

Analysis of the economic impact of wage expansion in Algeria: An empirical approach

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Abstract ;

The evolution of wages plays a crucial role in the economic dynamics of a country, influencing household consumption, business investment, and macroeconomic aggregates. In Algeria, where wage policies aim for social stability and wealth redistribution, wage expansion is of major importance. The new policy for 2023-2024 foresees significant increases, reaching up to 53% by 2027, with an initial target of 47% in 2024. This article empirically examines the economic impacts of these increases using the social accounting matrix (SAM) multiplier model. The results indicate that this policy will not be effective without a prior revitalization of Algeria's productive apparatus and the accompaniment of this policy by balanced economic measures aimed at stabilizing inflation and reducing wage disparities.

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1. Introduction

The Algerian economy is in constant evolution, marked by reforms and ambitious policies aimed at stimulating growth and improving the well-being of the population. Among these policies, salary expansion holds a central place due to its direct implications on purchasing power, domestic consumption, and social cohesion. The recent salary adjustments, characterized by significant increases planned until 2027, raise particular interest and questions about their real impact on the national economy. Indeed, salary policies, while crucial for ensuring equity and enhancing productivity, are also at the heart of economic and social debates. In Algeria, the salary increases decided by the public authorities between 2010 and 2011 initiated a new dynamic. The ambitious salary policy for 2023-2024 plans significant salary increases, gradually reaching 53% by 2027, with an initial target of 47% in 2024. This policy aims to support workers, reduce wage inequalities, and stimulate the economy (Algerie360, 2024; Algérie Focus, 2024). However, the impact of these measures on the economy remains to be determined, necessitating an in-depth empirical analysis. This article aims to analyze the economic impacts of recent salary increases in Algeria by adopting an empirical approach based on the social accounting matrix (SAM) multiplier model for the year 2021. This robust analytical tool allows for the evaluation of the effects of salary policy changes. We seek to examine how variations in salaries affect not only households and workers but also the economy as a whole, by assessing the repercussions on domestic demand, income distribution, and national production.

To achieve this objective, our article is organized as follows: the first section presents the main salary theories. The second section explains the foundations of salary policy in Algeria since 1990. The third section provides a quantified overview of salary evolution in Algeria, to understand the dynamics of their distribution over the past two decades. The fourth section focuses on empirical analysis, presenting the 2021 SAM multiplier model for Algeria, followed by empirical simulation and the main results. Finally, the conclusion summarizes the key findings and makes recommendations.

2. Theoretical foundations of wage design

Several salary theories attempt to explain the mechanisms of wage formation and evolution. Each theory highlights specific factors influencing wage levels, ranging from market forces to social and economic institutions. Here, we will briefly present those that are widely disseminated in the literature.

2.1 Market wage theory

The market wage theory provides a crucial theoretical framework for explaining the determination of wages in a market economy. It has evolved through contributions from classical and neoclassical economists. The classical economists, such as Adam Smith, David Ricardo, and Thomas Malthus, argue that wages are dictated by the interaction between the labor supply of workers and the labor demand of businesses. Wages adjust to balance these two forces in the market. Smith introduced the concept of the natural wage, sufficient for workers to meet their essential needs, while Ricardo developed the subsistence wage theory, suggesting that wages gravitate towards a subsistence level in the long run.

Neoclassical economists, like Alfred Marshall and John Bates Clark, refined these ideas by introducing the marginal productivity of labor. According to them, wages correspond to the additional contribution of the last worker hired to the total production. In other words, workers are paid based on their marginal contribution to production, thereby linking wages to productivity and economic efficiency.

2.2 Institutional wage theory

The institutional wage theory posits that wages and working conditions are not solely determined by market forces, but also by a set of rules, norms, and institutions that regulate the labor market. Authors such as John Dunlop and Richard Freeman have significantly contributed to this theory. Dunlop examined how industrial relations systems influence wages and working conditions, while Freeman studied the impact of unions on wages and employment. This perspective highlights the importance of institutional structures in wage formation and suggests that institutional interventions may be necessary to ensure fair remuneration and just working conditions (Dunlop, 1958; Freeman, 1980). The institutional wage theory thus fits into a broader framework of labor economics, where market dynamics are complemented by institutional factors. Interventions such as public policies, government regulations, and collective agreements play a crucial role in determining wages and working conditions. Moreover, this theory explores the interactions between employers, workers, and institutions, emphasizing that these relationships are essential for understanding the functioning of the labor market.

