

## Government subsidies and income inequality in Algeria: An analytical and empirical study

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**Abstract.** *This paper aims, on the one hand, to test the impact of government subsidies on income inequality, and on the other hand, to investigate the role of corruption control in increasing the effectiveness of government subsidies in the process of reducing the income gap in Algeria over the period 1996-2016. The results confirm the effectiveness of government subsidies in alleviating income inequality in Algeria. The findings also show the significant negative impact of corruption control on income inequality. The combined effect of government subsidies and control of corruption appears to be of paramount importance in reducing income inequality in Algeria.*

**Keywords:** government subsidies, income inequality, control of corruption, governance, Algeria.

**JEL Classification:** D3, D73, H5, O55.

## 1. Introduction

Many Algerian citizens are incredibly resentful of the glaring inequality, uneven income distribution as well as the fast-deteriorating economic conditions. All these factors threaten to widen even further the gap between the rich and the poor, at a time when getting rid of the oil remains a veritable, seemingly insurmountable, challenge to the Algerian government. The wealth of scholarly research seems to unanimously agree on the calamitous impacts such situations are likely to engender. Oil revenues are still the first and only funder of virtually all existing manifestations of government subsidies in Algeria. In fact, the Algerian authorities are still chained to using these subsidies as the most important means of solidarity with the socially vulnerable classes (World Bank, 2020, pp. 1-42).

Inequality in the distribution of wealth and income continues to exist in a patently clear fashion, as evidenced by the statistics available at the World Bank. The available data indicate that the richest 20 percent of Algerians own 37.2 percent of the income, compared to 9.4 percent for the poorest 20 percent of Algerians (World Bank, 2021, pp. 146-147). This unambiguously confirms that the gap between the poorest and the richest segments of the Algerian society has never ceased to grow larger and larger. The level of inequality in income distribution in Algeria has been the inevitable outcome of decades of institutional weaknesses and unwise government policies. Sassoon (2016) underscored the potential role of corruption in triggering off income inequality; corruption contributes significantly to undermining the effectiveness of government financial support. If corruption becomes a nationwide scandal and a way of doing business, matters will doubtlessly get more and more difficult, especially with the unfair and ineffective subsidy policy from which the poor and the rich alike are permitted to benefit. Worse still, due to the large-scale manifestations of corruption, the rich are likely to draw greater benefits than their poor counterparts, which may ultimately lead to further intensification of the already existing social ferment and class tension (Sassoon, 2016, pp. 156-184).

It is noteworthy that the current subsidy policy applied by the Algerian government plainly violates the principle of social justice. It can never stand to reason that a person earning a higher salary benefits more than a citizen with a low salary from government subsidies. Similarly, it is utterly unacceptable that families with limited incomes benefit merely an estimated 7 percent from subsidized primary commodities (such as sugar, oil, wheat and flour), whilst the percentage of people with high incomes benefiting from that subsidy can get as high as 14 percent (UNDP, 2016, pp. 1-274). Therefore, the Ministry of Finance is currently revisiting energy subsidies and reviewing the categories that deserve them. Every economist is aware of the fact that this procedure was supposed to be applied since the beginning of the third millennium, and it is economically correct and it attempts to address social justice issues. Having said that, the implementation method will definitely affect the ultimate outcome of this decision and whether and to what extent it is prone to make life easier for the less well-off and the underprivileged sections of the Algerian society. On the other hand, however, the transition from general to targeted subsidies will not change anything and will not improve the economic situation of the socially vulnerable groups unless the Algerian government takes strict measures to curb corruption that erodes the

national economy and deprives it of opportunities for progress. This is essentially what underpins the following primary research question which we have put forward:

To what extent do government subsidies contribute to reducing income inequality that continues to be rife in Algeria?

In order to answer the question above, this paper examines the impact of government subsidies on income inequality on the one hand, and investigates the role of corruption control in increasing the effectiveness of government subsidies in the process of reducing the income gap in Algeria over the period 1996-2016 by using the method of ordinary least squares (OLS) on the other. The rest of the paper is structured as follows. Section 2 presents a theoretical review on the concepts and effects of government subsidies, section 3 discusses government subsidies from the perspectives of the abuse of power and the need for social stability, section 4 analyzes government subsidies, income inequality and corruption in Algeria, section 5 provides the empirical analysis, and finally section 6 concludes the paper and draws some policy implications.

