# The impact of government subsidy for investment projects in job creation: An empirical evidence-case of Algeria during the period 1995-2016

# أثر الدعم الحكومي للمشاريع الاستثمارية في خلق فرص العمل: دراسة قياسية لحالة الجزائر خلال الفترة 1995-2016

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## Abstract:

This study aims to measure the size of the impact of government subsidy provided to investment projects on job creation in Algeria, from the perspective of econometrics. Data panel (for 07 sectors) cover a Twenty-two-year time horizon, from 1995 to 2016. The data was processed using the technique of Multiple Regression. The estimation was made by the Ordinary Least Squares method (OLS), using the Pooled Regression Model (PRM). The results of the study denoted the variables: exemption from tax on corporate profits, exemption from tax property, and guaranteed access to finance affect positively the creation of job opportunities. While the value-added tax exemption variable had a negative impact. In addition, the results showed that tax exemption variables on professional activity do not affect job creation.

**Keywords:** Tax incentives, Financial incentives, Government subsidy, Investment projects, Job creation.
**Jel Classification Codes**: H71, H25, E22, J23.

## ملخص:

تهدف هذه الدراسة إلى قياس حجم تأثير الدعم الحكومي المقدم للمشاريع الاستثمارية على خلق فرص العمل في الجزائر، من وجهة نظر الاقتصاد القياسي. تغطي البيانات الطولية للدراسة (07 قطاعات) أفقا زمنيا مدته 22 عاما، خلال الفترة الممتدة من 1995 إلى غاية 2016. تمت معالجة هذه البيانات باستخدام تقنية تحليل الانحدار المتعدد (نموذج الانحدار التجمعي (PRM))، بحيث تم التقدير بواسطة طريقة المربعات الصغرى العادية (OLS). وفي إطار تحليل البيانات أشارت نتائج

الدراسة إلى أن المتغيرات: الإعفاء من الضريبة على أرباح الشركات، والإعفاء من ضريبية الممتلكات، وضمان الحصول على تمويل مصرفي تؤثر إيجابياً على خلق فرص العمل، بينما كان لمتغير الإعفاء من ضريبة القيمة المضافة تأثير سلبي. بالإضافة إلى ذلك أظهرت النتائج أن متغير الإعفاء من الضريبة على النشاط المهني لا يؤثر على خلق فرص العمل.

**كلمات مفتاحية:** التحفيز الضريبي، حوافز التمويل، الإعانات الحكومية، مشاريع الاستثمار، خلق فرص العمل.

**تصنيف JEL :** H71, H25, E22, J23.

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## 1. INTRODUCTION:

A World Bank report (2013) stated that more than 200 million people are unemployed worldwide, while there are two billion working-age adults remain outside the workforce. Moreover, the report estimates that an additional 600 million additional jobs are needed over the next 15 years to keep pace with new arrivals to the job market (Farole, Ferro, & Michel Gutierrez, 2017, p. 06). As for Algeria, it is not immune to these challenges to create sufficient employment opportunities for its growing working-age population, according to the International Monetary Fund.

At the current rates of labour force participation, Algeria will need to create 2.3 million jobs by 2030 to absorb the new entrants into the workforce. Bringing labour market participation gradually from 40 percent to 60 percent will require the creation of 5 million new jobs by 2030 (IMF, 2014, p. 44). Where will these jobs come from? The World Development Report asks (World Bank, 2013), then answers that the private sector is the only sustainable engine for job creation in any economy, confirming widely reported statistics that 9 out of 10 new jobs are its establishment in the private sector (Farole, Ferro, & Michel Gutierrez, 2017, p. 06).

Many countries in the world provide government subsidy for investment projects for the private sector using various tools, in order to motivate it to create more job opportunities. Algeria is one of these countries. The Algerian government subsidy the private sector through government subsidy institutions for investment projects. While the year 2016 witnessed a 9.6% decrease to 7185 in the number of these investments, the invested amount increased by 24.8% to 1.8

trillion dinars ($ 14.9 billion), and the number of jobs under these ed investment projects increased by 9.1% to 164,000 (Oxford Business Group, 2017, p. 41). This study aims to investigate the impact of government subsidy for investment projects on job creation in Algeria. The following problem has been formulated in this regard:

How effective is a government subsidy for investment projects in creating job opportunities in Algeria during the period 1995-2016?

To answer the study problem, we formulated (05) hypotheses, these hypotheses were formulated from literary studies, and they will be clarified in the section on Literature and hypotheses development.

This article aims to quantify the impact of government subsidy for investment projects on job creation in Algeria, from an econometric perspective. Panel data (07 sectors) covers a 22-year horizon, from 1995 to 2016.

