

Household consumption determinants in Algeria over the period 2006-2020

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Abstract:

Due to the significant economic importance of the consumption topic, it has become one of the prominent issues in Algeria, receiving considerable attention from both the government and employers. It is considered a primary driving force for the economy. The study revolves around estimating the household consumption function in Algeria for the period (2006 – 2020). In order to test theoretical economic models and endeavor to construct a suitable model for household consumption in Algeria, we employed the standard analytical approach to analyze the estimation results. The main results obtained shows that an increase in income can lead to higher levels of household consumption. Families can afford more expenses and increase their purchases of goods and services also population growth can influence patterns of household consumption. An increase in the number of individuals in a household means higher daily needs and, consequently, increased consumption.

Keywords: Consumption; disposable income; population growth; household, expenses

JEL Classification: C01; C21

Introduction

The study of household consumption holds great importance, as it allows for the examination and analysis of consumer behavior in satisfying various needs through the consumption of goods and services. Therefore, it is necessary to have standardized indicators through which developmental planners can evaluate different economic policies that impact production and strategic inventory of all goods and services. This is crucial for maintaining a balance between future supply and demand.

Consumption is considered one of the economic phenomena that economists have attributed significant importance to studying. Consumption is a fundamental component of economic activity, and delving into this phenomenon means exploring an axis that forms the backbone of the economic system in any society. Undoubtedly, household consumption within the family element constitutes a substantial part of total consumption. In this context, families can be regarded as an important economic part that can play a crucial role in economic development. Similar to private savings, which is also considered a source of internal financing, household consumption can be viewed as a factor influencing total demand and, consequently, impacting the size of employment. This leads us to examine the economic variables that govern individuals decisions in determining the consumption ratio, essentially exploring the consumption function itself.

The decisions of families in choosing products and services are influenced by a range of self and non-self consumption motives. These factors and motives are shaped by various and diverse determinants. In this context, our topic is "Estimation of Family Consumption Function in Algeria: A Standardized Analytical Study During the Time Period (2006 – 2020)." We will attempt to study household consumption, its types, and its significant determinants. The research problem, which can be formulated as follows, revolves around: What are the primary economic determinants that can be utilized to explain the consumption behavior of Algerian households ?

Within the context of the presented problem, we have formulated several hypotheses as follows:

There are economic and non-economic factors that influence household consumption.

There are varying perspectives explaining household consumption in economic thought.

One of the key determinants of household consumption is disposable

income, in addition to other factors.

Several scientific studies and research have been conducted on the topic of household consumption. Here are some of the prominent studies:

- Standard and analytical study on the consumption expenditure of Algerian households according to the survey of the National Statistics Office for the year 2000 (Hamoudi Ali, 2005): The results of this study indicate that an increase in income leads to a proportional increase in the consumption expenditure. High-income earners have significant purchasing power and demand elasticity, unlike low-income individuals who exhibit weak demand elasticity for the same goods.

- Analytical study of Algerian households consumption in inflation conditions from 1970 to 2003 (Abu Bakr Sameer Qiuwa, 2006): The researcher aimed to find a relationship between Algerian household consumption and other variables. The study highlights a linear model that is influenced by current and previous period consumption, changes in disposable income, while unemployment rates do not affect household consumption. Additionally, there is a negative relationship between the savings interest rate and household consumption.

- Standard study of determinants of family consumption in Algeria from 1990 to 2010 (Zroukhi Sabah, 2012): The study concludes that interest rates linked to savings do not affect family consumption. There is no clear relationship between family consumption and interest rates. Consumption patterns were not affected by changes in the general level of inflation rates.

- The U.S. Consumption Analysis: Using a Linear Regression Model (Songyi Paik, 2016). This study concluded that consumption is influenced by disposable income, oil price and recession, but is not affected by interest rates.

