An Econometric Analysis of the Impact of Fiscal and Monetary Policies on Economic Well-Being in Algeria (2000–2023) Using Hanke's Economic Misery Index

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Abstract :

This study aims to analyze the impact of fiscal and monetary policy and its impact on economic well-being in Algeria during the period 2000–2023. Hanke's Misery Index is utilized as the dependent variable, while government spending and budget balance are considered independent variables representing fiscal policy trends. Additionally, money supply growth and loans to the economy serve as indicators of monetary policy, with institutional quality included as a control variable. To achieve this objective, the ARDL model is employed.

The results indicate the existence of a long-term equilibrium relationship between the studied variables. The study showed that the dominant fiscal policy had a significant positive impact on the misery index in both the short and long term. As for money supply growth, it exhibited a negative effect in the short term, but became positive in the long term due to the unsustainability of monetary policy. Furthermore, neither the loans extended to the economy nor the institutional quality index showed any significant long-term effect .

Keywords: Wellbeing, Misery Index, Fiscal Policy, Monetary Policy.
JEL classification codes: I3 ;I32 ;H3 ;E5

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Introduction:

The Economic Misery Index is one of the primary tools for measuring individuals' welfare in modern economies, as it reflects the economic challenges faced by society due to rising inflation and unemployment rates. This index provides insights into the living conditions of individuals and serves as an important indicator for understanding the relationship between economic policies and citizens' welfare. In this context, fiscal and monetary policies play a crucial role in shaping the index, as government decisions influence key variables such as money supply, interest rates, and public spending, which collectively impact growth, inflation, and unemployment, and consequently, the Economic Misery Index.

In Algeria, the economy is highly sensitive to fluctuations in oil prices, given that oil revenues constitute the primary source of financing for the state budget. This dependence has led to growing economic challenges, such as budget deficits, rising public debt, and persistent inflation. Despite government efforts to implement various fiscal and monetary policies to address these challenges, the outcomes of these policies remain inconsistent, reflecting a negative impact on individuals' welfare. Against this backdrop, the key research question arises: **How do fiscal and monetary policies affect the Economic Misery Index in Algeria over the period 2000-2023?**

To address the research problem, this study formulates hypotheses regarding the impact of government expenditure and budget balance as indicators of fiscal policy orientation, the growth rate of the money supply and credit extended to the economy as indicators of monetary policy orientation, and institutional quality as a control variable:

Hypothesis 1: There is a significant negative effect of fiscal policy variables on the Economic Misery Index.

Hypothesis 2: There is a significant negative effect of Monetary policy variables on the Economic Misery Index.

Hypothesis 3: There is a significant negative effect of Institutional quality on the Economic Misery Index.

To test these hypotheses, the study employs a combination of methodological approaches and analytical tools to derive empirical findings. The deductive and inductive approaches will be used to establish the theoretical framework for welfare economics and the Economic Misery Index. Additionally, econometric and analytical techniques will be applied to examine the evolution of the index in Algeria and to analyze the relationship between fiscal and monetary policy variables, as well as institutional quality, and Hanke's Economic Misery Index over the period 2000–2023. The analysis will be conducted within the defined

research scope using the ARDL model to ensure robust empirical results and to provide well-founded policy recommendations aligned with the study's objectives.

I. Theoretical Framework of Welfare Theory and the Economic Misery Index:

Welfare the theory in economics is a fundamental field that seeks to understand how to improve the well-being of individuals and societies within different economic systems. Over time, this theory has evolved from classical concepts centered on utility to more comprehensive perspectives that consider various economic and social dimensions of welfare. Among the tools available for measuring and analyzing individual and societal welfare, the Economic Misery Index stands out as a flexible and comprehensive instrument that provides an overall picture of a society's economic conditions and their impact on individuals' well-being.

1. The Evolution of Welfare Economics in Economic Thought :

The well-being of individuals and societies has been a central focus of economic theory, experiencing significant development over time. Economic thinkers have shaped welfare economics based on multiple concepts, ranging from classical interpretations to contemporary standards that emphasize happiness and broader socio-economic indicators.

1.1. Early Foundations: The Pursuit of Individual Utility :

The foundations of economic welfare theory can be traced back to classical economists such as Adam Smith. In his seminal work *The Wealth of Nations* (1776), Smith introduced the pioneering idea that individuals' pursuit of their self-interest unintentionally contributes to enhancing overall societal welfare. This notion was encapsulated in his famous concept of the "invisible hand," which describes how individual economic activities, driven by self-interest, lead to improvements in the collective welfare of society. (Minowitz, 2004, p. 383)

However, this understanding was not sufficiently comprehensive to establish clear methods for measuring societal welfare. Smith's focus was primarily on economic mechanisms that promote welfare through trade, specialization, and wealth distribution, rather than developing specific quantitative measures of well-being.

1.2. Individual Utility: Neoclassical Theories and the Measurement of Welfare :

Neoclassical economic theories, alongside welfare economics, developed the concept of utility as a fundamental framework for analyzing economic behavior. These theories were influenced by utilitarian thought, which

dominated the 18th and 19th centuries and was pioneered by thinkers such as Jeremy Bentham and John Stuart Mill, who proposed utility as the primary measure of economic welfare. (Drakopoulos, 2024, p. 425)

At this stage, utility was considered a measure of the pleasure or satisfaction individuals derive from various economic activities. According to this model, individual welfare was expected to be maximized through market mechanisms that optimize social utility. Neoclassical economists also sought to apply mathematical concepts to measure individual welfare using numerical expressions of happiness or satisfaction, laying the groundwork for measurable utility. However, these theories faced significant challenges, as utility was not always quantifiable, nor did it necessarily capture the true human experience of happiness. (Bergson, 1938, p. 313)

With the emergence of ordinal utility, which argues that preferences or satisfaction can only be ranked rather than measured quantitatively, a major debate arose over the ability of economic theories to fully grasp the dynamics of individual welfare.

