

Inflation and Household Consumption in Algeria: An Econometric Study (1990-2022)

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Abstract:

Inflation is one of the two most important economic problems facing countries. In the world must suffer independent of the economic and political systems Especially at present After the economic crisis and fluctuations in production Like other countries Algeria has most of its problems. This is because rising prices have a serious impact on household consumption. or reduce purchasing power From this research We attempt to clarify the impact of inflation on household consumption in Algeria through an econometric study, which aims to find out whether the relationship between these two variables agrees with economic theory or vice versa. After the study, we can deduce that the results are not consistent with economic theory.

Keywords: inflation; household consumption; econometric study .

JEL Classification : E31, E21, C51

ملخص :

التضخم ظاهرة عالمية تعاني منها كل دول العالم على اختلاف أنظمتها الاقتصادية والسياسية خصوصا في الوقت الحالي بعد أزمة كورونا وتذبذب الإنتاج. وكان للجزائر نصيب كبير من هذا المشكل، فقد أثر ارتفاع الأسعار على الاستهلاك العائلي بشكل رهيب مما أدى إلى انخفاض في قيمة النقود وبالتالي تدهور القدرة الشرائية . من خلال هذا البحث نحاول تسليط الضوء على أثر التضخم على الاستهلاك العائلي في الجزائر باجراء دراسة قياسية الهدف منها معرفة ما إذا كانت العلاقة بين المتغيرين موافقة للنظرية الاقتصادية أو العكس. و بعد الدراسة توصلنا أن النتائج لا توافق النظرية الاقتصادية .

الكلمات المفتاحية : التضخم، الاستهلاك العائلي، دراسة قياسية

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1. Introduction :

The economic crises that maximum international locations of the world are enduring inside the current technology constitute a standard phenomenon this is almost periodically recurring, exhorting governments to get busy and look for the vital answers to them.

Among the most vital and most risky of these crises is the only that shook the worldwide monetary stability: The Great Depression of 1929, the inflation disaster in some European international locations, specifically Germany, Austria, and Hungary, as well as the 1987 disaster due to the decline in oil charges and the rise in dollar costs, which affected specially the oil-generating nations.

Let by myself, the global economic disaster in 2007, which left big numbers of unemployment because of nations adopting austerity rules and shedding people, the global health crisis of 2019 and the accompanying cessation of manufacturing and rising prices as properly. All of those crises took on a global character, with devastating consequences that spread to all countries of the world, such as developed and underdeveloped alike.

The idea of inflation varies in line with the propositions of various financial schools. The classical college suggests that costs are decided via the free interplay between deliver and call for for goods and services. That fee movement or the inflation fee is immediately proportional to the amount of money, and inversely proportional to the volume of manufacturing and the price of demand for money (Dhia Majeed, 2000, p. 81).

The Keynesian faculty is pretty sure that inflation way an growth in actual demand over the to be had deliver of goods and services, main to an growth in expenses. Therefore, in step with this college, inflation is related to modifications in the amount of cash, in hobby prices, and inside the degree of employment in the efficient system of any us of a.

As for the monetarist college, it confirms that the real purpose of inflation is the increase in the supply of money via the financial government in a manner that exceeds the quantity of demand for it. However, at the equal time, it suggests that the motive of the imbalances is because of the components of the money demand characteristic, however now not to the cash deliver (Anon., 2024).

Perhaps the most crucial stricken by inflation is the own family region, as it is the most important sector in the financial system, which ends up in major changes inside the intake of this region. Algeria has been suffering from sizable inflationary pressures lately for a couple of reasons, which in flip have led to exceptional forms of inflation in the countrywide economy, resulting in serious effects simultaneous with changes whose root motive is in the shape of its monetary system. In the context of combating inflation, Algeria, like different countries, is trying to pursue a policy of concentrated on... Inflation.

Algeria has lately been considered one of the countries that are seeking by using all way to gain complete development in numerous fields, by using employing all the skills, qualifications and components available to it. It has additionally adopted in depth reform programs with the intention to reconsider its monetary policy with the aid of adopting a few regulations related to balances.

Major economic measures aimed at reducing inflationary pressures and preserving the purchasing power of citizens. This led us to state the following problem:

What is the impact of inflation on household consumption in Algeria?

