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FAMILY SAVINGS OF THE WORKING POPULATION IN MINDANAO, PHILIPPINES

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Abstract:
The study was conducted to understand the saving behavior of the working population in Mindanao using the Family Income and Expenditure Survey (FIES) datasets covering the periods 2003 to 2015. The study determined the factors which influence the families to save using Tobit regression and compared the levels of family income, expenditures, and savings of the regions of Mindanao. The study revealed that the real value of family savings increases as the family head gets older, but it eventually declines as the head nears retirement age. Tobit estimates revealed that in Mindanao, the age of the family head, household tenure, wages from agricultural and non-agricultural activities, income from entrepreneurial activities and cash assistance from abroad positively influence families to save; while sex of the family head, educational attainment, and the number of young dependents negatively influence the families to save. Moreover, the family size, marital status and geospatial location of the family heads have shown both positive and negative influences on family savings for different years. Meanwhile, the ANOVA results revealed that in 2015 there were significant variations between and among the income, expenditure, and savings of families in all regions of Mindanao. However, the Tukey-Kramer HSD test revealed that family savings in some regions in Mindanao have statistically the same means such as the Zamboanga Peninsula and CARAGA, Northern Mindanao and Davao Region, and SOCCKSARGEN and ARMM, while other regions vary significantly from each other. Overall, the ANOVA results revealed that for 2015 the Davao Region has the highest mean family income and expenditure, while Northern Mindanao recorded the highest mean family savings. The ARMM region showed the least value of mean income, mean savings and mean expenditures of families among the regions of Mindanao.

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1. Introduction

Savings is considered a significant factor that contributes to the economic growth and development of any country (Romer, 1986; Shaw, 1973; Solow, 1956; Todaro and Smith, 2017). It is an important macroeconomic variable in the accumulation of wealth, productivity, and growth of the economy, including the dependence on foreign capital from external sources (Adam and Agba, 2006). In spite of the importance of high saving rates, developing economies like the Philippines is struggling to generate higher savings ratio being country which has one of the lowest savings rates among the East Asian countries (Bersales and Mapa, 2008).

The nationwide 2018 Consumer Expectation Survey conducted by the Bangko Sentral ng Pilipinas shows that in the third quarter, the percentage of households with savings was lower at 32.5 percent compared to the second quarter results of 37.4 percent. It further revealed that the number of Filipinos with debts or loans increased to 43.4 percent during the third quarter of 2018 as compared to 27 percent in the second quarter. The survey has found out that Filipinos are significantly net consumers where a big portion of their disposable incomes are instantly spent for personal or family spending instead of setting aside part of their incomes for savings. This attitude is confirmed by previous studies (Orbeta, 2006; Todaro and Smith, 2017) pointing out that the weak economic growth of the Philippines is due to low rates of savings.

The downward trend in savings indicates a problem. When national saving is declining, of which private saving is derived from the business firms and the households or family, it can result in an insufficiency of funds to support domestic investment that can spur economic activities. Second, when family or household saving is low, there may be inadequate support for the numerous retiring labor section of the broad economic landscape (Magda, 2015). Furthermore, a low savings rate is a concern because the growth of the economy and the continued investment generation can only be assured through a robust state of domestic saving. Savings through investment builds a country's capacity to grow even more in future. Hence, it is urgent that any decline in savings should be immediately arrested.

The low savings rate or poor financial management and inclusion among families result in desperate and irreversible choices. Worse, it leads to economic and social suffering. In fact, the closure of several investment schemes (e.g., Kabus Padatuon or KAPA International, RIGEN Marketing, GoldSkin, Ever Arm Any Marketing, Organico Agribusiness Ventures Corp., Ada Farm Agriventures, and Alabel-Maasim Credit Cooperative), which victimized thousands, if not millions of people, and where operations have originated in Mindanao, were a manifestation that many Filipinos, particularly in the provinces, would like to have enough savings.

Knowing the savings profiles and contributory variables to family savings, the study can promote financial literacy, especially in the provinces where poverty is extreme. In an effort to achieve the vision of the Filipinos as inscribed in Philippine Development Plan (PDP) 2040, family savings plays a crucial role in achieving this: "*Filipinos enjoy strongly rooted comfortable and secure life.*" The need for families to save is pivotal because they cannot predict what the future holds and its uncertainties. Economic indicators such as income and expenses may be subjected to exogenous factors or market volatilities (i.e., health issues, investment scams, earthquakes and pandemics way beyond the family's control. Savings in the form of goods or money allow families to become financially secure, able to avail possible opportunities and provide safeguards when uncertainties arise. Therefore, the study of family savings in Mindanao is important both at the micro and macro level of policy analysis. It should be highlighted that savings are not an end, but a means to an end.

1.1 Objectives of the Study

The study intends to determine necessary contributory variables to the family saving of the working population in Mindanao. Specifically, the study aims to:

1) present the savings profile of the working population in Mindanao;
2) determine the magnitude of the effect of identified contributory variables to the family savings of the working population in Mindanao; and,
3) compare the family saving, family expenditure and family income in Mindanao.

2. Literature Review

The literature on savings is extensive but few focused on the micro level. Hence, this study limits the objective focusing on the contributory role of household characteristics like age, sex, family size, educational attainment, number of young dependents, disposable income, income from entrepreneurial activities, and the geospatial location relating to the formation of savings in the household level. This is basically to comprehend the manner that these independent variables affect the savings.

Chua, Kiong, Villa, and Paguta (2016) enumerated some household saving variables in their case study in Payatas in Quezon City, these were: economic expectations, home-ownership status, consumption, debt, family income, including the number of economically dependent members of the household This study employed Tobit regression model and the computation for the conditional marginal effects for both the censored and samples that are truncated. There are three sections in which the study has endeavored which include the results of Tobit regression, the findings of conditional marginal impacts on total respondents, as well as on households that are practically savers. It was found out that there was a positive relationship between the capacity of households to save between the household's economic expectations and their disposable incomes.

