in a low-income society and within social policy. A total of around 77 research reports were mapped and tabulated. Asset accumulation is the sum of liquid savings, retirement savings, home equity, net financial worth and net worth.

Asset accumulation can come from personal/individual savings and investments and intergenerational and interhousehold transfers. The individual constructs consist of economic resources and needs, social network, financial literacy and psychological variables. The institutional constructs comprise access to finance, information, incentives, facilitation, expectations, restrictions and security.

An individual’s uniqueness characterises their personal attitudes, behaviour and preferences with regard to savings events and phenomena. As such, they are affected by attributes, labels, status, mark and achievements. What is embedded varies across individuals, such as sex and age. The age factor defines one’s preferences that are dynamic and change over the course of time, which is referred to as one’s life cycle.

One’s status can reflect the result and fruits of one’s involvement with others, such as their education, health, marriage and employment. Health status includes one’s personal history and medical records and is affected by factors including morbidity, natality and mortality. Marital status may include dependency factors, heredity, genealogies, genetics and fertility.

The preferences and phenomena of saving often become intertwined with liquidity preferences. The saving-liquidity face-off or trade-off depends on one’s social condition and psychology. This inter-related entanglement has become the basis of the buffer-stock hypothesis (BSH) and this demand side also requires the existence of a supply side in order to function in terms of physical aspects and access. Some level of financial literacy
and financial inclusion activities are needed as a way of filling the void and bridging the gap.

In short, the determinants of saving can be classified into three stages, as follows:

a. the intention, desire and will to save.

b. the ability, capacity and power to save

c. the facilities and incentives to save.

An individual’s savings capacity and preferences are elevated when payment transfers are made either by the government in the form of subsidies, as transfers from private institutions and as interhousehold and/or intergenerational transfers. Lesnoy and Leimer (1985) investigated the interrelationship between social security and the economy. They also tracked relevant empirical studies in relation to Feldstein’s (1974) findings.

Lesnoy and Leimer’s study was based on Feldstein’s (1974) original empirical evidence and conclusion that social security had significantly reduced private saving in the US by 50%. However, they concluded that historical evidence failed to support the hypothesis that social security had reduced private saving.²

Whatever is not consumed is saved. People’s consumption needs, patterns and priorities vary across genres and ages; as such, the young need to be educated and the elderly need to be cared for. Each successive cohort also faces a different set of economic and social policies and priorities. Some may also refer to one’s consumption patterns in association with the preferred and chosen lifestyles and the related living expenses.

By sector, one’s consumption is structured, with there being needs in terms of food, clothing, housing, education, energy, telecommunications, transport, medication, leisure and saving (i.e., precautionary). For many people, expenditure on food and clothes remains marginal in comparison to their expenditure on housing. Medical bills are another pressing issue for people who are neither privately insured nor covered by social security programmes.

**Conceptual Framework**

We therefore begin to form an estimation model based on the assumption that what is not consumed is saved. That is, \( S = f(Y) \) and \( S = Y - C \), where \( S \) is saving, \( Y \) is income and \( C \) is consumption. The variables included in the LCH are age, sex and employment status. The demographic status of an individual includes their marital status and dependency factors (ratio).

Financial literacy variables include an individual’s education attainment level, along with their knowledge and a level of expertise in diversifying their asset accumulation efforts. One’s diversified asset portfolio may be present and actualise in terms of ownership of house(s), financial assets, (life and health) insurance coverage and participation in pension savings.
Individuals who are financially literate may also be in a position to expect additional income through their ownership of financial assets, on either a short-term or periodic basis. Likewise, they may have access to financial institutions in formal ways. However, policy intervention is required in order to provide financial access to financially unworthy individuals. To this end, its aim is to broaden the financial inclusion of the whole society.

The regular metrics and measurements in terms of financial inclusion are the existence of financial institutions serving microfinancing needs, the level of physical access and the cost of accessing them in terms of money spent and time consumed. Non-formal financial access is typically granted through informal social support obtained within one’s social networks, in the form of interhousehold and/or intergenerational transfers. Arisans and loan sharks are the highest forms of interhousehold transfers.

Some level of financial support and development is needed by setting and establishing IDAs. In Indonesia, IDAs manifest in the operationalisation of KJP and KJS for Jakarta-registered people, or KIP or KIS for nationwide coverage. In terms of social security programmes, there are both the free version and the paid versions. The paid versions can be in the form of either Defined Contributions (DC) or Defined Benefits (DB).

Financial development provided for individuals may actualise, given some degree of incentives and facilitation to do so, for both institutions and individuals. Such facilities should have been developed in line with individual tendencies and societal trending.