2. The theoretical aspect:

2.1 The relationship between inflation and consumption (theoretical approaches)

In his treatise *The General Vision of Monetary Reform*, Keynes divided society into three categories: investors, corporate owners, and those who earn wages. We can study how our price changes affect each of: investment level due to an increase in the general price level. This results in receiving fewer goods and services with a more stable income than before. for business class The selling price will be higher. Production costs generally follow the increase. The third class tends to lose out when prices rise. and at the same time Real wages are falling. (Kamel & Ahmed, 1989, p. 487).

Because of the expectations of the person The number of units (or consumer units) related to the general price level plays an important role in changing the relationship between the quantity demanded of a commodity and its price. Consumers living under a certain level of inflation may turn to purchasing more goods and services as a result of expectations related to the future direction of inflation.

If individuals expect inflation to increase in the future, then to avoid a collapse in the purchasing power of the money they hold. (As a result of high inflation) they will resort to increasing current consumption. (Ahmed & Ahmed, 1992, pp. 244-245).

In terms of quantities and some units When the price of a commodity or group of commodities increases The quantity demanded of that commodity will decrease. In other words It reduces overall consumer spending on that commodity. However, this does not lead to a reduction in consumption. When the income is sent to the procurement of goods This, in turn, means that the question concerns the distribution of land plots for consumption in different markets. According to the ability of markets to substitute for each other in comparison with relative prices, that is, with the exchange rate between them. And it is not necessary to take into account changes in absolute prices. When such changes cannot affect relative prices.

When the general price level increases All prices will increase proportionally. and consumers will receive new and higher returns. This change is limited to absolute price increases. without relative price imbalances and has no ability to influence general consumption levels.

However, there are those who think this analysis is incorrect. When prices increase, it does not generally mean that prices for all goods and services have been included or reached the same level. It is possible that the prices of some goods rise and others fall, and it is impossible to imagine the substitution of one good for another. To cause a decrease in the value of money or in the value of previously received returns. Occurring or current purchasing power in the consumption phase Exchanges between goods are transformed into exchanges between expenditures or consumers.

The Pigou effect: A percentage increase in the price level means an increase in monetary output by the same percentage. Meanwhile, real output and patterns of

expenditure and the distribution between consumption and wealth remain the same. But the situation is different when the price level increases more.

The value percentage makes more than the output. (increase in national output) as a result of certain economic conditions One of them is the current lack of income distribution due to price increases. or some element of production that receives most of the current increase from increased prices.

This is observed when profits increase under inflation. In this case, the general price level may have a positive effect on the level of consumption. It affects this through two cash balances deducted by each consumer. And this effect is called the Pigou effect. Each increase in price reduces the real value of these balances. And this belief will cause individuals to increase or decrease their consumer spending as a result of these circumstances..

Considering that consumers rarely observe changes in these factors. Whether it is the continuous increase in prices or the return of money. They thus fall into what is called The "financial illusion" represented by changes in real consumption Some families barely look forward to their income levels increasing and ignore what is happening. This is because the general price level increased by the same percentage. Some families are certified as financially sound. But in reality, it's the opposite.

Therefore, these households allocate a larger share of their income to consumption. This results in no decrease in real consumption. On the other hand, we find other families That hardly takes into account increases in the general price level. and neglecting the same proportional increase in disposable income. This is because these families believe they have no financial status. But in reality, they are not Sao, so these households reduce the proportion of their income that goes towards consumption. This results in the actual level of consumption not increasing.

From Keynesian analysis of the inflationary hiatus An increase in aggregate demand is related to the supply of goods and services. It shows that consumption and household size move in opposite directions. When the trend of consumption increases The trend towards poverty will decrease proportionately. And hence household consumption is considered surplus compared to supply. And this is where the inflation gap appears.

2.2 The relationship between inflation and consumption (some previous studies):

2.2.1 Sabah Zarroukhi's study (Sabah, 2011). . This study aims to identify important economic variables that affect family consumption in Algeria. Try to predict the future of this phenomenon. and determine the strength of the relationship between the representative variable and the explanatory variable. A direct relationship is revealed when income changes by one unit, consumption changes by 0.09.

The study also found an inverse relationship between inflation and consumption. A one-unit change in the inflation rate leads to a change in consumption of 5,968.45, but this relationship is directly related to the interest rate. Contrary to economic theory, in statistics, there is a strong relationship between the dependent variable and the explanatory variable.