By the early 20th century, scholars such as Pareto, Lerner, and Arrow began developing criteria for measuring and improving welfare at both individual and societal levels. Pareto (1909) introduced the *Pareto Principle*, which states that any economic change should improve at least one individual's welfare without harming others. This concept had a significant impact on the development of economic models focused on improving individual welfare, but it remained insufficient as a precise tool for determining how to enhance overall societal welfare. (Yew-Kwang, &1987, p. 253)

Later theories, such as those proposed by Amartya Sen and Kenneth Arrow in the 1950s, aimed to provide mathematical methodologies and economic evaluation tools for measuring societal welfare under various economic and political conditions. However, a major gap persisted in the ability to comprehensively measure individual welfare, leading economists to explore new conceptual frameworks for understanding economic well-being.

1.3 Contemporary Theories: Comprehensive and Multidimensional Welfare :

In the 1970s, the concept of happiness economics emerged as a new trend in economic literature. Richard Easterlin (1974) introduced a groundbreaking argument suggesting a weak relationship between economic growth and happiness levels in high-income countries. His studies indicated that people in wealthy nations do not experience significantly higher happiness levels compared to those in poorer countries, raising questions about the validity of traditional economic theories that linked economic growth to well-being. (OPkonji & Igbanugo , 2019, p. 78)

Challenging the traditional perspective, Tibor Scitovsky (1976) rejected the utilitarian assumptions of economists, emphasizing that welfare is not solely dependent on income or consumption growth. Research has demonstrated that multiple factors, such as mental health, social relationships, personal security, and institutional quality, play a fundamental role in enhancing well-being, surpassing the narrow materialistic definition. (OPkonji & Igbanugo , 2019, p. 78)

By the early 2000s, it became evident that measuring individual welfare required a combination of economic, social, and psychological factors. Recent studies confirmed the significance of social determinants, such as family relationships, psychological well-being, and health, in shaping an individual's overall well-being. This aligns with the modern perspective of behavioral economics, which extends beyond purely economic considerations. (KAHNEMAN, Diener, & Schwarz, 1999)

A study by Clark et al. (2017) further demonstrated that the determinants of happiness and misery, from an individual welfare perspective—based on survey data from the United States, the United Kingdom, and Indonesia—include income and employment, but also social factors (such as education and family life) and health (both mental and physical). This study adds to a growing body of research that advocates for a multidimensional understanding of human well-being, moving beyond a singular focus on economic growth or consumption. (Clark & ALL, 2017, p. 17)

2. The Economic Misery Index as an Indicator for Assessing Welfare :

In terms of analytical tools, economists have utilized a diverse range of indicators to assess economic welfare levels, spanning both traditional and modern indices, with the aim of providing comprehensive insights into individual and societal well-being. Among the most prominent traditional indicators is the per capita Gross Domestic Product (GDP), which is commonly used to measure income levels and material welfare. However, this indicator has faced criticism for its exclusive focus on material aspects, failing to reflect non-material dimensions such as quality of life or personal satisfaction.

In response to these critiques, alternative and more comprehensive indicators have emerged. One such measure is the Misery Index, which focuses on unemployment and inflation rates as key components that directly impact individuals' daily quality of life. Another significant alternative is the Human Development Index (HDI), which integrates income, health, and education metrics to provide a broader perspective on human welfare. Additionally, the Capability Approach, developed by Amartya Sen and Martha Nussbaum, challenges the notion that individual well-being can be assessed solely through

income or available resources. Instead, it emphasizes the importance of fundamental capabilities that enable individuals to lead a dignified life, such as literacy, access to basic necessities like food, and active participation in political affairs. (Amartya , 1999)

Alongside these approaches, various other indicators have been developed to assess welfare levels. Notable among them are the Quality of Life Index published by the Economist Intelligence Unit, the Mercer Quality of Living Survey, the Gallup Global Well-Being Survey, and the Better Life Index introduced by the Organization for Economic Co-operation and Development (OECD).

In recent years, several countries have adopted the Gross National Happiness (GNH) Index as a tool for evaluating the effectiveness of public policies in promoting overall well-being. However, this index has sparked considerable debate among academics and policymakers. Critics argue that its results may be susceptible to political manipulation and that its subjective nature makes cross-country comparisons of well-being particularly challenging. Moreover, traditional happiness indicators are often criticized for their failure to incorporate key macroeconomic variables, limiting their ability to link economic performance with individual welfare levels.

In contrast, the Misery Index stands out for its simplicity and ease of interpretation, making it a widely used tool for assessing economic performance and analyzing the impact of economic policies on living standards. This clarity enables a better understanding of the economic challenges faced by societies and assists policymakers in shaping and guiding their decisions. (OPkonji & Igbanugo , 2019, p. 71)

2.1. Okun's Economic Misery Index :

In the context of appropriately utilizing macroeconomic indicators to measure individual economic well-being, and in response to the sharp rise in inflation and unemployment rates witnessed in the United States and much of the world during the 1970s, Arthur Okun introduced a simple concept to provide President Lyndon Johnson with a quick snapshot of the economy. He developed a straightforward measure of economic misery by summing inflation and unemployment rates without assigning specific weights to them. This approach provided a deeper understanding of how economic policies impact social welfare, as inflation and unemployment are the two primary factors directly affecting individuals' economic quality of life. Consequently, the index does not merely measure material poverty but rather encompasses a mix of economic factors that contribute to the deterioration of living standards and overall well-

being, reflecting levels of economic dissatisfaction or macroeconomic distress in a country.