### Table 1

| Variable | Var. Name | Impact to Saving |
|----------|-----------|------------------|
| Income   | Ln_income | +                |
| Consumption | Ln_PCE | – (Personal Consumption Expenditure) |
| Demographics | Age | +/- |
|             | Dependency Rasio | – |
|             | Sex | +/- |
|             | Educ-level | + |
|             | Number_child | – |
|             | hhsize | – |
|             | Marital_status | +/- |
|             | Employment_status | +/- |
| Location   | Urban_rural | +/- |
|             | Region | +/- |
| Psychological | Past_saving | + |
|             | Risk2 | + |
Variable | Var. Name | Impact to Saving
--- | --- | ---
Institutional | Distance to Financial Institution | –
 | Cost to Financial Institution | –
 | Time to Financial Institution | –
 | Availability of Financial Institution | +
 | Insurance ownership | +
 | Amount of Insurance type | +
 | Pension ownership | +
 | Pension amount | +
 | Financial literacy | Loan ownership status | +/-
 | Source of Loan | +/-

**RESEARCH METHOD**

This study uses two IFLS datasets, from the years 2007 and 2014. Two different datasets were used with the aim of obtaining more robust estimates of the effects of the variables. The IFLS datasets were selected as they provide more detailed information and financial data with regard to the demographic, education and health characteristics of Indonesian families and households. The number of households surveyed, and respondents interviewed rose from 11,439 in 2007 to 13,720 in 2014.

**Table 2**

Respondents and households surveyed by provinces, 2007-2014

| Province | Regencies / Cities | IFLS |
| --- | --- | --- |
| | 2007 | 2014 | 2007 | 2014 |
| Aceh | 1 | 2 | 1 | 2 |
| North Sumatera | 24 | 31 | 698 | 1051 |
| West Sumatera | 15 | 16 | 534 | 575 |
| Riau | 11 | 12 | 83 | 117 |
| Kepulauan Riau | 1 | 1 | 19 | 33 |
| Jambi | - | 6 | - | 21 |
| South Sumatera | 14 | 16 | 459 | 632 |
| Bangka Belitung | 4 | 5 | 57 | 81 |
| Bengkulu | - | - | - | - |
| Lampung | 10 | 14 | 454 | 564 |
| Banten | 5 | 6 | 438 | 526 |
| DKI Jakarta | 5 | 5 | 759 | 842 |
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| Province            | Regencies / Cities | IFLS       |
|---------------------|--------------------|------------|
|                     | 2007 | 2014 | 2007 | 2014 |
| West Java           | 19   | 20   | 1905 | 1937 |
| Central Java        | 29   | 31   | 1396 | 1715 |
| DI Yogyakarta       | 5    | 5    | 634  | 755  |
| East Java           | 31   | 31   | 1638 | 1834 |
| Bali                | 9    | 9    | 551  | 657  |
| West Nusatenggara  | 8    | 9    | 746  | 1021 |
| West Kalimantan     | 1    | 1    | 1    | 2    |
| Central Kalimantan  | 6    | 6    | 10   | 23   |
| South Kalimantan    | 12   | 12   | 543  | 619  |
| East Kalimantan     | 4    | 9    | 22   | 54   |
| North Sulawesi      | 1    | -    | 1    | -    |
| Southeast Sulawesi  | -    | -    | -    | -    |
| South Sulawesi      | 21   | 22   | 466  | 634  |
| West Sulawesi       | 3    | 5    | 24   | 24   |
| West Papua          | -    | 1    | -    | 1    |
| Total               | 239  | 275  | 11,439 | 13,720 |

Respondents 11,439 13,720
Urban’s 6,122 8,174
Rural’s 5,317 5,546

Based on the analytical framework presented above, we develop a general model to estimate the determinants of saving in Indonesian rural and urban households.

\[ S = f \text{ (income, consumption, demographic status, psychological, institutional, financial literacy)} \]
Table 3
Components Variables

| Components       | Variables                                      |
|------------------|------------------------------------------------|
| Income           | income                                         |
| Consumption      | personal consumption expenditure (PCE)         |
| Demographic status and location | Age, Dependency Ratio, Sex, Educ, HH-Size, number of Children, Marital Status, Employment status, urban-rural, region |
| Psychological    | past saving experience, risk-taking attitude   |
| Institutional    | access to financial institutions (Distance, Cost, Time, Availability) |
|                  | Insurance ownership and Amount of insurance types, Pension ownership and value |
| Financial literacy | Loan ownership and knowledge about source of Loan |

Dependent Variables
The first definition of saving is per capita income less per capita consumption. Here, the total amount of income received by one household is divided by the number of household members, less personal consumption expenditure (PCE). The second definition of saving is per capita assets not used for business (HR02). This figure is available in Book 2.