As shown by the perfect coefficient of determination (0.99) and the model is significant using the Fisher's statistical test (F)...

A nonlinear family consumption model was estimated for the same study period. This reveals a direct relationship between income, population size and family consumption. and an inverse relationship with inflation

2.2.2 A study by researcher (Nasser Ghazi, 1998). This study aims to estimate family consumption patterns in the Kingdom during the period 1963-1995 by identifying and determining variables that affect family expenditures according to economic theory. Researcher's expectations and previous literature

The model is estimated using the ordinary least squares method. Researchers have widely examined several economic variables to measure, including: national income; Inflation, wealth, imports Consumption from previous years and a dummy variable representing the Gulf of Thailand crisis.

From detailed analysis Studies have found that inflation has a significant impact on family consumption expenditures. Interestingly, The research did not establish a significant impact of the Persian Gulf crisis on family consumption expenditures. This, researchers attribute to the effectiveness of Saudi Arabia's economic policy during the crisis and its relatively short period of time...

2.2.3 Researcher (Abdul Karim, 2011) **study**, "Determinants of the consumption function in Sudan during the period 1980-2008." The aim of this study is to model the consumption function and identify variables with significant influence. The consumption model was estimated using the ordinary least squares method. Initially, the linear function did not provide the best results. This is because some parameters are not statistically significant. This leads to a semi-logarithmic function instead of an approximation.

After estimation It was found that the model suffered from multicollinearity and autocorrelation problems. These problems were resolved by removing savings. which is defined as an undesired variable. The AR(1) correction coefficient is introduced to deal with the autocorrelation problem. After estimating the model Evaluated and tested according to standard economic and statistical criteria. The model successfully passed all these evaluation criteria.

The model's predictive ability was then tested. This reveals high predictability. Finally, from 1972 to 2011, the best possible model was developed to determine the determinants of family consumption in Sudan. Studying the consumption function and modeling family consumption using ordinary least squares reveals important insights into the dynamics of family consumption among key findings. The main variables that affect consumption include income and other variables such as inflation. change in income Income in the previous period and consumption in the previous period.

The data shows multi-core linearity. and the linear function shows no significance of the constant and inflation coefficient. A statistically significant positive relationship was found between consumption and inflation. Analysis shows that existing income and inflation rates are responsible for 90.

The practical aspect:

3.1 Formulating the econometric model: From a theoretical perspective and from previous research studies. We consider inflation to be one of the two most important

economic indicators affecting consumption in general and household consumption in particular.. Accordingly, the study model was as follows:

$$CONS = f(INF, GDP) \dots\dots\dots(I)$$

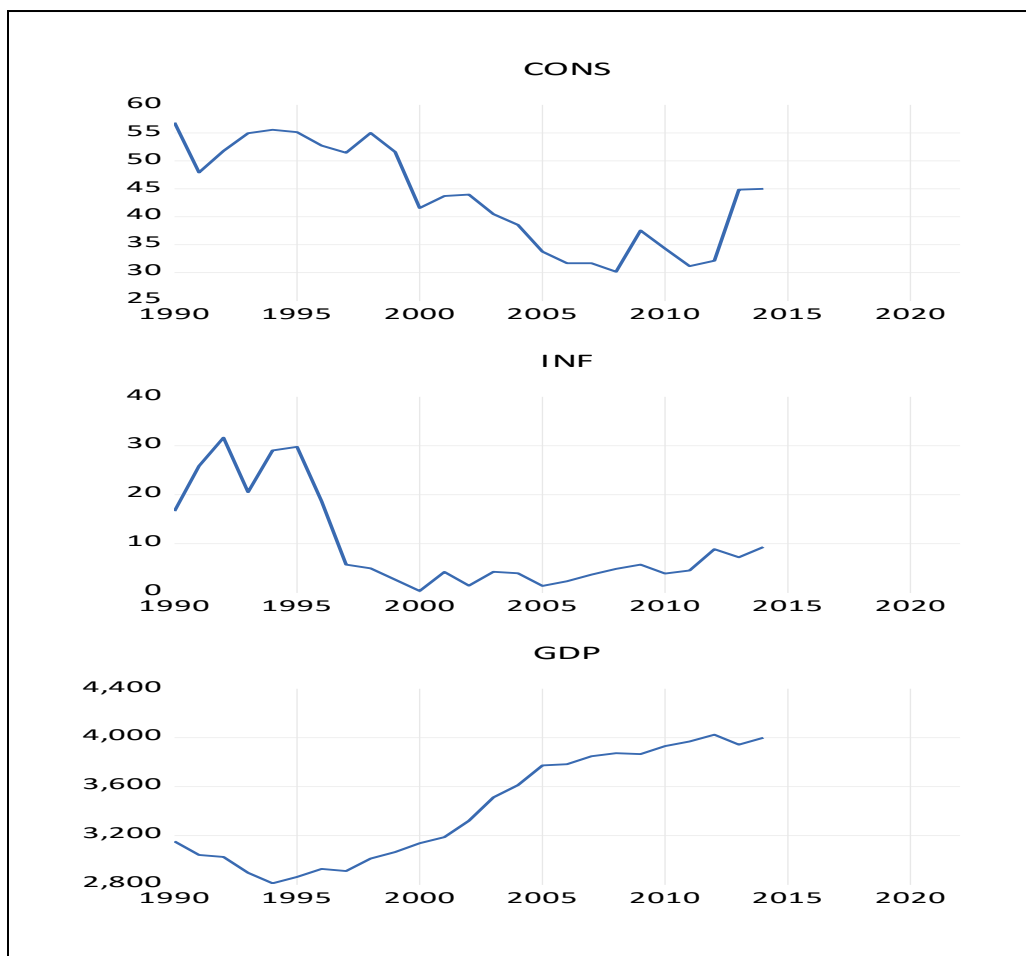
Assuming the relationship between the variables is linear by introducing the logarithm to the variables, our formed model becomes as follows:

$$\log(CONS_t) = \alpha + \beta_1 \log(INF)_t + \beta_2 \log(GDP) + \varepsilon_t \dots\dots (II)$$

whereas:

- CONS: represents the ratio of household consumption to gross domestic product.
- INF: represents the inflation rate.
- GDP: represents the GDP per capita at constant prices.

Study data were obtained from the National Statistical Office and the World Bank. and covers the period 1990 to 2022. The graphic below shows the evolution of the model variables during the study period:



Source: Researchers from Eviews 12

Figure (1): Evolution of the study variables

The graphical representation of the variables shows us that there is a component of the general trend, and therefore these variables are likely to be unstable.

3.2 Model estimation:

3.2.1 Study of the stationary of series:

We will use the Unit-root test, which is the advanced Dickey-Fuller test (ADF), on all variables of the model: the ratio of household consumption to gross domestic product (CONS), the inflation rate (INF), and the GDP per capita (GDP). The application of the Advanced Dickey-Fuller (ADF) test depends on determining the degree of lag length, which we set as one, through the use of the partial autocorrelation function criterion, and the following table summarizes the ADF test.

Table (1): Unit root test for a series using ADF

STATIONARY OF FIRST DIFFERENCE SERIES				STATIONARY OF ORIGINS SERIES				VARIABLES
Propability	ADF ^c	ADF ^t	Level	Probability	ADF ^c	ADF ^t	Level	
0.00	-4.99	-2.66	% 1	0.48	-0,50	-2,66	% 1	<i>Log(CONS)</i>
		-1.95	%5			-1,95	%5	
		-1.60	%10			-1,60	%10	
0.000	-7.37	-2.66	% 1	0.23	-1.10	-2,66	% 1	<i>Log(INF)</i>
		-1.95	%5			-1,95	%5	
		-1.60	%10			-1,60	%10	
0.007	-2.76	-2.67	% 1	0.97	1.66	-2,66	% 1	<i>Log(GDP)</i>
		-1.95	%5			-1,95	%5	
		-1.60	%10			-1,60	%10	

Source: Researchers from Eviews 12

We note from the table that the calculated statistical value of Dickey Fuller Advanced