2.3 Efficiency wage theory

The efficiency wage theory provides a relevant framework for understanding why some companies choose to pay wages above the market rate. The work of Shapiro, Stiglitz, and Akerlof has laid the foundation for this theory, highlighting the importance of employee

motivation and the reduction of opportunistic behavior. Shapiro and Stiglitz (1984) introduced the idea that higher wages can boost productivity by increasing the opportunity cost of job loss for workers, thereby encouraging them to be more productive and loyal to their employer. Akerlof (1982) also emphasized that higher wages can improve job satisfaction, motivation, and employee morale, leading to increased productivity. This strategy allows companies to attract and retain more qualified employees while reducing problems related to information asymmetries where employees may conceal their true skills or intentions.

2.4 Wage hierarchy theory

The wage hierarchy theory is based on the idea that salaries within organizations are structured according to a hierarchy based on the complexity, responsibilities, and skills required for each position. According to this theory, jobs are evaluated and classified based on their relative value, which allows for the establishment of fair and transparent pay scales. This hierarchy aims to ensure internal equity by aligning compensation with responsibilities and skills while maintaining external competitiveness in relation to the labor market. By encouraging internal progression and offering appropriate incentives, the wage hierarchy seeks to motivate employees, improve their performance, and ensure wage justice within the organization (Lawler, 1971; Milkovich and Newman, 1987).

2.5 Expectancy theory

Victor Vroom's expectancy theory, developed in 1964, proposes that employee motivation is influenced by their perception of the relationship between effort, performance, and reward. According to this theory, individuals are motivated to invest effort in their work if they believe that their efforts will lead to high performance (expectancy), that this performance will be followed by appropriate rewards (instrumentality), and that these rewards are desirable (valence). Applied to salary structures, this theory suggests that effective compensation systems must establish a clear link between performance and rewards, with attractive incentives to motivate employees (Vroom, 1964).

3. Foundations of Wage Policy in Algeria Since 1990

Since its independence, Algeria has adopted three types of wage policies corresponding to three distinct phases. The first phase, implemented during the early post-independence years (1962-1974), was characterized by the reproduction of the remuneration system in place before independence. The second phase, covering the period from 1974 to 1990, was marked by the adoption of a socialist-oriented wage policy, explicitly defined in the general

status of workers (GSW). The third phase began with the questioning of the GSW through the promulgation of Law 90-11 on April 21, 1990, introducing a new wage policy that remains unfinished to this day. For the purposes of our study, we will limit ourselves to a brief presentation of the wage policy initiated in 1990, following the liberalization of labor relations within the framework of market economy reforms. The wage policies of the first two phases have been extensively developed, among others, by Boutaleb K. (2013) and Akkache F. (2021).

3.1 Main orientations of Law 90-11 of April 21, 1990

The promulgation of Law 90-11 on April 21, 1990, marked the transition from a rigid and centralized wage policy under the General Status of Workers (GSW) to a decentralized and flexible wage policy based on collective bargaining and the liberalization of labor relations. This liberalization is manifested by the introduction of a performance-based remuneration system, complementing the time-based and/or quantity-based wage system, in accordance with Article 83 of Law 90-11. In this new conception, the general wage policy falls under the exclusive competence of the parties involved in collective bargaining, who have great freedom and flexibility to determine job classifications, the corresponding index points for each position, as well as the values of the index points and the corresponding minimum base salaries, as stipulated in Article 153 of Law 90-11. The indemnity regime is also subject to negotiations, both in terms of amount and the modalities of granting. This includes allowances related to seniority, overtime, or working conditions, including zone allowances and bonuses linked to productivity and work results. The professional classification and the minimum base salaries alone can establish a wage grid, from which the base salaries corresponding to each job position are derived. According to Boutaleb K. and Boutaleb O. (2022, p. 627), each employer must have their own salary grid, adapted to the job classification within the organization. Thus, the same position can be classified and remunerated differently from one company to another.