The forms of income received include salary, payment transfers, rent and individual assets, and these data are extracted from Book K, 3A and 3B. Data pertaining to the interviewed respondents are available in Sections TK, BA and HI. For the household members who were not interviewed due to their exclusion as target respondents, Section TK is replaced with AR15b.

Independent Variables

Tabel 4
Operationalisation Variable

| Variable | Var. Name | Operationalisation | IFLS                      |
|----------|-----------|--------------------|---------------------------|
|          |           |                    | Book | Section | Conditional                                |
| Income   | Ln_income | All income, in Ln (natural logarithm) | K, 3A, 3B | TK+BA+HI | TK → AR15b, if household members uninterviewed due to non-targeted |
| Consumption | Ln_PCE | Personal consumption expenditure, in Ln | K, 3A, 3B | TK+BA+HI | TK → AR15b, if household members uninterviewed due to non-targeted |
| Age      | Age       | Age of household head | K | AR | AR02b==1 and AR09 |
| Demographics | Rasio_dep | Dependency ratio == ((ART 0-14) + (ART 65+)) x100% | K | AR | AR01a=1,2,5,11 and AR09<15 or AR09>65 |
|          |           |                    |          |         |                                           |

(Art 15–64)
| Variable               | Var. Name                      | Operationalisation | IFLS                      |
|-----------------------|--------------------------------|--------------------|---------------------------|
| Sex                   | Sex of household leader        | K                  | AR                        |
|                       |                                |                    | AR02b=1, and AR07          |
| Dummy                 |                                | Female → Sex=0; Male → Sex=1 |
| Educ_level            | Education attainment           | K                  | AR                        |
|                       |                                | AR02b==2 and AR16 and AR17 |
| Dummy                 |                                | SD → Tingk_pend_i1=1; else=0 |
|                       |                                | SMP → Tingk_pend_i2=1; else=0 |
|                       |                                | SMA → Tingk_pend_i3=1; else=0 |
|                       |                                | Univ → Tingk_pend_i4=1; else=0 |
| Number of children    | Number of children             | K                  | AR                        |
|                       |                                | EP04; AR01a==1,2,5,11 and AR09<15? |
| hhsize                | Amount of household members    | K                  | AR                        |
|                       |                                | AR02                      |
| Marital status        | Marital status of household leader | K              | AR                        |
|                       |                                | AR02b=1 and AR13          |
| Dummy                 |                                | Not married, yet → Sta_kw=0 |
|                       |                                | Married → Sta_kw=1        |
| Employment status (ES)| Employment status              | 3A                 | TK24a                     |
| Dummy                 |                                | Self-employed → D_ES1=1; else=0 |
|                       |                                | Self-employed with the help of other ART, part-timer → D_ES2=1; else=0 |
|                       |                                | Self-employed with fixed staffs → D_ES3=1; else=0 |
|                       |                                | Labour, govt employee → D_ES4=1; else=0 |
|                       |                                | Labour, private employee → D_ES5=1; else=0 |
|                       |                                | ART employed but unpaid → D_ES6=1; else=0 |
|                       |                                | Freelancer in agriculture → D_ES7=1; else=0 |
| Variable  | Var. Name | Operationalisation                                                                 | IFLS                                                                 |
|-----------|-----------|------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Location  | Urban_rural | Urban-rural status                                                                  | CF BK1 LK                                                           |
|           |           | Dummy                                                                              | Urban_rural=1; else=0                                                |
| Region    | Region    | Regional classifiers                                                               | CF BK1 LK                                                           |
|           |           | Dummy                                                                              | Sumatera → Dw1=1; else=0                                             |
|           |           |                                     | Jawa-Bali → Dw2=1; else=0                                            |
|           |           |                                     | Others → Dw3=1; else=0                                               |
| Psychological | Past_saving | Past saving experiences, in Ln                                                   | 2 HR16                                                             |
|           | Risk2     | Risk taking attitude / profile                                                     | 3A Final SI21 – SI22                                                |
|           |           | Dummy                                                                              | Risk averter → Risk1=1; else=0                                      |
|           |           |                                     | Risk neutral → Risk2=1; else=0                                       |
|           |           |                                     | Risk lover/taker → Risk3=1; else=0                                   |
| Institutional | Distance | The closest saving/financial institutions                                           | CF-1 A0, A1                                                        |
|           | Cost      | The fare to closest fin. inst., in Ln                                              |                                                                      |
|           | Time      | Length of time to the closest fin. inst.                                          |                                                                      |
|           | Availability | Micro-financing institutions (MFI)                                                   |                                                                      |
|           | Insurance ownership | Health insurance coverage                                                           | 3B Final AK01, AK06                                                 |
|           | Amount of insurance types | Amount of insurance types                                                          | 3B Final AK01, AK06                                                 |
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| Variable                  | Var. Name                        | Operationalisation                      | IFLS Book | Section | Conditional                           |
|---------------------------|----------------------------------|----------------------------------------|-----------|---------|----------------------------------------|
| Pension ownership         | Pension saving availability      | Dummy                                  | 3A        | Final   | RE14                                   |
|                           |                                  | Pension saving available               |           |         | → Pensium=1; else=0                     |
| Pension value             | Amount of pension received       | Dummy                                  | 3A        | Final   | RE14                                   |
| Loan ownership status     | Knowledge of financial institutions | Dummy                                  | 2         | BH09>0  | → Memiliki_pinjaman=1; else=0          |
| Source of loan (SL)       | Places to the borrowings         | Dummy                                  | 2         | BH01    |                                        |
| Financial literacy        |                                  |                                        |           |         |                                        |
|                           |                                  | Private banks                          |           |         | → SL_Bank_swasta=1; else=0             |
|                           |                                  | Cooperatives                           |           |         | → SL_Koperasi=1; else=0                |
|                           |                                  | State banks                            |           |         | → SL_Bank_pemerintah=1; else=0         |
|                           |                                  | Agriculture banks                      |           |         | → SL_Bank_pertanian=1; else=0          |
|                           |                                  | Employer                               |           |         | → SL_Majikan=1; else=0                 |
|                           |                                  | House owner                            |           |         | → SL_Pemilik_rumah=1; else=0           |
|                           |                                  | Shop owner                             |           |         | → SL_Pemilik_toko=1; else=0            |
|                           |                                  | NGO                                    |           |         | → SL_LSM=1; else=0                     |
|                           |                                  | Neighbouring                           |           |         | → SL_Kas_RT=1; else=0                  |
|                           |                                  | Arisan                                 |           |         | → SL_Arisan=1; else=0                  |
|                           |                                  | Agriculture associations               |           |         | → SL_Klp_tani=1; else=0                |
|                           |                                  | Loan shark                             |           |         | → SL_Rentenir=1; else=0                |
|                           |                                  | Office                                 |           |         | → SL_Kantor=1; else=0                  |
| Variable | Var. Name | Operationalisation |
|----------|-----------|--------------------|
| Pawnshop | SL_Pegadaian=1; else=0 | IFLS |
| NBFI (non-bank financial inst.) | SL_LKNB=1; else=0 | |
| Others | SL_Lainnya =1; else=0 | |
| Unknown | SL_Tdk_tahu =1; else=0 | |