## 2. Government subsidies: concepts and effects

Broadly speaking, government subsidy can be defined as the financial assistance granted by the state to support certain priority sectors, yet such subsidy schemes are typically hallmarked by their low productivity. Through the provision of subsidies, governments usually aim to make the prices of basic consumer items within the reach of the middle-income and financially vulnerable social groups. The government subsidy is also a crucial and effective mechanism to opt for addressing any sudden imbalance in the prices of basic consumer products. By way of example, when the prices of raw materials that go into the production of basic consumer goods go up, the state intervenes through government subsidies to restore balance to prices and keep them within the reach of socially vulnerable groups. Framed differently, to achieve this, the state treasury pays the difference between the real price of goods and services and the price set on them to the producers of that good or the providers of that service, taking into consideration the minimum levels of income. This type of governmental subsidy is also labelled direct subsidy. It is prone to take on a variety of other forms, such as granting interest-free or low-interest loans and tax breaks. To render things simpler to assimilate, a government can use taxes to achieve a fairer distribution of income and wealth among the different tiers of the social ladder. This can be accomplished through a range of measures, like the use of progressive taxes on income and wealth as well as regressive taxes on essential consumer goods. Government subsidies can, likewise, be made accessible by providing education and health services free of charge along with granting unemployment compensation benefits to the categories that are eligible for assistance. Therefore, the government subsidy, especially in developing countries, is one of the most important forms of solidarity with low-income and socially vulnerable classes because it enables them to keep pace with the inflationary spiral and the rising cost of living and provides them with their necessary daily needs under the most difficult circumstances. It is also considered as an effective way to attain a better-balanced economic

and social system, as government subsidy has become one of the most important pillars of social stability and security (Clements et al., 1995, pp. 2-58).

Government subsidy can be traced back as early as the beginning of the 19<sup>th</sup> century. Many European countries and the United States provided financial aid to the agricultural sector in order to maintain the level of local production of agricultural crops and food especially during the World War II. Since then, the use of government subsidies has witnessed a rapid increase throughout the world. Sometimes it may be very difficult for some vital sectors, even in developed countries, to dispense with government subsidies, such as those sectors that are characterized by high costs and limited profitability. For example, the French government has so far continued to support public transport, especially in its capital, due mainly to its very high cost on the poor, low income people and students. Even the United States, which is the home of international institutions and organizations calling for the need to abandon subsidies, still subsidizes the agricultural sector and animal industries due to natural disasters and the difficult climatic conditions facing these two vital sectors (Buigues and Sekkat, 2009, pp. 1-203).

On the other hand, government subsidies weigh heavily on the national budget, that is why many countries adopt austerity policies, starting first by lifting government subsidies either instantaneously or gradually in times of economic recession, and this results in enormous social unrest and tensions, especially if this step is not accompanied by wage improvements; it is very dangerous to price the highest priority goods and services according to the fluctuations of international markets without raising wages.

Government subsidy has tremendous effects; it is preferable to control it. It is supposed to be just a transitional phase that culminates in lifting the subsidy and replacing it with direct cash payments to those who deserve them only. One of the most important negative aspects of government subsidy is its high cost and absorption of financial resources that are supposed to be directed to other areas such as preserving the environment and developing infrastructure, education and health services, in addition to its indirect contribution to the environmental deterioration due to the excessive exploitation of natural resources and pollution. There is another case in which rich, factory owners, companies and wealthy people benefit more than the poor and low-income families from government subsidies; in this way, government subsidies contribute to filling the pockets of the rich at the expense of the poor, that is why international institutions such as the International Monetary Fund and the World Bank advise many developing countries to revisit their subsidy policies (Devarajan and Ianchovichina, 2018, pp. 5-25).

### **3. An analysis of government subsidies from the perspectives of the abuse of power and the need for social stability**

Governments often maintain subsidies in response to the dictates of those in authority who are surrounded by businessmen who in turn need government subsidies in order to secure large profit margins and hoard billions of dollars in their bank accounts. It is unreasonable that the poor's consumption of oil does not exceed one-half liter per day, and his consumption of sugar does not exceed one kilogram per day, while the consumption of

larger bakeries, candy and soft drinks factories, hotels and restaurants exceeds tons of sugar, flour and large quantities of oil per day. Furthermore, the rich, owners of luxury cars and factory owners consume huge amounts of fuel that far exceed the consumption of low-income and poor people who do have a car. Therefore, the policy of general and broad-based subsidies aroused great controversy due to its lack of benefit to the vulnerable target groups; the continuation of these policies clearly makes sure that the rich get richer, and hence fuels class warfare and breeds hatred and social unrest (Mulas-Granados et al., 2008, pp. 1-41).