## 2. Background

### 2.1. Government subsidy for investment projects

Although the word "subsidy" is commonly used in economics (WTO, 2006, p. 47), There are some of the difficulties in describing the subsidy definition. Although it appears to be agreed that subsidization involves the government and results in somebody's benefits (WTO, 2006, p. 48), This is in line with (Houthakker, 1972, p. 07), the definition of subsidy "My own starting point was also an attempt to define subsidies. Yet we came to the conclusion that the meaning of subsidy is just too elusive in the process of doing so". As a consequence, the relatively large research package When describing a subsidy, government subsidies use many terms (Schwartz & Clements, 1999, p. 120).

Some interpretations of subsidies will not include all possible tools in one group because they also describe the term subsidy on other grounds. However, the meanings of subsidies tend to refer to one of the following characteristics of government interventions that restrict the meaning of subsidies: the recipients of the subsidies, the type of subsidies, and their goals and outcomes (WTO, 2006, p. 49).

Government subsidies is defined by (Schwartz & Clements, 1999, p. 120). “A subsidy can be defined as any government assistance that allows consumers to purchase goods and services at prices lower than those offered by a perfectly competitive private sector, or raises producers' incomes beyond those that would be earned without this intervention”. According to the Oxford

dictionary, subsidies are defined as "money that is paid by a government or an organization to reduce the costs of services or of producing goods so that their prices can be kept low" (Oxford Online Dictionary, 2019).

Government subsidy is not limited to developing economies alone, but even advanced (liberal) economies that emphasize economic freedom, such as the USA government use subsidies within their economic policies. While the United States also opposes other countries (such as China, Brazil, and India) when it comes to providing government subsidies, it is clear that large subsidies the US government tends to provide to large corporations. Indeed, small and start-up companies do not receive the vast majority of subsidies that can be explained through arguments based on the promotion of new businesses (Pappas, Walker, Xu, & Zeng, 2019, p. 02).

When the nation's wealth grows very quickly, the further development of this happy state may be hampered by insufficient incentives for new investments in light of the application of the principle or conditions of laissez-faire (non-governmental interference in economic activity). Ultimately, the welfare of a country depends on the adequacy of these inducements (Keynes, 1964, p. 335). Keynes noted the need for governments to take supportive policies for investment projects through incentives and subsidy measures. There are many forms of government financial subsidies for investment projects, and perhaps the most prominent of these common forms used by countries to encourage investment projects, we find a policy for tax intervention (tax expenditures).

Stanley Surrey (1967), used the current term "tax spending" (Shaviro, 2006, p. 176). Where tax expenditures are defined as "those revenue losses attributable to provisions of the tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability." (Shaviro, 2006, p. 179). As defined as losses of public income resulting from tax provisions that, for reasons of economic and social policy, provide special benefits to different groups of taxpayers. It aims to stimulate specific investment activities or projects (Wilkinson, 1986, p. 23). The tax expense system provides a vary subsidy system that uses tax mechanisms as a means of paying benefits. It provides many forms, including income exceptions; exemptions, deductions, credit-for-tax credits, preferential tax rates, and tax deferrals (Surrey, 1973, p. 06).

In addition, we find that among the government's financial subsidy policies for investment projects to which countries resort, those measures are

directed to help secure the necessary financing for investment projects through credit guarantees (guaranteeing the provision of bank loans to investors).

**2.2. Job creation by investment projects**

"Job creation is the difference in employment in all plants that increase employment between the two time periods" (Klette & Førre, 1998, p. 250). A study conducted by Birch between 1969 and 1976 revealed that, on average, about 60 percent of all jobs in the United States are created by companies with 20 or fewer employees, about 50 percent of all jobs are created by independent and young entrepreneurs. Large companies (with more than 500 employees) generate less than 15 percent of all net new jobs (Birch, 1979, p. 29), The study's result denoted that the small investment project sector was the main driver of job creation for the economy (Parker, 2018, p. 509).

Investment is described as one of the most effective tools for promoting job creation (Kim & Won-Kyu, 2009, p. 05), It is one of the tools that is frequently used to address job losses during economic crises (ILO, 2011, p. 01). Short-term job creation is subject to restrictions on provided physical capacity, and access to financing capital through increasing levels of the use of the investment projects. Some cost reductions - whether capital or labour costs - will at least lead to some improvement in the employment decision [(i)]. This is the vision that job creation advocates take into account when making decisions about investment projects (Harrison & Kanter, 1978, p. 426). Each of the economic development policies, labour market policies, and policies that entrepreneurship and investment policies, have a role to play in creating the conditions for job creation and expansion. These policy areas can be combined more effectively to contribute to job creation (OECD, 2014, p. 27). OECD reviews of domestic growth and investment strategies revealed the development of more jobs by promoting effective investment (OECD, 2014, p. 32).