**Note: ART stands for Anggota Rumah Tangga (household member)**

Quantile regression is used as the method of analysis in this study. This method was selected as it offers two advantages: 1) it overcomes the issue of heteroscedasticity, and 2) its estimates are perceived to be more robust against outliers in the response measurements. For the quantiles, which are sorted from lowest to highest, the data are divided equally.

Quantile regression is an extension of linear regression. Linear regression is a statistical tool used to model the relationship between a set of predictor variables and a response variable, where the mean value of the response variable is estimated for given levels of the predictor variables. The $\theta$-th quantile regression method is estimated by minimising the absolute value of error with $\theta$ as the weight for a positive error and $(1-\theta)$ as the weight for a negative error. It is written mathematically as follows:

$$\min_{\beta \in \mathbb{R}^p} \sum_{i=1}^{n} \rho_{p}(y_i - Q_{\theta}(Y|X))$$

Where:

$p$ represents quantile index $\in (0, 1)$; $\rho_p$ is the asymmetric loss function, where $0 < p < 1$; and $\rho_p(\varepsilon)$ is a loss function of quantile regression, that is:

$$\rho_{p}(\varepsilon) = \begin{cases} 
  p \varepsilon, & \text{if } \varepsilon > 0 \\
  (p-1)\varepsilon, & \text{if } \varepsilon < 0 
\end{cases}$$

Quantile regression was first introduced by Koenker and Bassett in 1978. The linear model of quantile regression equation can be written as $y_i = x_i'\beta + \varepsilon_i$

To establish a baseline model of saving behaviour, many have referred to the variables used in Yuh and Hanna’s (2010) paper for the theoretical justification under a life cycle framework. The variables are (categorical) age, marital status, racial/ethnic status, education, the presence of a child under the age of 18, self-employment status, home ownership, income, net worth, current income relative to normal income, future income expectations, health status and health insurance coverage.

To represent income, Heckman and Hanna (2015) used percentiles of the federal poverty thresholds. Four categorical variables were created to represent the increments of the
poverty thresholds. These were up to 100%; 101–150%; 151–200%, and 201–300%.

According to Hogarth and Anguelov (2003), poverty threshold measures correct for unequal variances and are more suitable for low-income households.

