

## Measuring and Analysing the Relationship of Financial Leverage and Working Capital to Economic Value Added of a sample Algerian economic enterprise using dynamic analysis for the period 2010-2019.

قياس وتحليل علاقة الرافعة المالية ورأس المال العامل بالقيمة الاقتصادية المضافة لعينة من المؤسسات الاقتصادية الجزائرية باستخدام التحليل الديناميكي للفترة 2010-2019.

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### Abstract:

This study attempts to demonstrate the nature of the relationship of financial leverage and working capital to the economic value added of 11 Algerian economic enterprises for the period between 2010-2019. This is through using Panel data and total debt to private funds as a measure of leverage and total working capital to the volume of assets to measure working capital. To perform that, we rely on the dynamic model of sectional time series data using Generalized Method of Moments (GMM). The study found that there was a direct correlation between working capital with statistical significance, as well as a direct correlation between financial leverage and economic value added. In addition to the abstract slower dependent variable regression coefficient, which reflects the convenience of the dynamic models for the data used?

**Keywords:** Financial decisions; financial leverage; Working capital; Economic value added; Generalized Method of Moments (GMM).

**JEL Classification Codes:** M21, Z23, G32, C33.

### ملخص:

تحاول هذه الدراسة تبين طبيعة علاقة الرافعة المالية ورأس المال العامل بالقيمة الاقتصادية المضافة لـ 11 مؤسسة اقتصادية جزائرية للفترة 2010-2019، بالاستعانة ببيانات البانل (*panel data*) وباستخدام إجمالي الديون إلى الأموال الخاصة كمقياس للرافعة المالية وإجمالي رأس المال العامل إلى حجم الأصول لقياس رأس المال العامل، معتمدين في ذلك على النموذج الديناميكي لبيانات السلاسل الزمنية المقطعية وذلك باستخدام الطريقة المعممة للعزوم (*Generalized Method of Moments (GMM)*)، وتوصلت الدراسة إلى وجود علاقة طردية بين رأس المال العامل ذات دلالة إحصائية، ووجود علاقة طردية بين الرافعة المالية والقيمة الاقتصادية المضافة، وأن معامل الانحدار المتغير التابع المبطل معنوي وهو ما يعكس ملائمة النماذج الديناميكية للبيانات المستخدمة.

**كلمات مفتاحية:** القرارات المالية، الرافعة المالية، رأس المال العامل، القيمة الاقتصادية المضافة، طريقة العزوم المعممة.

**تصنيفات JEL:** M21 Z23, G32, C33.

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## **INTRODUCTION:**

The relationship of financial leverage and working capital to economic value is of interest to many financial researchers. This is because financial leverage reflects the change in the revenue available to owners that is long-term liabilities in an enterprise's financial budget, while working capital covers short-term commitments. All this is necessary in order to achieve the modern financial management's objective of maximizing value known as economic value added (EVA). Its emergence was thanks to researchers Jull Stern and his colleague Stewart. They viewed economic value added as a modern measure of how efficient management is and its ability to generate more profits than the cost of capital, regardless of its source, and if profitability is greater than the cost of funds, we are in the process of creating value. (Landlords' wealth), if the cost of the money is greater than the profit made, we are here facing the waste of wealth (destruction of value). Thus, economic value added has become a measure of management's efficiency. The latter can help to make long-term decisions about how to obtain external sources of financing, including financial leverage, and the other is the good use of short-term resources (working capital). Aforementioned, the study problematic can be formulated in the following question: **What is the nature of the relationship of financial leverage and working capital to the economic value added of the enterprises under consideration.?**

To achieve the purpose of the study, the problematic was divided into the following sub-questions:

1. Is there a direct correlation between working capital and economic value added?
2. Is there a direct correlation between financial leverage and economic value added?

## **Study Hypotheses:**

In order to answer the study problematic, we start from the following hypotheses:

1. The first hypothesis: There is a direct correlation between working capital and economic value added in the enterprises under consideration.
2. Second hypothesis: There is a direct relationship between financial leverage and economic value added in the enterprises under consideration.

## **The Importance of the Study:**

The importance of the study lies in the nature of the problem studied and the questions arising from it, which link three variables that appear to be separate but are overlapping in their content. The first variable of working capital is associated with short-term financial decisions and the second variable is linked to the financial structure of how funds are obtained for financial leverage. Meanwhile, the latter is the ultimate objective of any financial management, which is to maximize the enterprise's value and is identified as economic value added.