(ADF^c) is greater than the tabulated value of Dickey Fuller Advanced (ADF^t) at the 5% level, for the variables **Log(CONS)** and **Log(INF)** **Log(GDP)**, respectively :

$$ADF^c = -0.50 > ADF^t = -1.95$$

$$ADF^c = -1.10 > ADF^t = -1.95$$

$$ADF^c = 1.66 > ADF^t = -1.95$$

Through this test, we accept the null hypothesis (the existence of the unit root), therefore the series, Log (CONS), Log (INF) and Log (GDP) are not stationary, and this leads us to study the stationary of the first difference series and for all previous series. From the table, we can see that the statistical value of ADF (ADF^c) is less than the tabular value (ADF^t) at the level of 5%, for the first differences of the variables (D(Log(CONS), D(Log(INF)) and D(Log(GDP)) respectively:

$$ADF^c = -4.99 < ADF^t = -1.95$$

$$ADF^c = -7.37 < ADF^t = -1.95$$

$$ADF^c = -2.76 < ADF^t = -1.95$$

Through this test, we reject the null hypothesis (the existence of a unit root), therefore the series (D(Log(CONS) ,D(Log(INF)) ,D(Log(GDP)) are stationary, which means that the variables (origin series) are integrated of the first degree, and that the differences of these variables are integrated from The zero degree, and therefore it is possible for these variables to be co-integrated.

3.2.2 Cointegration test:

To test the long- and short-term relationship between the study variables, we use the **Johansen Test** and the **Error Correction Model (ECM)**, after proving the existence of simultaneous integration.

Based on the cointegration literature, two methods were used: the first was the **Engle-Granger method** and the second was **the Johansen method**.

3.2.3 Johansen cointegration test

We will use the Johansen cointegration test, the results of which we will summarize in the following table:

Table (2): Johansen cointegration test - Trace test

Eigenvalues	Critical values	Trace Statistics	Assumptions about the number simultaneous Integration equations
0.568394	30.12820	29.79707	Nothing
0.292520	10.80263	15.49471	At least one
0.116296	2.843573	3.841466	At least two

Source: Researchers from Eviews 12

From the table we note that:

- At the first line ($r=0$), we note that the calculated statistical effect value (TR^c) is greater than the tabulated value of the effect (TR^t) at a 5% significance level:

$$TR^c = 30.12 > TR^t = 29.79$$

Through this test, we reject the null hypothesis, which states that there is no cointegration relationship.

- At the second line ($r=1$), we notice that the calculated statistical value of the trace (TR^c) is less than the tabulated value of the effect (TR^t) at a 5% significance level:

$$TR^c = 10.8 < TR^t = 15.49$$

Through this test we accept the null hypothesis, which states that there is at least one cointegration relationship.

Through our application of the Johansen trace test, we found that there is a single cointegration relationship between the variables.

3.2.4 Granger cointegration test

We summarize the results of estimation using OLS in the following equation:

Through equation (III), we note that all model parameters have statistical significance, using the Student statistic.

We obtained a negative sign for the coefficient of GDP per capita at constant prices and a positive sign for the coefficient of the inflation rate.

After that, we studied the stationary of the residuals (e), the results of which we summarize in the following table:

Table (3): Granger cointegration test

Variable	ADF calculated (ADF^c)	1%	5%	10%	Probability
e	-2.82	-2.67	-1.95	-1.60	0.006

Source: Researchers from Eviews 12

We note from the table that the calculated ADF statistical value (ADF^c) is less than MacKinnon's tabulated value:

$$ADF^c = -2.82 < Mackinnon^t = -2.67$$

Through this test, we reject the null hypothesis (the existence of a unit root), and therefore the series of errors (e) is stationary.

- Estimating the model using error correction (ECM).
- Estimating the model using **Granger** error correction

After ensuring the integration of the first-order variables according to the Johansen and Granger tests, we come to estimate the model using Granger error correction model, which is shown by the following equation:

$$\Delta \log(CONS_t) = 0008 - 0.70 e_{t-1} + 0.32 \Delta \log(CONS_{t-1})_t + 0.03 \Delta \log(INF)_t - 1.48 \Delta \log(GDP) \quad (III)$$

(0.36) (-2.44) (1.57) (1.67) (-1.66)

From the calculated statistics of the students We show that all parameters of equation (III) are not statistically significant at the 5% significance level. Moreover, the error correction factor is statistically significant and has a negative sign (-0.70), while the negative sign This confirms the convergence of short-term equilibrium and long-term equilibrium, that is, it measures the proportion of imbalance in household consumption (the proportion of household consumption in relation to the gross domestic product) that can be adjusted from one year to another.