In this study, we retain the usage of those terms and classifications defined in the regular, usual and classical theories. Based on what we mentioned earlier, the model formation is to be used as the implication of our findings for the purposes of public policy making.

\[
S_{ai} = \alpha + \beta Inc_i + \delta Cons_i + \sum_{k=1}^{8} \gamma_k Dem_{ki} + \vartheta Loc_i + \sum_{k=1}^{2} \mu_k Psi_i + \sum_{k=1}^{7} \rho_k Inst_i
+ \sum_{k=1}^{2} \varphi_k Ltrc_i + \varepsilon_i
\]

where:

| Variable | Definition |
|----------|------------|
| Sav      | Saving1 is measured in Ln of per capita income less per capita consumption. |
| Inc      | Saving2 is measured by per capita assets not used for business |
| Cons     | Income, in Ln. |
| Cons     | personal consumption expenditure (PCE), in Ln. |
| Dem      | Demographic variables such as age, dependency ratio, sex, education attainment, number of children, household size, marital status, employment status. |
| Loc      | Location of respondents surveyed, either rural or urban, and region. |
| Psi      | Past saving experience, risk-taking attitude/behaviour of the household leader. |
| Inst     | Institutional factors such as distance to the bank, fare to reach the bank, length of time to get to the bank, awareness of financial institutions, possession of insurance and pension savings. |
| Ltrc     | Household knowledge of financial institutions, measured as outstanding loan amounts and where to borrow from. |

Since we are using so many dummy variables, we are unable to regress all at once the independent variables that have been identified and measured. Should we do so, there would be perfect multicollinearity present among the independent variables, which would violate the classical assumption. Yet despite this, some of the available variables are limited in terms of qualified respondents, particularly in Model 4. Therefore, we split the estimation work across six models.
Table 5
Variables used in 6 models of regression
to estimate saving determinants in Indonesia

| Variable                  | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---------------------------|---------|---------|---------|---------|---------|---------|
| Dependent                 | ln_sav1 (ln_sav2) | ln_sav1 (ln_sav2) | ln_sav1 (ln_sav2) | ln_sav1 (ln_sav2) | ln_sav1 (ln_sav2) | ln_sav1 (ln_sav2) |
| Independent               | ln_Income | ln_Income | ln_Income | ln_Income | ln_Income | ln_Income |
|                           | ln_pce | ln_pce | ln_pce | ln_pce | ln_pce | ln_pce |
|                           | age | dependency_ratio | dependency_ratio | distance | ln_past_saving | age |
|                           | chldrn_amount | chldrn_amount | hhszie | Insurance_type | pension_amount | risk2 |
| Dummy                     | risk2 | risk2 | Inst_avaibility risk2 |  |  | SL_Bank_swasta |
|                           | Insurance_ownership | Insurance_ownership |  |  |  | SL_Koperasi |
|                           | Pension_ownership | Pension_ownership |  |  |  | SL_Bank_pemerintah |
|                           | loan_status | loan_status |  |  |  | SL_Bank_pertanian |
|                           | sex | sex |  |  |  | SL_Majikan |
|                           | marital_status | marital_status |  |  |  | SL_Pemilik_rumah |
|                           | urban_rural | urban_rural | urban_rural |  |  | SL_Pemilik_toko |
|                           | educ_level_i1 | dw1 | dw1 |  |  | SL_LSM |
|                           | educ_level_i2 | dw2 | dw2 |  |  | SL_Kas_RT |
|                           | educ_level_i3 | dw3 | dw3 |  |  | SL_Arisan |
|                           | educ_level_i4 | D_ES1 | D_ES2 | D_ES3 | D_ES4 | D_ES5 |
|                           |               | D_ES6 | D_ES7 | D_ES8 | D_ES8 | D_ES8 |
In order for a quantitative study on any subject to matter, it is essential to provide some rigorous and detailed analysis, which in our case must cover both the microeconomic and macroeconomic issues at hand. In order to cover both perspectives, there is the sizeable and daunting task of compiling different data sets for the construction of the estimation models.

However, it is relatively easy to develop an econometric model for the determinants of saving in Indonesia from the macroeconomic perspectives given that the required data sets are already available, in place and intact. Since no macroeconomic data set includes data pertaining to personal touch, sentiment and response, the data sets that are available for use in the context of microeconomic issues lead us to the use of IFLS data, which is open, public and non-proprietary.

It was easy to get lost in the data when it came to the process of extracting, exploring, processing and analysing the IFLS data, from design to execution, presentation and interpretation, without having the ability to contact the persons involved in the survey activities. Our early findings led to nothing but confusion and apparent conflicts between the data, trends and facts.

Following intense and heavy consultations with the IFLS data extraction experts, however, we were able to extract and use the most relevant operational variables more effectively and efficiently to estimate the roles of the determinants of saving in Indonesian rural and urban households. Various simple Java scripts in Stata were able to automate the data extraction quickly and flawlessly.