Okun's approach was remarkably simple, with the proposed formula as follows:

$$OMI = Inf + Un$$

Where:

- **Inf**: Inflation rate (%)
- **Un**: Unemployment rate (%)

Using this basic indicator, Okun suggested that the Misery Index could be interpreted as a primitive utility function or a disutility function in economics (Po-Chin, Xiao-Yin, & Sheng-Chiah, 2014). He further explained that rising inflation and unemployment rates lead to economic and social costs for a country, as higher inflation erodes individuals' purchasing power, while increasing unemployment results in income loss and heightened social pressures—both of which contribute to greater economic misery within society (Anokwuru & Chidinma, 2022, p. 27)

The index gained widespread recognition following a major article in The Wall Street Journal, which highlighted the challenges of assessing economic performance in a complex year like 1970 and emphasized the need for a single measure that could capture the overall economic condition. Despite criticisms of oversimplicity, Okun referred to the indicator as the "discomfort factor," arguing that it effectively combines unemployment and inflation rates—two key drivers of public economic dissatisfaction. The higher the index, the greater the level of economic discomfort. However, he also noted that people tend to be less affected by inflation if the labor market is strong and less sensitive to unemployment if price levels remain stable and acceptable. (Cohen & ALL, 2014, p. 8)

The Misery Index gained further public attention when it was adopted as a tool in U.S. presidential campaigns, particularly during the 1970s and 1980s. For instance, in his 1976 presidential campaign, Jimmy Carter used Okun's index as a measure of "economic misery" to criticize the economic policies of then-President Gerald Ford. The index continued to attract public interest, especially during the second presidential debate in 1980, when Governor Ronald Reagan incorrectly attributed the index to Carter and used it to criticize Carter's administration policies. (Cohen & ALL, 2014, p. 9)

2.2. The Development of the Economic Misery Index

The concept of economic misery has continuously evolved, with multiple analytical tools being developed to measure it more accurately, making it a crucial instrument for assessing economic policies and their impact on societies.

In 1999, economist Robert Barro refined the Misery Index by incorporating additional economic factors that have a significant effect on individual well-being. Barro expanded the index by including nominal interest rates and real GDP growth, making it a more comprehensive and precise measure. This modification adjusted the original formula to account for the effects of monetary and fiscal policies, as well as broader economic improvements that help alleviate economic distress.

The revised Misery Index formula proposed by Barro is as follow : (Tunçay, 2021, p. 243)

$$BMI = GDP - i + Un + Inf$$

Where: **i**:Long-term nominal interest rate (%), **GDP**: Real GDP growth rate (%).

In this model, the impact of monetary policies on economic misery is evident. Higher interest rates increase financial burdens on individuals, whereas positive GDP growth reflects economic improvement, helping to reduce perceptions of economic distress.

In the early 2000s, economist Steve Hanke introduced additional refinements to the concept of economic misery. He developed a new Misery Index that incorporated changes in per capita GDP, aiming to provide a more accurate measure of individual well-being, particularly in countries experiencing significant wealth disparities.

The revised formula for the Hanke Misery Index (HMI) is as follows : (Tunçay, 2021, p. 243)

$$HMI = GDP\ per\ capita - i + Un + Inf$$

Where:

- **GDP per capita**: Per capita real GDP

With this adjustment, the index better reflects how economic growth affects individuals through changes in income per capita, making it a more precise tool for evaluating economies with large wealth disparities and measuring the effectiveness of economic policies. It also serves as a useful indicator for forecasting shifts in public sentiment based on economic changes.

For example, a rising Misery Index signals deteriorating economic conditions, leading to reduced consumer and investor confidence and delays in consumption and investment decisions. Conversely, a declining index suggests an improving economic performance, fostering financial stability and increasing confidence in the economy. This underscores the importance of government intervention when the index rises, through measures such as lowering interest

rates, adjusting unemployment policies, or stimulating economic growth to mitigate the negative impact on citizens.

Based on the experiences of developed countries, or at least as a general rule, the optimal value of the Misery Index should be below 7%. A Misery Index of 10%, although high, remains manageable, whereas a Misery Index exceeding 10% typically indicates the emergence of fundamental deficiencies in economic systems.

Thus, under normal conditions, the Misery Index in developed economies tends to remain below 7%. However, during periods of economic recession, even in advanced economies, the index may rise above 10% .(Dadgar & Nazari, 2018, p. 176)

II. The Evolution of the Economic Misery Index in Algeria (2000-2023) :

The Algerian economy underwent significant transformations during the period 2000-2023, directly impacting Hank's Economic Misery Index in the country. These changes led to fluctuations in the index levels over the years.

Figure01: Evolution of Hank's Economic Misery Index in Algeria (2000-2023)
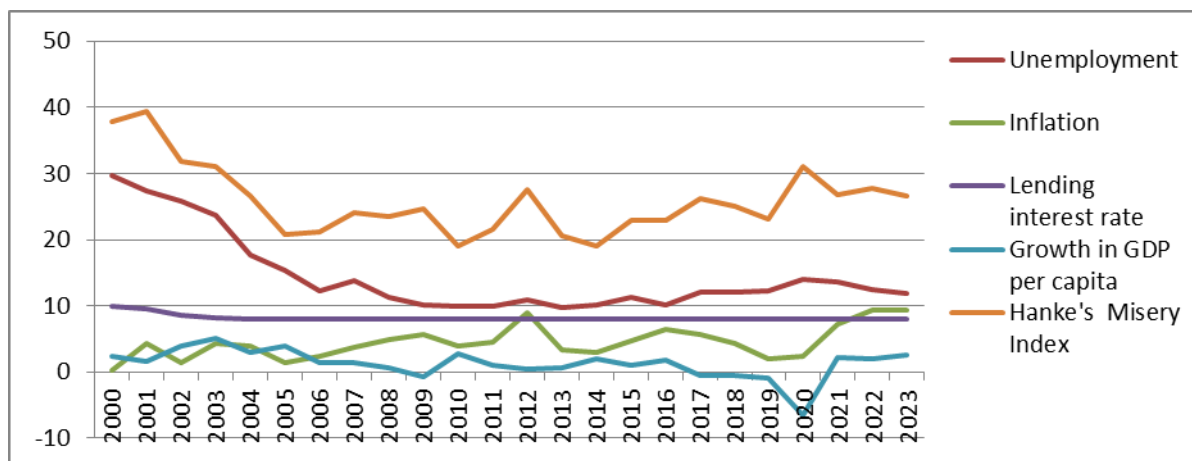
Source: Prepared by the researcher based on World Bank statistics https://data.albankaldawli.org/indicator and Hanke's Misery Index equation