- Total Consumption Function of Algerian Families : A Standard Study for the Period from 1974 to 2017 (Youssef, December, 2019): The study investigates the final consumption of Algerian families from an overall economic perspective. The findings reveal a direct relationship between consumption and national income, with a significant impact of the overall price index on consumption.

- Causality between Energy Consumption and Economic Growth: Evidence from Algeria (Dr. Chekouri Sidi Mohammed, Dr. Chibi Abderrahim, Pr. Benbouziane Mohamed 2020). the analysis suggest a unidirectional

causality running from GDP per capita to energy consumption. This result implies that an energy conservation policy may not harm the economic growth in Algeria.

1- Consumption definition

Consumption is defined as the use of goods or the enjoyment of services to satisfy the needs and desires of economic agents, whether they are individual end consumers, productive entities, official or semi-official bodies. Consumption is considered the primary driving force behind the production process (Dr.Mekhalif, Dr. Khattar, 2017, p. 113)

The Hall hypothesis states that consumption is a function of lifetime ("permanent") income, rather than income in each period independently.

Consumption is further defined as the quantity of goods and services that allows for the immediate satisfaction of economic agents needs.

Due to the significance of the role of consumption in economic activity, various schools of thought (classical, Keynesian, neoclassical) have attempted to formulate a conceptual understanding of it.

Following the periodic global economic crises, especially the crisis of 1817 resulting from a lack of consumption, which returned to the limited markets for surplus production, the classical school, led by Thomas Malthus (1799-1834), saw the necessity of expanding domestic markets, liberalizing trade, and increasing leisure consumption for landowners. This was to be achieved by subdividing large properties into smaller units, along with increasing their incomes. The classical school also advocated for state intervention to increase spending on consumer and investment goods, i.e., actual demand, to achieve balance in production volume.

The Keynesian theory emerged as a response to the economic crisis of 1929, which disrupted or caused imbalance in the capitalist system, leading to the failure of economic factors between supply and demand and their lack of equilibrium.

The General Theory of Keynes in 1936 aimed to advocate for state intervention in economic activity by encouraging spending on consumer and investment goods. Keynes stated, "The organizer does not demand an additional unit of investment goods unless the marginal efficiency of this machine is equal to the rate of interest, which compels him to borrow the necessary money to purchase this machine."

According to Keynes, consumption is the expenditure on the purchase of consumer goods and services, which he divides into commodity consumption and service consumption.

2-Types of Consumption

Before delving into the types of consumption, it is necessary to distinguish between types of goods, as economists have categorized them based on their use:

Consumer Goods: These are goods and services directed towards the end consumer, meeting their needs directly without the need for transformative processes. Examples include food (bread).

Durable Goods: These are goods that are used multiple times over relatively long periods, such as cars, electrical appliances, and residential properties.

Non-Durable Goods: These are goods used for a short period and multiple times, such as cosmetics and cleaning supplies.

Capital or Industrial Goods: These are goods purchased by enterprises and directed towards industrial projects to aid in production. Examples include land, machinery, and raw materials.

After identifying the types of goods, economists distinguish between several types of consumption as follows:

2-1. Autonomous Consumption and Induced Consumption

The difference between autonomous consumption and induced consumption lies in the factor of income.

2-1-1-Autonomous Consumption (Automatic Consumption)

This is consumption that does not depend on personal income, even if the income is zero. Instead, it relies on individual inputs, such as aid and gifts.

2-1-2- Income-Dependent Consumption

This is consumption linked to an individual's income, where consumption increases with income and vice versa (a positive relationship between income and consumption).

2-2-Final Consumption and Intermediate Consumption

The difference between them is related to if they directly or do not directly satisfy human needs and wants.

2-2-1-Final Consumption

This involves households and businesses using goods and services for final and direct use. This type of consumption is considered non-productive, such

as food consumption.

2-2-2-Intermediate Consumption

This is the use of products, materials, and services by enterprises in the production of other goods and services. It is considered productive consumption.