Szopinski (2017) has categorized family income and its genetic category, as well as the size of the place where the family resides as independent variables that affect

household savings in Poland. The study revealed that families with higher incomes were likely complemented by savings with higher levels; thus, families residing in bigger cities are likely to have higher earnings. The study also showed that family genetic factors had encouraged a high family savings rate, including those childless families, as well as those persons who are living alone.

The study of Bebczuck, Gasparini, Amendolaggine, and Garbero (2015) on household behavior, as well as the key drivers in terms of family savings in 10 Latin American countries, have included eleven variables that affect the rate of savings at household levels: (a) income, (b) age, (c) number of young dependents, (d) educational attainment, (e) government transfers, (f) remittances, (g) self-employment, (h) capitalization pension systems, (i) access to financial services, (j) urban location, and (k) health and education. It was found out that income was positively identified to affect family savings, while the age factor was immensely helpful though has a declining effect on family savings. Browning and Lusardi (1998) and Deaton (1992) emphasized that individuals accumulate savings for precautionary or buffer-stock purposes to insure against risks and uncertainty, and the desire of the person as he ages to leave a bequest to heirs. When controlling for current income, the quantity of younger dependents showed an encouraging impact, yet yields negative results when present family income decreases when educational attainment was considered.

Furthermore, household heads with higher education were found to reduce the rate of savings when controlling for income. The negative result was possible once current income is controlled where household heads having higher education envision an increasing trend in lifetime personal income, which in turn increases spending and savings reduced. In the same manner that increased aid from the government, as well as financial transmittals in the total income of the household summarily decreases the rate of savings, which conclusively discourages savings. Also, the study further revealed that self-employment diminishes the saving rate, while the homeownership factor records a higher rate of saving. Finally, the study revealed that geospatial location affects household savings rates. The study found that urban households save less than those rural ones.

Using Tobit regression model, Hailu and Mirach (2014) on household savings determinants in Ethiopia, considered nine variables in their study and found out that household savings are determined by basic demographic factors such as (a) age, (b) sex, (c) marital status, as well as (d) financial organizations in terms of financial saving and the number of times for drawing money. Age was found out to determine household savings positively and significantly. The reason for this might be age-related saving motivating factors. Moreover, the study further shows that males and females have distinct preferences when it comes to consumption and savings patterns. Thus, sex is also another variable that explains household savings significantly where females were considered saver than males. In the same study, marital status was found out as another significant factor for household savings. The main reason for the finding might be the fact that most female partners are spouses that make their liquid money contribution very less. Furthermore, there are also social and other costs added most of the time for married

individuals. Besides, the form of institutions that households used for saving is also another strong determinant for household savings. Households who used formal institutions such as banks are in a better performance than those who used informal ones. The study also revealed that the common reasons that cause low household savings were due to inadequate family incomes, culture, level of education, social engagements, and most importantly being unemployed.

The same Tobit model was used in the study of Girma, Belay, Bezabih, and Jema (2013) in the determination of the variables on household savings in Ethiopia where it employed 'single equation' approach. The study findings showed that educational level, size of the real property, as well as yearly family income has a positive effect to savings. The findings of the study are consistent with that of Kibet, Mutai, Ouma, Ouma, and Owuor (2009) who used the cointegration analysis in the identification of household saving determinants in Kenya. Meanwhile, Hailu and Mirach (2014) stated that as the household head gets older the propensity to save also diminishes.

In the Philippines, the study of Mapa and Bersales (2008), using the secondary regional data from the 1985 to 2003 Family Income and Expenditure Survey, concluded that the dynamics of the country's population structure have a direct relationship to the propensity of Filipino families to save. The study ventured into the generalized least square (GLS) approach to arrive at the probable numerical values and was used as a tool to elucidate the parameters of the rate of savings at the household level in the country. They emphasized that the high dependency ratio in the younger age bracket, which has high requirements for educational needs as well as health needs, culminates in the household's low rate of savings. Although much to be argued, they came up with an argument that the high population growth rate is one of the key reasons for the country's weak growth rate in the broader economic performance. However, in terms of savings, they contended that those individuals who were 'supposed' to belong in the upper bracket of the dependency scale (age 65 and above) were still considered as active savers. Finally, educational attainment and remittances were found to be major sources of savings at the household level.

In an earlier study, Mapa and Bersales (2006), on the determination of household behavior and knowing the various factors that determine household savings in the Philippines from the same period based on regional accounts, revealed that the propensity of the households to set aside money for savings have been declining for the period covered in the study. Accordingly, the year 2003 was recorded to have the lowest rate of household savings since the year 1988, although there was an incremental increase in savings from 2000 to 2003 for those who belong to the highest income cluster. With the use of Instrumental Variable Estimation (IVE) approach (with pseudo-panel figures sourced from 1988-2003 FIES) coupled with the use of GLS model, the study has generated the factors influencing household savings, these are: (a) income level, (b) educational attainment, (c) the ratio of young dependent, (d) the ratio of elder dependents, and the (e) overseas remittances were considered as vital determinants in terms of the propensity of households to save. Meanwhile, Orbeta (2006) ventured to study the effect of the number of children on household savings in the Philippines using

2-stage least squares (2SLS) or general method of moments (GMM) thereby providing consistent and efficient results. The study showed that having children does not have any adverse effect on the ability of the household to save; however, more children are considered regressive in terms of the ability of a household to save. Moreover, Orbeta (2006) noted that more children meant more families will be endangered from household income losses and more severe to marginally poor families. Cumulatively, any added child to the family certainly reduces the ability of the household to save.

3. Material and Methods

3.1. Data Source and Data Collection

Secondary data were obtained from the Philippine Statistics Authority (PSA) through a formal request letter to the National Statistician. The public use files (puf) of the Family Income and Expenditure Survey (FIES) results for 2003, 2006, 2009, 2012, and 2015 from the PSA were provided free of charge and used to achieve the objectives of the study. Data on savings, income, expenditures and as well as the variables were extracted from said datasets.