When conflicts erupt, non-democratic regimes resort to subsidizing some basic consumer goods and services in order to buy social peace, win the satisfaction of the middle class, lower-middle class, and poor, remove threats to a stable national order, achieve social stability, and thus stay longer in the position of power and reap more benefits. In many Arab countries, government subsidies are considered a tool to preserve political stability, and not to maintain social balance, nor to narrow the income gap. In this case, the government subsidy becomes a dangerous weapon in the hands of governments and is completely stripped of its essence aiming at supporting poor and vulnerable groups (Sala-i-Martin, 1997, pp. 81-102).

Governments should do everything possible to achieve social justice, especially by addressing the root causes and avoiding superficial solutions that do not serve the needs and interests of those on the lower rungs of the social ladder. For example, governments that pursue a policy of general subsidies should accurately identify the sectors that need those subsidies, as well as the beneficiary parties in each sector and the extent of their benefit, in addition to accurately identifying the target groups. There is also a need to take all necessary measures to strengthen the fight against corruption which has a significant effect in obstructing the process of directing subsidies to those who deserve them; delaying these steps will only make the situation worse; when crises occur, it becomes very difficult to identify priority sectors and groups for subsidies; thus, the broad-based subsidy policies that were put in place prior to the economic crisis will be maintained because the difficulty increases as a result of the intertwining and conflicting interests of those in authority and the absence of parliamentary oversight over the process of channeling government subsidies.

It is not impossible to deal with different constraints in implementing targeted subsidies, as many countries have taken the initiative of abandoning the formerly adopted subsidy policy and replacing it with the targeted subsidy policy, such as Brazil and India, which have published lists of the names of subsidy beneficiaries and provided them with electronic cards that can be presented when purchasing subsidized goods. The Moroccan government, for example, embarked on a targeted subsidy policy, but it has faced a major obstacle, namely that of the absence of a database that enables the competent authorities to determine who are still eligible for a subsidy. As a result, the Moroccan government has applied a temporary policy that requires those who consume large quantities of subsidized goods, such as companies, factories, hotels and restaurants, to pay compensation. However, the fate of this policy is similar to the fate of tax collection policies, where evasion frequently appears and corrupt practices extensively prevail. The Saudi government has initiated the

implementation of the targeted subsidy policy and has established the “Citizen Account Program” to mitigate the negative impact of economic reforms by paying cash to Saudi citizens as compensation for rising food and energy prices (Machado et al., 2018, pp. 1-65). This cash transfer program, that started in December 2017, revealed that the number of beneficiaries reached 12.5 million in June and 11.9 million in July 2018. The Saudi government has allocated SR32 billion for the account in the 2018 budget (USD 8.53 billion). (Citizen's Account Program)

It should be noted that the registration in this account must be done online, and thus it excludes poor households, particularly those living in remote areas, who not only lack Internet access but also face electricity issues, in addition to the completely marginalized group of stateless people (bidun) who are considered “illegal residents” by the Saudi government and are not eligible for Saudi citizenship, although they were born in the Kingdom. According to the Office of the United Nations High Commissioner for Refugees (UNHCR), Saudi Arabia is estimated to have 70,000 stateless persons (Data on Persons under UNHCR’s Statelessness). The experience of Saudi Arabia in adopting a targeted subsidy policy clearly shows that the problem of lack of data on the beneficiaries of subsidies and internet inaccessibility constitutes a major obstacle standing in the way of the success of the targeted subsidy policy and reflects a negative image in the eyes of other Arab governments seeking to replicate the Saudi experience.

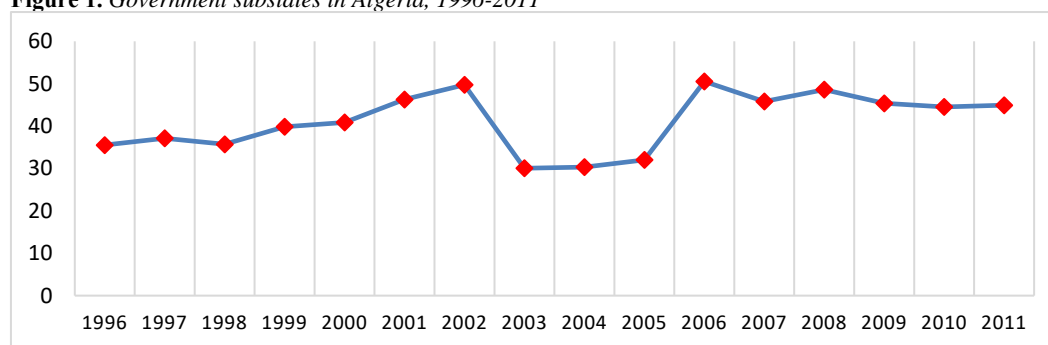
#### 4. Government subsidies, income inequality and corruption in Algeria