2-3-Immediate Consumption and Gradual Consumption

The difference between them is related to the frequency of use

2-3-1-Immediate Consumption

This is the immediate use of goods and services once, such as consuming food or using raw materials and transportation.

2-3-2-Gradual Consumption

This is the repeated use of services and goods several times, gradually depleting goods and services rather than consuming them immediately, such as cars, buildings, and clothing.

2-4-Individual Consumption and Collective Consumption

If it is a private consumption or a public consumption

2-4-1-Individual Consumption

Consumption of a good or service that pertains to a specific individual, such as taking medicine prescribed by a doctor for a sick person, exclusively for that individual.

2-4-2-Collective Consumption

Consumption of a good or service by a group of individuals, such as going for a walk in the park (which is collective consumption).

3- Consumption function

The consumption function is defined as the relationship between consumer spending and its determinants, particularly disposable income after tax deduction. It is also defined as the relationship between consumption and disposable income. It is further characterized by relying on total consumer spending on the horizontal axis, including autonomous consumption (C_0), the marginal propensity to consume (MPC), and its dependence on disposable income (Y_d) (Hussein Dikhan Droush, Testing the Hypotheses of the Consumption Function in the Jordanian Economy, Studies, 2019).

The basic assumptions underlying the Keynesian theory regarding the consumption function are as follows:

- The consumption function is constant and stable, at least in the short term. Changes in the consumption function result from changes in income, meaning a movement from one point to another on the consumption curve, and the relationship between consumption and income is a positive one.
- The marginal propensity to consume (MPC) is determined according to the constraint $1 > MPC > 0$, and it remains constant along the consumption function because it is a linear function. Keynes suggested that the MPC could also be non-linear, decreasing as income increases.
- The average propensity to consume (APC) decreases with an increase in disposable income. Keynes argued that the APC decreases with rising income.

The average propensity to consume (APC) is always less than the marginal propensity to consume (MPC), where $APC < MPC$.

4-Determinants of consumption expenditure

We can have economic factors and also social or non economic factors

4-1-Available Individual Income

Available individual income is the amount an individual receives in exchange for the work they perform, primarily directed towards acquiring or consuming needs, whether permanent or non-permanent. When families spend their money on consumption, it is said that they have consumed their income under the constraint of their budget, as these families cannot consume needs greater than their income unless they borrow. Family income is the money the family can freely dispose of, so we refer to this type of income as available individual income, distinguishing two types:

4-1-1- Permanent Income

This is the financial amount that a family receives for intellectual and physical effort exerted over a limited period. The way this income is consumed varies from one family to another based on each family's standard of living.

4-1.2 Transitional Income

These are financial amounts that families receive at a specific time from profits distributed by the enterprise or from grants and bonuses. Some families continue at the same consumption pace despite an increase in their available income, saving the surplus for investment purposes.

4-2-General Price Level

The concept of price starts with the fact that production, goods, and services have a cost that determines their value after determining their overall cost. If production has a total level, it is measured by the general price level, which is considered one of the fundamental and important factors affecting consumption. To clarify all this, we will discuss the following two cases:

If the rise or fall in the general price level is accompanied by a proportional decrease or increase in available cash income, in this case, consumers perceive themselves neither in a good nor a bad situation. Therefore, they maintain their consumption spending level.

4-3- Lack of Correlation between Changes in the General Price Level and Compensatory Changes in Available Cash Income

This means that there are changes in real available income that will directly impact individual consumption behavior. An increase in prices leads to a decrease in real available income, resulting in an absolute shortage in total household consumption on the one hand. On the other hand, a decrease in prices leads to an increase in available income, meaning an increase in the absolute amount of consumption.

4-4- Income Distribution

It is known that income distribution in society is not equal among all its categories, resulting in variations in consumption tendencies. Higher-income categories exhibit a lower average tendency compared to lower-income categories. Therefore, any change in the direction of income distribution to become more just may lead to an increase in the average tendency for consumption at the societal level.