**3. Literature and hypotheses development**

Almost all industrialized countries use government subsidies to support economic development in specific sectors to create jobs (Fuest & Huber, 2000, p. 171). In this regard, Parker's indicates that general tax cuts may be a powerful means of stimulating job creation (Parker, 2018, p. 509). Taxes have long been an important means of public policy, whether subject to classical or Keynesian economic thought. The establishment of a tax system is usually an option that governments choose to implement incentive policies in favour of specific goals

(Zatla & Djelil, 2015, p. 74). In Algeria, Zaid and Taibi found that taxes and tax incentives more specifically represent an important component of the investment decision (Zaid & Taibi, 2019, p. 85). In Taleb's study concluded that the tax incentives that the Algerian government provided during the period 1993-2015 affect the increase in job creation (Taleb, 2017, p. 598). What this study lacks, however, is that it did not quantify the effect of the subsidy provided in the form of tax incentives on job creation in more detailed manner. This is what this study will look at. We will include some evidence to formulate the hypotheses of the study, about the positive impact of government subsidies for investment projects on job creation in the form of tax incentives.

In addition to the impact of tax incentives, other incentives influence investment outside taxes (Zaid & Taibi, 2019, p. 85). They are called financing incentives, such as government credit support (Guaranteed access to finance).

**3.1. Exemption from tax value added**

Low rates of value-added tax (VAT) allow more significant investment, thus contributing to further increase growth and employment. In 2016, 6 years after the (VAT) reduction in Germany from 19 to 7% in the housing sector, an additional 46,666 job opportunities were created, representing an increase of 18.5%, which is a large percentage compared to a rise of 14.6% in the overall economy in the same period. In the same vein, after reducing the value-added tax (VAT) from 25 to 12% in 2012, Sweden experienced an 8% increase in employment (HOTREC, 2017, p. 15). Based on the above, we will formulate the first hypothesis related to the effect of the VAT exemption as follows:

**H1:** The exemption from value-added tax within the framework of government subsidy for investment projects has a positive impact on job creation.

**3.2. Exemption from tax on corporate profits**

The results of a study by Ljungqvist and Smolyansky (2016) indicated that the increasing in corporate tax rates hurt jobs. Increasing one percentage point in the company tax rate reduces employment by between 0.3% and 0.5%. While corporate tax cuts contribute to boosting economic activity during the recession, and by reducing corporate profit tax, employment increases by about 0.6% (Ljungqvist & Smolyansky, 2016, pp. 31-32). Overall employment comparisons from 1990 to 2012 indicated that countries that reduce corporate income taxes have an advantage for short-term employment growth compared to countries that do not make any changes in corporate income tax rates (Shuai & Chmura, 2013,

pp. 192-193). Based on the above, we will formulate the second hypothesis related to the effect of tax exemption on corporate profits as follows:

**H2**: The exemption from corporate profits tax within the framework of government subsidy for investment projects has a positive impact on job creation.

### 3.3. Exemption from tax on professional activity

As with all tax exemptions, we assume that tax exemption from professional activity for investment projects affects the creation of more job opportunities. Based on the above, we will formulate the third hypothesis related to the effect of tax exemption on professional activity as follows:

**H3:** The exemption from fees for professional activity within the framework of government subsidy for investment projects has a positive impact on job creation.

### 3.4. Exemption from tax property

A study by Dye's et al (2001) found a negative statistical correlation between property tax rates and employment growth (Dye, McGuire, & Merrima, 2001, p. 776). Therefore, exemption from property tax can be an incentive for investment projects to create more job opportunities. Based on the above, we will formulate the fourth hypothesis related to the effect of the property tax exemption as follows:

**H4:** The exemption from property tax within the framework of government subsidy for investment projects has a positive impact on job creation.