However, it is important to emphasize that despite the freedom of social partners to set wages, this freedom is constrained by the obligation to respect the guaranteed minimum wage (GMW)¹. The establishment of this minimum wage remains a government prerogative, following consultation with social partners, taking into account productivity trends, the price index, and the general economic situation. In other words, the lowest salary provided by the wage grid must not be lower than the GMW. We will later examine the

¹ The guaranteed minimum wage (GMW) is set by public authorities through a decree. As defined by Article 84 of Law 90-11, it includes the base salary, allowances, and bonuses of all kinds, with the exception of allowances paid as reimbursement for expenses incurred by the worker.

evolution of the nominal and real amounts of the GMW to understand its impact on consumer purchasing power.

3.2 The reforms introduced in 2007

In 2007, a presidential decree published in the Official Journal on September 29 introduced a new approach to salary determination. This reform aimed to codify labor relations in a more flexible manner, tailored to the new economic realities (JORA, 2007). Article 2 of this law describes the creation of a salary scale, which includes various groups, categories, subcategories, minimum indices, grades, and corresponding indices related to the advancement of civil servants within their ranks. The groups, categories, subcategories, minimum indices, grades, and corresponding indices are set according to a predefined order. The first criterion considered in this scale is qualification, which led to a significant evolution in the careers of civil servants. With this new salary scale, the wages of some civil servants nearly doubled. However, some lost their classification due to their qualifications but retained and even saw their salaries increase.

In the years 2022, 2023, and 2024, reforms continued to follow the same logic of revision and adaptation to new economic realities. These adjustments included a progressive salary revaluation and a restructuring of categories and indices to better reflect the qualifications and responsibilities of civil servants.

3.3 The reforms introduced starting in 2022

In 2022, new adjustments were introduced to the salary scale and the remuneration system for civil servants, as published in the Official Journal N° 23 dated April 6. This new salary scale now ranges from 1 to 17 categories, compared to the previous range of 1 to 53 categories. Additionally, there are 7 positions for senior executives outside these categories. It was also decided to increase the base index point used for salary calculations from 45 Algerian dinars to 65 dinars. Simultaneously, a reduction in the global income tax (GIT) was implemented. The increase in the index point naturally varies from one civil servant to another, depending on their current salary and grade (JORA, 2022).

Regarding the reduction of the GIT, the Finance Law for the year 2022 proposes a complete overhaul of the tax scale to reduce the fiscal pressure on household incomes. Adjustments have been made to income brackets and corresponding tax rates (Ministère des Finances, 2022).

The adjustments introduced to the salary scale and the remuneration system for civil servants in 2022 were complemented and reinforced by four presidential decrees concerning

the salary scales for 2023 and 2024, published in the Official Journal N°3 dated January 16, 2023. These decrees revalue the salaries and wages of civil servants, set the remuneration terms for contract agents, and outline the conditions for granting index bonuses to senior position holders in public institutions and administrations. The text even confirms the planned increases for 2024 (JORA, 2023).

Presidential Decree N° 23-54 amends Presidential Decree N° 07-304 of September 29, 2007, which established the salary scale and remuneration system for civil servants. It details, through tables, the modifications to the salary scale for the years 2023 and 2024, based on the category of the civil servant, the group to which they belong, and the echelon index. The new scale revalues the minimum index and echelon indices according to categories, with an initial increase in 2023 and a second in 2024. For example, the minimum index for a category 11 civil servant increases from 623 index points as of January 1, 2023, to 698 index points as of January 1, 2024.

Presidential Decree N° 23-56 amends Presidential Decree N° 07-308 of September 29, 2007, which sets the recruitment modalities for contractual agents, their rights and obligations, the components of their remuneration, the rules relating to their management, as well as the disciplinary regime applicable to them. It revises upward the salary indices for contractual agents and workers employed in public structures. For instance, a worker or agent classified in category 1 sees their index increase to 325 in 2023 and to 400 in 2024, while an agent classified in category 7 sees their index rise to 473 in 2023 and to 548 in 2024.

Presidential Decree N° 23-55, which sets the modalities for granting the index-based bonus to holders of senior positions in public institutions and administrations, modifies the index-based bonus tables according to categories and sections as of January 1, 2023, and January 1, 2024.