4-5- Wealth

Wealth is defined as the accumulation of individuals financial and real estate assets. It is essential to distinguish between income and wealth. Wealth often includes more than income, and it frequently enters the total consumption function as a determinant of consumption.

4-6--Interest Rate

The interest rate is the price paid for sacrificing present consumption, within the context of saving. Some believe that an increase in the interest rate leads to saving and, consequently, a decrease in consumption. However, this is not necessarily true. An increase in the interest rate may lead to a reduction in the amount to be saved to achieve a steady income. Moreover, an increase in the interest rate can lead to a decrease in investment due to

reduced demand for loans, an increase in current savings, resulting in a decrease in income value, and consequently, a decrease in consumption and saving.

4-7-Inflation

An economic phenomenon that reflects a sharp rise in prices, accompanied by a decrease in the purchasing power of money. If we consider consumption as a simple linear function of current income only, we would exaggerate the value of the current consumption slope. This is because during periods of rising prices and current income, both variables will have a positive impact on consumption. The impact of rising prices is evident in consumption patterns, as the relative increase in prices of food, beverages, cigarettes, and clothing leads to an increase in the proportion spent on these goods. In general, the proportion of income spent on essential goods increases if inflation affects the prices of these goods compared to the prices of other goods.

4-8- Social Environment Factors

Classical and Keynesian economic analyses did not give significant importance to social and psychological aspects and their impact on consumption, unlike contemporary "Duesenberry's" relative income theory. This theory is classified as a social and economic approach to explaining individual consumption behavior. Individuals, in their consumption, are influenced by the interaction between their desires within the framework of their income and the type of goods they intend to consume. The freedom of individuals in making consumption decisions is evident in changing the quality of goods they consume. This differs from classical analysis that focuses on the quantity of goods purchased as an expression of individuals consumption behavior. This theory emphasizes the nature of imitation and emulation related to consumption, involving individuals desire to emulate the lifestyles of socially prestigious individuals. Those individuals with high consumption levels tend to increase their consumption, depleting their savings. As a result, individuals either feel satisfaction and contentment with their current consumption level or the opposite.

4-9- Personal Factors

These factors involve the psychological behavior of the consumer, impacting individuals desire to make purchases. The consumption behavior of individuals within society is influenced by changes in advertising and marketing styles, shifts in the attractiveness of goods, expectations about future price levels, expectations regarding the availability of goods in the

market, and the likelihood of changes in future income levels. For instance, if consumers anticipate the possibility of the country facing the danger of war, they may immediately buy more consumer goods and store them for future use. This consumption trend can shift the consumption function upwards. Expectations about price movements also affect the consumption function. If individuals expect an increase in the prices of goods in the future, this expectation will drive them to purchase more goods, thus increasing total consumption and shifting the function upwards. Similarly, if the government announces effective economic plans that would boost the national economy and eliminate recession, individuals in the society may feel that economic recovery is imminent. They may anticipate that their incomes will rise sooner or later, increasing their desire to make purchases in the hope of improving their economic conditions in the future. This leads to a shift in the consumption function upwards. Changes in individuals' tastes can also positively or negatively affect consumption, depending on the nature of the change. Tastes are influenced by various factors such as advertising, and they change with cultural and social levels. All these factors can influence the level of consumption within society and shift the consumption function either upwards or downwards.

5-The Consumer System of Algerian Families

There are new criteria and rules that have emerged in Algerian society following the shift towards openness to the global market. These include:

The abundant flow of funds to various categories due to a commercial boom and a desire to accumulate wealth for most citizens. This has led to extreme luxury among the wealthy class, driven by a desire to showcase and flaunt wealth.

Opportunism and the exploitation of loopholes in every situation to achieve rapid wealth. Materialistic tendencies have prevailed among various segments of society.

Cultural emulation of the Western lifestyle in all its material developments.

Increased demand across all segments of society, especially with the widespread practice of installment buying.