##### 4.1. Government subsidies in Algeria

Figure 1 clearly shows a wide provision of government subsidies in Algeria over the period 1995-2011. The Algerian Minister of Finance, Abdurrahman Rawia, made a hugely controversial statement on July 2, 2018, announcing that the government will review energy subsidies in 2019; he stated that the current subsidy policy applied by the Algerian government violates the principle of social justice. He also pointed out that it is unreasonable that the people with higher salaries benefit more than the poor and low-income people from government subsidies; he justified this by the fact that the percentage of low-income families benefiting from subsidized basic food commodities such as wheat flour, sugar, vegetable oil, and powdered milk is only 7 percent, while the percentage of high-income earners benefiting from these subsidies is 14 percent. That is why the Ministry of Finance finally decided to subject energy subsidies to peer review and target them to specific eligible categories. The Minister confirmed that this procedure will be done by communicating with citizens, obtaining all necessary information, finding appropriate targeting methods that can accurately predict household poverty, ensuring that all families receiving subsidies must meet certain eligibility criteria, and incorporating direct cash transfers to replace general energy subsidies. He indicated that all concerned authorities will be contacted for launching a broad public communication campaign and implementing these procedures, as this project is not only beneficial to needy families but also very rewarding to the state budget (Ministry of Finance, About the Policy of Subsidies). It is well known that this procedure was supposed to be applied since the beginning of the third

millennium and is economically correct and more remunerative, as it enhances social justice, promotes greater equality in Algeria, and establishes a solid base on which a productive economy can be based in accordance with the need to reduce dependence on oil. It is worthwhile to note that the way the above-mentioned procedures will be implemented is of paramount importance and is the basic pillar on which depend the consequences and outcomes of this first-of-its-kind decision. The Ministry of Finance's ability to implement this decision remains in doubt, as it is expected that the government will implement the first part of the targeted subsidy policy which requires the removal of broad-based subsidies but will turn a blind eye to how the second important part of the policy could be implemented, especially that it obliges substituting generalized subsidies with targeted cash transfers to the people most in need. It is worth mentioning that it is extremely difficult, if not impossible, for the concerned authorities to identify those eligible for subsidies across the entire Algerian territory. In fact, The Ministry of Finance had originally failed to measure the black market.

**Figure 1.** *Government subsidies in Algeria, 1996-2011*



**Source:** World Bank's World Development Indicators (WDI), the data are available online at: <https://databank.worldbank.org/source/world-development-indicators> (accessed 06/04/2022).

#### 4.2. Income inequality in Algeria

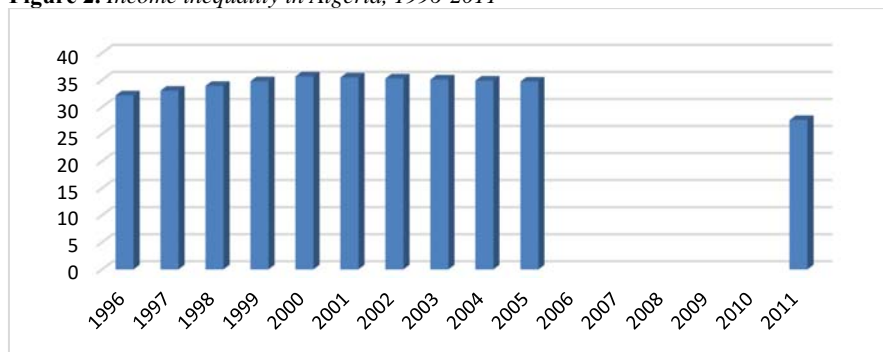
Recent data on income inequality in Algeria are almost non-existent and non-accurate. Algerian statistical institutions have failed so far to present a recent update on income inequality statistics. The government rarely conducts national household surveys in order to collect detailed data on income and wealth at the individual and household levels. Even surveys conducted by independent researchers are often not comprehensive and end up underestimating income inequality. The lack of reliable data and the issues of transparency inevitably contribute to the widening of the vacuum left by a decaying democracy, but more than that, they naturally render any empirical study on income inequality issues in Algeria contradictory to the actual facts and make them lead only to doubtful and contradictory conclusions.