Presidential Decree N° 23-57 amends executive Decree N° 90-228 of July 25, 1990, which establishes the remuneration method applicable to workers holding senior state positions. This decree includes tables that explain the evolution of the index-based bonus according to the category of the holder of the senior position and the base index to which they belong. According to Article 3 of this decree, the holder of a senior state position is reclassified in the scales provided for in Articles 1 and 2 in the same categories, sections, and grades they held on the respective effective date of these scales.

The salary revaluations for 2022, 2023, and 2024, affecting 2.8 million civil servants, will result in a cumulative salary increase of 47% over these three years. This increment will reach 53% by 2026 and 2027.

4. The Dynamics of salary evolution in Algeria

We will now attempt to provide a quantified overview of salary evolution in Algeria, based on the availability of data, to understand the dynamics of salary distribution over the past two decades. Firstly, we will present the evolution of net salaries by legal sector, by legal sector and qualification, as well as by activity sector and legal sector. We will then discuss the evolution of the Guaranteed Minimum Wage (GMW) to understand the purchasing power of consumers.

4.1 Analysis of the evolution of net wages in Algeria by legal sector, qualification, and activity

It is important to note that the Office for National Statistics (ONS) has conducted annual salary surveys among Algerian companies, whether public or private. These surveys aim to determine the level of net salaries by qualification, by sector of activity, and by legal sector, as well as the structure of gross salary (base salary and bonuses-allowances). The distribution of salaries in the informal sector has not been taken into account, which does not allow for an appreciation of the disparities. The results of the last published survey date back to 2021. Table N°1 presents the evolution of average net salaries in Algeria, differentiated by legal sector (public and private) over the period from 2009 to 2021. This analysis highlights the salary disparities and the trends in remuneration increases in the two legal sectors.

Table 1. Evolution of average net salaries by legal sector (in DZD)

Year	2009	2011	2013	2015	2018	2019	2020	2021
Public	35676	41192	50954	54743	57324	58400	59273	60136
Private	20137	23879	29240	32078	33389	34100	34412	34857
Overall	25049	29352	36104	39242	40955	41800	42271	42848

Source: Annual surveys on wages by the national office of statistics (ONS) (2009-2021)

The evolution of net average salaries in Algeria from 2009 to 2021 shows a significant increase in wages across all legal sectors, although the growth rate slowed down starting in 2014. The progression of salaries was more pronounced in the early years (2009-2013), with a 17.2% increase between 2009 and 2011, reaching 23% between 2011 and 2013. This period was followed by stabilization, with an 8.7% increase between 2013 and 2015, and

more moderate growth thereafter: a 4.4% increase between 2015 and 2018 and a 4.6% increase between 2018 and 2020.

By legal sector, wages in the public sector were consistently higher than those in the private sector throughout the studied period. The wage gap between the two sectors persisted, with public sector salaries being on average about 70% higher than private sector salaries throughout the decade. This wage gap peaked at 77.16% in 2009, then slightly decreased, reaching 72.50% in 2011, 70.65% in 2015, and registering a negligible rise in 2018 to reach 72% in 2021. The wage disparities between the public and private sectors remain significant, although both sectors experienced improvements in their average salaries, with the public sector seeing more regular and faster growth compared to the private sector.

Table N °2 presents a comparative analysis of the evolution of net average salaries by qualification and legal sector in Algeria, covering the years 2009 to 2021. This analysis highlights salary trends for three categories of qualifications: executives, supervisory staff, and operational staff, in both the public and private sectors.

Table 2. Evolution of net average salaries by qualification and legal sector

Year \ Qualification	Executives		Supervisory staff		Operational staff	
	Public	Private	Public	Private	Public	Private
2009	55487	41978	39245	21126	23822	16487
2011	62857	47856	44491	26563	28637	19402
2013	77798	58046	55403	31108	35156	24259
2015	83372	69631	60389	35656	37285	25249
2018	87571	72657	63070	37550	39026	26105
2019	88594	73685	640901	26927	40067	26927
2020	89894	74415	65359	38252	40567	27129
2021	90946	75151	66373	38741	41239	27516

Source: Annual surveys on wages by the national office of statistics (ONS) (2009-2021)

The evolution of net average salaries in Algeria between 2009 and 2021, as indicated in Table 2, shows a general and significant improvement in remuneration for all qualifications across all legal sectors. However, salary increases are more pronounced for executives and supervisory staff compared to operational staff.