The expansion, diversity, and multiplicity of activities following the socio-economic development and changes in Algerian society, resulting in variations and changes in consumption patterns.

5-1-Components of Consumption Patterns

Consumption, in general, refers to the use of goods and services with the aim of obtaining benefits. Consumption is the primary goal of economic activity, serving as a driving factor for production. It has gained increased attention in various fields, including consumption planning, income distribution justice, economic feasibility studies, as well as the formulation of plans and policies for addressing inflation.

Consumption patterns, or lifestyles in general, encompass five components that together form an individual's way of life. These components exist within a society or community, and individuals must interact with them according to specific methods, which can be referred to as a philosophy of interaction. These components are consumption, nutrition, clothing, home furnishing, and leisure.

5-2-The Impact of Government Spending Policies on Household Consumption in Algeria

By examining the impact of economic stimulus plans on economic variables, seen as intermediate channels for the impact of public spending on economic growth, it is evident that, concerning consumption, there has been a continuous increase throughout the specified period, whether it be general or private consumption. This indicates that public spending in Algeria did not displace private consumption during the implementation of stimulus plans.

6-Presentation of the data

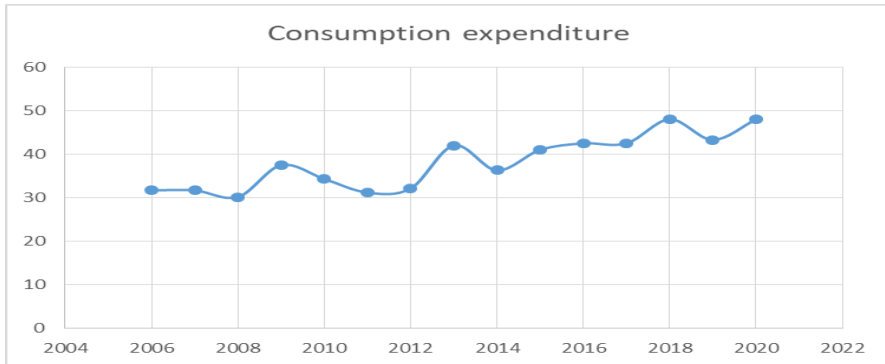
In the study, we employ a multiple linear regression model to conduct a regression of family consumption in Algeria on a set of independent variables, including disposable income, inflation rate, savings, point of sale, and gross domestic product. The aim is to formulate these variables quantitatively and then estimate this model using standard economic methods to draw significant quantitative conclusions about the impact of the aforementioned economic variables on the behavior of Algerian family consumption.

It is worth noting that the data for the study variables were collected annually for the period (2006-2020) from the following sources: the National Statistics Office, the World Bank, and the National Monetary Fund's website.

6-1-Dependent Variable (response variable): Household Consumption.(cons)

The following graphics shows the evolution of consumption expenditure in Algeria from the year 2006 to 2020.

Figure number (1): Consumption expenditure evolution in Algeria



Source: World Bank.

Due to the increase in the money supply without a corresponding increase in goods and services, there has been an impact on the citizens standard of living and their final consumption. The consumption of households as a percentage of the Gross Domestic Product (GDP) has experienced instability, fluctuating between highs and lows depending on the fluctuations in prices. This is reflected in the graphic presented.

We observe from that graphic, there are fluctuations from year to year in the percentage of consumption by Algerian households, indicating instability in purchasing power rates in Algeria during the specified period and this is attributed to a large set of reasons that significantly contributed to the disruption of the living conditions of the Algerian citizen, including the deficit in agricultural and industrial production, monopolies, speculation, poor organization, and the deterioration of purchasing power, especially the real guaranteed minimum wage. Additionally, there is the depreciation of the Algerian dinar both domestically and internationally.