Figure 2 shows a stark income inequality in Algeria; the World Bank data on household income distribution reflect a slight decrease in the degree of inequality between income distributions in Algeria. The value of the Gini index (the most common measure of income inequality) decreased from 35.3 in 1995 to 27.6 in 2011. The share of the poorest 20 percent of the population with the lowest income (the bottom quintile) increased from 7 percent in

1995 to 9.4 percent in 2011; while the share of the richest 20 percent (the top quintile) decreased from 42.6 percent in 1995 to 37.2 percent in 2011. The share of the richest 10 percent of the population decreased from 26.9 percent to 22.9 percent during the same period. However, disparities in the distribution of wealth and income remain prominent in Algeria, as evidenced by the fact that the richest 20 percent of Algerians received nearly 4 times more income than the poorest 20 percent. This confirms that the gap between the richest and poorest segments of the Algerian society is still wide. In 2011, 0.5 percent of the total Algerian population was suffering from extreme poverty and living on less than US\$1.90 per person per day. In fact, 3.9 percent of Algeria's population was living on less than \$3.20 per person per day, and 29.2 percent of Algerians was living below the \$5.50 per day threshold (Gini index, World Bank estimate – Algeria), measured in 2011 purchasing power parity dollars. These are scary numbers given the total Algerian population and vast natural resources and all the elements of wealth in which the country abounds. There are also glaring regional disparities between various regions of the country in terms of average wages, living standards and poverty rates.

It is true that the Algerian government offers the jobless a monthly unemployment grant of 13,000 dinars (around \$90) as an attempt to help them face the rising cost of living; it also raised public-sector salaries by reducing tax on overall income and raising the indicative point. But these measures failed to keep pace with crazy price increases and maintain the same level of household consumption and hence were a merely tactical maneuver designed to gain political points rather than economic and social ones.

**Figure 2.** *Income inequality in Algeria, 1996-2011*



**Source:** The Standardized World Income Inequality Database (SWIID), the data are available online at: <https://fsolt.org/swiid/> (accessed 06/04/2022).

### 4.3. Corruption in Algeria

The current level of income inequality in Algeria is nothing but the result of decades of institutional weaknesses and unwise policies. The role of corruption in creating and exacerbating income inequality cannot be denied either. Powerful people, industrialists, businessmen, and those who could influence the action of the government have accumulated large fortunes especially during periods of high oil prices by using their influence to get low-interest loans; this contributed to the diversion of a large part of public wealth into private pockets and away from public use. Figure 3 shows a blatant corruption in Algeria. Corruption has contributed to discouraging the growth of middle-class wealth

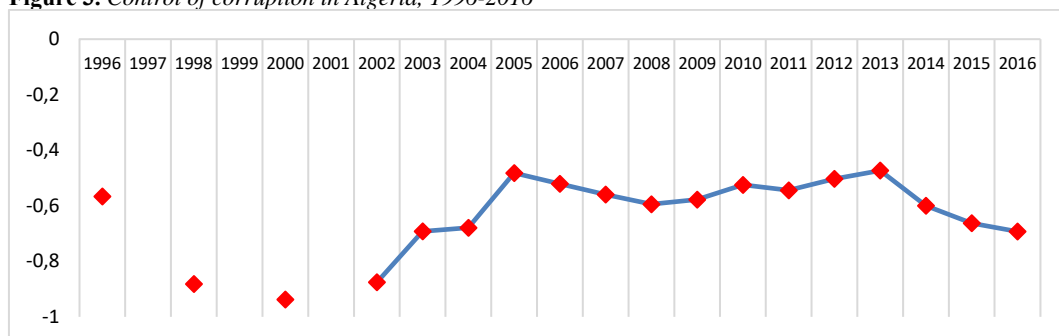


despite improvement in educational opportunities that was supposed to have significant consequences for labor force participation. It is worth mentioning that recruitment and employment practices are particularly vulnerable to corruption and other wrongdoings such as nepotism and bribery that prevent people belonging to educated middle classes from getting high-paying prestigious jobs. Therefore, nothing will avail to remedy this unnatural inequality in the distribution of income if the corrupt status quo remains unchanged (Matallah and Benlahcene, 2021, pp. 31-50).

International reports also indicate that corruption in the Algerian economy is rampant and will not dissipate overnight. Algeria has not made any meaningful progress in combating corruption. According to Transparency International's Corruption Perception Index 2017, Algeria ranked 112 out of 180 countries, with a score of 33 on a scale of 0 (high corruption) to 100 (no corruption). (Corruption Perceptions Index 2017) According to the World Bank's Control of Corruption Index (CCI), Algeria's score declined from -0.66 in 2015 to -0.69 in 2016 (Worldwide Governance Indicators –WGI); this indicator ranges from -2.5 (most corrupt/least effective) to 2.5 (least corrupt/most effective). The Heritage Foundation's 2018 Index of Economic Freedom shows that Algeria scored very poorly on government integrity and precisely obtained 29 points, on a scale of 0-100, where 0 represents a lack of integrity and 100 represents a complete integrity (Heritage Foundation, 2018, pp. 69-70). All these indicators confirm that corruption characterizes the business and public sectors in Algeria. Corruption has been a prime mover of a number of economic issues including income inequalities which have vexed the poor and needy for decades, culminating in the appearance of a largely pessimistic and melancholic view of the possibility of permanently reducing income inequality in Algeria.