3.2. Methods

In presenting the saving profile of the working-age population in Mindanao, descriptive statistics were shown using Microsoft Excel 2018. The mean value, maximum value, minimum value, and standard error of the family characteristics were presented.

To account for the interregional price variability, all monetary values such as income, expenditures, and savings were deflated using provincial or regional consumer price indices compiled by the Philippine Statistical Authority from 2003 to 2015.

3.2.1. Statistical Tools: Tobit Regression and ANOVA

To determine the contributory variables to family savings, Tobit analysis was used. Tobit regression is a statistical procedure that measures the individual effects of a censored or truncated vector of explanatory variables on a single non-negative variable (Gujarati, 2007). The most important explanatory variables are those that account for a significant proportion of the variation in the recorded family savings of the region. The direction of the magnitude of the specific effect of any variable is given by the slope coefficients. Such an estimate gives the impact of the variables on the level of family savings if all the remaining variables are held constant.

3.2.1.1. Analysis of Variance (ANOVA) and Tukey-Kramer HSD Test

The savings pattern of the households was studied and compared for different regions in Mindanao using analysis of variance (ANOVA), where the total sum of squares (TSS) is broken down into an explained sum of squares (ESS) and the residual sum of square (RSS). Savings across regions differ significantly if the F–value is significant. Otherwise, savings across regions are similar. Using the ANOVA method, the third objective of the study is met.

To determine which specific regions in Mindanao, have differences or similarities in terms of mean income, mean expenditure and mean savings when compared with other regions, Tukey-Kramer HSD test was performed.

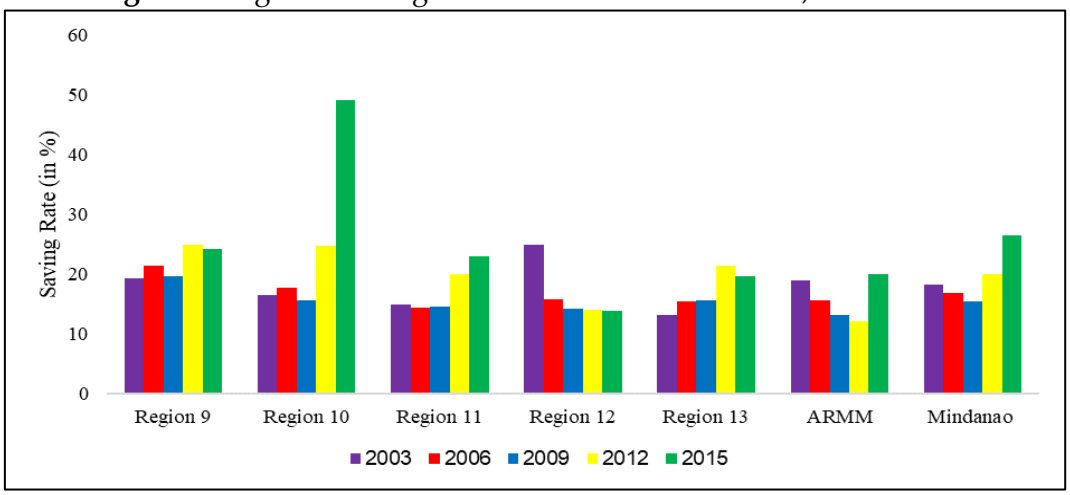
4. Results and Discussion

4.1 Life-Cycle Profile of Family Savings

The average savings across regions in Mindanao shows a different picture than income. Regions 9, 10, 11, and 13 show an increasing trend of savings from 2003 to 2015, while Region 12 or SOCCKSARGEN exhibits decreasing trend. ARMM's average saving shows almost constant behavior from 2003 to 2012 but in 2015 it spiked.

Overall, Mindanao showed an increasing trend of saving rates from 2003 to 2015 as presented in Figure 1.

Figure 1: Regional saving rate of families in Mindanao, 2003 to 2015



Source: Author's computation from Family's Total Income and Total Expenditure, 2003 to 2015.

Table 1 shows the average regional family savings per capita decile of the working-age population in Mindanao, from 2003 to 2015. Savings across different brackets and regions in Mindanao vary from each other, signifying differences in family savings. Noticeably, some of the region's first to fourth decile, representing the first four-tenths (4/10) of the total population based on savings, showed negative savings. A negative saving simply means that expenses made by the family are greater than the income received.

The average per capita saving of the working population in Mindanao is presented in tables. The poorest decile represents the families belonging to the bottom 10 percent, while the richest decile represents families belonging to the top 10 percent of the total population.

Table 1: Mean saving per capita decile of working population in Mindanao, by region, 2003 to 2015