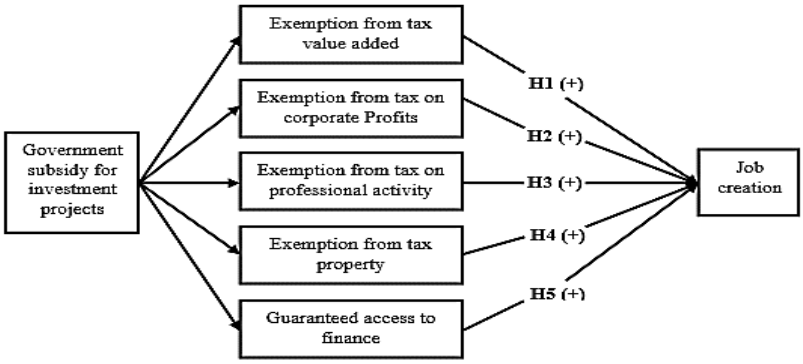
### 3.5. Guaranteed access to finance

Capital and employment are two main elements of investment projects. In a study, used two complementary data sets- cross-sectional micro-level data set covering over 50,000 firms across 70 developing countries and a panel micro-level data set covering fewer developing countries but over 4.3 million observations. It found that increasing access to finance leads to increase job growth in developing countries, and the relationship between access to finance and employment growth is strong (Ayyagari, Juarros, Martinez Peria, & Singh, 2016, p. 27). So that, Investment incentives reduce the cost of capital for employment (Luger, 1984, p. 481). Such as easy access to financing or obtaining subsidized government credit. Based on the above, we will formulate the fifth hypothesis related to the effect of guaranteeing access to bank financing as follows:

**H5:** Guaranteed access to finance within the framework of government subsidy for investment projects has a positive impact on job creation.

Figure (1) shows the theoretical model of the study.

**Fig.1. Theoretical model of the study**




**Source:** Prepared by the researcher.

## 4. Materials and methods

### 4.1. Type and scope of the search

In this study, we will examine a possible relationship between government subsidy for investment projects and job creation in these projects. To measure this value, we use the number of jobs provided by investment projects annually. To test the study hypotheses, the last variable is taken as a dependent variable.

On the following pages, we will list the independent variables based on the government subsidies procedures approved by the supporting government institution for investment projects in Algeria.

### 4.2. Sample: Choice and justification

As part of this study, we will focus on investment projects that received government subsidies by institutions that support investment projects in Algeria, during the period from 1995 to 2016. This sample was chosen as the longest possible period in which sufficient statistical data are available for the study. It is also worth noting that the first appearance of a government institution regulating and investment projects was in 1993. It was established under the name of the Promotion of Support and Steady Investments Agency (P.S.S.I.A)[(ii)] (Law n° 93-12, 1993), Because of the Algerian state's adoption of the capitalist economic system in 1989 (The transition from a socialist economic system to a market economy system) (Al-Dustour, 1989). With regard to the start of the actual work of the Promotion of Support and Steady Investments Agency (P.S.S.I.A) in 1994

by executive decree (Law n° 94-319, 1994), statistical data were available on government subsidies for investment projects in Algeria by the agency starting in 1995. Moreover, for another, this data has been updated in 2016. We also note that in 2001 in the context of economic reforms, subsidy promotion and the Fixed Investment Agency (P.S.S.I.A) were transferred to the National Investment Development Agency (N.A.D.I)[(iii)] because of the amendment of the Investment Law (Order n° 03-01, 2001), with wide powers for organizing investments projects.

Governmental institutions in investment projects in Algeria, referred to earlier, and charged with the task of providing government subsidies and facilities for investment projects, by providing tax concessions, whether in the construction phase or the exploitation phase. It is also responsible for ensuring that acceptable investment projects receive the necessary financing from the banking sector.

**4.3. Data collection**

The data approved in this study were collected from several sources. The data of the declaration of investment projects [(iv)] for the private sector are based on Both the Promotion of Support and Steady Investments Agency (P.S.S.I.A) during the period from 1995 to 2001, as well as the National Investment Development Agency (N.A.D.I) during the period from 2002 to 2016. This data was obtained through National Publications Office of Statistics (Statistical Yearbook of Algeria), as well as publications of the Ministry of Industry and Mines (SME statistical information bulletins).

It should also be noted that the data of tax exemptions granted to investment projects during the period under study were obtained by the Bureau of Statistics, Directorate of Tax Operations, General Directorate of Taxes, Algerian Ministry of Finance, Citing: (Melikaoui, 2010, p. 179) & (Zinet, 2019, p. 143).

The study data was formed as "Panel data" (longitudinal data) structure (Balanced Panel) by economic sectors, which were defined by Baltagi's, "the term panel data or longitudinal data refers to the pooling of observations on a cross-section of households, countries, firms, etc. Over several periods" (Baltagi, 2005, p. 01). Therefore, we analysed 154 observations spread over 22 years, categorized by sector of activity (07 sectors: agriculture, industry, construction and public works, health, transportation, tourism, services). This form of data was used to obtain a homogeneous statistical series to reduce bias, and Baltagi's also indicated that "Time-series and cross-section studies not controlling this heterogeneity run the risk of obtaining biased results" (Baltagi, 2005, p. 04).