## **Study Methodology:**

To ascertain the validity of the hypotheses adopted, we relied in this study on the descriptive method to clarify the theoretical framework of the studied variables and previous literature relevant to the topic considered. Also, we used the econometric statistical method to conduct the econometric study and determine the optimal model for interpreting and determining the relationship of the interpreted variables, namely financial leverage, working capital, to the subordinate variable represented by economic value added. In order to process available financial data, statistical software Eviews version 12 was used.

**Previous Studies:**

1. **Study (2012): Monika Bolek, Marta Kacprzyk, Rafal Wolski:** This study aimed at finding the relationship between economic value added and the cash conversion cycle of Wall Street listed companies during the period 1997-2009. In this study, the researchers divided the sample study into 10 portfolios to calculate average portfolio prices. This was done in order to know the type of correlation between the cash conversion cycle and economic value added, using correlation analysis and multiple regression analysis. The study concluded that the decrease in the monetary cycle in one unit increases the economic value added in the same unit.
2. **Study (2014): Famil Samiloglu Hasim Bagci, Yusuf Polat:** This study aimed at seeking the impact of the capital structure including financial leverage in profitability known as the economic value added within the 120 Istanbul Exchange listed companies during 2003-2012. We relied in doing that on statistical methods, including longitudinal data. The study found that the capital structure affects the economic value added.
3. **Study (2014) Amir Musazadeh, Azim Aslani, Mohammad Hassanzadeh:** This study aimed to survey the relationship between working capital and economic value added in the 430 companies listed on the Tehran Stock Exchange during 2008-2013. The researchers used the Spss program, and the study found that working capital has a strong correlation with economic value added.
4. **Study (2015) Vijayalakshmi & Manoharan:** This study aimed at finding financial leverage effect in the most important indicators expressing the value of the enterprise, namely, economic value added and market value in 7 companies listed on the New York Stock Exchange and Bombay Stock Exchange during the period 1996-2010. This was achieved relying on Panel Data statistical methods and the small square method. The study found a significant statistically of the financial leverage impact on both economic value added and market value in the companies under consideration.
5. **Study (2020) Zaher Abdel Fattah Al-Slehat:** This study aimed at finding the impact of financial leverage, company size and asset structure on the value of 13 companies listed on the Amman Stock Exchange during 2013-2018. We relied on statistical methods such as simple regression analysis, as well as the root analysis of the unit between the studied variables and the diversity factor in order to ensure the stability of the sequence. The study concluded that there was no financial leverage impact on the value of the companies under consideration. However, both the size of the company and the asset structure have an impact on the value of listed companies.
6. **Study (2020) Pratheepkanth Puwanenthiren:** The aim of this study was to verify the nature of the relationship between working capital management and the value of the 100 Sri Lankan companies for 2014-2018, using regression analysis. The study found a strong positive correlation between the cash conversion cycle and the company's value, despite a negative correlation between accounts receivable turnover ratio and inventory turnover ratio of the company's value.

## **1- Theoretical Framework of the Study:**

### **1-1- Working Capital:**

With a view to adjusting and identifying the study variables, we will try to present concepts and foundations of working capital, financial leverage and added economic value added.

Working capital is described as the difference between current assets and current liabilities. Also, it is an essential part of the day-to-day transaction (exploitation cycle) of purchasing raw materials, paying wages and salaries, paying daily expenses, as well as meeting short-term obligations in a timely manner (Paramasivan & Subramanian, 2009, p. 42).

Furthermore, it can be described as the capital needed to finance the monetary cycle. That represents the time taken to pay the supplier for goods, until it returns from consumers who pay for the goods purchased, in addition to the period in which the goods are spent in warehouses (Dennett, 2007, p. 87).

This is considered to be the asset part of the enterprise's exploitation activity, i.e., the elements within the exploitation cycle. In other words, it reflects the sum of the exchange-traded value in circulation that translates the permanent financial supply's movement into liquidity in less than a year (Abdel-Baqi, 2015, p. 287).

Thus, it can be said that working capital represents the difference between current assets and current liabilities (short-term debt) in the financial budget. It aims to manage each current asset item; including monetary assets, receivable turnover, stock and short-term investments, and the management of each current liability item; including credits, short-term accounts receivables, short-term accruals, and bills- receivable in order to balance profitability and risk positively contributing to maximizing the enterprise's value.