Region	Year	Mean Saving Per Capita Decile									
		1	2	3	4	5	6	7	8	9	10
Region 9 (Zamboanga Peninsula)	2003	-12,817	-7,265	-3,710	-1,057	2,170	6,662	14,160	29,573	72,081	2,604,464
	2006	-10,823	-5,161	-1,081	1,333	4,713	10,217	20,281	38,855	86,896	1,483,458
	2009	-9,761	-3,478	-243	3,223	7,125	12,736	21,844	39,328	81,434	4,273,474
	2012	-4,529	1,927	6,144	10,659	15,682	22,945	35,002	54,953	100,336	888,149
	2015	6,759	9,979	12,464	15,482	18,579	22,810	30,910	44,671	82,350	585,375
Region 10 (Northern Mindanao)	2003	-11,595	-4,963	-1,916	1,179	4,640	9,957	17,745	34,875	73,124	1,580,092
	2006	-15,268	-6,197	-1,700	2,082	5,830	11,629	20,670	39,605	81,722	1,752,012
	2009	-15,361	-6,757	-2,778	354	4,237	10,029	18,234	36,124	75,729	2,109,691
	2012	-3,201	602	3,212	7,647	13,171	20,724	31,354	51,913	103,744	1,017,331
	2015	-3,119	2,211	6,963	12,123	19,464	29,836	43,968	69,900	122,334	1,478,098
Region 11 (Davao Region)	2003	-16,270	-7,399	-2,917	1,124	5,316	10,788	18,726	33,161	69,103	6,464,577
	2006	-17,430	-7,774	-2,150	1,962	6,478	13,691	24,322	40,937	79,328	582,830
	2009	-16,587	-6,529	-1,896	1,800	6,668	13,095	23,197	39,799	76,653	1,880,126
	2012	-16,016	-6,795	-1,105	4,450	10,778	19,258	32,932	53,241	101,853	2,703,503
	2015	990	3,750	7,694	12,757	18,207	27,140	38,602	60,052	111,088	4,172,223
Region 12 (SOCCKSARGEN)	2003	-21,523	-10,701	-5,145	-500	4,578	10,487	19,103	35,473	70,382	43,497,513
	2006	-20,529	-10,769	-3,752	1,053	5,930	12,100	20,134	34,523	63,457	3,521,903
	2009	-20,898	-11,070	-5,607	-1,218	3,252	9,242	19,272	34,893	67,200	1,765,041
	2012	-24,957	-13,131	-6,758	-1,913	2,842	8,866	17,280	31,189	68,605	1,583,200
	2015	-27,951	-14,356	-6,262	-1,534	2,648	8,305	18,264	35,619	75,475	1,747,320
ARMM	2003	-8,300	-2,241	1,480	4,055	6,751	11,133	17,364	27,563	54,211	1,282,657
	2006	-10,982	-4,963	-1,344	1,613	4,503	8,362	13,209	23,609	46,062	1,750,329
	2009	-12,353	-5,937	-1,848	1,035	4,155	7,594	12,847	21,951	42,242	1,146,620
	2012	-24,957	-11,813	-4,748	733	5,029	8,949	14,972	23,345	45,262	776,101
	2015	-6,898	-109	4,500	8,328	11,550	15,153	19,902	30,027	58,524	605,908
Region 13 (CARAGA)	2003	-14,777	-7,244	-3,584	-1,103	1,831	5,575	12,621	25,548	59,505	1,190,346
	2006	-16,919	-9,190	-4,687	-1,137	2,359	6,841	13,778	26,024	58,712	4,001,556
	2009	-15,869	-8,355	-4,108	-1,132	2,570	7,037	13,370	25,292	52,296	5,034,028
	2012	-12,742	-4,717	403	5,464	11,286	19,322	31,150	49,619	93,502	1,469,151
	2015	-14,400	-5,476	-508	4,266	9,853	18,138	29,802	53,454	88,565	1,702,923

* Deflated using 2010 CPI (2010=100).

Source: Author's computation from FIES.

Looking at the mean saving per capita across the regions, the picture of inequality of savings of the bottom 10 of the population and the richest 10 is more pronounced as shown in Table 1. The first to third quintiles of almost all regions in Mindanao showed negative savings while the remaining quintiles are positive. Negative values of per capita savings mean that families in the bottom 40 percent of the population do not have any form of savings. Instead, they have debts or loans from either formal or informal financial institutions.

In 2003 the families belonging to the upper 10 percent of the population has an average savings of 67,780 while the poorest families dissaves by 14,101 pesos. In 2006, the families in the richest decile save on average by 71,439 pesos, while the poorest families or the bottom 10 percent dissaves by 15,006 pesos. In 2009 and 2012, families belonging to the richest decile saved on average 68,652 pesos and 83,960 pesos, respectively. For the same year, the bottom 10 dissaves by 14,992 pesos and 14,732 pesos, respectively. In 2015, the per capita decile saving showed that the richest decile saved 89,723 pesos, on average, while the poorest decile dissaves 7,436.5, annually. These gaps in terms of saving show that families in the richest decile have at least 12 times the value of savings than those of the families in the poorest decile.

These results are consistent with the findings of the Bangko Sentral ng Pilipinas 2018 Consumer Expectations Survey (CES) across the country, which revealed that the number of Filipinos with debts or loans increased to 43.4 percent during the 3rd quarter of 2018 as compared to 27 percent of the second quarter. The results indicate that Filipinos are likely spending a larger portion of their disposable income on immediate consumption rather than on savings for the future. This might be the reason why most Filipino families are easily attracted to investment schemes which promise higher investment returns potentially to be used to pay debts/loans.

4.1.1. Per Capita Poverty Threshold and Life Cycle Profiles of Family Savings in Mindanao

The annual per capita poverty threshold used as censored values in the Tobit regression analysis is presented in Table 2.

Table 2: Annual per capita poverty threshold in Mindanao, 2003 to 2015

Region	Poverty Threshold				
	2003	2006	2009	2012	2015
Region IX	10,407	12,743	16,260	18,076	20,925
Region X	11,605	12,917	16,878	19,335	22,345
Region XI	11,399	13,389	17,120	19,967	22,754
Region XII	11,328	13,319	16,405	18,737	21,025
Region XIII	11,996	14,324	18,309	19,629	22,570
ARMM	12,733	12,647	16,683	20,517	21,563
Mean for Mindanao*	11,812	13,223	16,943	19,377	21,864

* Average annual per capita poverty threshold in Philippine peso, 2003 to 2015
Source: Philippine Statistics Authority

Table 3 shows the average family savings, by age bracket, in Mindanao from 2003 to 2015 exhibiting an overall increasing trend of family savings over the years and as family heads become older.

Furthermore, Table 3 presents the average family savings of the working population in Mindanao, by age brackets, from 2003 to 2015. The savings by age bracket is important to know whether as the family head becomes older, on average, they save more resources or not.