After diagnosing the data, we found that it contains sufficient information, that is, there are no missing values. From this point of view, we will draw on a sample of 154 observations. We will also use statistical software (Stata) version 15 for statistical analysis of this sample.

### 4.4. Measurement of variables

Regarding the measurement of independent variables, we used the information mentioned previously in the databases. In the end, the variables are coded appropriately. Table (1) shows the summary of measures and sources of dependent and independent variables.

**Table 1. Summary of measures and sources of variables**

| Dimensions | Variable | Symbol | Data Source | Measure |
|---|---|---|---|---|
| Job creation by investment projects | Job creation | JC | (ONS, 2019) (MIM, 2019) | Number of jobs created by investment projects yearly |
| Government subsidy for investment projects | Exemption from tax value added | VAT | Directorate of Tax Operations, Citing: (Melikaoui, 2010) & (Zinet, 2019). | The value of exemptions from tax value added granted to investment projects yearly |
| | Exemption from tax property | TP | Directorate of Tax Operations, Citing: (Melikaoui, 2010) & (Zinet, 2019). | The value of exemptions from tax property granted to investment projects yearly |
| | Exemption from tax on corporate profits | TCP | Directorate of Tax Operations, Citing: (Melikaoui, 2010) & (Zinet, 2019). | The value of exemptions from tax on corporate profits granted to investment projects yearly |
| | Exemption from tax on professional activity | TPA | Directorate of Tax Operations, Citing: (Melikaoui, 2010) & (Zinet, 2019). | The value of exemptions from tax on professional activity granted to investment projects yearly |
| | Guaranteed access to finance | GAF | (ONS, 2019) (MIM, 2019) | Amounts of financing obtained from the banking sector for acceptable investment projects yearly |

**Source:** Prepared by the researcher.

### 4.5. Empirical model

The analysis will be based on a multivariate model to explain the impact of government subsidy for investment projects on job creation. We have formulated elementary mathematical equations which permit us to estimate the values of the dependent variable (job creation within the framework of investment projects) by independent variables (exemption from value added tax, exemption

from property tax, exemption from corporate tax on profits, exemption from tax on professional activity, Guaranteed access to finance). We will use the logarithmic formula to reduce the gap between large and small values. In this regard Benoit's in this regard, "Logarithmically transforming variables in a regression model is a very common way to handle situations where a non-linear relationship exists between the independent and dependent variables. Using the logarithm of one or more variables instead of the un-logged form makes the effective relationship non-linear, while still preserving the linear model" (Benoit, 2011, p. 2011). From above, we can define the job creation model in the form of a regression equation as follows:

$$\log \mathrm{JC} = \beta_0 + \beta_1 \log \mathrm{VAT} + \beta_2 \log \mathrm{TP} + \beta_3 \log \mathrm{TCP} + \beta_4 \log \mathrm{TPA} + \beta_5 \log \mathrm{GAF} + \varepsilon$$

Can write the equation more simply:

$$\mathrm{LJC} = \beta_0 + \beta_1 \mathrm{LVAT} + \beta_2 \mathrm{LTP} + \beta_3 \mathrm{LTCP} + \beta_4 \mathrm{LTPA} + \beta_5 \mathrm{LGAF} + \varepsilon$$

The above formula helps us to analyse data by relying on non-standard parameters of independent variables. It also helps us define the independent variables that explain the dependent variable and those that do not explain it.

## 5. Results

Statistical analysis of the data includes the following: Data analysis approaches, descriptive analysis of the variables, correlation analysis of the job creation Model, and statistical analysis by multiple regression.

### 5.1. Data and descriptive

Although the main approach of data analysis is the technique of statistical analysis using multiple regression to test the accuracy of hypotheses, secondary statistical analysis is useful before using this regression. This will allow us to know the statistical aspects of the sample, which gives a rougher picture to know the shape of the distribution followed by the model variables.

Table (2) describes the minimum and maximum values, mean, standard deviation of each variable and the observation number for each variable.