The evolution of Hanke's Misery Index can be analyzed across the following periods :

1. Phase One: Period of High Economic Misery (2000-2006) – A Challenging Economic Adjustment Period:

This phase was characterized by record-high levels of economic misery, as Algeria was undergoing a difficult economic transition with reform policies that had yet to yield tangible results. At the beginning of the new millennium, the Misery Index recorded high levels due to unemployment rates exceeding 25%, despite relatively low inflation rates. This rise was a consequence of the economic crisis of the 1990s, which led to declining investments and a weakened private sector, reducing the economy's ability to generate sufficient employment opportunities.

Economic conditions began to improve with the rise in oil prices, which reached $22.8, $23.3, $29, $38.5, $54.6, and $67.3 per barrel in 2001, 2002, 2003, 2004, 2005, and 2006, respectively . This improvement led to a shift in fiscal policy from the structural adjustment measures of the previous phase to the implementation of economic recovery programs. These programs primarily aimed at increasing economic growth rates and reducing unemployment. Consequently, there was a slight improvement in per capita GDP, with positive but fluctuating growth rates, reaching 2.36% in 2001 and 5.09% in 2004.

On the labor market front, more than 728,666 jobs were created between 2000 and 2004 as part of the economic recovery programs. This resulted in a significant decline in the unemployment rate from 30% in 2000 to 17.7% in 2004. The public works sector accounted for the largest share of employment creation, playing a crucial role in generating job opportunities. (Djamat & Razzag, 2020, pp. 410-411)

With the introduction of the Supplementary Growth Support Program in 2005, which aimed to create two million jobs, employment increased by approximately 12.5%, leading to a further decline in the unemployment rate to 12.27% in 2006. These developments had a positive impact on the Economic Misery Index, which began to decline by 2006.

2. Phase Two: Period of Improvement and Relative Stability (2007-2014) – The Oil-Driven Economic Recovery Period- :

This phase marked the best improvement in the Economic Misery Index, as Algeria benefited from the oil boom to enhance its economic situation and reduce pressure on citizens. The index reached its first low point in 2009, with a rate of 19.09%, and its second in 2013, when it reached 13.07%.

These indicators reflect a period of gradual economic transition in Algeria, where the government made concerted efforts to stimulate growth through economic recovery programs and infrastructure development. However, these measures were not sufficient to ensure sustainable growth in per capita GDP due to the continued heavy reliance on the oil sector and the economy's

vulnerability to fluctuations in global oil prices, as well as the political and economic challenges that the region experienced during that period.

In 2008, per capita GDP declined slightly by -0.72%, partly attributable to the global financial crisis that erupted in late 2007 and continued to affect the global economy. Although oil prices remained stable that year, the financial crisis negatively impacted the Algerian economy through reduced demand for oil exports and slower foreign investment flows.

A similar scenario occurred in 2011, when the economy experienced a significant slowdown in per capita GDP growth, recording a growth rate of 0.38%. This slowdown was partially due to the effects of the "Arab Spring," which caused political and economic instability in several neighboring countries, alongside declining oil prices and continued reliance on the public sector, limiting opportunities for achieving sustainable economic growth.

In terms of the labor market, this phase was characterized by the adoption of several policies and measures aimed at boosting employment. These included the establishment of institutions dedicated to supporting entrepreneurship, such as the National Agency for the Management of Microcredit and the National Investment Development Agency in 2009, as well as the promotion of small and medium-sized enterprises. These initiatives helped improve labor market conditions and reduce unemployment rates to around 10% by 2010, positively impacting the decline in the Economic Misery Index, despite continued fluctuations in inflation rates.

Inflation followed an upward trajectory starting in 2006 and accelerated in 2009, despite a 3.1% reduction in the money supply in the same year. Domestic inflation gradually replaced imported inflation, whose impact on retail prices diminished, despite the global rise in agricultural commodity prices in the second half of that year. As was the case in 2008, food prices, particularly fresh agricultural products, were the main drivers of price index growth.

With the launch of the Supplementary Growth Support Program (2010-2014), the inflation rate declined by 2.5% compared to 2009, despite a 10.7% increase in the money supply during the same period. This monetary expansion can be attributed to the initiation of economic projects under the program and the continued government efforts to achieve high growth rates and reduce unemployment. However, this improvement was not sustainable due to the excessive reliance on imports and the public sector.

In 2012, inflation surged again as the prices of various categories of goods increased, particularly food products, which rose at more than twice the rate of industrial goods and services. This resulted in a new spike in the Economic

Misery Index. However, the index quickly declined in the following year, reaching its lowest recorded value of 13.07%.