Prior to doing this, however, the data extraction required a stage of manual calculations, which were time-consuming and also prone to human error. Fatal statistical errors can occur in the event that respondents’ answers which should be treated as a coded message are instead extracted and used as they are. Manual operation becomes essential once the observed variables have been all but reduced, thereby excluding the split households from the extraction. Any ‘do not know’ answers are then settled with probing questions and are sometimes proxied.

Samples and their representations are vulnerable to selection bias. They may be voluntary or not, participated in or not, and other labels might have different responses when asked. In relation to policy implications and findings, less rigorous studies, whether quantitative and/or qualitative, should be considered tentative. A lack of rigorous methods is a major weakness of many quantitative studies.
RESULT AND DISCUSSION

We derived a total of 24 variables from the 8 components used in the model formation, which we believe to be reasonable determinants of household saving (behaviour) in Indonesian rural and urban areas. Half of the 24 independent variables that we identified, measured and utilised are dummies.

To avoid perfect multicollinearity amongst the independent variables and a violation of the classical assumptions while using many dummy variables simultaneously, we split the work into six jobs or models, as mentioned earlier in the Econometric Modelling section. The independent variables used vary by the definition of dependent variables and models employed.

Overall, a total of 11,439 respondents were interviewed in 2007 and 13,720 in 2014. To recap, we have six models, three percentile classes, two dependent variables and two observation periods. This produces a total of 72 estimation equations undertaken. To sum up and simplify, we split the summarised findings by the dependent variables, that is Ln_sav1 and Ln_sav2.

Next, we selected the most highly determinant independent variables according to their significances, correlations and tendency. To ease the interpretation for each estimation equation model, we implement scoring methods for the most significant variables. We score an equation on the three bases of 1) the conformity of the actual and empirical sign to the hypothesised one; 2) the magnitude of the coefficient estimator; and 3) the magnitude of the significance value.

Table 6
Number of independent variables used by models and dependent variable definitions

| Model | Dep_Var | Indep Vars | Dep_Var2 | Indep Vars2 |
|-------|---------|------------|----------|-------------|
| 1     | Ln_sav1 | 16         | Ln_sav2  | 17          |
|       | Ln_sav1 | 17         | Ln_sav2  | 18          |
| 2     | Ln_sav1 | 15         | Ln_sav2  | 16          |
|       | Ln_sav1 | 16         | Ln_sav2  | 17          |
| 3     | Ln_sav1 | 10         | Ln_sav2  | 11          |
|       | Ln_sav1 | 10         | Ln_sav2  | 11          |
| 4     | Ln_sav1 | 6          | Ln_sav2  | 7           |
|       | Ln_sav1 | 6          | Ln_sav2  | 7           |
| 5     | Ln_sav1 | 3          | Ln_sav2  | 4           |
|       | Ln_sav1 | 5          | Ln_sav2  | 6           |
| 6     | Ln_sav1 | 18         | Ln_sav2  | 19          |
|       | Ln_sav1 | 18         | Ln_sav2  | 19          |
Table 7
Saving determinants in Indonesia in 2007 and 2014, whereas saving is defined by Ln_sav1

| Determinant   | Score 2007 | Score 2014 | Correlation 2007 | Correlation 2014 | Significance 2007 | Significance 2014 | Tendency 2007 | Tendency 2014 | Remark |
|---------------|------------|------------|------------------|------------------|-------------------|-------------------|---------------|---------------|--------|
| ln_income     | 100        | 100        | +                | +                | ***               | ***               |               |               |        |
| marital_status| 91.67      | 75         | +                | +                | **                | **                |               |               | Married HH leader has higher saving (rate). |
| Insurance_type| 91.67      |            |                  |                  |                   |                   |               |               |        |
| chldrn_amount | 83.33      | 75         |                  |                  |                   |                   |               |               | The riskier the HH, the lower saving (rate), vice versa |
| risk2         | 83.33      | 100        |                  |                  |                   |                   |               |               |        |
| loan_status   | 75         | 75         | +                | +                | **                | **                |               |               | The higher the loans, the higher saving (rate), vice versa † |
| ln_cost       | 75         | 83.33      |                  |                  |                   |                   |               |               |        |
| D_ES          | 66.67      | 100        |                  |                  | ***               | ***               |               |               | Self-employed & freelancers have higher saving rates, if compared with the status of employee or labour. |
| Dw            | 66.67      | 75         |                  |                  | ***               | ***               |               |               | Higher saving (rates) applies for HH living within the regions, outside of Sumatera, Java, and Bali. |
| Urban_rural   | 100        |            |                  |                  |                   |                   |               |               | Higher saving (rates) applies for HH living in villages. |