**Table 2. Descriptive statistics of the variables model for job creation**

| Variable | Obs | Minimum | Maximum | Mean | Mean Std. Deviation | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| **JC** | 154 | 462 | 161825 | 22995.67 | 28597.52 | 2.509386 | 10.57541 |
| **VAT** | 154 | 151 | 86243 | 35450.23 | 23728.02 | 0.2880235 | 2.225493 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **TP** | 154 | 0 | 29 | 7.136364 | 8.541378 | 1.392532 | 3.744768 |
| **TCP** | 154 | 27 | 13159 | 4322.364 | 3286.424 | 1.225436 | 4.19491 |
| **TPA** | 154 | 304 | 17285 | 3711.909 | 3453.383 | 2.659781 | 11.17947 |
| **GAF** | 154 | 1402 | 1507381 | 128967.4 | 218120.6 | 3.791239 | 19.49307 |

**Source**: Prepared by the researcher. Depending on software Stata outputs. Version (15.0).

It appears from the table that "job creation" (JC), "tax exemption from professional activity" (TPA), and guaranteed access to finance" (GAF) are the most volatile of all independent variables. The coefficient of variance exceeds or close to 100% in these variables. This is due to the large range between the minimum and maximum observed variables, but other variables appear to be relatively stable from year to year. However, as shown in Table (2), the number of observations for this study is 154.

The study of the distribution of variables in the model is based on the normal distribution test. The shape of the distribution measured by the "skewness and kurtosis".

The coefficient of skewness explains asymmetric data around the mean. According to Table (2), the deviation value for all variables approximates the value zero (0), and from it, we conclude that the distribution is symmetric around the average, according to Karl Pearson.

The kurtosis coefficient is used to measure the peak or stability of the curve. It must be within the valid values in the range [-3,3]. When a kurtosis value equals to 3, the distribution is mesokurtic and corresponds to a normal distribution of data according to Carl Pearson, as per Table (2). The value of kurtosis for all variables is close to the value 3, except for the “job creation” (JC), “exemption from tax on professional activity” (TPA), and “guaranteed access to finance” (GAF) variables. For this, we will use the logarithmic formula when estimating the model.

### 5.2. Correlation Analysis

The correlation analysis of the independent variables of the model will allow us to identify the possible presence of multicollinearity.

**Table 3. Correlation matrix of the model of job creation**

| Variable | LJC | LVAT | LTP | LTCP | LTPA | LGAF |
|---|---|---|---|---|---|---|
| **LJC** | 1.0000 | | | | | |
| **LVAT** | 0.0260 | 1.0000 | | | | |
| **LTP** | 0.1069 | 0.2537 | 1.0000 | | | |
| **LTCP** | 0.0709 | 0.7795 | 0.1757 | 1.0000 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **LTPA** | 0.0663 | 0.6404 | 0.3651 | 0.6815 | 1.0000 | |
| **LGAF** | 0.8477 | 0.2721 | 0.0271 | 0.1416 | 0.1177 | 1.0000 |

**Source**: Prepared by the researcher. Depending on software Stata outputs. Version (15.0).

The correlation analysis in Table (3) helps detect potential multicollinearity problems in the model. We did not find the problem of multicollinearity by calculating the correlation coefficients between two independent variables for all possible combinations. The highest correlation does not exceed 77.95%, which is below the generally allowed limit of 80% when resorting to a Pearson binary correlation.

**5.3. Main results**

Used the multiple regression (logarithmic formula) in Table (4) allows seeing the explanatory power of the model. Estimation using the Ordinary Least Squares (OLS) Method, by the Pooled Regression Model (PRM). The test of the Model includes all variables (LVAT, LTP, LTCP, LTPA, LGAF). These variables contain 154 observations. But when the logarithmic formula was used in the model, the number of observations became only 140 due to negative values distributed across all economic sectors over the twenty-two years represented for the sample period (1995 - 2016).

**Table 4. Regression analysis summary and regression variance analysis**

| **Regression analysis summary** | | | **Regression variance analysis** | | |
|---|---|---|---|---|---|
| $r$ | $R^2$ | $\bar{R}^2$ | df | F | Sig F |
| 0,9062 | 0.8212 | 0.8145 | (5, 134) | 123.09 | 0.0000 |

Model: (Constant), LVAT, LTP, LTCP, LTPA, LGAF.
**Source**: Prepared by the researcher. Depending on software Stata outputs. Version (15.0).

Now, let us test the overall significance of the regression model. The explanatory power of the model or the proportion of explained variance $R^2$ is 82.12%. It is interesting to note here that the Fischer statistical value of the model F = 123.09. This difference represents a variance of very high significance “F (5, 134) = 123.09, Sig F = .0000 <.05”. The relationship between the coefficients (r) of the model is very acceptable since it is 0.9062. Therefore, it was concluded that the regression model is highly significant, as the set of independent variables does reliably predict the dependent variable, and the sample used in regression analysis is homogeneous and variation of the distributed data over the twenty-two years has no effect on data consistency.