The mean family savings of the working population in Mindanao was 26,509.8 pesos in 2003; 26,756.47 pesos in 2006; 32,170.55 pesos in 2009; 44,458.41 pesos in 2012; and 57,539.8 pesos in 2015. The average saving trend of the average family savings from 2003 to 2015 is increasing with a mean value of 40,231.31 pesos, annually.

Table 3: Average savings of the working population, by age bracket, in Mindanao, 2003 to 2015

Age Bracket	Average Saving				
	2003	2006	2009	2012	2015
15-19	28,060.29	26,530.34	30,267.58	44,258.60	55,886.92
20-24	26,627.92	26,629.61	32,391.57	44,360.33	57,373.56
25-29	26,287.55	26,635.62	32,376.29	44,437.97	57,808.05
30-34	26,288.10	26,862.96	32,375.77	44,677.78	57,763.12
35-39	26,303.85	26,750.45	32,400.74	44,519.35	57,774.66
40-44	26,365.46	26,852.88	32,362.50	44,499.16	57,791.19
45-49	26,302.43	26,844.18	32,365.95	44,505.52	57,784.33
50-54	26,282.20	26,814.73	32,376.29	44,481.25	57,794.44
55-59	26,288.65	26,849.39	32,382.55	44,450.74	57,771.17
60-64	26,291.54	26,794.56	32,406.30	44,393.38	57,650.53
Standard Deviation	554.89	117.23	668.78	110.80	595.38
Mean	26,509.80	26,756.47	32,170.55	44,458.41	57,539.80
Coefficient of Variation	0.020931	0.004381	0.020789	0.002492	0.010347

*Deflated using 2010 CPI (CPI=100)
Source: Author's computation.

4.2 Tobit Estimates

Table 4 presents the estimation results of the Tobit regression analyses of the family savings of the working population, in Mindanao, from 2003 to 2015. Moreover, these tables also show the total sample size used per region and per year. A squared correlation between observed and expected values is also shown.

Table 4 presents the estimation results for 2003 to 2015 using the FIES for all working families in Mindanao. All estimates apply only to heads of families whose savings are above the threshold or poverty levels of the specific region. Family savings over the period change. Hence, the expected sign of the variable or the factors considered to influence savings may also change. Recall that the working population is defined as 15 to 64 years old. The 14 years old and below and the 65 years old and above are excluded.

Among the variables considered to influence individual family savings, **age** has a significant positive influence on family savings. The estimated coefficient for the age of the family head is highly significant at a ten percent level to impact family savings in

Mindanao, except only for the year 2003. They range from 152.46 (2003), 357.65 (2006), 552.17 (2009), 664.80 (2012), and 352.94 (2015). For every additional 1 year of age of the family head, family savings are estimated to increase in peso by 152.46 (2003), 357.65 (2006), 552.17 (2009), 664.80 (2012), and 352.94 (2015), holding other factors constant. This positive impact of the age of family heads to save result is consistent with the results of Mapa and Bersales (2006), and Bebczuk *et al.* (2015). As explained by Mapa and Bersales (2006), as the person increases in age, the bequest motive or the desire to acquire goods and even properties declines. They tend now to save their resources for unanticipated events that might happen in the future, a form of a precautionary measure.

The estimates for the number of **young dependents** revealed that as the number of young dependents increase, a significant negative effect on family savings occurs. These estimates for number of young dependents range from -1,364.50 (2003), -4,318.8 (2006), -497.75 (2009), -6,915.10 (2012) and -4,422 (2015). For every increase in one young dependent to the family per year, the family savings are estimated to reduce by 1,364.50 (2003), 4,318.8 (2006) 497.75 (2009), 6,915.10 (2012) and 4,422 (2015) pesos, holding other factors constant. This negative result is consistent with the life cycle hypothesis and supports the earlier studies conducted recommending that slowing the pace of population growth has been associated with high savings in East Asia (Mapa and Bersales, 2006; Orbeta, 2006). According to Orbeta (2006), the impact of additional children on the saving rate is negative on average and is regressive with a negative impact on the poorest households and a positive impact on the top four quintiles. Additional children will expose more families to the risk of income shortfalls: much more so for poorer households.

Family size has two possible impacts on family savings as shown by the sign of the coefficient. On one hand, the bigger the size of the family, the lower the family savings. Estimated impact of family size to family savings in peso range from -3,868.4 (2003), -1,127.9 (2006), -4,284.2 (2009), 1,723.6 (2012) and -757.09 (2015). As the number of family members increases by 1, family savings are estimated to reduce in pesos per year by 3,868.4 (2003), 1,127.9 (2006), 4,284.2 (2009), and 757.09 (2015), holding other factors constant. According to Orbeta (2006), poverty worsens as the family moves from smaller to bigger size. He further explained that consumption theory tells that consumption is directly proportional to the number of household members. Consumption is financed by either income or savings. Thus, the bigger the size of the family, the bigger the consumption and the lesser the savings. Browning and Lusardi (1996) concluded that saving ratios are higher for couples with no children or fewer children, and the least for lone parents. In Australia, Harris Loundes, and Webster (1999) found a negative and significant relationship between household savings (measured as ordered discrete responses) and both the number of children and whether there are children in the household.