The public sector continues to offer higher salaries, but the private sector is catching up, especially for executives and supervisory staff. The private sector shows faster salary growth, particularly for executives, with an increase of 78.9% from 2009 to 2021 compared to 63.9% for the public sector, and for supervisory staff, with a growth of 83.5% from 2009 to 2021 compared to 69.1% for the public sector.

The gap between executive salaries in the public and private sectors has significantly narrowed from 32% in 2009 to 21% in 2021. Conversely, for operational staff, the salary gap between the public and private sectors has increased during the same period, from 44.48% in 2009 to 49.87% in 2021. This can be attributed to a faster increase in the average salaries of operational staff in the public sector, reaching 73.1% compared to 66.9% for the private sector. These trends suggest a changing labor market, with a growing appreciation for skills and high qualifications in both the public and private sectors.

Table N° 3 presents the evolution of net average salaries by branch of activity, differentiated by legal sector over the period from 2015 to 2021. This analysis highlights the wage disparities between the two legal sectors, as well as the salary growth trends in various branches of activity in Algeria.

Table 3. Evolution of average net salaries by industry branch and legal sector

Branch \ Year	2015		2018		2021	
	Public	Private	Public	Private	Public	Private
Extractive Industry	101293	25 736	107030	26432	112 696	27 119
Manufacturing Industry	47 220	32 327	48930	34072	51 229	35 428
Construction	35 137	28 974	36954	29997	38 826	31 359
Trade and Repair	47 138	42 127	49957	43619	51 826	45 576
Hotel and Restaurant	34 136	32 002	35867	33763	36 921	35 548
Transport and communication	56 284	35 698	58566	37958	61 214	39 559
Financial Activities	56 311	73 246	57271	75098	60 096	76 089
Real Estate, Business Services	41 381	27 456	44 462	28 406	46 948	29 987

Source: Annual surveys on wages by the national office of statistics (ONS)(2015-2021)

According to Table N° 3, net average salaries in Algeria have generally increased between 2015 and 2021, but this increase is accompanied by significant disparities between sectors of activity as well as between the public and private sectors. The examination of average monthly salaries by major branches of activity reveals considerable gaps. Extractive industries and financial activities report the highest salaries, while the construction, real estate, and business services sectors record the lowest average salaries.

Another notable disparity is found between the public and private sectors, where public sector salaries are generally higher, except in financial activities. In this sector, private salaries exceed those of the public sector by 30% in 2015, 31% in 2018, and 26.61% in 2021. According to Boutaleb K and Boutaleb O (2022), this gap is explained by the presence of foreign private banks in Algeria, offering more generous remuneration systems. Other sectors show a higher average salary in the public sector compared to the private sector. The extractive industries, dominated by hydrocarbons, present one of the largest salary gaps between the public and private sectors, highlighting the importance of the public

sector. In this sector, the average salary is four times higher in the public sector than in the private sector. This gap is significant regardless of the level of employee qualification. For example, executives in the public sector of extractive industries earn an average salary approximately three times higher than in the private sector, and the net average salary of supervisory and operational staff in the public sector is also three times higher than in the private sector. These salary disparities concern not only companies with different legal statuses but also various sectors of activity.

4.2 Analysis of the Evolution of the nominal and real guaranteed minimum wage GMW in Algeria

Since 2001, the Algerian public authorities have undertaken periodic revisions of the GMW, with significant nominal increases. Table 4 presents the evolution of the GMW from 1990 to 2020, in nominal and real terms, as well as the Consumer Price Index (CPI). This analysis highlights the impact of inflation on workers' purchasing power.

Table 4. Evolution of the nominal and real guaranteed minimum wage (GMW) in Algeria (1990-2020)

Year	1990	2001	2004	2007	2010	2012	2020
Nominal GMW (DZD)	1000	8000	10000	12000	15000	18000	20000
CPI	120,2	557,6	109,95	118,24	136,23	155,05	225,5
real GMW	832	1435	9095	10149	11011	11609	8869

Source: Benhabib L., (2021), p. 156.