Table (5) shows the result of regression analysis. From these results, we

can determine the importance of the independent variables based on the test (Sig t-Student, P> | t |). Whereas, the standard Beta value, which can arrange the force of influence of these variables (signification) on the dependent variable.

**Table 5. Regression analysis result (Job creation)**

| Model | Coef. | Std. Err. | t | P>\|t\| |
|---|---|---|---|---|
| Constant | 1.728372 | 0.5166737 | 3.35 | 0.001 |
| LVAT | - 0.4523567 | 0.0550583 | - 8.22 | 0.000 |
| LTP | 0.1678473 | 0.0448366 | 3.74 | 0.000 |
| LTCP | 0.2986043 | 0.0658831 | 4.53 | 0.000 |
| LTPA | 0.0465904 | 0.0757517 | 0.62 | 0.540 |
| LGAF | 0.8427753 | 0.0343632 | 24.53 | 0.000 |

**Source**: Prepared by the researcher. Depending on software Stata outputs. Version (15.0).

The results of the multiple logarithm regression model appear:

The "LGAF" coefficient (0.8427753) is significantly different from (0) using 0.05 level of significant of because its value (p) is equal to 0,000, and it is smaller than 0.05 (P > | t | = 0.000 < 0.05). Which means that the variable of guaranteed access to finance "LGAF" affects positively on job creation, and the strength of this effect is 84.72%.

The "LTCP" coefficient (0.2986043) differs significantly from (0) using 0.05 level of significant because its value (p) is 0,000, which is less than 0.05 (P > | t | = 0.000 < 0.05). This means that the LTCP exemption has a positive impact on job creation, and the strength of this impact is 29.86%.

The "LTP" coefficient (0.1678473) is significantly different from (0) using 0.05 level of significant because its value (p) is 0,000, which is smaller than 0.05 (P > | t | = 0.000 < 0.05). This means that the LTP exemption has a positive impact on job creation, and the strength of this impact is 16.78%.

The "LVAT" coefficient (- 0.4523567) is significantly different from (0) using 0.05 level of significant because its value (p) is 0,000, which is smaller than 0.05 (P > | t | = 0.000 < 0.05). This means that the LVAT variable affects negatively on job creation, and the strength of this effect is 45.23%.

The "LTPA" coefficient (0.0465904) does not differ statistically significantly from (0) using 0.05 level of significant its value (p) is definitely 0.540 greater than 0.05 (P > | t | = 0.540 > 0.05).

**5.4. Additional tests**

Based on the results of multiple logarithm regression analysis we will analyse the significant variables at confidence level 5% (exemption from value

added tax "LVAT", exemption from corporate profit tax "LTCP", exemption from property tax "LTP", guaranteed access to finance "LGAF"). In addition, we will comment on the insignificant variable (tax exemption from professional activity "LTPA"), on the dependent variable (job creation) according to the model, indicating the direction of impact (negative or positive) as shown in Table (6). We will also present in this part the regression model experimental that presented in the following experimental equation:

$$\text{LJC (Job creation)} = 1.728372 - 0.4523567\ \text{LVAT} + 0.1678473\ \text{LTP} + 0.2986043\ \text{LTCP} + 0.0465904\ \text{LTPA} + 0.8427753\ \text{LGAF} + \varepsilon$$

**Table 6. Study results summary**

| Hypothesis | Variable | P>\|t\| | Decision | Expected direction of the relationship | Direction of relationship according to the results | Test result of the hypothesis |
|---|---|---|---|---|---|---|
| H1 | LVAT | 0.000 | Significant | + | - | Not supported |
| H2 | LTP | 0.000 | Significant | + | + | Supported |
| H3 | LTCP | 0.000 | Significant | + | + | Supported |
| H4 | LTPA | 0.540 | Not significant | + | … | Not supported |
| H5 | LGAF | 0.000 | Significant | + | + | Supported |

**Source**: Prepared by the researcher. Depending on software Stata outputs. Version (15.0).

## 6. CONCLUSION:

### 6.1. Discussion of the results

To address the problem of the study, which focused on the following question: "How effective is government subsidy for investment projects in creating job opportunities in Algeria during the period 1995-2016?" we built a theoretical model and 05 hypotheses formulated based on what was stated in previous literature. In order to verify the theoretical model and the hypotheses, we relied on data for investment projects that received government subsidy in Algeria for the period from 1995 to 2016. These data include 154 observations in the form of "Panel data" structure (Balanced Panel) by economic sectors (07 sectors: agriculture Industry, construction and public works, health, transportation, tourism, services). The sample size was sufficient for statistical analysis. This data was processed using the technique of multiple regression analysis (logarithmic formula), while the Ordinary Least Squares method (OLS) was used in the

estimation process by Pooled Regression Model (PRM), using the Stata version program (15.0). we will present the effect of independent variables and the direction of influence on job creation in detail while discussing the hypotheses.