Transparency International's report entitled "People and Corruption: Middle East and North Africa Survey 2016" revealed the results of a public opinion poll on the prevalence and incidence of corruption in nine Arab countries, including Algeria where the sample includes 1200 citizens aged 18 years and over; this survey was conducted in Algeria from May 28, 2015 to June 17, 2015. The results indicate that there is a high level of corruption among the state officials and that the provision of public services in Algeria is marked by widespread bribery and lack of accountability.

**Figure 3.** Control of corruption in Algeria, 1996-2016



**Source:** World Bank Governance Indicators, the data are available online at: <http://info.worldbank.org/governance/wgi/index.asp> (accessed 06/04/2022).

This report revealed the depth of popular discontent over pervasive corruption that erodes people's trust in government and institutions, undermines the rule of law, leads to lack of access or unequal access to basic services, health, quality education and employment opportunities, especially among the poor and minorities, exacerbates inequality, perpetuates social injustice, and distorts the development process (Transparency International, 2016).

## 5. Empirical analysis

### 5.1. Data and methodology

This paper aims, on the one hand, to test the impact of government subsidies on income inequality, and on the other hand, to investigate the role of corruption control in increasing the effectiveness of government subsidies in the process of reducing the income gap in Algeria over the period 1996-2016, this time period has been chosen on the basis of data availability for the following variables:

INQ: income inequality which is measured by the Gini index; a high value indicates a large income disparity, the data are taken from the Standardized World Income Inequality Database (SWIID) (Solt, 2016, pp. 1267-1281).

SUB: government subsidies and other transfers (% of expense), the data are taken from the World Development Indicators database.

CC: control of corruption which ranges from -2.5 (bad) to 2.5 (good), the data are taken from the World Bank's Worldwide Governance Indicators (WGI) database.

PS: political stability and absence of violence; this index ranges from -2.5 (bad) to 2.5 (good), the data are taken from the World Bank's Worldwide Governance Indicators (WGI) database.

GE: government effectiveness which ranges from -2.5 (bad) to 2.5 (good), the data are taken from the World Bank's Worldwide Governance Indicators (WGI) database.

GDP: GDP per capita growth (annual %), the data are taken from the World Development Indicators database.

This study applies the ordinary least squares (OLS) method to examine the impact of government subsidies on income inequality in Algeria. Our empirical model builds on earlier contributions. For example, Frost and van Stralen (2018) investigated the impact of government subsidies on income inequality in 69 countries over the period 2000-2003 using the ordinary least squares (OLS) method; the results indicate that government subsidies negatively and significantly affect income inequality. Chakraborty and Gupta's (2009) study extended Lucas' (1988) internal growth model, and demonstrated that the use of the revenue collected from the rich by taxation in financing education and training for the poor and initiating programs for low-income earners, contributes significantly to alleviating the income gap. Forteza and Rossi (2009) found that support programs provided by the government contribute substantially to keeping down income inequalities between different classes in society. Dabla-Norris et al (2015) scrutinized the impact of government subsidies on income inequality in 97 countries during the period 1980-2012. Out of their major findings, what is worth mentioning here is that government subsidies and pro-poor policies promote a more equitable distribution of income and wealth in those countries.

Sulemana and Kpienbaareh (2018) analyzed the nature of the relationship holding between corruption and income inequality in 48 low- and middle-income African countries during the period 1996-2016 using the ordinary least squares (OLS) method; They found, amongst an array of other results, that a high level of corruption is associated with increased income inequality. There are many other studies that confirmed the negative effect of corruption on income distribution (Tanzi, 1995, pp. 161-180; Gupta et al., 2002, pp. 23-45; Gyimah-Gyimah-Brempong and de Gyimah-Brempong, 2006, pp. 245-269; Apergis et al., 2010, pp. 125-135).