6-2-Independent Variables (explanatory variable):

We present data about the evolution of some determinants of the consumption

- Gross Domestic Product (GDP)

● Total Population (POP)

The evolution of population over the period of 2006-2020 is presented in the following table :

Table number (1): Population evolution in Algeria

Unit : Millions

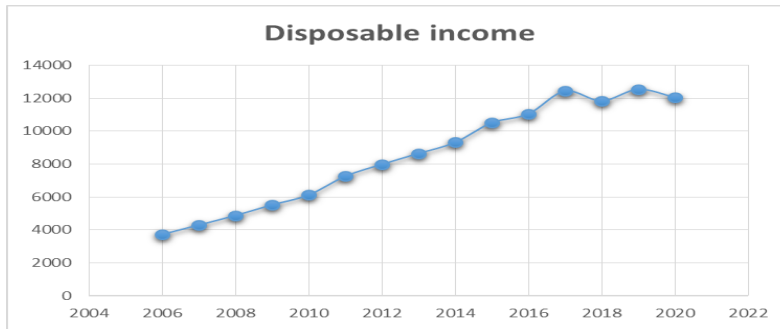
06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
33,4	34	34,5	35,2	35,8	36,5	37,2	38	28,7	39,5	40,3	41,1	41,9	42,7	43,4

Source: World Bank

● Disposable Income.(DI)

The disposable income evolution in Algeria over the period of 2006-2020 is presented in the following graph

Figure number (2): Disposable income evolution in Algeria



Source: World Bank.

As observed in the above the graphic, there is a continuous increase in the available income for households. The value of available income varies from year to year, reaching 12,055.6 billion DZD in the year 2020. This is the highest value attained during the study period, compared to the initial 3738,1 billion DZD in the year 2006.

- Inflation Rate (INF)
- Savings Rate (SAV)
- Unemployment Rate (UNEM)

6-3-Determining the Mathematical Form of the Model

To estimate the size and direction of the impact of economic variables on household consumption, the study starts with the following model:

$$cons_t = B_0 + B_1DI_t + B_2INF_t + B_3SAV_t + B_4UNEM_t + B_5GDP_t + B_6POP_t + e_t$$

where:**i**: Represents time, i.e., the value of the variable in year i.

$B_0, B_1, B_2, B_3, B_4, B_5, B_6$ The other variables are as mentioned above, representing the parameters of the model.

7-Results and interpretation

To assess the validity of the estimated standard model for family consumption in Algeria, it is necessary to conduct a series of tests to determine its adequacy from both an economic theoretical perspective and its statistical and measurable validity.

7-1-Résultats

After entering the data into the Eviews 12 program and performing the necessary operations, taking into account the correlation between the explanatory variables and after numerous tests, we arrived at the following final model:

Table number (2) : Results of least square method

Sample: 2006 2020 Included observations: 15				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.493214	0.656464	-2.274632	0.0421
DI	0.293362	0.103510	2.834140	0.0151
POP	1.139281	0.096790	11.77070	0.0000
R-squared	0.966767	Mean dependent var	5.030569	
Adjusted R-squared	0.961228	S.D. dependent var	0.116290	
S.E. of regression	0.022898	Akaike info criterion	-4.538654	
Sum squared resid	0.006292	Schwarz criterion	-4.397044	
Log likelihood	37.03991	Hannan-Quinn criter.	-4.540163	
F-statistic	174.5416	Durbin-Watson stat	0.710530	
Prob(F-statistic)	0.000000			

Source: World Bank.

The obtained model can be clarified as follows:

$$cons_t = 0,29 DI_t + 1,13 POP_t - 1,49 \quad \text{With } R^2=0,96$$

Through the presented model, it is observed that the coefficient of disposable income is positively signed, indicating a direct relationship

between the dependent variable (family consumption) and the explanatory variable (DI). This is economically acceptable. For the coefficient of total population, its positive sign suggests a positive relationship between family consumption and population, which is also economically acceptable.

7-2-Economic interpretation

Through the above model, we observe the following:

Regarding the intercept parameter, its sign aligns with economic theory, indicating a statistically significant economic constant. This is consistent with prior expectations.