In the framework of testing the five study hypotheses, we found that the first hypothesis indicates a positive impact of the value-added tax exemption on job creation. On the other hand, the results of the study showed that there is a counter (negative) relationship with statistical significance between the exemption from (VAT) for investment projects and job creation, and the strength of this effect is 0.4523. That is, when the (VAT) exemption changes by one unit (one million Algerian dinars), job creation in investment projects will decrease by 0.4523 units (jobs). Consequently, the first hypothesis that "The exemption from value added tax within the framework of government subsidy for investment projects has a positive impact on job creation" is rejected according to the results of the study.

As for the second hypothesis, which indicates that there is a positive effect of the exemption from the tax on corporate profits on job creation, the results of the study indicated a positive relationship of statistical significance between the exemption from tax on corporate profits for investment projects and job creation, and the strength of this effect was 0.2986. That is, whenever the tax exemption from corporate profits is changed by one unit (one million Algerian dinars), the job creation in investment projects will increase by 0.2986 units (jobs). Consequently, the second hypothesis that "the exemption from corporate profits tax within the framework of government subsidy for investment projects has a positive impact on job creation" is acceptable according to the results of the study.

As for the third hypothesis, which says, "The exemption from fees for professional activity within the framework of government subsidy for investment projects has a positive impact on job creation," the results of the study were against its expectations. As there is no statistically significant relationship between exemption from fees for professional activities for investment projects and job creation. Thus, this hypothesis is rejected.

The fourth hypothesis indicates that there is a positive effect of the property tax exemption on job creation. The results of the study showed that there is a positive relationship of statistical significance between the exemption from the real estate tax for investment projects and the creation of job opportunities, and the strength of this effect is 0.1678. That is, when the variable of exemption

from the real estate tax for investment projects changes by one unit (one million Algerian dinars), the job creation in investment projects will increase by 0.1678 units (jobs). Thus, the fourth hypothesis that saying "The exemption from property tax within the framework of government subsidy for investment projects has a positive impact on job creation" is accepted according to the results of the study.

The fifth hypothesis indicates that there is a positive effect of guaranteed access to finance on job creation. The results of the study denoted there is a positive relationship of statistical significance between ensuring access to bank financing for investment projects and job creation, and the strength of this effect is 0.8427. That is, when this variable changes by one unit (one million Algerian dinars), the job creation in investment projects will increase by 0.8427 units (jobs). Consequently, the fifth hypothesis that "guaranteed access to finance in the framework of government subsidy for investment projects has a positive impact on job creation" is acceptable based on the results of the study.

### 6.2. Recommendations

The Algerian government should focus more on financing incentives (government credit: guaranteed access to finance for acceptable investment projects), as it is the most influencing factor in job creation according to the results of this study;

Rationalizing and managing government subsidy using various tools and policies (financing incentives and taxes) and linking them directly to the number of job opportunities provided by investment projects, especially investment projects that provide less than 100 jobs;

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## 8. Notes

**(i)** The marginal cost curve moves to the right (downward) in economics books jargon, suggesting that income would now be maximized at a higher level of production-and thus at a higher level of employment.

**(ii)** Instituted by the legislative decree 93-12 (05.10.1993), relating to investment promotion, the promotion of support and steady investments agency (P.S.S.I.A) is an administrative nature public establishment (A.P.E.), to serve promoters' investments in Algeria, created by the executive decree n° 94-319 (17.10.1994). **The role of the P.S.S.I.A. is to:** Assist promoters in realizing their projects; Place all information concerning the international and national economic environment at investors' disposals; Contribute to the development and promotion of new spaces and types of investment for the national market and free zones set up in ALGERIA.

**(iii)** Instituted by the Order n° 03-01 (20.08.2001), relating to investment promotion, the National Agency of Development and Investment (N.A.D.I) is an administrative nature public establishment (A.P.E.), to serve promoters' investments in Algeria, created by the executive decree n° 01-281dated on September 24 th,2001. **The role of the N.A.D.I. is to:** Assist promoters in realising their projects; Place all information concerning the international and national economic environment at investors' disposals; Contribute to the development and promotion of new spaces and types of investment for the national market and free zones set up in Algeria.

**(iv)** Investment declaration: Declared project according to article 4 of the Order n° 01-03 relating to the investment declaration.