Note: †: Lenders of 2007: employer (individual or office), neighbouring cash pool (kas RT), cash bondage (arisan), cooperatives. Lenders of 2014: pawnshops, private banks, cooperatives.
| Determinant | Score 2007 | Score 2014 | Correlation 2007 | Correlation 2014 | Significance 2007 | Significance 2014 | Tendency 2007 | Tendency 2014 | Remark |
|-------------|------------|------------|------------------|------------------|------------------|------------------|---------------|---------------|---------|
| ln_income   | 100        | 100        | +                | +                | ***              | ***              |               |               | In 2014, HH at the level of 11-90% have the highest MPS. |
| Tkt_pend    | 100        | 83.33      | +                | +                | ***              | **               |               |               | In 2014, HH's savings at the level of 99-100% is unaffected by education attainment. |
| D_ES        | 100        | 58.33      | +                | +                | ***              | **               |               |               | In 2007, self-employed, PNS, private have higher saving rate, in average. In 2014, the additional status were temp/casual workers. |
| ln_past_saving | 100      | 83.33      | +                | +                | ***              | ***              |               |               | In 2007, married HH leader has higher saving (rate). HH's savings at the level of 99-100% is unaffected by marital status. |
| Marital_status | 91.76    | 83.33      | +                | +                | **               | **               |               |               | Higher saving rate applies on HH living outside Sumatera, Java, and Bali. |
| Dw          | 91.67      | 58.33      | +                | +                | **               | **               |               |               | In 2007, married HH leader has higher saving (rate). HH's savings at the level of 99-100% is unaffected by the number of children. |
| jumanakrt   | 83.33      | 75         | -                | -                | **               | **               |               |               | |

Table 8
Saving determinants in Indonesia in 2007 and 2014, whereas saving is defined by $\text{Ln}_\text{sav2}$
The Determinants of Savings in Indonesian Households (Using Ifls Data)

| Determinant          | Score | 2007 | 2014 | 2007  | 2014  | 2007 | 2014 | Remark                                      |
|----------------------|-------|------|------|-------|-------|------|------|---------------------------------------------|
| ln_biaya_kebank      | 75    | 66.67| -    | -     | **    | *    |      | In 2014, indebted HH has lower saving (rate)† |
| age                  | 75    |      | +    | **    |       |      |      |                                             |
| loan_status          | 58.33 |      | -    | *     |       |      |      | In 2014, the riskier the HH, the higher saving (rate), vice versa |
| risk2                | 83.33 |      | +    | **    |       |      |      |                                             |

Note: † Lenders of 2014 were state banks, private banks, cooperatives, employer (individual & company), NGO, neighbouring cash pool (kas RT).

For the conformity, if all fit with the theory, then the score is 100; if there is partial fit, the score is 50; and if none fit, the score is 25. A high estimator has a score of 100, a medium estimator 50 and a low estimator a score of 25. If the significance is accorded 3 stars (***) , the score is 100; part significance (**, *) scores 25; and a paired one-star (and, and/or, or) has a score of 50.

The time dimension matters as the determining factors for saving (behaviour) change over time (analysis). In the first definition of saving (Ln_sav1), the 2007 finding shows that ln_income was the most highly determinant factor for saving (behaviour). In 2014, a total of four variables were found to be the most significant variables; that is, ln_income, risk2, employment status and urban/rural location.

In the second definition of saving (Ln_sav2), the 2007 finding shows that the determining variables were ln_income, education level, employment status and past saving experiences. In 2014, the determining power of all but the first of these variables fell, thus leaving ln_income as the only determining factor of saving (behaviour).

This study has attempted to identify the most significant factors in terms of influencing saving (behaviour) among Indonesian rural and urban people. Although we classified the factors by six components, it is not possible to establish fixed and rigid definitions as the lines and boundaries blur according to time, place and by reader.

One may base the classifier on the individual or institutional constructs or factors at play. In this study, we use loose definitions in practice. As a result, there may be a certain degree of inconsistency in terms of both the conceptual or analytical framework and the model formation. This also applies to the econometric modelling and detailed info on the independent variables.

The determining factors on savings may shift from being relevant to irrelevant, significant to insignificant, or vice versa. Two of the independent variables displayed a declining trend with regard to their ability to determine saving in both of the survey
periods (i.e., 2007 and 2014), in addition to both dependent variables (that is \( \text{ln}_1 \) and \( \text{ln}_2 \)). The two independent variables in question were marital status and dependency factor.

The other form of results in both survey periods showed an increase only when \( \text{ln}_1 \) was the dependent variable, with the opposite also being true, that is, a decrease when \( \text{ln}_2 \) was the dependent variable. The 3 independent variables in this outcome were employment status, regional classifier and disincentives to go to the bank.

