JPB REVIEW
INTERNATIONAL JOURNAL OF PROFESSIONAL BUSINESS REVIEW
ISSN: 2525-3654
OPEN ACCESS

AN ANALYSIS OF HOUSEHOLD CONSUMPTION FOR THE CITY OF CHACHAPOYAS, AMAZONAS

Edinson Cueva Vega[A], Manuel Antonio Morante Dávila[B], Alex Javier Sánchez Pantaleón[C], Omer Cruz Caro[D], Marden Rigoberto Zumaeta Barrientos[E]

ARTICLE INFO

Article history:

Received 14 April 2023

Accepted 13 July 2023

Keywords:

Consumption;
Income;
Marginal Propensity to Consume;
Econometric Estimation.

ABSTRACT

Objective: The objective of this study was to identify the profile of academic research on blended learning in the world and propose a research agenda for the topic.

Theoretical framework: Recent literature has reported good results in both student performance and satisfaction in blended learning (Dziuban et al., 2004). However, there is still much to investigate and learn about BL because it is a recent development.

Method: The research is descriptive was non-experimental, the sample was calculated by probabilistic sampling, for the estimation of consumption a simple model of consumption was used a general linear regression model (GLRM) that was supported by the estimation by ordinary least squares (OLS).

Results and conclusion: The results show an 83.0% degree of goodness of fit. In other words, 83.0% of the variability of consumption is explained by the variability of family income. The marginal propensity of households to consume is 62.6 percent, i.e., for each additional monthly income generated, 0.62 percent of this new income is converted into consumption expenditure, taking into account all the components of consumption, and the remainder, i.e., 37.4 percent, is spent on savings or investment, bearing in mind that the economic theory of saving and investment essentially are the same.

Implications of the research: The study is important because it describes consumption at the microeconomic level, using an econometric model that explains the relationship between consumption and income. Socially, it describes consumer behavior.

Originality/Value: The value of the study focuses on the analysis of income with consumption through an econometric model that describes how much of the income is destined for consumption.

Doi: https://doi.org/10.26668/businessreview/2023.v8i7.2620

[A] *Master in Public Management and Local Development. Instituto de Investigación de Economía y Desarrollo (IDED), Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Chachapoyas, Peru.*
E-mail: edinson.cueva@untrm.edu.pe Orcid: https://orcid.org/0000-0001-5102-7594
[B] *Master in Administration with Mention in Business Management. Instituto de Investigación de Economía y Desarrollo (IDED), Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Chachapoyas, Peru.*
E-mail: manuel.morante@untrm.edu.pe Orcid: https://orcid.org/0000-0003-3098-9019
[C] *Doctor in Public Management and Governance. Instituto de Investigación de Economía y Desarrollo (IDED), Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Chachapoyas, Peru.*
E-mail: alex.sanchez@untrm.edu.pe Orcid: https://orcid.org/0000-0001-5708-272X
[D] *Master in Engineering with Mention in Project Management and Management. Instituto de Investigación de Economía y Desarrollo (IDED), Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Chachapoyas, Peru. E-mail: omer.cruz@untrm.edu.pe Orcid: https://orcid.org/0000-0001-5664-3222*
[E] *Bachelor in Economics. Instituto de Investigación de Economía y Desarrollo (IDED), Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Chachapoyas, Peru. E-mail: marden.zumaeta@untrm.edu.pe Orcid: https://orcid.org/0000-0001-6785-0956*

ANÁLISE DO CONSUMO DOMÉSTICO DA CIDADE DE CHACHAPOYAS, AMAZONAS

RESUMO
Objetivo: O objetivo deste estudo foi identificar o perfil da pesquisa acadêmica sobre o aprendizado misto no mundo e propor uma agenda de pesquisa para o tema.
Estrutura teórica: A literatura recente tem relatado bons resultados tanto no desempenho do aluno quanto na satisfação na aprendizagem mista (Dziuban et al., 2004). No entanto, ainda há muito para investigar e aprender sobre BL porque é um desenvolvimento recente.
Método: A pesquisa é descritiva não foi experimental, a amostra foi calculada por amostragem probabilística, para a estimativa do consumo foi utilizado um modelo simples de consumo um modelo de regressão linear geral (GLRM) que foi apoiado pela estimativa por mínimos quadrados ordinários (OLS).
Resultados e conclusão: Os resultados mostram um grau de 83,0% de adequação do ajuste. Em outras palavras, 83,0% da variabilidade do consumo é explicada pela variabilidade da renda familiar. A propensão marginal das famílias para o consumo é de 62,6%, isto é, para cada renda mensal adicional gerada, 0,62% dessa nova renda é convertida em despesa de consumo, levando em conta todos os componentes do consumo, e o restante, ou seja, 37,4%, é gasto em poupança ou investimento, tendo em mente que a teoria econômica de poupança e investimento são essencialmente a mesma.
Implicações da pesquisa: O estudo é importante porque descreve o consumo no nível microeconômico, a partir de um modelo econométrico que explica a relação entre consumo e renda. Socialmente, descreve o comportamento do consumidor.
Originalidade/Valor: O valor do estudo concentra-se na análise da renda com consumo por meio de um modelo econométrico que descreve quanto da renda se destina ao consumo.