It is noteworthy that the importance of working capital is the management of current assets and liabilities, because investing in current assets represents a large part of total assets. The importance of the latter is reflected in the fact that the organizations' financial managers spend most of their time managing current assets and liabilities. This is through arranging short-term sources of financing, negotiating appropriate credit terms, controlling cash movements and controlling inventory investment (Prasaman, 2011, p. 564). In addition, it also gives an idea of the safety margin for the enterprises ,i.e., the availability of liquidity on their due date, given that working capital can be calculated from the bottom up of the budget. The latter is calculated by making the difference between current assets and current liabilities, while from the top of the budget it is calculated by making the difference between non-current liabilities and non-current assets.

Working capital may take one of the following three cases (AAOUID, 2017, p. 13):

- First case: Working capital is positive ( $FRNG > 0$ ). This situation is explained by the fact that current assets are greater than current liabilities, i.e., an enterprise can meet its short-term obligations, while achieving a safety margin consisting in working capital.
- Second case: Negative working capital ( $FRNG < 0$ ). This situation is achieved when an enterprise is unable to meet its short-term debt by converting current assets into liquidity, i.e., the enterprise have not controlled its cash cycle.
- Third case: A rare situation in reality, namely, that there is non-existent working capital, i.e., an equality between current assets and current liabilities.

### **1-1-1 Determinants of Working Capital:**

There are several factors that determine the value of working capital Namely (Al-Najjar & Muhammad Al-Ali, 2010, p. 202):

- **Cost:** Which are the conditions of payment for the raw materials' value, the various sale conditions and the extent of credit granted by the enterprise to its customers.
- **Time:** Waiting time for the arrival of raw materials and various procurement policies play an important role in determining the volume of working capital required for enterprises.
- **Size:** Seasonal fluctuations and various events play an important role in determining working capital. Especially when enterprises are forced to stockpile large quantities of production in order to sell them in a short seasonal period. So, sufficient working capital is required to cope with these conditions.

Additionally, other factors come in the following points (Abu Al-Jadayel, 2012, p. 133):

- Enterprises' stage of growth and development.
- Stock turnover rate.
- Terms and conditions of sale and purchase.
- Seasonal consumption.

### **1-2- Financial Leverage:**

Leverage has different meanings; the contents vary according to the fields of use. In the field of natural and physical sciences, it means the use of force and special effects of lifting heavy objects (Stanley & others, 2000, p. 122).

Financially they can be defined as total debt in the financial structure to total assets. This definition applies to economic institutions similar to financial institutions. Financial leverage reflects the extent to which deposits are used in the banks' financial structure (Al-Shammari, 2019, p. 289) and can be expressed as the ability to use fixed costs or funds to increase shareholders' returns before interest and taxes are calculated, thereby generating value for shareholders. (Paramasivan & Subramanian, 2009, p. 83) It is also defined as the extent to which economic institutions depend on borrowing from financial and banking institutions, whether debts or bonds, in order to meet their financial needs (Al-Sayegh, 2018, p. 183) , According, financial leverage can be said to indicate the extent to which debts are used instead of issuing new shares in the financial structure in order to generate profits as an attempt to enhance shareholders' value.

#### **1-2-1 Financial Leverage Measurement:**

There are several measures that reflect financial leverage: the extent to which an enterprise relies on borrowed funds for its financing and the extent to which the latter fulfils its obligations on maturity. The most important measures are the following:

- **Financial leverage ratio:** measured in the following formula:  $FL = EBIT/EPs$  This ratio indicates the extent to which the company is able to generate returns before interest and tax calculation (Paramasivan & Subramanian, 2009, p. 87).

So that:

FL: Financial Leverage.

EBIT: Earnings Before Interest and Taxes

EPS: Earnings Per Share.

- **Long-term Loans to Working Capital:** This ratio shows the extent to which long-term sources (loans) can be covered using working capital (Al-Maghrabi, 2020, p. 120)
- Financial leverage can be measured in banking institutions, represented in assets both on and off budget without taking into account risk to capital from the first category. This percentage must not be less than 3% (Al-Maghraby, 2020, p. 102).
- **Current Liabilities to Private Funds:** This ratio refer to the relationship between the amount of money provided by the owners of the enterprise and the amount of money that comes from others. If the owners of the enterprise do not finance the assets from private funds, long-term sources of funds will not finance current assets due to respect for the balance rule. There form, the enterprise is obliged to resort to short-term funding to finance these assets (Tawfik, 1987, p. 122).
- The impact of financial leverage can also be measured from the following formula (Thauvron, 2005, p. 44):

$$K_c = k_a + (k_a - k_d) \frac{DF}{CP}$$

So that:

$K_c$  : Financial profitability

$k_a$  : Economic returns after taxes.