## 5.2. Results and discussion

**Table 1.** *Descriptive statistics*

	INQ	SUB	CC	PS	GE	GDP
Mean	33.87546	41.06409	-0.631768	-1.324498	-0.611363	1.953281
Median	34.78876	42.68269	-0.586226	-1.230870	-0.565170	1.758011
Maximum	35.66425	50.50476	-0.473484	-0.915213	-0.467568	5.850521
Minimum	27.60000	30.04739	-0.937911	-1.875876	-1.088766	-0.508245
Std. Dev.	2.341471	6.884789	0.140639	0.271786	0.173522	1.566999
Skewness	-1.927522	-0.289276	-0.998024	-0.744005	-1.732652	0.775736
Kurtosis	5.801187	1.757683	2.875017	2.494160	4.899336	3.277393
Jarque-Bera	10.40784	1.252050	2.999871	1.852537	11.71185	2.173509
Probability	0.005495	0.534713	0.223145	0.396029	0.002863	0.337310
Sum	372.6301	657.0254	-11.37182	-23.84096	-11.00453	41.01891
Sum Sq. Dev.	54.82487	711.0047	0.336249	1.255748	0.511868	49.10969
Observations	11	16	18	18	18	21

**Note:** Std. dev. indicates standard deviation.

**Source:** Authors' Computation Using Eviews 10.0.

Table 1 presents the summary statistics for the variables included in the empirical study covering Algeria over the period 1996-2016. As can be readily seen from Table 1, income inequality (INQ) has an average of 33.87 and a maximum value of 35.66, reflecting how far behind Algeria is; the bitter truth is that this country is well known for its abundant oil and gas wealth that can truly lead to significant reductions in income inequality and lift millions of people out of poverty. The variable “government subsidies” (SUB) has a maximum value of 50.50 percent of total government spending, indicating that providing government subsidies is one of the Algerian government's earliest and most important priorities; these subsidies account for half of total government expenditure; it is worth noting that this is a very large percentage compared to the share of government subsidies in neighboring countries. Control of corruption index (CC) has an average of -0.63; lagging control of corruption has placed Algeria at a distinct disadvantage; pervasive corruption tends to create a greater sense of “them” and “us” in the Algerian society. Political stability and absence of violence index (PS) has an average of -1.32, reflecting Algeria's poor performance in maintaining political stability. Government effectiveness index (GE) has an average of -0.61 and a maximum value of -0.46, highlighting the government ineffectiveness (i.e., low quality public services, citizens' dissatisfaction and high bureaucratic obstacles) which led to the deterioration of living conditions despite all of the reforms that have been made. GDP per capita has an average of 1.95 percent and a maximum value of 5.85 percent, reflecting that the growth rate of GDP per capita is abnormally weak compared with Algeria's potential.

**Table 2.** Regression results for Algeria over the period 1996-2016

Regressors	(a)	(b)	(c)
	Dependent Variable: INQ		
C	86.26386 (0.0000) ***	85.51856 (0.0001) ***	3.308220 (0.0000) ***
SUB	-1.584956 (0.0001) ***		
CC	-62.59586 (0.0005) ***		
SUB*CC	-1.897806 (0.0002) ***		
PS		-24.56110 (0.0001) ***	
GE			-1.345332 (0.0028) ***
GDP		-1.243589 (0.0772) *	-1.585895 (0.0275) **
R-squared	0.988906	0.994963	0.976204
Prob (F-statistic)	0.000230	0.000891	0.000000

\*p < 0.1; \*\*p < 0.05; \*\*\*p < 0.01.

Source: Authors' Computation Using Eviews 10.0.

Table 2 presents the OLS regression results. Column (a) reveals that government subsidies (SUB) exhibit a statistically significant negative effect on income inequality in Algeria at the 1% level of significance; government subsidies promote a more equal distribution of income because they enable poor and middle-class families to meet their basic needs and provide them access to public services such as education and health care. Control of corruption (CC) negatively and significantly affects income inequality in Algeria at the 1% level of significance; the weak control of corruption reflects the aggravation of bribery, graft, misappropriation, and nepotism; all these factors would tighten the screws on poor citizens, leading to growing income disparities and widening the gap between the haves and the have-nots. The multiplicative interaction term between government subsidies and control of corruption (SUB\*CC) carries the expected negative sign and is statistically significant at the 1% level of significance, implying that the combined effect of government subsidies and control of corruption appears to be of paramount importance in reducing income inequality; control of corruption helps improve the effectiveness of government subsidies and targets them in favor of those who truly deserve them, thus narrowing the absolute income differences between the rich and the poor. The value of the coefficient of determination ( $R^2 = 0.9889$ ) indicates that government subsidies, control of corruption, and the multiplicative interaction term between them are able to explain approximately 98.89 percent of the total variance in income inequality in Algeria. The p-value of the F-statistic is less than 0.01, implying that the estimated model is overall significant.