Concerning the disposable income, we note that it is positive, signifying a positive relationship between disposable income and family consumption. As disposable income increases by one unit, family consumption rises by 0,29 units, in accordance with economic theory.

For the coefficient of population (POP), it is positive, indicating a positive relationship between family consumption and population. As population increases by one unit, family consumption increases by 1,13 units, aligning with economic theory.

From the above, it is evident that the model is acceptable from an economic standpoint, with all parameter signs aligning with economic theory.

7-3-Emperical interpretation

7-3-1-Total Significance Test for the Model

To test the overall significance of the model, we use the determination coefficient and the Fisher's F-test as follows:

- **Determination Coefficient:**

The obtained value for the determination coefficient is 0.9667, which is very close to one. This indicates that family consumption is explained by 96.67% by the explanatory variables, suggesting a strong relationship between family consumption and the explanatory variables. The remaining approximately 03,33% is explained by other factors not included in the model and is encompassed in the error term.

- **Fisher's F-test:**

This test aims to assess the overall significance of the regression model under the following assumptions:

$$H_0: B_1 = B_2 = B_3 = 0$$

$$H_1: B_0 \neq 0, B_1 \neq 0, B_2 \neq 0, B_3 \neq 0,$$

In the first hypothesis, it is assumed that there is no relationship between the dependent variable and the explanatory variables. As for the alternative hypothesis, it suggests the presence of at least one non-zero coefficient in the model.

Because p-value (F-statistic) <0.05, we reject the null hypothesis in favour of the alternative hypothesis. At the 5% significance level there is enough evidence to suggest that there is a relationship between the dependent variables “disposable income”, “total population”, and the independent variable ”consumption”, establishing the overall statistical significance of the model."

7-3-2- Significance Test of Coefficients

The t-statistic is employed to assess the significance of the model coefficients and evaluate the impact of the explanatory variables on the dependent variable by testing hypotheses related to the estimated parameters, as follows:

$$H_0: B_0 = B_1 = B_2 = B_3 = 0$$

$$H_1: B_0 = B_1 = B_2 = B_3 \neq 0$$

The results of the significance test of coefficients can be illustrated according to the accompanying table containing both the calculated and tabulated t-statistics. The tabulated values are extracted from the t-table at a significance level of 0.05, with degrees of freedom equal to (v = n - k), where v = 21-3 = 18.

Table number (3) :Results of T-statistic test

Compare	Probability	Tabulated value	Calculated value	Variables
2,274632 < 2,101	0,0421	2,101	-2,274632	C
2,834140 < 2,101	0,0151	2,101	2,834140	DI
11,77070 < 2,101	0,0000	2,101	11,77070	POP

Source: World Bank.

For the disposable income (DI), the total population (POP) and the intercept (C), we observe that the calculated Student's t-statistic is greater than its tabulated value, with a probability less than 0,05. Therefore, we reject the

null hypothesis and accept the alternative hypothesis. This means that the DI, POP and C are statistically significant at a significance level of 0.05 in explaining family consumption during the study period, making them influencing household consumption.

Conclusion

In our research, we aimed to analyze the function of household consumption in Algeria. This study derives its importance from highlighting the significant factors influencing household consumption and attempting to analyze this phenomenon to arrive at an economic model to understand the impact of these variables.

As an introduction, we addressed concepts related to consumption in general by providing a comprehensive definition of consumption, including its determinants and types. Furthermore, we explained the consumption system of Algerian families. The study indicated that household consumption is in continuous development due to the implemented schemes by the state aiming to improve individuals' living standards.

Finally, to achieve our research goal, we delved into econometrics and presented a standard model. We also reviewed previous studies in this field, utilizing these economic models to analyze the phenomenon of household consumption in Algeria by modeling the data of variables explaining this phenomenon. The results obtained in the study have shown consistency with the theoretical and practical foundations of the household consumption model. Specifically, they indicate a linear relationship between household consumption, total population, and disposable national income.

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