$k_d$  : Cost of debt after taxes.

DF : Debts

CP : Private funds

The cost of debt is estimated by dividing the debt interest amount, including financial leases, if any, by total debt. There form ,the financial leverage effect can be said to be the ability to increase the financial return on copyright by financing a portion of investments with borrowed capital at a lower rate, i.e., to achieve greater value than borrowing costs, where financial leverage consisting in (DF/CP).

This corresponds to three cases (Ogien, 2011, p. 96):

- $e - i > 0$ : The company has a positive financial leverage effect, the higher the debt in the financial structure, the higher the profits.
- $e - i < 0$  : i.e., company has a negative impact on financial leverage, the higher the debt, the lower the profit ratio.
- $e - i = 0$ : In this case the company has no negative or positive financial leverage effect, i.e., profitability is independent of financial leverage.
  - effect, i.e., profitability is independent of financial leverage.

### **1-3 Economic Value Added:**

The economic value or the value itself, which is the current value of the total available cash flows, updated to the cost rate of capital in a fixed-activity environment, without changing operational and financial dimensions (Nassib & others, 2018, p. 17). While economic value added, it is a term proposed by Stern & Stewart in 1991 with the aim of defining and measuring a company's ability to create net value, this term is one of the most important indicators of financial performance and value measurement, and it is said to be the most accurate criterion for analysing and interpreting value creation (Omani & Ben Ali, 2020, p. 132). It can be argued from an economic point of view that a company that creates economic value is a company whose capital return is greater than the opportunity cost, i.e., a company that has created a wealth whose capital return is substantial (Al-Nuaimi & Al-Tamimi, 2007, p. 130).

Also, it is considered a tool for evaluating project quality, namely post-tax operating profit, less total annual capital cost. If the economic value added is positive, then we say that the company's projects have generated additional wealth for it. But, if it is negative, this means that these projects have depleted capital. Therefore, investors prefer EVA because this latter attribute the profit to the necessary source amounts that it has made (Shehadeh & Al-Hayali, 2015, p. 20). It should be noted that to calculate the economic value added, both operating profit (NOPAT) and invested capital in addition to the cost of capital must be available. The following equations show that (Caby & Others, 2013, p. 34):

$$\begin{aligned} EVA_t &= (r_{et} - k_t)C_t \\ &= NOPAT_t - (k_t \times C_{t-1}) \\ &= CFD_t + \Delta C_t - (k_t \times C_{t-1}) \end{aligned}$$

So that:

$EVA_t$ : Economic Value Added .

$r_{et}$ : Economic returns calculated by exploitative result to invested capital.

$C_t$ : Invested capital.

$k_t$ : Average cost of capital.

$NOPAT_t$ : Result of post-tax exploitation.

$\Delta C_t$ : Change in invested capital.

$CFD_t$ : Available cash flow.

From the foregoing, it can be said that the use of the economic value added input would achieve the following (Al-Zubaidi, 2008, p. 173):

- Consistency between administrative decisions and landlords' wealth.
- Financial decisions are also allowed to be modelled and valued in real terms.
- Contribute to the elimination of multiple-target anarchy.

- An important tool in making investment decisions and decisions of expected investment expansions.
- Provide a basis for an incentive system for employees within the business company.

## 2- Econometric Study

We will try to measure and analyse the relationship between working capital and financial leverage with economic value added. This will be achieved through following methodological steps, and using appropriate statistical and mathematical tools and methods for the study model.

### 2-1 Methodological Procedures for the Econometric Study:

Before proceeding to estimate the model, the variables used in its estimate must be described and adjusted.