As shown in column (b), political stability (PS) negatively and significantly affects income inequality in Algeria at the 1% level of significance; political stability and absence of violence create certainty in the political and economic environment, and hence encourage the adoption of appropriate income redistribution policies. GDP per capita exhibits a statistically significant negative effect on income inequality at the 10% level of significance; one of the most important factors contributing to the exacerbation of inequality in the distribution of income and wealth is a low per capita GDP; a more equal distribution of income is more often observed in countries characterized by high per capita

income. The value of the coefficient of determination ( $R^2 = 0.9949$ ) indicates that political stability and GDP per capita are able to explain approximately 99.94 percent of the total variance in income inequality in Algeria. The p-value of the F-statistic is less than 0.01, implying that the estimated model is overall significant.

According to the regression results reported in column (c), government effectiveness (GE) has a significant negative impact on income inequality in Algeria at the 1% level of significance; lack of government effectiveness results in problems with public service provision and accessibility and significant bureaucratic hurdles, triggers income inequality, and leads to a deterioration in living standards and social disruption; when the government fails to provide needed public services, the heaviest burden falls on the shoulders of the poorest and most vulnerable. Income inequality (INQ) is negatively and significantly affected by GDP per capita growth at the 10% level of significance; a 1% increase in GDP per capita growth is found to reduce income inequality by 1.58% in Algeria; Thus, one can say that Algeria can achieve remarkable progress in reducing income inequality by rethinking economic policies from the income distribution perspective, broadening access to high quality public services for the poor, re-targeting subsidies to people with low incomes, and directly supporting poor households. The value of the coefficient of determination ( $R^2 = 0.9762$ ) indicates that government effectiveness and GDP per capita growth are able to explain approximately 97.62 percent of the total variance in income inequality in Algeria. The p-value of the F-statistic is less than 0.01, implying that the estimated model is overall significant.

## 6. Conclusion

This study has truly confirmed the effectiveness of government subsidies in alleviating income inequality in Algeria. Government subsidies stimulate a fair distribution of income in Algeria because they enable the middle and poor classes to meet their basic needs and access public services such as education and health care. This study also showed the significant negative impact of corruption control on income inequality in Algeria, where the weak control over corruption is still a readily discernible daily fact for the Algerian citizen. Such insufficient control has led to the intensification of bribery and the exacerbation of bureaucracy and nepotism in Algeria; all of these factors together have combined to tighten the screws on the poor and needy, and will ultimately lead to a widening income gap that will inevitably aggravate social polarization and put social cohesion at risk. Additionally, this study confirmed the effectiveness of the joint effect of government subsidy and corruption control in reducing income inequality in Algeria. In light of the findings this study has yielded, this research paper has come up with the following important recommendations:

- To ward off the materialization of all manner of unwanted social upheaval, the government should work tirelessly on determining the citizens who are entitled to receive direct financial transfers, instead of providing broad-based subsidies. Similarly, it should determine the amount of cash transfers that will be allocated to each target group. To avoid depriving some groups, especially those who live in the countless remote areas, every care and focus must put into guaranteeing that such procedure is

extremely accurate and has taken adequate time for preparation and perfection to get launched.

- The Algerian government should also seriously apply this procedure for the benefit of the low-income and socially vulnerable strata.
- The transition from general to targeted subsidies will not change anything and will not improve Algeria's economic situation unless and until the Algerian government takes stern measures to curb corruption that has persistently eroded the national economy and deprived it of opportunities for progress. The Algerian government ought to work hard to limit the growth of the active black market that absorbs colossal sums of money that can be invested to move the big economic wheel forward. This procedure will not stir stagnant waters if the Ministry of Finance does not deter tax evasion virtually publicly practiced by the great tax-dodgers.
- This transition must perforce be accompanied by raising wages, developing road infrastructure and digitalizing the national economy, thereby following in the footsteps of the developed countries that implement targeted subsidy programs. If such measures are not put in place, it will make matters uncontrollably worse, as it might fuel social tension and lead to the total extinction of the middle class in Algeria.
- It goes without saying that to achieve income equality in Algeria no magic wand is there to be used, but it stands to reason that an ideal level of inequality can be reached by finding the right mix of policies. In addition to the above, the government should work on collecting more data on income and wealth. It should, likewise, ensure more transparency, modernize the tax system, improve the quality of education and health care services and create job opportunities. If the deep-rooted income inequality is not addressed and its deterioration is not prevented, Algeria will, as time goes by, find itself amongst the countries which are vulnerable to all manner of social, political and economic disasters.

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### Declaration of competing interest

The authors declare that they have no conflict of interest.

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