Palavras-chave: Consumo, Rendimento, Propensão Marginal ao Consumo, Estimativa Econométrica.

ANÁLISIS DEL CONSUMO DE HOGARES EN LA CIUDAD DE CHACHAPOYAS, AMAZONAS

RESUMEN
Objetivo: El objetivo de este estudio fue identificar el perfil de la investigación académica en el aprendizaje mixto en el mundo y proponer un programa de investigación para el tema.
Estructura teórica: La literatura reciente ha reportado buenos resultados tanto en el rendimiento de los estudiantes como en la satisfacción del aprendizaje mixto (Dziuban y otros, 2004). Sin embargo, todavía hay mucho por investigar y aprender acerca de BL porque es una novedad reciente.
Método: La encuesta es descriptiva y no fue experimental, la muestra se calculó por muestreo de probabilidad, se utilizó un modelo de consumo simple y un modelo de regresión lineal general (GLRM) para la estimación de cuadrados ordinarios (OLS).
Resultados y conclusión: Los resultados muestran un grado de adecuación del ajuste del 83,0%. En otras palabras, el 83,0% de la variabilidad del consumo se explica por la variabilidad de los ingresos familiares. La propensión marginal de los hogares al consumo es del 62,6%, es decir, por cada ingreso mensual adicional generado, el 0,62% de ese nuevo ingreso se convierte en gasto de consumo, teniendo en cuenta todos los componentes del consumo, y el resto, es decir, el 37,4%, se gasta en ahorro o inversión, teniendo en cuenta que la teoría económica del ahorro y la inversión es esencialmente la misma.
Implicaciones de investigación: El estudio es importante porque describe el consumo a nivel microeconómico, utilizando un modelo econométrico que explica la relación entre consumo e ingreso. Socialmente, describe el comportamiento de los consumidores.
Originalidad/Valor: El valor del estudio se concentra en el análisis del ingreso con consumo mediante un modelo econométrico que describe la cantidad de ingresos destinados al consumo.

Palabras clave: Consumo, Ingresos, Propensión Marginal al Consumo, Estimación Económica.

INTRODUCTION

One of the most important components contributing to economic growth in a given country is private consumption (Al-Thaqeb & Algharabali, 2019; Maruejols et al., 2022; Mochón, 2006; Wu & Zhao, 2022). Consumption is the expenditure that families make on all

goods and services, which includes transient and durable goods (Eika et al., 2020; Luo, 2021; Rashid et al., 2021). Household consumption expenditure (the amount spent on goods and services at the household level) is becoming increasingly important worldwide (Adams et al., 2022; D'Ambra et al., 2021). Consumption has played a crucial role in economic development (Luo et al., 2022), which is why consumption can be defined as the use of goods and services, being an essential daily process (Hall, 2011). Global consumption, human population, and economic activity have grown steadily in recent decades (Ferreira et al., 2023).

As incomes increase, people now have access to a multitude of consumer goods and services associated with increased prosperity (Adams et al., 2022; Salo et al., 2021; Siman et al., 2020). In this context, the costs of services tend to be an important part of the household budget (Pesendorfer et al., 2023; Zhang et al., 2022). Many families make some kind of budget to manage their daily finances (Zhang et al., 2022), set spending limits for different categories of consumption, use budgeting tools to monitor their spending, and adjust these limits in response to exceeding or underutilizing their budgets (Bhat et al., 2020; Martins et al., 2019; Möser, 2010; Luo, 2021).

Households are likely to adjust their consumption differently in response to a similar wage change and subsequent consumption inequality (Theloudis, 2021; Zhang et al., 2021). Its distinctive feature is that households have heterogeneous preferences about consumption (Nguyen, 2018). This has implications for how much inequality is relevant to consumption in the face of wage fluctuations in the economy (Ferreira et al., 2023).