#### 2-1-1 The Study Sample:

The study sample consists of the annual data of a group of Algerian economic enterprises for the period 2010-2019. This sample was selected based on the availability of the necessary financial data to calculate the study variables. The following table shows this:

**Table (1): Economic institutions under study**

|                                    |    |
|------------------------------------|----|
| Saidal                             | 1  |
| ALLIANCE ASSURANCES                | 2  |
| NCA ROUIBA                         | 3  |
| Al Ruwad Industrial & Services Co. | 4  |
| Public company for Road Works      | 5  |
| Marmura Mills                      | 6  |
| Amar Bin Amar Mills                | 7  |
| Belghith Mills                     | 8  |
| Public company SOTRASHYPE          | 9  |
| cement company                     | 10 |
| Al- Aurassi                        | 11 |

Source: Prepared by researchers

#### 2-1-2 Study Variables:

- **Dependent Variable** :Economic value added and calculated in the following formula:

$$EVA_t = (r_{et} - k_t)C_t$$

- **Independent Variables:**

-Financial leverage expressed as ELEV is calculated in the following formula:  $RF - Re$ .

-Working capital expressed as FRNG: The difference between current assets and current liabilities to total assets.

Descriptively, the evolution of these series can be observed as shown in the following table:

**Table (2): Descriptive statistics of measured variables**

|                | <b>EVA</b> | <b>LEV</b> | <b>FRNG</b> |
|----------------|------------|------------|-------------|
| <b>Mean</b>    | 86181233   | 1.596355   | 0.138869    |
| <b>Median</b>  | 37607271   | 1.419000   | 0.153000    |
| <b>Maximum</b> | 1.67E+09   | 10.94100   | 0.812000    |

***Measuring and Analysing the Relationship of Financial Leverage and Working Capital to Economic Value Added of a sample Algerian economic enterprises using dynamic analysis for the period 2010-2019***

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|                     |           |           |           |
|---------------------|-----------|-----------|-----------|
| <b>Minimum</b>      | -5.26E+09 | -15.45700 | -0.697000 |
| <b>Std. Dev.</b>    | 5.88E+08  | 2.290104  | 0.224220  |
| <b>Skewness</b>     | -6.626750 | -2.957126 | -0.177649 |
| <b>Kurtosis</b>     | 64.42674  | 31.42098  | 4.483356  |
| <b>Jarque-Bera</b>  | 18099.12  | 3862.514  | 10.66350  |
| <b>Probability</b>  | 0.000000  | 0.000000  | 0.004836  |
| <b>Sum</b>          | 9.48E+09  | 175.5990  | 15.27560  |
| <b>Sum Sq. Dev.</b> | 3.76E+19  | 571.6587  | 5.479916  |
| <b>Observations</b> | 110       | 110       | 110       |

Source: Software outputs evIEWS12

### **2-1-3 The Method and Statistical Tools Used:**

In the current study, we adopted the statistical method of measuring and analysing the relationship of working capital and financial leverage to the economic value added in the dynamic Panel data model using version 12 evIEWS software. Aiming to obtain an appreciable and consistent results of the regression transactions. The Generalized Method of Moments (GMM) will be used. The Generalized Method of Moments became one of the most important statistical tools used to analyse economic and financial data. It has been used by Lars Hansen for the first time in 1982. Since then, it has been widely used in a broad variety of areas; including macroeconomic, finance, agricultural and environmental economics, and has been applied to time series, cross-sections and panel data (Hall, 2005, p. 1).

What distinguishes this method is (Hall, 2005, p. 48):

- The correct estimation requires that not only is the generalized situation, but that sufficient information must be available to determine the parameter's vector.
- The estimation of long-term common variation.
- Typical diagnostics to test the validity of the model's specification.

In addition to addressing impartiality resulting from neglecting other variables—that may have to do with the dependent variable, and addressing the root effects of the unit if any, it facilitates finding appropriate tools by selecting predefined variables and external variables (Robert Bates, 2003, pp. 12-13).

Arellano and Bover in 1995, and Bond and Blundell in 1998 added calculation of the first differences for the estimated model by Generalized Method of Moments and used backward variables over time periods at the level as Instrumental variables (Bond & Others, 2001, p. 4).

### **Model Estimation**

Before estimating the model, it is necessary to know how homogeneous the parameters of the estimated model are using the hsiao test. The following table illustrates the test results:

**Table (3): Hsiao Homogenization Test**

| Hypotheses | F-Stat   | P-Value  | Rejection |
|------------|----------|----------|-----------|
| H1         | 8.651310 | 1.32E-14 | Rejection |
| H2         | 6.846212 | 2.56E-10 | Rejection |
| H3         | 5.559754 | 1.64E-06 | Rejection |

Source: Software outputs evIEWS12

From the table above, we note that the static analysis model of the panel data cannot be estimated and therefore we move to the application of the dynamic model. Before starting the econometric study, we first build on the correlation matrix in order to determine the direction and strength of the relationship between the studied variables. The following table demonstrates this.