Analysis of the evolution of the minimum guaranteed salary (GMW), presented in the table above, shows a regular nominal increase in the minimum wage. It rose from 1,000 DZD in 1990 to 20,000 DZD in 2020, with an average increase of about 2,000 DZD at each revaluation. Although this increase might seem significant in nominal terms, persistent inflation, as indicated by the consumer price index (CPI), which increased from 120.2 in 1990 to 225.5 in 2020, has eroded the real purchasing power of workers. By adjusting the nominal SNMG to account for inflation, the real GMW fluctuated, rising from 832 DZD in 1990 to a peak of 11,609 DZD in 2012, before declining to 8,869 DZD in 2020. This significant drop in the real GMW in 2020, despite a nominal increase, highlights the negative impact of inflation, which has nullified the perceived gains from the GMW raise. This situation underscores the urgency for more robust wage policies and inflation control measures to genuinely improve the well-being of workers in Algeria.

5. The empirical approach

The primary aim of this section is to quantify the economic impacts of recent salary increases in Algeria, employing an empirical approach based on the 2021 SAM multipliers model. This model was selected due to its ability to provide a comprehensive representation of the economy by integrating the interactions between production, income generation, and its utilization. It allows for the consideration of both direct and indirect effects of any exogenous injection or policy change. Through this approach, we seek to understand how salary variations affect not only the workforce but also the economy as a whole, by evaluating the repercussions on national production, domestic demand, and income distribution.

5.1 Presentation of the social accounting matrices and modeling methodology

The first step in establishing a multiplier model (SAM) is the design of an SAM for the considered economy. The SAM is a matrix representation of the national accounting system that elaborates on the interrelations between various institutional units and economic sectors. It allows for the analysis of interactions between different components of an economy by reproducing all flows within an economy over a given period, usually a year. According to Decaluwé, Martens, and Savard (2001), the SAM offers a systematic and coherent presentation of transactions occurring in a determined economy, while providing economic policy makers with the accounting basis of an analytical framework to guide their strategic decisions.

An SAM for an open economy generally comprises five types of aggregated accounts: activity accounts, product accounts, production factor accounts, domestic institutional accounts (households, businesses, government), and foreign accounts (rest of the world), as well as a joint savings-investment account for all institutions. However, the level of disaggregation of these accounts varies according to the study's requirements and data availability. In this regard, we developed an SAM for the Algerian economy for the base year 2021, suitable for analyzing the impacts of macroeconomic shocks and policies, in accordance with the methodology of Fofana (2007). It includes forty-six accounts divided into nineteen production activity accounts, nineteen corresponding product accounts, two production factors (capital and labor), four institutional accounts (households and individual businesses, financial and non-financial enterprises, the government, and the rest of the world), one account for trade margins, and finally, one account for capital accumulation. Filling out this SAM specifically required the input-output table (IOT) estimates and the overall economic table (OET) published by the Office for National Statistics (ONS) for the year 2021. Information regarding production, exchange, and consumption of goods and

services, as well as the distribution of factor incomes, primarily came from the IOT. Inter-institutional transfers and savings are recorded in the OET. The 2021 SAM is converted into a multiplier model, following the methodology of Defourny and Thorbecke (1984) and Breisinger, Thomas, and Thurlow (2009). We partitioned the MCS into endogenous accounts ; activities/products, production factors, and domestic institutions (households, businesses, government) and exogenous accounts; rest of the world, government, and capital which are grouped into a single account represented by a vector. Thus, the initially forty-six accounts of the MCS are restructured into forty-one endogenous accounts consisting of three groups (activities/products), factors, institutions, and one exogenous account representing the injection vector.

Next, we transformed the endogenous part of the matrix into the corresponding average expenditure propensities matrix (A) of order (41x41), by dividing each element of the endogenous accounts matrix by the total of its column. The resulting technical coefficients are structural coefficients, generally non-negative and less than unity. The obtained technical coefficients matrix (A) indicates the proportion of each column account's expenditure on the row account, revealing the expenditure structure of all endogenous column accounts.