This improvement was primarily driven by a sharp and significant decline in inflation rates, which aligned with the medium-term target set in this area, bringing inflation down to 3.25%. This was largely due to the slowdown in food price inflation, which fell to 3.18%. Given that food prices contribute 43.1% to the overall price index, their decline had a significant impact on inflation reduction.

Additionally, the Bank of Algeria increased the required reserve ratio from 9% to 11% in May 2012, which absorbed 23% of excess liquidity. This measure effectively reduced liquidity flows within the economy, contributing to the decrease in inflation and, consequently, the decline in the Economic Misery Index.

3. Phase Three: The Gradual Deterioration (2015-2019) – The Oil Crisis and Economic Recession- :

During this phase, Algeria experienced a gradual return to economic misery due to recession and the absence of proactive policies to protect the economy from oil price fluctuations.

In the early years of the period2015-2016(Initial Resilience), growth rates remained positive, ranging between 0.55% and 2.0%, driven by continued public spending and investment programs. Inflation and unemployment remained within manageable levels, despite early signs of declining oil prices in 2014. However, this temporary improvement did not last, as the oil price shock gradually led to a decline in public revenues, forcing the government to adopt austerity measures that slowed down economic activity.

By 2017, the per capita GDP growth rate began to decline, entering negative territory at -0.54% and further dropping to -0.94% by 2019. This downturn was primarily due to the sharp decline in oil prices, which fell to $60 per barrel in 2018, down from $112 per barrel in 2011. As a result, state revenues declined, prompting the government to reduce public spending, freeze employment, and halt several investment projects that had previously generated jobs. These factors negatively impacted domestic consumption, economic growth, and unemployment rates, exacerbating economic distress.

The heavy reliance on oil revenues, without tangible progress in economic diversification, left Algeria highly vulnerable to external shocks. Additionally, economic uncertainty was further aggravated by political unrest in 2019, which worsened economic misery levels.

This period can thus be divided into two sub-phases:

- The first sub-phase witnessed relative economic stability, with modest improvements in key indicators.
- The second sub-phase saw a significant economic downturn, highlighting the fragility of growth and the continued overdependence on the oil sector as the primary driver of the economy.

4. Phase Four: The Shock and Acute Crisis Period (2020–2023) – The COVID-19 Pandemic and Slow Recovery- :

This phase is considered the most challenging since the early 2000s, as the economy faced dual shocks (both internal and external) that affected all components of the misery index. These shocks had a negative impact on the economic misery index, which saw a significant increase, reaching 31.06% in 2020. The outbreak of the COVID-19 pandemic led to a slowdown in economic activity and a decline in global oil demand, which adversely affected public revenues. Additionally, lockdown measures and restrictions on economic activities placed considerable pressure on various productive and service sectors, leading to a sharp decline in the per capita GDP growth rate, which fell to -6.61%.

At the same time, economic shutdowns contributed to rising unemployment rates, while increasing global prices fueled inflation, exacerbating the economic challenges faced by citizens.

In the following years, the economic misery index witnessed a gradual improvement, declining to 26.58% in 2023. This improvement was driven by higher per capita GDP growth rates, alongside a gradual reduction in unemployment, despite inflation remaining at elevated levels. The recovery was directly linked to the easing of health restrictions, which facilitated the gradual restoration of economic activity, supported by rising oil prices, a rebound in global demand, and improved performance in non-oil sectors, particularly in agriculture and services.

Moreover, the continued momentum of economic recovery contributed to government support for certain productive sectors and stimulated domestic demand, in addition to the implementation of financial and economic reforms that enhanced overall economic performance. However, persistent challenges remain, most notably sustained inflation and global market fluctuations, which could affect the sustainability of this economic recovery.

IV. Examining the Impact of Fiscal and Monetary Policies on Hanke's Economic Misery Index in Algeria (2000–2023)

To assess the impact of fiscal and monetary policies on Hanke's Economic Misery Index (HMI) in Algeria over the period 2000–2023, a

dynamic macroeconomic model was employed, tailored to the study period and the nature of the Algerian economy. This model incorporates a set of variables derived from economic theory and previous empirical studies.

- Dependent Variable:
  - o Hanke's Economic Misery Index (HMI)
- Independent Variables:
  - o Fiscal Policy Indicators:
    - Government expenditure as a percentage of GDP (GE)
    - Budget balance as a percentage of GDP (BG)
  - o Monetary Policy Indicators:
    - Money supply as a percentage of GDP (MS)
    - Loans to the economy as a percentage of GDP (LE)
  - o Governance Efficiency:
    - Institutional Quality (IQ)

The relationship is expressed as follows:

$$HMI = \alpha + \beta_0 BS + \beta_1 GE + \beta_2 MS + \beta_3 LE + \beta_5 IQ + + \varepsilon_t \quad -$$

Where:

- α α‹β_0‹β_1‹β_2‹β_3‹β_4‹β_5 are the model parameters.

- ε_t represents the stochastic error term.

1. Testing the Stationarity of Variables

To determine the stationarity of the time series for the study variables, the Augmented Dickey-Fuller (ADF) test was employed. The results are presented in the following table:

Table 1: Stationarity Test of Variables Using the ADF Test

|	LEVEL			1st DIFFERENCE			Decision
	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept	None	
HMI	0.0710	0.3506	0.3118	0.1340	0.7085	0.0093	I(1)
BG	0.1149	0.1244	0.0107				I(0)
GE	0.2030	0.4340	0.7191	0.0009	0.0052	0.0000	I(1)
LE	0.4247	0.3274	0.8791	0.0042	0.0159	0.0004	I(1)
MS	0.0758	0.0021	0.9979	0.0027	0.0148	0.0000	I(1)
IQ	0.8469	0.0350	0.1935	0.0001	0.0008	0.0000	I(1)

Source: Eviews 12 Outputs

From the table, it is evident that the time series of the study variables achieved stationarity only after first-difference transformation, indicating that they are integrated of order one (I(1)), except for the budget balance variable, which was found to be stationary at level (I(0)). Based on these results, the Autoregressive Distributed Lag (ARDL) model can be applied.