**Table (4): Correlation Matrix**

| Correlation       |          |          |          |
|-------------------|----------|----------|----------|
| Probability       | EVA      | LEV1     | FRNG     |
| EVA               | 1.000000 |          |          |
| LEV1              | 0.621734 | 1.000000 |          |
| Prob(t-statistic) | 0.0000   | -----    |          |
| FRNG              | 0.303029 | 0.027500 | 1.000000 |
| Prob(t-statistic) | 0.0013   | 0.7755   | -----    |

Source: Software outputs evIEWS12

Through analysing the correlation matrix between the studied variables, we conclude that there is a positive and abstract correlation between financial leverage and economic value added, as well as a positive and abstract correlation between working capital and economic value added.

After confirming the nature of the relationship between the study variables, we will appreciate the relationship of working capital and financial leverage to the economic value added at 11 Algerian economic enterprises, using the Generalized Method of Moments based on the following formula:

$$\begin{aligned} @DADJ(EVA) = & C(1) * @DADJ(EVA(-1)) + C(2) * @DADJ(LEV1) + C(3) \\ & * @DADJ(FRNG) \end{aligned}$$

The following table shows the summarization of the results of the estimate using Generalized Method of Moments GMM.

**Table (5): estimation Results**

| Variable                                       | Coefficient | Std. Error         | t-Statistic | Prob.     |
|------------------------------------------------|-------------|--------------------|-------------|-----------|
| EVA (-1)                                       | 0.202277    | 0.002960           | 68.33074    | 0.0000    |
| LEV1                                           | 1.75E+08    | 16396454           | 10.69468    | 0.0000    |
| FRNG                                           | 2.21E+09    | 55154572           | 40.08511    | 0.0000    |
| <b>Effects Specification</b>                   |             |                    |             |           |
| <b>Cross-section fixed (first differences)</b> |             |                    |             |           |
| Root MSE                                       | 4.66E+08    | Mean dependent var |             | -77487580 |
| S.D. dependent var                             | 6.02E+08    | S.E. of regression |             | 4.74E+08  |

***Measuring and Analysing the Relationship of Financial Leverage and Working Capital to Economic Value Added of a sample Algerian economic enterprises using dynamic analysis for the period 2010-2019***

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|                          |          |                   |          |
|--------------------------|----------|-------------------|----------|
| <b>Sum squared resid</b> | 1.91E+19 | J-statistic       | 7.121928 |
| <b>Instrument rank</b>   | 11       | Prob(J-statistic) | 0.523537 |

Source: Software outputs evIEWS12

From the table above, we note that statistical analyses using the Generalized Method of Moments for the first differences of the panel data are acceptable and demonstrate the validity of the estimated model through the diagnostic test. Since the sargam test (J-statistic) showed acceptance of the null hypothesis—which stipulates the acceptance of backward assistance variables and that first-degree differences are statistically acceptable, because the corresponding probability of testing was greater than 0.05 at 0.52—this indicates the quality and relevance of the tools used in the model and the validity of the conditions of moments used. To find out the abstractness of the model, we use the Wald test and the following table test results:

**Table (6): Wald Test**

| <b>Equation: Untitled</b> |              |           |                    |
|---------------------------|--------------|-----------|--------------------|
| <b>Test Statistic</b>     | <b>Value</b> | <b>Df</b> | <b>Probability</b> |
| <b>t-statistic</b>        | 68.33074     | 85        | 0.0000             |
| <b>F-statistic</b>        | 4669.090     | (1, 85)   | 0.0000             |
| <b>Chi-square</b>         | 4669.090     | 1         | 0.0000             |

Source: Software outputs evIEWS12

From the table above, we note that the probability value of the Wald test is less than 0.05. This indicates the overall abstractness of the statistically estimated model. To test for a subjective correlation between errors, we use the Arellano-Bond test shown in the following table:

**Table (7): Arellano-Bond Serial Correlation Test**

| <b>Arellano-Bond Serial Correlation Test</b> |                    |                      |                     |              |
|----------------------------------------------|--------------------|----------------------|---------------------|--------------|
| <b>Equation: Untitled</b>                    |                    |                      |                     |              |
| <b>Sample: 2010 2019</b>                     |                    |                      |                     |              |
| <b>Included observations: 88</b>             |                    |                      |                     |              |
| <b>Test order</b>                            | <b>m-Statistic</b> | <b>rho</b>           | <b>SE(rho)</b>      | <b>Prob.</b> |
| <b>AR(1)</b>                                 | -1.441096          | -6424975249996536000 | 4458394136374860800 | 0.1496       |
| <b>AR(2)</b>                                 | 0.538038           | 1674831508903126600  | 3112850388689286800 | 0.5906       |