In Peru, household consumption contributes more than 60% to the Gross Domestic Product (GDP) and during the last 70, years household consumption has registered an average annual growth of 3.4% (Instituto Nacional de Estadística e Informática [INEI], 2021). Likewise, during the first quarter of 2022, private consumption increased by 4.8%, this is mainly explained by the increase in consumption of food, and other perishable goods and services (INEI, 2022).

Indeed, the Peruvian State has been promoting private consumption through its fiscal and monetary policies (Castro-Bedriñana et al., 2021; Hong, 2023). One of them is the exemption from the General Sales Tax (IGV), which through Legislative Decree N° 083-2022-EF exempted some foods that make up the basic family basket (Castillo & Graham, 2022). Similarly, the Central Reserve Bank (BCRP) reduced the benchmark rate from 2.25% to 0.25% in 2020 to cushion aggregate demand affected by the COVID pandemic 19 (Economic Commission for Latin America and the Caribbean [ECLAC], 2021). In this context, given the

importance of this component in the economy, it is important to investigate the characteristics of consumer behavior.

Microeconomic theory holds that individuals are rational people and therefore choose the baskets that maximize their usefulness (Caputo & Paris, 2013; Kemp et al., 1995), however, there are restrictions in which the consumer faces the moment of choice (Raboy, 2017; Thill, 2009; Tokarčíková et al., 2015). Consumption decisions depend on people's disposable income, that is, the income that remains after consumers have paid their taxes (Blanchard et al., 2012; Thill, 2009). In this sense, when disposable income increases, consumption also tends to increase, although to a lesser extent, and this is known as the marginal propensity to consume (Ginsburgh et al., 1988; Romeo, 2020). However, within these restrictions imposed by the market, families are free to choose what to buy and do so according to their individual tastes and preferences and according to the degree of usefulness or satisfaction provided by the goods and services (Case et al., 2012).

Considering the importance of consumption on the economy at both the micro and macro levels, this research aims to estimate a simple econometric model for family consumption in the city of Chachapoyas, finding the consumption pattern of families, as well as the marginal propensity to consume and save.

THEORETICAL FRAMEWORK

On the other hand, the National Institute for the Defence of Competition and the Protection of Intellectual Property (INDECOPI) (2021), points out that consumers behave in a complex and diverse manner according to their characteristics; (i) social, such as their occupation and level of education, which allows them access to different opportunities in society; (ii) demographic, concerning their age and the life cycle through which they pass; and (iii) economic, concerning their purchasing power, group or socio-economic level, the same factors that influence them. consumer behavior and purchasing decisions.

Analysis of Household Consumption

The family is one of the main sources of consumption in society since they constantly require goods and services for their development (Corrado et al., 2022; Makridis, 2022; Nonthapot & Jirukkakul, 2023), it is a primary function in a society and economic systems (Wang et al., 2021). Consumption refers to the final consumption expenditure of households and consumer units (Wu & Wang, 2023). From a macroeconomic point of view, it is not

important to determine which types of goods are consumed, or who exactly consumes them, but what factors determine society's overall consumption (Li et al., 2016).

The consumption function expresses the relationship between income and consumption (Brunt et al., 2011; Diacon & Maha, 2015). The relationship between income and consumption is direct, i.e. if income increases, consumption will also increase (Bordón-Lesme et al., 2022; Duarte et al., 2021; Qian et al., 2022); some economists consider consumption to be the engine of any economy (Pramandari et al., 2022), since as there is enough consumption, needs will be better met and firms will sell more (Christodoulides et al., 2021; Hobson et al., 2021; Montoya et al., 2023), and thus if households earn and spend some income ((Luri Minami et al., 2021; Pottier, 2022; Saito, 2022). The level of disposable income is the main determinant of household consumption (Bohlmann & Inglesi-Lotz, 2021; Chancel et al., 2023; Yang, 2023).

In general, the higher the income, the higher the consumption, and vice versa, that is, the lower the income will tend to give less consumption, this is according to the consumption function (A. K. Mishra et al., 2022; K. Mishra et al., 2022; Tu et al., 2021). But if families do not consume some part of their income, then this cycle will be interrupted, causing production and income to decrease (Zhang & Guo, 2020). For this reason, it is necessary that these revenues somehow return to the income-expenditure cycle (Hubar et al., 2020; Varlamova & Larionova, 2015), because they try to channel these resources not consumed by families to other sectors that, if they are willing to spend them (Datta, 2014), and if companies manage to receive these unconsumed revenues, they will then be able to acquire more capital or production goods, thereby increasing the productive capacity of the economy (Mari & Keizer, 2022; Wagmiller et al., 2020).