The lack of statistical significance of the model parameters leads us to perceive that there is no short-term dynamic relationship between the model variables.

3.2.5 Granger's static equation

To find the Granger static equation, which is also called the long-run equation, we use the OLS method. By applying it we obtain the following long-run equation:

$$\log(CONS_t) = 14,11 + 0,04 \log(INF)_t - 1,28 \log(GD Pt) \dots\dots\dots(IV)$$

(9.48) (2.10) (-7.08)

4. Statistical interpretations:

The econometric model demonstrates a robust statistical relationship between economic indicators and household consumption, with an R-squared value of 0.77. The key variables of inflation rate and GDP explain 77% of consumption variations, revealing strong predictive capabilities. The remaining 23% variance suggests potential influences from unaccounted social, cultural, and micro-economic factors. This comprehensive model provides valuable insights for researchers and policymakers to understand complex consumer behavior dynamics.

Our statistical analysis, utilizing the Student test, confirmed the statistical significance of all model parameters, indicating robust model specification. The Fisher test further validated the overall statistical acceptability of the model, with a probability value (prob F-stat) less than 0.05, which meets standard statistical significance criteria.

However, the Durbin-Watson test revealed potential concerns regarding autocorrelation between error terms, suggesting the need for careful interpretation and potential model refinement. These comprehensive statistical diagnostics provide a nuanced understanding of the model's reliability and potential limitations.

5. Economic explanations:

Our economic analysis revealed a critical deviation from established economic theory in the estimated function, challenging existing experimental and theoretical frameworks. The inflation coefficient unexpectedly demonstrates a positive sign, indicating a direct relationship between household consumption and inflation rate—a finding that fundamentally contradicts standard economic principles. This counterintuitive result suggests the presence of unique economic dynamics that warrant deeper investigation and nuanced understanding. The divergence from traditional economic expectations highlights the complexity of consumer behavior in specific economic contexts.

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The inflation factor in the equation can be interpreted as follows:

- A 1% increase in inflation results in a direct change in household consumption of only 0.04%.

- Regarding the per capita GDP coefficient, its negative sign, as indicated by the previous equation, suggests an inverse relationship between the dependent variable (household consumption) and the independent variable (per capita GDP). This result contradicts the expected sign based on economic theory.

The interpretation of the per capita GDP coefficient in the equation is as follows:

- A 1% increase in per capita GDP leads to a 1.28% decrease in the unemployment rate.

6. Conclusion:

The study of inflation and consumption are two frequently occurring topics. As it is the basis of socio-economic studies in developing countries such as Algeria and its importance is clear through the important role of these variables in construction economic policy, this study aims to build the studied econometric model. The impact of inflation on household consumption in Algeria.

Through our econometric analysis, we uncovered several significant and counterintuitive insights about consumption patterns in Algeria:

First, we discovered that Algerian family consumption exhibits a positive correlation with inflation, which deviates from standard economic expectations. This anomaly can be attributed to wage structures that fail to keep pace with inflationary pressures, thereby substantially impacting the affordability of essential consumer goods.

Secondly, our research revealed an inverse relationship between household consumption and GDP per capita, another finding that challenges conventional economic theory. This observation highlights critical issues of economic inequality, suggesting that wealth generation predominantly benefits large-scale projects while neglecting individual purchasing power and wage increases.

These research findings, which consistently diverge from traditional economic models, underscore the unique characteristics of the Algerian consumer and the distinctive structural dynamics of the Algerian economic landscape. Our study emphasizes the need for a nuanced understanding of economic behavior that transcends generic theoretical frameworks and recognizes the specific contextual factors shaping consumption patterns in Algeria.

The results not only challenge existing economic theories but also provide valuable insights into the complex interplay between inflation, income, and consumer behavior in a developing economic context.

From this study it is necessary:

- Diversify the income sources of the local economy and increase income. Explore all available economic resources. and avoid gains from sudden drops in oil prices.
- Give importance to the agricultural sector Promote investment and take action to deal with the prices of imported goods
- Reduce the burden of output taxes in proportion to the wage gap and the demands of the free market, taking into account the purchasing power of two workers.
- Improve the awareness of Algerian consumers because they are often considered irrational.

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