The balance between total resources and expenditures maintained by each SAM account allows the economy to be represented by a linear model expressed in matrix form as follows:

$$Y = A y + E \quad \begin{matrix} (k \times 1) & (k \times k)(k \times 1) & (k \times 1) \end{matrix} \dots\dots\dots(1)$$

Where Y is the matrix of endogenous income, and E is the matrix of exogenous accounts. The matrix of average expenditure propensities A is obtained.

The matrix of accounting multipliers M is derived from equation (1):

$$Y = (I - A)^{-1} E = M Y \quad \dots\dots\dots(2) : \text{Where } I \text{ is the identity matrix.}$$

M is the total multipliers matrix that links the income of exogenous accounts to the injections Y. Specifically, it indicates the effects of changes in one or more exogenous accounts on each of the 41 endogenous accounts, taking into account the interrelationships between different production sectors, factors, and institutions in the Algerian economy.

A change in the endogenous vector Y, moreover, also generates a change in the leakage vector, namely the exogenous accounts E:

$$Y_n = \sum_{j=1}^k a_{nj} Y_j + E_n$$

Leakages are income flows from endogenous accounts to exogenous accounts. By allowing the system to regain equilibrium, leakages such as savings, taxes, and imports play a crucial role in determining the multiplier effect of an exogenous injection.

5.2 Empirical simulation and presentation of main results

The evaluation of the impact of a salary increase on the endogenous accounts of the SAM is based on the analysis of the impact vector, which results from multiplying the multiplier matrix by the injection vector. To express the variation in the injection, represented here by a unitary increase in the wages paid by the State to households, we assigned a value of 0 to all elements of the shock vector, except for the one representing households. In other words, the shock vector will consist of null elements, except for the element linking the State to households, which will be equal to 1. The examination of the impact vector allows for the detection of effects on sectoral production in the lines corresponding to sectors, as well as effects on income in the lines corresponding to factors, households, and businesses. Thus, the first 19 lines show the effect of the unitary wage increase on the production of each sector, while the following 19 lines measure the effect on sectoral output. The final lines of this vector indicate the effect of the unitary wage increase on the incomes of production factors and institutional sectors. The results of these effects are illustrated in the tables below.

Table 5. Impact of a unit increase in wages on sectoral production

Code	Industry sector	Effect on Production
1	Agriculture, Forestry, Fishing	0,2267
2	Water and Energy	0,0098
3	Hydrocarbons	0,0621
4	Petroleum Services and Public Works	0,0005
5	Mining and Quarrying	0,0007
6	ISMME	0,0499
7	Construction Materials	0,0033
8	Construction, Public Works, and Hydraulics	0,0049
9	Chemicals, Plastics, Rubber	0,0237
10	Agri-foodsector	0,1756
11	Textiles, Apparel, Knitwear	0,0374
12	Leather and Footwear	0,0119
13	Wood, Paper, and Cork	0,0139
14	Various Industries	0,0117
15	Transport and Communications	0,0887
16	Commerce	0
17	Hotels, Cafés, Restaurants	0,0282
18	Business Services	0,0046
19	Household Services	0,0263
Total		0,7797

Source: Compiled by the author from simulations using Matlab software.

The results presented in Table 5 indicate that the policy of increasing wages has not had a significant impact on the production of various activity sectors. The overall observed effect remains modest, not even exceeding the threshold of one unit, standing at approximately 0.78 monetary units, which is considered negligible. Moreover, it is important to highlight that the agriculture, agro-food industry, and transport and communications sectors responded more significantly to this policy compared to other sectors.

Table 6. Impact of a unit increase in wages on sectoral Output

Code	Industry sector	Effet on Product
P ₁	Agriculture, Forestry, Fishing	0,2860
P ₂	Water and Energy	0,0102
P ₃	Hydrocarbons	0,0678
P ₄	Petroleum Services and Public Works	0,0005
P ₅	Mining and Quarrying	0,0012
P ₆	ISMME	0,2052
P ₇	Construction Materials	0,0055
P ₈	Construction, Public Works, and Hydraulics	0,0050
P ₉	Chemicals, Plastics, Rubber	0,0634
P ₁₀	Agri-foodsector	0,2813
P ₁₁	Textiles, Apparel, Knitwear	0,0920
P ₁₂	Leather and Footwear	0,0243
P ₁₃	Wood, Paper, and Cork	0,0307
P ₁₄	Various Industries	0,0219
P ₁₅	Transport and Communications	0,0919
P ₁₇	Hotels, Cafés, Restaurants	0,0501
P ₁₈	Business Services	0,0070
P ₁₉	Household Services	0,0263
Total		1,2705

Source: Compiled by the author from simulations using Matlab software.