In this sense, saving is extremely importante (Quyen & Tuan, 2022), since if society dedicates all or almost all of its income to consumption, there is very little left for saving (Charles & Lundy, 2013; Pybus et al., 2022), and consequently, it will be difficult to finance the increase in productive capacity investment (Castro & Bleys, 2023; Shafqat et al., 2023). Thus, it could be concluded that for the economy to grow it is necessary to increase the productive capacity, to increase this productive capacity it is necessary to invest and to be able to invest it is necessary to save (Kleine et al., 2021; Winkelmann, 2012).

METHODOLOGY

The research design was non-experimental since there is no manipulation of the variables, observing the phenomenon as it occurs in this context and then analyzing it. The

method used was the inductive method, which refers to the movement of thought that goes from particular facts to general statements, i.e. moving from the results obtained from observations to the formulation of hypotheses, i.e. generalizing the results.

The population was determined by all inhabitants aged 18 and over in the city of Chachapoyas. According to the INEI (2018), the total population in the urban area of the city of Chachapoyas is 22,330 people older than 18 years. Likewise, the sample was determined by a probabilistic sampling, of the simple random type, to determine the sample size the following formula was used:

$$n = \frac{N * Z^2 * p * q}{e^2 * (N-1) + Z^2 * p * q}$$

Where:

n = is the size of the population sample to be obtained.
N = is the size of the total population.
Z = is the value obtained by confidence levels.
e = Sampling error (precision)
p = Estimated proportion = 1 – p

Applying the above we will have that the sample size will be as follows:

$$n = \frac{22{,}330(1.96^2)\ (0.5)(1-0.5)}{(0.05)^2 * (22{,}330-1) + 1.96^2(0.5)(1-0.5)}$$
$$n = 377.679$$
$$n = 378 \text{ pobladores.}$$

The technique used was the survey with the instrument questionnaire.

For the formulation of the simple consumption model, a general linear regression model (MRLG) was used that was based on the ordinary least squares (OLS) estimation, which tries to minimize quadratic errors, so that they do not affect the estimation of our dependent variable.

The value of total consumption expenditure is determined by the sum of the expenditure in all the consumption baskets specified in our operationalization and the value of these variables will be determined in the processing of the survey of the population of Chachapoyas. The value of the income is determined by processing the survey.

Considering these considerations, the simple consumption regression model for the population of Chachapoyas is defined using the equation:

$$CONSUMO = \beta_0 + \beta_1 INGRESO + \mu$$

To estimate the regression model of consumption, econometric tests were evaluated to demonstrate the validity of the model, so that statistical inference is efficient and the information is representative of the population. The model was estimated using Generalized Least Squares (GMC).

RESULTS AND DISCUSSION

Characterization of the Sample

Of the total number of people surveyed, it was found that the age range of the heads of household is between 20 and 80 years, where the average age was approximately 36 years, 34.1% being male and 65.9% female. Regarding the level of education, it was found that 23.2% had only completed primary school, 25.4% had completed secondary school, 13.0% had non-university higher education and 38.4% had university higher education. This is due to the fact that the sample was characterized by heads of households with medium-high educational levels. Families in the city of Chachapoyas have an average of 4 members per household, the most representative type of housing was their own with 55.8% and 40.58% having a type of rented housing.

Characterization of Household Consumption Expenditure and Income

Concerning basic services, it was found that 100 percent of families have a drinking water service in their homes, as well as electricity service with 97.8 percent. For the internet service, it was found that only 26.8% had such a service and for the cable service 59.4% had such a service. The expenditure range for the water component ranges from S/5.00 to S/200.00, with an average water expenditure of S/32.20 per household. For the electricity expenditure component, the expenditure range is between S/5.00 and S/150.00; taking as an average electricity expenditure of S/35.12 per household, considering only persons who pay for the service. In the gas component, between S/17.5 and S/75.00, with an average expenditure of S/41.59, and those who spend on fuel, between S/5.00 and S/400.00, with an average expenditure of S/153.20.