Whatever the empirical results and findings led to, concluded or synthesised, when paired with the hypothesised ones, we should reconsider the measurement and interviewer’s perception of the respondent’s knowledge and apply some weightings accordingly. When dealing with social environment elements, however, it is not possible to set these using particulars and specifics, only relatively. As with any research, the original and intended purpose is to provide some justification, support and evidence to support the framework analysis and hypotheses with regard to the various concerns and phenomena of the ongoing trend and tendency. They will all lead ultimately to the issuance of public policies, which although may be beneficial to some parties will also steer others towards positions of disadvantage. The dependent variables should not be confined to nominal saving figures but rather should include anything that is related to saving, both directly and indirectly, with the same applicable to the reasons for saving, from preferences to behaviours, habits and rites.

The parties involved in saving should also not be confined to the two types of savings actors, that is the demanders and suppliers, but should also include those in the middle such as the government and anyone with a vested interest in savings events, with health and education being the most prolific sectors. It may relate to providers and financiers institutionally, in addition to social programmes such as welfare, insurance and pension schemes as the means.

**CONCLUSION AND SUGGESTION**

**Conclusion**

From all of regressions were conducted, the empirical findings show that income is the sole and most significant variable in terms of savings accumulation. Employment status was found to be the next best predictor among the determinant variables for saving. Both of the independent variables show consistency in the estimation equations.

However, interpreting one’s employment status as the factor that either encourages and/or discourages saving remains open to the half-empty or half-full question, betting on the flip of the coin with the same face-off, trade-off or consequences. On the other hand, risk preferences, education attainment, past saving experiences and urban/rural location were the third best predictors for determining saving in Indonesia.

In any case, retaining the saving indicator as the sole and main dependent variable to be tested, measured and estimated will not solve the real issue that people face. People’s financial empowerment should not be confined to a status enhancement such as that
attained through financial literacy, financial inclusion, access to finance, financial support and financial development.

Access to finance may help to solve all of the financial issues affecting both sides, that is the demanders and suppliers of microfinancing, on both individual and institutional bases. New regulations on public policy also need to be directed for the purpose of empowering people financially.

**Suggestions for Future Research and Surveys**

Classification has become a necessity as it is needed to contain the widespread phenomena of differentiation efforts and in order to bring a long-term impact. The automatic segmentation of society or respondents can be carried out using EViews. While the classification basis may vary from demographic to geographic, psychographic or behavioural, EViews has a threshold regression feature, which is something that is not offered by SPSS. It is thus recommended that future studies and research use this method.

Some bases of classification may have blurred lines; additionally, there may be compartmentalisation and pigeon-holing of the thresholds. Therefore, threshold regression comes into play for the purpose of estimating, generating and interpreting non-linear regression models. Threshold AutoRegressive (TAR) models can be Self-Exciting (SETAR), Nested (NeTAR) or other.

Psychographic profiles may include attitudes, lifestyle, hobbies, risk aversion, personality traits, leadership traits, the magazines read, television programmes watched, PRIZM^4 clusters, etc. The behavioural variables may include brand loyalty, usage level, benefits sought, distribution channels used, reaction to marketing factors, etc.

Classes in society may be based on many things. The most common are poverty level, regional wage systems, and middle-, upper- and lower-income level. The state of the competing classes in society is outlined as “the top 1% wealthiest people in the world have grown ever richer, while the middle class has stagnated” (Gold 2017). Many have focused their observation and analysis on this top 1% of people, such as Forbes. On the other hand, it is the job of governments to address the issues and problems faced by the lower-income class, such as poverty. The widening spread of inequality manifests in the occurrence of relative poverty, which can be defined as a condition in which a person does not enjoy a certain minimum level of living standards when compared to the rest of the population of that country (Sabates 2008).

Living standards vary over time and across places, with the same being true of saving behaviour and its determinants. Surveys conducted on a periodic basis offer the best means of tracking these factors, with BPS having already engaged in the tracking of living expenses in Indonesia. The process was started in 1977/1978 and continued in 1988/1989, 1996, 2002, 2007 and 2012, with plans in place for BPS to repeat it in 2018 with a living expense survey (SBH) conducted across a total of 90 cities, comprising 34 provincial capitals and 56 regencies/cities. This urban survey aimed to cover 14,160 census blocks and 141,600 households (Nursiyono 2017).
The following are some of the detailed items that should have been included in the IFLS data.

1. The structure of consumption, that is by food, education, medical bills (which are incidental, paid out of pocket and not covered by either or both of social and/or private insurances), childcare, elderly care, vehicle (or transportation) expenses and debt instalments.

2. Expenditure on the consumption of utilities, such as basic phone services, internet services, paid television, clean water, electricity.

3. The perception and/or sentiment of the respondents with regard to their current status compared with the standardised level such as KFM, KHM, KHL, UMR/UMP, living expenses, poverty level, Gini ratio, or other. 

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