Table 4: Estimates of family savings of the working age population in Mindanao, 2003 to 2015

Mindanao/ Year	Variable												Squared Correlation	Sample Observation
	Age	**Sex**	**FS**	**MS**	**Educ**	**YD**	**HT**	**WAGNA**	**INCEA**	**CONAB**	**GL**	**Constant**		
2003	152.46* *(84.01)*	-7439.6* *(3970.8)*	-3868.4* *(534.08)*	-7173* *(3625.9)*	-19910* *(3033.7)*	-1364.5^{ns} *(917.64)*	2018.3^{ns} *(1861.4)*	0.669* *(0.011)*	0.958* *(0.002)*	0.54* *(0.002)*	NDA	-78957* *(5062.6)*	0.9884	10,700
2006	357.65^{ns} *(192.42)*	-1101.2^{ns} *(6480)*	-1127.9^{ns} *(1131.9)*	-11,104* *(6292)*	-16,689* *(5371.1)*	-4,318.8* *(1559.6)*	1964.5^{ns} *(3420.5)*	0.578* *(0.016)*	0.701* *(0.015)*	0.539** *(0.03)*	4672.2* *(3317)*	-87,385* *(110130)*	0.7574	9,225
2009	552.17* *(128.45)*	-11407* *(3529.4)*	-4284.2* *(795.30)*	922.86^{ns} *(3331.5)*	-15494* *(4049.7)*	-497.75^{ns} *(1149.9)*	1625.5^{ns} *(2656.6)*	0.639* *(0.012)*	0.814* *(0.007)*	0.651* *(0.014)*	-2850.6^{ns} *(2522.3)*	-126410* *(7765.4)*	0.8570	9,249
2012	664.80* *(134.53)*	-6009.5* *(4767)*	1723.6* *(952.09)*	-4682.6^{ns} *(4516)*	-2741.8* *(3511)*	-6915.1* *(1204.1)*	0.576* *(0.010)*	0.703* *(0.021)*	2062.1^{ns} *(2805.5)*	0.677* *(0.012)*	9545.5* *(2631.4)*	-141070* *(7929.4)*	0.6146	9,795
2015	352.94^{ns} *(279.78)*	-9012.7* *(5023.5)*	-757.09^{ns} *(1100.3)*	-2,535.9^{ns} *(4858.5)*	-6342.5^{ns} *(4409)*	-4422* *(1447.7)*	6550.1* *(3093.5)*	0.529* *(0.009)*	0.726* *(0.010)*	0.568* *(0.018)*	NDA	-99567* *(8335.6)*	0.7799	10,403

*significant at 10% level.

Legend: CONAB – Cash Assistance from Abroad; HT – Household Tenure; ns – not significant; Educ – Educational Attainment; GL – Geospatial Location values in parentheses () are standard errors of the regression coefficients; YD – Number of Young Dependents; NDA - no available data; WAGNA Wage from Agri and Non-Agri Activities; INCEA – Income from Entrepreneurial Activities; MS – marital status; FS – family size.

On the other hand, the increase in family size can also positively contribute to family savings if family members are fewer young dependents, are physically and able to work, highly educated and with better health (Lugauer, Ni, and Yin, 2015). Hence, a positive sign of the coefficient is possible. An increase of 1 working family member, assuming the additional family member with high education, and better health, savings are predicted to increase by 1,723.6 (2012) pesos, holding other factors constant.

Estimates of **wages from agricultural and non-agricultural activities** showed a significant positive contribution to the family savings of the working population in Mindanao. To assess its impact on savings, for every 1,000 pesos increase in the nominal wage coming from agricultural and non-agricultural activities by year, family savings are predicted to increase by 669 (2003), 578 (2006), 639 (2009), 703 (2012), and 529 (2015) pesos, holding other factors constant. For every additional 1,000 peso income, almost 60 percent goes to savings.

Turning to the estimates of **entrepreneurial activity**, the more the family head is engaged in any entrepreneurial activity, the more income and savings a family has. As shown in Table 15, income from the entrepreneurial activity is statistically significant to contribute to the family savings, except only for 2012. For every increase of 1,000 pesos from entrepreneurial activity family savings is predicted to increase by 958 (2003), 701 (2006), 814 (2009), 2,062 (2012), and 726 (2015), ceteris paribus.

Cash assistance/remittance from abroad is a form of income received by families from a family member who is working abroad or an Overseas Filipino Worker (OFW). Cash assistance from abroad has a significant positive impact on family savings. To assess its impact on family savings, for every 1,000 pesos increase in cash assistance from abroad, family savings are predicted to increase per year by 540 (2003), 539 (2006), 651 (2009), 677 (2012), and 568 (2015) pesos, holding other factors constant. However, Mapa and Bersales (2006) pointed out that remittances can also be a disincentive for saving as these are withdrawn to settle immediate bills and to purchase goods.

4.2.1. Interpretation of Dummy Variables

Dummy variables are considered "shifters" of the intercept or constant term, especially for those families where savings are above the threshold value per region.
For 2015,

- If the family head is male, married, a college graduate, and owns the house, then the model which fits his family savings is:

  $Sav_{2015} = (-99{,}567 - 9012.7 - 2535.9 - 6{,}342 + 6{,}550) + 352.94(age_i) - 757.09(fsize_i) - 4{,}422(yd_i) + 0.529(wagna_i) + 0.726\ (incea_i) + 0.568\ (conab_i) + \varepsilon_i$

- If the family head is female, not married, not a college graduate, and does not own the house, then the model which fits her family savings is:

  $Sav_{2015} = (-99{,}567) + 352.94(age_i) - 757.09(fsize_i) - 4{,}422(yd_i) + 0.529(wagna_i) + 0.726\ (incea_i) + 0.568\ (conab_i) + \varepsilon_i$

The **sex of the family head** is an important indicator of whether or not there is a difference as to who saves more between the male and female family head. From Table 15, the negative sign of the coefficient can be interpreted: a male head saves less. If the family head is a female, then she saves more compared to a male head. This result is consistent with the report of the Bangko Sentral ng Pilipinas on the 2017 National Baseline Survey on Financial Inclusion where financial inclusion is seen as higher among women than men. The gender gap favoring women is driven by institutions like microfinance, cooperatives and other financial products and services. The contrast between savings behavior among males and females is likely due to the cultural set-up of the Philippines where the wife is usually the one in charge of budgeting and managing finances. However, the report highlighted also that the gap in savings between the two is not very remarkable.