The number of contributors per household ranges from one to five contributors, where 89.1% of households had up to two contributors at home and those with more than two contributors were 10.9%. Families have an average monthly income of between S/ 200 and S/ 1,500, with an average monthly family income of S/ 1,991.30; it is also noted that the highest

rate of income per family with only one contributor is S/ 1,000.00, i.e. for the case under study, 14.8 percent of families have a single contributor, averaging 1,000 soles, while 9.8 percent of families with the same characteristics have an average income of S/ 900.00, and 8.2 percent of families have an income of S/ 1,500.00, as well as families. have an average income of 300 and 800 soles respectively represent 6.6% and 6.6%.

Very low incomes are less frequently observed, with an average income of S/200.00 and families with very high incomes represent an income of S/4,000.00. Considering the educational levels of heads of household, the highest percentage is with primary education, with an average income of S/ 600.00, with secondary education, with an average income of S/900.00, with a non-university tertiary education, they have an income of between S/1,000.00 and S/1.500.00 and with a university tertiary education, they concentrate their income of between S/1,000.00 and S/5,000.00.

The relationship between fuel expenditure and household income is a positive relationship for income; the families with the highest incomes make this expenditure on fuel, with these incomes with a minimum of S/1,000.00 and a maximum of S/6,000.00. Household spending on alcoholic beverages is directly related to income level. Of those expenditures on alcoholic beverages, 73.1% were males and 26.9% were females.

Expenditure on education per family is between S/10.00 and S/1,000.00, with an average expenditure of approximately S/223.85. Expenditure on education is highest among women, with 66.7 percent, and 33.3 percent among men. Regarding expenditure on hotels and restaurants, it is shown that expenditure on restaurants is between S/20.00 and S/700.00 with an average expenditure of S/132.50, and expenditure on hotels is between S/20.00 and S/200.00 with an average expenditure of S/100.00.

Expenditures on furniture, household items, and household maintenance are characterized by expenditures mostly by women. 31.2 percent of families spend on furniture, 50.7 percent spend on household items, and 45.7 percent spend on household maintenance. In expenditure on goods and services, there are 50 percent of families with a range of S/5.00 and S/600.00 and an average of S/105.58. Health expenditure is one of those most represented, with 86.96 percent ranging from S/5.00 to S/450.00, with an average of S/118.35. These expenditures vary among families with children, with 69.2 percent of families with children spending on health and 30.8 percent of families without children but spending on health.

Expenditure on clothing can be seen between S/20.00 and S/500.00 with an average expenditure of S/159.17, and the percentage of expenditure on clothing by sex, of which 70 per

cent are female and 30 percent are male, with an average expenditure of S/400.00. 43.5 percent of families spend on recreation and culture in the range of S/10.00 to S/300.00, with an average of S/88.33. Communications expenditures 94.2 percent of households spend monthly in the range of S/5.00 to S/700.00, with an average of S/67.62. Household food expenditure is shown in the range of S/80.00 and S/1500.00 per month with an average expenditure of S/393.01 and a daily expenditure of S/13.1 soles per household. 87 percent of families spend on transportation costs, ranging from S/10.00 to S/400.00 per month, with an average cost of S/78.46.

Modelo del Gasto e Ingreso de las Familias

The model takes into account total household consumption expenditure, ranging from S/227.00 to S/5,690.00 per month, taking into account all the expenditure components (consumption), with an average total consumption expenditure of S/1,465.82 per month and family income between S/200.00 and S/8,000.00 per month, with an average monthly income of S/1,936.96.

Taking into account these considerations and fine-tuning the simple consumption regression model:

$$CONSUMO = \beta_0 + \beta_1 INGRESO + \mu$$

By estimating the model through Generalized Least Squares (GMC), it is observed:

Figure 1: *Linear regression model*

```
Linear regression                               Number of obs     =        138
                                                F(1, 137)         =     165.35
                                                Prob > F          =     0.0000
                                                R-squared         =     0.8296
                                                Root MSE          =     696.79

------------------------------------------------------------------------------
             |               Robust
gasto_total_co~o |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------+------------------------------------------------------------
ingreso_familiar |   .6259223   .0486763    12.86   0.000     .5296684    .7221763
------------------------------------------------------------------------------

Iteration 0:   log pseudolikelihood = -1098.7268

Generalized linear models                       No. of obs      =        138
Optimization     : ML                           Residual df     =        137
                                                Scale parameter =   485518.4
Deviance         =  66516023.89                 (1/df) Deviance =   485518.4
Pearson          =  66516023.89                 (1/df) Pearson  =   485518.4

Variance function: V(u) = 1                     [Gaussian]
Link function    : g(u) = u                     [Identity]

                                                AIC             =   15.93807
Log pseudolikelihood =   -1098.7268             BIC             =   6.65e+07

------------------------------------------------------------------------------
             |               Robust
gasto_total_consumo |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----------------+------------------------------------------------------------
   ingreso_familiar |   .6259223   .0486763    12.86   0.000     .5305186     .721326
------------------------------------------------------------------------------
```

Source: Econometric model based on surveys using Stata.