Source: Software outputs evIEWS12

The table above shows that the probability of statistical testing is greater than 0.05. This indicates that there is no second-degree serial self-correlation to the extent of random error, i.e., acceptance of the null hypothesis that there is no second-degree serial self-correlation. This demonstrates the validity of the moments, constraints used in the estimation.

### 2-3 Discussion of the Findings:

Based on Table 05 and the following equation:

$$\text{@DADJ(EVA)} = 0.202276930677 * \text{@DADJ(EVA(-1))} + 175354869.735 * \text{@DADJ(LEV1)} + 2210877256.83 * \text{@DADJ(FRNG)}$$

We notice that:

- The delayed economic value added factor by one time EVA (-1) came abstractly and positively at the level of 5%. This means that the 1% change in economic value added in the previous period leads to an increase in the economic value added by 0.2% in economic enterprises. This indicates that the economic value added is affected by the financial performance of the previous period of these enterprises.
- There is a positive correlation between the working capital and the economic value added; and what is noted is that this relationship is abstract. As the results indicate, that the higher the working capital rate one unit would leads to an increase in the value added index in the enterprises studied by 2210877256.83. This indicates that the enterprises under consideration pursue a reserved investment policy. Because they hold high working capital; which indicates that working capital has a relationship with the dependent variable in terms of its contribution to wealth generation represented by economic value added. The results of this study are consistent with the study of Amir Musazadeh, Azim Aslani, Mohammad Hasanzadeh (2014).
- Since the study results indicate that each increase in the ratio of financial leverage dependence by one unit would lead to an increase in the Economic Value Added Index by 175354869.735, there is a positive correlation between financial leverage and economic value added. This is a logical relationship consistent with financial theories that confirmed that the use of debt in the financial structure of enterprises will maximize the value of these enterprises. That was compatible with the study of Vijayalakshmi & Manoharan (2015) and disagreed with the study of Fattah Al-Slehat Zaher Abdel(2020).
- The statistical abstractness of the slower dependent variable regression factor at the 5% abstract level reflects the relevance of the dynamic models used.
- Statistical abstractness of both the working capital variable and financial leverage at the level of 5%.
- From a review of some previous studies, it was found that there was a financial leverage effect on the economic value. Other studies refuted this effect based on the difference between the sample and the environment studied.

***Measuring and Analysing the Relationship of Financial Leverage and Working Capital to Economic Value Added of a sample Algerian economic enterprises using dynamic analysis for the period 2010-2019***

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**Conclusion:**

This study aimed at measuring the relationship of financial leverage and working capital to the economic value added of Algerian economic enterprises. Relying on a sample of 11 enterprises for the period 2010-2019 through an econometric study to build a dynamic model of Panel data using the Generalized Method of Moments GMM. The study produced a series of results; the most important of which are:

- The inability of the static model to estimate the relationship between financial leverage and working capital with the economic value added.
- The abstractness of the slower dependent variable regression coefficient at the abstractness level. This reflects the relevance of the dynamic models for the data used.
- No second-degree serial correlation between estimated errors.
- The quality of the tools used in the model and the validity of the Generalized Method of Moments used in the estimation.
- The presence of a strong positive correlation between financial leverage and economic value added.
- The presence of a strong positive correlation between working capital and economic value added.
- The results of the study correspond to the hypothesis that there is a positive correlation between working capital and economic value added and the hypothesis that there is a positive correlation between financial leverage and economic value added in the enterprises under consideration.
- The abstractness of the statistically estimated model.

Based on the study's findings, a number of recommendations can be made. Most importantly:

- Algerian enterprises' managers must reconsider assessing the effectiveness of their companies by drawing on modern measures; including economic value added, in order to determine how well enterprises use their business assets.
- These enterprises must avoid focusing on achieving profit, which is one of the traditional objectives of financial management. Rather, it must focus on the modern objectives of financial management, which are maximizing and creating value.
- Emphasize the good management of working capital by financial managers within Algerian enterprises to ensure the proper utilisation of internal resources.

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