2. Bounds Test for Cointegration

Prior to estimating the long-term relationship among the study variables, it is essential to identify the optimal lag length. This is determined by selecting the

lag structure that produces the minimum values according to established statistical criteria. The findings reveal that the optimal lag order for the variables is (2, 2, 1, 2, 2, 0).

Figure 1: Determination of the Optimal Lag Length for the Model
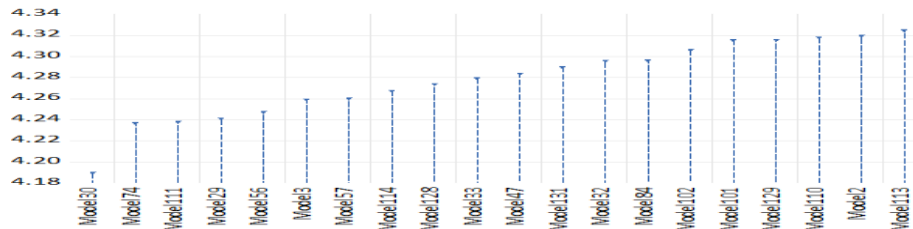
Source: Eviews 12 Outputs

To test for the existence of a long-term equilibrium relationship among the variables, the Bounds Test will be conducted by calculating the F-statistic and comparing it with the critical values provided by Pesaran et al. The table below presents the results of the Bounds Test:

Table 2: Bounds Test for Cointegration Among Model Variables

F-Bounds Test		Null Hypothesis: No levels relationship			
Test Statistic	Value	Signif.	I(0)	I(1)	
			Asymptotic: n=1000		
F-statistic	7.944057	10%	2.08	3	
k	5	5%	2.39	3.38	
		2.5%	2.7	3.73	
		1%	3.06	4.15	
Actual Sample Size	22		Finite Sample: n=35		
		10%	2.331	3.417	
		5%	2.804	4.013	
		1%	3.9	5.419	
			Finite Sample: n=30		
		10%	2.407	3.517	
		5%	2.91	4.193	
		1%	4.134	5.761	

Source: Eviews 12 Outputs

From the table above, it is evident that the calculated **F-Statistic (7.94)** exceeds the upper critical bound (**I1 Bound**) at all significance levels. Therefore, the null hypothesis of no cointegration is rejected in favor of the alternative hypothesis, confirming the existence of a long-run cointegration relationship among the variables.

3. Estimation of Short- and Long-Run Equilibrium Relationships:

The estimated model is only considered valid if it passes several economic and econometric tests to ensure its theoretical consistency and absence of econometric issues.

3.1. Economic Tests:

- The model exhibits strong explanatory power, as indicated by the coefficient of determination (R^2) = 0.937726, meaning that 93.77% of the variation in Hanke's Economic Misery Index (HMI) is explained by the

independent variables, while the remaining variation is attributed to factors not included in the model.

- In light of the results from the long-run and short-run equations of the estimated model, the error correction term **CointEq(-1)** is found to be statistically significant at the 5% level, with a negative sign (-2.160983). This result supports the existence of a long-term equilibrium relationship between the variables. Moreover, this coefficient reflects the speed of adjustment of the model in transitioning from short-run deviations to long-run equilibrium. Specifically, when the **Hanke's Misery Index** deviates from its long-run equilibrium value in period **t-1**, approximately **216.09%** of this deviation is corrected in period **t**.

- Economically, in terms of the partial elasticities of the variables on economic growth, the results were as follows:

   ✓ Regarding government expenditure (GE), it had a positive and statistically significant impact on Hanke's Misery Index in both the short and long run. The long-run partial elasticity of GE with respect to the Misery Index was 0.3033, meaning that a 1% increase in government expenditure led to a 30.33% increase in the Misery Index.This outcome can be attributed to the nature of government spending allocation, where a substantial portion was directed toward wages and social subsidies rather than productive investments. As a result, the positive impact of government expenditure on economic growth remained limited, keeping per capita GDP at relatively low levels.Furthermore, the expansion of government spending crowded out private sector access to financing and investment. The unsustainable reliance on oil revenues made government finances vulnerable to external shocks, often forcing the government to borrow domestically to cover fiscal deficits. This, in turn, led to higher interest rates, reducing the ability of private firms to borrow and invest.Additionally, increased public spending combined with tax reductions created excess aggregate demand, which inevitably led to a higher reliance on imports and additional inflationary pressures. These inflationary effects were further exacerbated by rising nominal wage demands from workers, which pushed up operational and production costs. However, since this increase in spending did not translate into higher employment levels, unemployment rates remained elevated, contradicting the Phillips curve and leading to the coexistence of high inflation and high unemployment.Moreover, financial corruption and misallocation of resources resulted in wasteful government spending, reducing its

efficiency and making it more susceptible to the cyclical nature of fiscal policies. Consequently, this weakened the government's ability to achieve sustainable economic stability and improve individual welfare by lowering the Misery Index

✓ egarding the budget balance (BG), it had a positive and statistically significant impact on Hanke's Misery Index in both the short and long run. The long-run partial elasticity of BG with respect to the Misery Index was 0.2891, meaning that a 1% change in the budget balance led to a 28.91% increase in the Misery Index.This outcome is attributed to financial constraints and weak fiscal deficit management. The nature of deficit financing and the inability to control and sustainably reduce it—whether due to rising public spending or weak domestic revenues—resulted in inflationary pressures and limited economic growth.Although most of Algeria's budget deficit was financed between 2005 and early 2006 through withdrawals from the Revenue Regulation Fund, and in 2007 partially through bond borrowing—which is a non-inflationary financing method—the deficit was also financed through external sources, including withdrawals from foreign reserves and external investments. This approach reduced money supply growth, thereby limiting inflationary pressures.However, starting in 2017, the government resorted to monetary financing (money creation), which led to a decline in purchasing power, increased inflationary pressures, and reduced the effectiveness of monetary policy in controlling inflation. As a result, this approach destabilized financial conditions and constrained long-term economic growth, ultimately preventing a reduction in the Misery Index.