The results for both a simple regression model and a generalized linear model evaluating the total monthly consumption expenditure per household and the monthly income per household are the same. The advantage of using a generalized linear model is that the results are free of heteroscedasticity problems, which facilitates the analysis of coefficients and statistics.

The evaluation of the basic criteria for the model specification is in such a way that the coefficient found is the most appropriate for prediction. In this context, as we observed in the previously estimated model, it is evident that the P-value value is less than 5%, i.e., that the coefficient found for the income variable is significant for the model with a confidence level of 95%.

If we evaluated the R-square of the simple linear regression model, we found an 83.0% degree of goodness of fit. In other words, 83.0% of the variability of consumption is explained by the variability of family income. So, the model does fit in a large percentage of the observed data.

The marginal propensity of households to consume is 62.6 per cent, i.e. for each additional monthly income generated, 0.62 per cent of this new income is converted into consumption expenditure, taking into account all the components of consumption, and the remainder, i.e. 37.4 percent, is spent on savings or investment, bearing in mind that the economic theory of saving and investment are the same.

A high MPC indicates that consumers are likely to spend more when they have more disposable income. This can be beneficial for the economy, as increased consumption can stimulate output and employment. However, it can also lead to an increase in inflation if supply cannot keep up with demand. On the other hand, a low MPC indicates that consumers are less likely to spend when they have more disposable income. This may be detrimental to the economy, as it may lead to a decline in output and employment. However, it can also help keep inflation under control if supply exceeds demand. (Rios, 2015).

The MPC obtained for Chachapoyas in this study is comparable to those of Ecuador and Colombia for the years 2012, 0.63 and 0.62 respectively (Rius and Román, 2015). Thus, the consumption-savings ratio would be considered high, favoring the dynamization of the economy through production and employment.

This result is similar to the results found by Sánchez and Ñamot (2017), who studied the elation of disposable income with private consumption according to the Keynesian theory, for which, they ran a model based on the method of corrected Ordinary Least Squares using explanatory variables of private consumption to disposable income and the interest rate, where they found that for each sun of disposable income, the consumption of families increases positively by 77%, i.e. the Marginal Propensity to consume is 0.77, i.e., that families are approximately less likely to consume. On average 23% for each additional sol spent, on the other hand, found that the interest rate impacts negatively private consumption in Peru for the study period.

Similarly, it coincides with the results found by Altamirano et al. (2016) who conducted a study on the case of Ecuador and found that, for every dollar that increases in income, the marginal propensity to consume will multiply by more than 90%, that is, less than 10% of income is left to save. This corroborates the results found with the Keynesian economic theory,

which maintains that consumption is a function of disposable income and, when income increases, consumption also tends to increase, although to a lesser extent Blanchard et al. (2012).

A consumption function based on neoclassical theory has been presented. For this reason, it is imperative to complement this study to determine its temporal variations and its serial dependence on its lags by applying a temporal consumption model.

CONCLUSION

The marginal propensity of consumers of the city of Chachapoyas is approximately 62.59%, that is, for each sol that is generated of income, 0.62 soles of this new income is converted into consumption expenditure taking into account all the studied components of consumption, on the other hand, the remaining 37.41% is allocated to savings or investment taking into account that economic theory mentions that savings and investments are the same.

Concerning food expenditure, 100 percent of the heads of household surveyed had some monthly expenditure on food, where it was also found that expenditure on this component was between S/80.00 and S/1500.00 per month, with an average monthly expenditure of approximately S/393.01, which can be calculated as a daily expenditure on the food of approximately S/13.1 soles per household.

86.96% of people spent on health, spending between S/5.00 and S/450.00 with an average monthly expenditure of S/118.35 per household. On the other hand, considering the total number of people surveyed, the average does not fall much, being S/102.91 per household. In this sense, it is recommended to carry out studies with other populations where there are more incomes and with different characteristics of the case study.

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