In terms of **marital status** of the family head, the coefficient shows two signs: negative (2003, 2006, and 2012) and positive (2009 and 2015). The negative coefficient implies that family heads who are married tend to save less than those other statuses (i.e., single, widowed divorced, among others.). This result is logical since heads who are married tend to spend more for personal consumption, especially if the family members are young or old age dependents. Estimates for the number of young dependents are statistically significant to reduce family savings in Mindanao. On the other hand, a positive coefficient for marital status is expected also, especially if the family head has more working members in the family and less a number of young dependents.

For **education**, the sign of coefficient where the family head is a college graduate is negative. This implies that even if family heads are college graduates, it does not automatically translate that they have more or higher savings than others. Gina *et al*. (2012) found that education has a weak association with saving among rural, low-income individuals in Africa. Bebczuk *et al*. (2015) explained that once current income is controlled, highly educated family heads envisage an upward lifetime income trend, which would boost consumption and depress saving.

Homeownership is associated with higher savings as shown in Table 15. Family heads who own the lot and own the house are found to significantly contribute positively to the family savings in Mindanao.

In terms of **spatial location** of families, results showed that families which reside in urban areas save more than those residing in rural areas. For 2006 and 2012 (except 2009) families residing in urban areas are statistically found to save more than those residing in the rural area. The differences in income and wages between the spatial locations are the possible reasons why people in urban areas tend to save more. In addition, families in urban settings tend to save more in anticipation of higher costs of living. However, the 2017 Financial Inclusion Survey of the Bangko Sentral ng Pilipinas revealed there is not much difference in the incidence of savings in urban-rural areas.

The **constant term** of the model consistently showed a statistically significant negative influence on family savings. The constant term is the expected savings of a family, regardless of the value of independent variables. Since the results are negative, there are no savings and a family must source out the amount (positive value, through

loans or whatever means) to meet their individual needs and the poverty threshold of the region.

Finally, the error term of the model captures other factors not considered in the econometric model used in the study, examples of which are psychological and cultural factors.

4.3 Analysis of Variance for Savings, Income, and Expenditure

The results of the analyses of variance (ANOVA) using the post hoc Tukey-Kramer for savings, expenditures and incomes are shown in Tables 5, 6, and 7, respectively.

Table 5: ANOVA result for family savings in Mindanao, 2003 to 2015

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	P-value	P- critical
Between Regions	3,527,422,553,184.50	4	881,855,638,296.13	0.00	0.05
Within Regions	1,400,559,771,779,140	49,367	28,370,364,246.95		
Total	1,404,087,194,332,320	49,371			

* significant at 1 percent level.

Table 6: ANOVA result for family expenditures in Mindanao, 2003 to 2015

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	P-value	P critical
Between Regions	30,886,546,063,008.50	4	7,721,636,515,752.12	0.00	0.05
Within Regions	618,577,674,424,009.00	49,367	12,530,185,638.67		
Total	649,464,220,487,018.00	49,371			

* significant at 1 percent level.

Table 7: ANOVA result for family incomes in Mindanao, 2003 to 2015

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	P-value	P-critical
Between Regions	53,663,897,738,821.50	4	13,415,974,434,705.40	0.00	0.05
Within Regions	2,542,339,862,686,040	49,367	51,498,771,703.49		
Total	2,596,003,760,424,860	49,371			

* significant at 1 percent level.

The analysis of variance or ANOVA was used to compare the mean savings, income and expenditure of all regions in Mindanao, from 2003 to 2015. In case the F-test shows significance, post-hoc analysis (Tukey-Kramer HSD test) was used to perform to know which of the means differ.

Shown in Tables 5, 6, and 7 are the 2015 ANOVA results of family savings, expenditure and income in Mindanao, respectively. The p-values indicate that differences among savings, expenditure and income are significant among and within regions in Mindanao. Moreover, Table 19 shows the Tukey-Kramer HSD result for 2015.

Overall, the analysis of variance generally showed significant differences in the mean savings among regions in Mindanao (see Table 5). However, the Tukey-Kramer HSD (see Table 8) test indicates that in 2015 the mean savings of Regions 11 and 10 are statistically the same. This result is understandable since progressive cities like Cagayan de Oro, Malaybalay Bukidnon, and Davao City are located in these regions. Similarly, Zamboanga Peninsula and CARAGA regions, as well as SOCCKSARGEN and ARMM have statistically the same mean family savings.

In terms of the mean income of families, the analysis of variance showed significant differences in the income of families in all regions of Mindanao for 2015 (see Table 7). However, the Tukey Kramer HSD test revealed that the Davao Region has recorded the highest mean income in Mindanao. Pairwise, the Northern Mindanao and CARAGA and as well as Zamboanga Peninsula and CARAGA regions showed statistically the same mean for family income. Similarly, Northern Mindanao and CARAGA, Zamboanga Peninsula and SOCCKSARGEN showed statistically the same mean income for the families. On the other hand, the ARMM has the lowest mean income value among the regions in Mindanao.

The Davao Region's highest mean income was driven by the fact that it is the economic hub of Mindanao, where its agriculture sector and tourist arrivals are flourishing. For major crops and fruits, production was recorded to increase for banana, durian, mango, rubber, abaca and cacao. The total volume of tourists reached 2,838,489 with a total tourist receipts value of Php 34.2 billion, surpassing 2014's tourist receipts by almost Php 9 billion or 32.7 percent. The remarkable performance of the Region 11 tourism sector was credited to the extensive tourism promotions such as the conduct of festivals and events region-wide.

For the analysis of variance for mean expenditure, results show significant differences in mean expenditure among regions in Mindanao (see Table 6). Further, the Tukey-Kramer HSD test revealed that the Davao Region has the highest mean expenditure among the families in the regions of Mindanao for 2015 (see Table 8). The Tukey-Kramer HSD results also revealed that Zamboanga Peninsula and Northern Mindanao have statistically the same mean for family expenditures. Similarly, with Northern Mindanao and CARAGA, as well as SOCCKSARGEN and CARAGA regions. Further, it also revealed that SOCCKSARGEN and Northern Mindanao regions have the same mean of family expenditure. Meanwhile, the ARMM showed the lowest mean value of expenditure for 2015.