✓ There is a positive and statistically significant long-run impact of money supply growth on Hanke's Misery Index, with a long-run partial elasticity of 0.2598. This implies that a 1% increase in the money supply growth rate leads to a 25.98% increase in the Misery Index.In the short run, the coefficient is positive and significant in the current period (t) but negative in period (t-1). This suggests that monetary policy is neither sustainable nor well-defined. While it has a positive effect in the short run, this effect becomes negative in the long run.This pattern is primarily due to uncontrolled monetary expansion and the reliance of monetary policy on deficit financing through money creation. Although this approach may provide temporary relief, it eventually leads to higher price levels, eroding purchasing power, and

negatively affecting overall economic welfare, thereby increasing the Misery Index.These findings highlight the need for a reassessment of monetary policy implementation and its instruments to ensure long-term economic stability and inflation control.

✓ The negative impact of loans granted to the economy on the economic misery index is statistically insignificant in the long run but significant in the short run. This indicates the ineffectiveness of these loans in supporting growth, reducing unemployment, and consequently lowering the economic misery index, despite their continuous increase and growing share of the money supply. Additionally, these loans are not being allocated to productive, revenue-generating sectors.This negative effect can be attributed to several factors:**Concentration of Loans in Non-Productive Sectors**: Loans have primarily been directed toward non-productive sectors such as real estate and consumption, rather than investment in industry, agriculture, or technology. This limits their impact on economic growth.**Dominance of Public Banks and Lack of Competition**: The public banking sector's dominance in loan distribution, coupled with the absence of competition, has led to inefficient financial resource allocation. Loans have often been directed toward state-owned enterprises regardless of their economic viability, due to non-economic considerations.**Weak Business and Investment Environment**: Even when loans are available, the absence of an attractive investment environment—characterized by a lack of economic and legislative reforms—prevents these loans from generating a positive impact on growth.

✓ The impact of the Institutional Quality Index on the Economic Misery Index is positive but statistically insignificant. The weak statistical significance suggests that institutional quality has not had a direct or meaningful effect on individual well-being. This can be attributed to the low level of institutional quality in Algeria.According to the World Bank's Worldwide Governance Indicators (WGI) report, Algeria ranks low in governance standards, particularly in terms of control of corruption and accountability. This translates into inefficient resource allocation and economic distortions that hinder effective coordination between fiscal and monetary policies, rendering monetary policy merely an auxiliary tool lacking clarity.As a result, the state loses its ability to manage the economy efficiently, limiting its capacity to achieve high growth rates, reduce unemployment, control inflation,

and ultimately lower the Economic Misery Index while improving individual well-being.

3.2. Econometric Tests

To ensure the model's quality, as well as the validity of the estimated parameters and results, a set of econometric tests is conducted to assess the model's reliability.

- **Stability Test**: The results of the two stability tests presented in Appendix 3 indicate that both the cumulative sum of residuals (CUSUM) and the cumulative sum of squares (CUSUMSQ) remain within the 5% confidence bounds. This confirms the model's stability over time and its ability to accurately represent the relationship between the variables. It also implies that the short-term error correction results can be relied upon to achieve long-term equilibrium, validating the suitability of the model's linear specification at a 5% significance level.

- **Normality Test (Jarque-Bera Test)**: As shown in Appendix 3, the test probability is 0.91, which exceeds 0.05. This indicates acceptance of the null hypothesis, confirming that the residuals follow a normal distribution.

- **Autocorrelation Test (Breusch-Godfrey Test)**: According to Appendix 3, the probability of the Lagrange Multiplier (LM) statistic is 0.27, which is greater than 0.05. This supports the acceptance of the null hypothesis, indicating the absence of autocorrelation in the residuals.

- **Heteroskedasticity Test (ARCH Test)**: One of the key tests used to detect the issue of heteroskedasticity is the ARCH test. As shown in Appendix 3, the test probability is 0.42, which is greater than 0.05. This indicates acceptance of the null hypothesis, confirming that the variance of the residuals is homoscedastic (constant over time).

III. Conclusion

This study aimed to analyze the interaction between fiscal and monetary policies and its impact on individual well-being in Algeria during the period 2000–2023. It assessed the effects of variables such as government spending, budget balance, money supply growth, loans granted to the economy, and institutional quality on Hanke's Economic Misery Index. The analysis employed the Autoregressive Distributed Lag (ARDL) model to examine both short- and long-term relationships among these variables.