The results presented in Table 6 also clearly illustrate the inefficiency and limited impact of the wage increase policy on products, with an overall effect limited to only 1.27 monetary units. Furthermore, the results indicate a significantly more pronounced reaction to changes in this policy in the products of the agricultural, agro-food, and transport and communications sectors compared to others. This suggests that the products of these sectors are more consumed by households, highlighting their importance in the domestic economy and their sensitivity to economic policy variations.

Table 7. Impact of a unit increase in wages on the income of production factors and economic Agents

Production Factor and Institutional Sector	Effect on Income
Labor	0,1086
Capital	0,3323
Enterprises (CQC and FI)	0,1674
Households	1,3180

Source: Compiled by the author from simulations using Matlab software.

According to Table 7, an increase of one monetary unit in the wages paid to households leads to a rise in capital income of 0.3323 monetary units, a more pronounced effect than that observed on labor income, which increases by only 0.1086 monetary units. As for the institutional sectors, only households show a more or less significant response. The income of households increases by 1.3180 monetary units, while the increase in the income of corporations and quasi-corporations (CQC) is minimal, not exceeding 0.1674 monetary units. Overall, the effect of a unitary increase in wages on national income is limited, with an increase of only 1.9263 monetary units.

The inefficiency of the wage increase policy in Algeria can be explained by the fact that a significant portion of these additional incomes is used to purchase foreign products rather than supporting local businesses and domestic production. This would have stimulated demand and, consequently, economic growth. This behavior has resulted in an increased import bill for the country. Furthermore, a significant portion of these additional incomes is either invested in durable goods, such as vehicles and real estate, or saved. Savings and imports act as leakages in the economy, thus limiting the effectiveness of the wage policy, as shown by the leakage vector described below.

Table 8. Leakage Vector

Exogenous Accounts	Leakages
Government	0,2806
Rest of the World	0,3323
Accumulation	0,2410

Source: Compiled by the author from simulations using Matlab software.

The examination of leakage vectors confirms the assertions made and demonstrates our result: the rest of the world holds the highest remuneration, even surpassing that of the State.

Moreover, the salary increases have primarily targeted high-income sectors and senior management positions, as we have shown above, thereby limiting the improvement in the

purchasing power of low-income households and, consequently, their impact on overall demand. Indeed, higher-income households generally have a lower marginal propensity to consume, meaning they spend a smaller percentage of their income on everyday consumer goods.

6. CONCLUSION

In recent years, Algeria has undertaken significant reforms in wage policy, introducing new wage-setting mechanisms and substantial increases in certain public sectors. These wage adjustments, marked by planned increases until 2027, have garnered particular interest and raised questions about their real impact on the national economy. This article aimed to empirically analyze the overall impact of recent wage increases on the Algerian economy.

The analysis of available data, particularly from ONS surveys, shows a favorable evolution of wages, although significant disparities persist among different categories of workers. Moreover, the perceived benefit of wage increases is negated by the effect of inflation.

The results of the analysis based on the 2021 SAM multiplier model reveal that the wage increase policy in Algeria is not fully effective. Although the increase in wages paid to households produces a generally positive effect on all activity sectors, production factors, and institutional sectors, this effect remains relatively weak and limited. The results also highlight a weak distributive effect, with a more pronounced impact on capital remuneration. As for institutional sectors, only households show a significant response.

These results suggest that the current wage policy in Algeria cannot stimulate national demand nor achieve the expected growth. The success of this policy depends on the income segment of the targeted population and the importance of leakages towards savings and imported products. Ultimately, to ensure the effectiveness of the wage policy, it is essential to revitalize the Algerian productive apparatus and accompany this policy with balanced economic measures aimed at stabilizing inflation and reducing wage disparities.

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