Overall, the findings of this study which revealed that family income, saving and expenditure of the working population are statistically different between and among regions, are consistent with the official reports of National Economic Development Authority (NEDA) and the data from the PSA. According to the NEDA report of 2018, the regional disparity in wealth has widened throughout the years. The data from the 2015 FIES also revealed that Mindanao regions earned and spent below the national average income and expenditure, respectively. This large gap in income, expenditure, and savings between and among major islands of the Philippines, particularly in Mindanao, poses a serious concern for policymakers primarily because many societal issues arise from these gaps. Despite the sustained economic growth of the Philippines sometime between the years 2000 to 2015, still inequality widens, a highly uneven distribution of goods and services exists. This only suggests that economic growth per se is not the problem but rather the highly uneven distribution of growth.

Table 8: Post hoc test result for mean income, expenditure and saving of the working population in Mindanao, in 2015, by region, using Tukey-Kramer HSD

Region	Mean Income (in pesos)	Mean Expenditure (in pesos)	Mean Saving (in pesos)
Region IX (Zamboanga Peninsula)	187,923.95[a/b]	144,497.88[d]	41,030.87[b]
Region X (Northern Mindanao)	212,147.60[c]	146,029.74[a/b/d]	56,117.87[a]
Region XI (Davao Region)	240,405.16	185,838.31	54,766.85[a]
Region XII (SOCCKSARGEN)	186,892.06[a/d]	161,377.74[a/c]	25,514.32[c]
Region XIII (CARAGA)	203,476.88[b/c/d]	163,535.56[b/c]	39,941.32[b]
ARMM (Autonomous Region for Muslim Mindanao)	134,426.43	109,523.78	24,902.65[c]

Note: Regions with common superscripts have means which are not significantly different from each other, at a 5% level of significance.

5. Recommendations

Mindanao, Philippines continues to strive for sustained economic growth and development. Based on the results of the study, the following are recommended:

1) Promote extensively financial literacy programs, especially in areas where poverty is extreme.
2) Device attractive investment incentives among financial institutions like banks, and cooperatives should.
3) Improve access to affordable urban housing.
4) Encourage overseas workers and the remittance beneficiaries to save a bigger portion of the remittances received in secured financial institutions.
5) Develop digital platforms for saving-investment schemes through the use of technology (e.g. mobile applications).

6. Conclusion

This study was conducted to know and understand the saving behavior of the working population in Mindanao, from 2003 to 2015. From the results of the study, it is shown that the real value of family saving in Mindanao increases as the family head gets older, but eventually declines as the head nears the retiring age which is 65 years old. The pinnacle of family saving for the working population is in the age group 30 to 34 years old, while ages 15 to 29 years old is the age group where family heads start to accumulate and pile stock of savings. Family savings starts to decline at ages 40 to 64 years old. The findings of this study are found consistent with the life-cycle hypothesis and permanent income hypothesis which exhibit the expected dissaving as individuals are getting towards the retiring age. Some family heads opt to retire at the age of 60 years old and some choose

to retire at the mandatory retirement age which is 65 years old. Moreover, health issues begin to flourish in the mid or early 40's, considering also the life expectancies of the people in Mindanao, by region.

One objective of the study was to determine the factors which influence working families to save using the family characteristics such as: age, sex, number of family members, educational attainment, number of young dependents, ownership and tenure of house and lot, wages received from agricultural and non-agricultural activities, income from entrepreneurial activity, cash assistance from abroad, and spatial location. Of these variables, the age of the family head, wages from agricultural and non-agricultural activities, income from entrepreneurial activities, cash assistance from abroad, geospatial location and house and lot tenure showed positive contributions to family savings. Meanwhile, the sex of the family head and the number of young dependents showed a negative contribution to family savings. Family size, marital status, and educational attainment of the family head showed positive and negative signs for their respective coefficients, implying that these variables may either increase or decrease the family savings.

The study was also conducted to compare the mean income, mean expenditure and mean savings of working families in Mindanao. Analysis of Variance (ANOVA) showed that there is a significant difference in income, expenditure and savings for all regions in Mindanao, from 2003 to 2015. These differences in income, expenditure and savings, by region of Mindanao, are mainly attributed to differences in resource endowments, economic activity by region, and the socio-political and economic atmosphere of the region. From the post hoc test (Tukey-Kramer HSD test) of ANOVA, Davao region ranked as the leading region in Mindanao with the highest mean income recorded for 2015. It is followed by Northern Mindanao, CARAGA Region, Zamboanga Peninsula, SOCCKSARGEN and lastly the Autonomous Region for Muslim Mindanao (ARMM). In terms of mean savings, Northern Mindanao recorded the highest mean saving followed by the Davao Region, Zamboanga Peninsula, CARAGA Region, SOCCKSARGEN and the ARMM in that order ARMM had the least value of mean income, savings and expenditures.

The widening gap in family income, expenditure, and savings between and among regions of Mindanao, poses a serious challenge for the policymakers. This suggests that economic growth per se is not the problem but rather the highly uneven distribution of growth which results in uneven development. It is no wonder why most Filipinos, despite the high risks involved, have joined investment schemes and other informal/illegal activities to they perceived can alleviate their poverty.

Closing the gap of inequalities between income, savings and expenditure has remained to be a challenge especially for the government and for the people of Mindanao. Unlocking these potentials is not an overnight activity. As Todaro and Smith (2017) defined economic development, requires a multi-dimensional process which involves reorganization and reorientation of the entire economic and social system. Policies which promote better savings across income brackets, financial management education and

financial inclusion among the families in Mindanao are therefore necessary for economic development.

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Conflict of Interest Statement
The authors declare no conflicts of interest.

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