The study yielded the following findings:

- The evolution of Algeria's Economic Misery Index (2000–2023) indicates that the economy has remained highly dependent on oil price fluctuations and external crises. Unbalanced economic policies have led to periods of

temporary improvement, followed by sharp declines that directly affected the components of the Economic Misery Index. This has made the index highly vulnerable to future fluctuations, especially if the rentier economic policies persist ;

- The econometric study confirmed the existence of a long-term equilibrium relationship between the examined economic variables and the misery index. The findings indicate that fiscal policy variables had a positive and significant impact on the economic misery index. Directing public spending toward wages and social subsidies instead of productive investments contributed to rising inflation without stimulating economic growth. Additionally, persistent fiscal deficits, particularly when financed through monetary expansion, exacerbated inflationary pressures and undermined financial stability , **These results contradicts the first hypothesis, indicating its invalidity**. Similarly, monetary policy variables did not yield different results. While money supply growth had a negative short-term effect, it turned positive in the long run due to the unsustainability of monetary policy, leading to price increases and a decline in purchasing power. Moreover, credit extended to the economy did not have a significant long-term impact, reflecting its weak allocation toward productive sectors and its limited effect on reducing unemployment and fostering growth, **These results contradicts the second hypothesis, indicating its invalidity**.Furthermore, the institutional quality index did not exhibit a significant effect on the economic misery index **Which contradicts the third hypothesis, indicating its invalidity**, highlighting weak economic governance and the adverse influence of corruption and misallocation of resources on the efficiency of economic policies.

Based on these findings, reducing the economic misery index in Algeria requires the adoption of more balanced and effective economic policies. In this context, we propose a set of recommendations:

1. **Enhancing coordination between fiscal and monetary policies**: A balance should be maintained between public spending and financial sustainability, with a reduction in reliance on oil revenues and a redirection of expenditures toward productive sectors rather than current consumption. Additionally, monetary policy should limit unregulated monetary expansion and control liquidity levels to ensure price stability ;

2. **Structural labor market reform**: Reducing unemployment rates requires strategies to support high-employment-generating sectors such as

industry, agriculture, and technology. Moreover, fostering entrepreneurship and investing in human capital should be prioritized ;

3. **Improving the efficiency of credit allocation to the economic sector**: Loan-granting mechanisms should be reassessed to ensure that credit is directed toward value-added productive projects. Additionally, the business environment should be improved, and competition within the banking sector should be enhanced to optimize financial resource allocation ;

4. **Enhancing the quality of economic institutions**: Economic governance reforms and increased transparency in managing public resources are essential factors for ensuring financial sustainability and achieving long-term economic stability ;

5. **Shifting toward a more diversified economic model**: Reducing dependence on the oil sector is a strategic necessity, which can be achieved by developing non-oil sectors and strengthening the role of the private sector in fostering sustainable economic growth.

In light of these recommendations, adopting a more integrated and comprehensive economic approach—combining fiscal and monetary policy tools with structural reforms—is essential for improving economic stability in Algeria and reducing the misery index, ultimately ensuring sustainable welfare for individuals and society.

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V. Annexes

Appendix 01: Long-Run Relationship Test

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BG	0.289132	0.082837	3.490384	0.0101
GE	0.303359	0.086232	3.517938	0.0098
MS	0.259843	0.086617	2.999899	0.0199
LE	0.467360	0.300920	1.553106	0.1643
IQ	-0.082777	0.100132	-0.826678	0.4357
C	28.07908	19.01925	2.671195	0.0183

EC = HMI - (0.2891*BG + 0.3034*GE + 0.2598*MS -0.4674*LE + 0.0828*IQ + 28.0791)

Appendix 02: Short-Run Relationship Test

ARDL Error Correction Regression
Dependent Variable: D(HMI)
Selected Model: ARDL(2, 2, 1, 2, 2, 0)
Case 2: Restricted Constant and No Trend
Date: 02/06/25 Time: 21:21
Sample: 2000 2023
Included observations: 22

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HMI(-1))	0.608042	0.125236	4.855165	0.0018
D(BG)	0.311564	0.062870	5.019339	0.0015
D(BG(-1))	0.111429	0.057746	1.929631	0.0950
D(GE)	0.973142	0.134875	7.215131	0.0002
D(MS)	0.355629	0.066905	5.315661	0.0011
D(MS(-1))	-0.261805	0.063826	-4.101830	0.0046
D(LE)	2.742238	0.43307	6.328970	0.0004
D(LE(-1))	0.555542	0.424014	2.753563	0.0589
CointEq(-1)*	-2.160683	0.212647	-10.16232	0.0000

R-squared	0.937726	Mean dependent var		-0.583902
Adjusted R-squared	0.898403	S.D. dependent var		4.077093
S.E. of regression	1.299135	Akaike info criterion		3.640104
Sum squared resid	21.73856	Schwarz criterion		4.050440
Log likelihood	-31.08519	Hannan-Quinn criter.		3.740247
Durbin-Watson stat	2.863666			

* p-value incompatible with t-Bounds distribution.

B: Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:
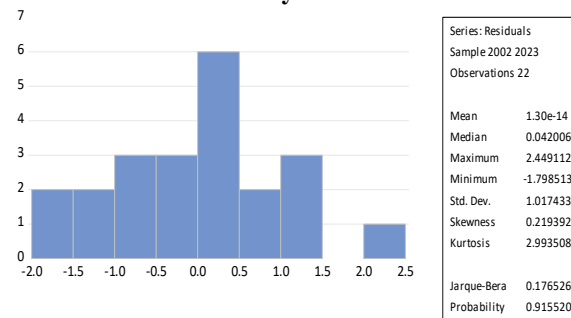Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.602196	Prob. F(2,7)	0.5737
Obs*R-squared	3.229568	Prob. Chi-Square(2)	0.1989

C: Homoscedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	0.651383	Prob. F(1,19)	0.4296
Obs*R-squared	0.696086	Prob. Chi-Square(1)	0.4041

A: Normality Test

Series: Residuals	
Sample 2002 2023	
Observations 22	
Mean	1.30e-14
Median	0.042006
Maximum	2.449112
Minimum	-1.798513
Std. Dev.	1.017433
Skewness	0.219392
Kurtosis	2.993508
Jarque-Bera	0.176526
Probability	0.915520

D: Structural Stability Test

CUSUM of Squares — 5% Significance

CUSUM — 5% Significance