



## The Effect of Board Diversity and Agency Costs on Firm Value An Econometric Study of CAC40 Index Companies

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### **Abstract:**

This study aims to examine the effects of board diversity and agency costs on firm value using a sample of 23 firms listed on the CAC40 Index over the period 2016–2025, based on panel data. Economic Value Added (EVA) was used as a measure of firm value. The explanatory variables included board diversity, represented by gender diversity on the board and foreign board membership, while agency costs were represented by asset turnover. Financial leverage, firm size, and board meetings were also included as control variables. The results revealed a negative and statistically significant effect of gender diversity on the board, agency costs, and the attendance rate of board members at meetings on Economic Value Added. They also showed a positive and statistically significant effect of financial leverage on Economic Value Added, whereas no statistically significant effect was found for foreign board membership or firm size.

**Keywords:** agency costs; board diversity; firm value; panel data.

### **Introduction**

The issue of corporate governance and value creation in the economic enterprise is closely associated with the separation of management from ownership. This phenomenon gave rise to managerial capitalism, which became entrenched through management teams' control over corporate resources and their pursuit of self-interest at the expense of shareholders through a range of legitimate and illegitimate practices. This situation led to financial crises, embezzlement, and accounting scandals, including those involving Enron, WorldCom, Tyco, and Parmalat. These embezzlements and scandals resulted in the destruction of wealth in these companies and stemmed from the absence of effective disciplinary and monitoring mechanisms. This heightened interest in the effectiveness of corporate governance mechanisms as a system for monitoring executive management, disciplining its behavior, and ensuring that it serves the objective for which it was appointed, namely maximizing value creation.

The board of directors is one of the most important internal corporate governance mechanisms, and the degree of diversity among its members is a characteristic that may affect the effectiveness of its monitoring role and the quality of managerial decisions. On the other hand, agency costs are among the factors associated with the conflict-of-interest problem between managers and shareholders, which may affect firm performance and its ability to create



value. Accordingly, this study seeks to shed light on board diversity and agency costs and their effects on firm value, particularly in French companies included in the CAC40 Index of the Paris Stock Exchange.

### **Research Problem:**

Given that corporate governance is the system through which companies are directed and monitored (Cadbury, 1992), this concept is closely related to value creation within the firm, particularly through a set of mechanisms aimed at disciplining the behavior of executive management and ensuring that it serves the fundamental objective for which it was appointed, namely value creation. In light of the growing interest in the effectiveness of governance mechanisms, board diversity and agency costs emerge as two factors that may affect firm value, particularly in French companies included in the CAC40 Index of the Paris Stock Exchange.

On this basis, the following research problem can be formulated:

Is there a statistically significant effect of board diversity and agency costs on firm value, measured by Economic Value Added (EVA), in economic enterprises included in the CAC40 Index of the Paris Stock Exchange during the period 2016–2025?

In light of the research problem, the following hypotheses were formulated:

- There is a statistically significant effect of gender diversity on the board of directors on firm value, measured by Economic Value Added (EVA), in economic enterprises included in the CAC40 Index during the period 2016–2025.
- There is a statistically significant effect of foreign board membership on firm value, measured by Economic Value Added (EVA), in economic enterprises included in the CAC40 Index during the period 2016–2025.
- There is a statistically significant effect of agency costs on firm value, measured by Economic Value Added (EVA), in economic enterprises included in the CAC40 Index during the period 2016–2025.

### **Study Objectives:**

This study seeks to examine the effect of board diversity, as one of the corporate governance mechanisms, and agency costs on the value of the firms under study from the perspective of modern financial indicators. To achieve this objective, it is necessary to examine the effects of gender diversity on the board, foreign board membership, and agency costs on firm value, measured by Economic Value Added.

### **Methodology and Research Tools**

To address the research problem and test the validity of the hypotheses, the descriptive-analytical approach was adopted to analyze the theoretical relationship between board diversity and agency costs and the value of the economic enterprises under study, together with an analysis of the econometric results. The statistical approach based on panel-data models was also employed using EViews 10 and GRETl to obtain the study results. Descriptive statistical techniques, including descriptive statistics and a correlation matrix, were used, together with a set of tests to ensure the statistical and econometric quality and robustness of the model appropriate for the study.



## **1. Theoretical Framework of the Study**

### **1.1 Analysis of the Effect of Board Diversity on Firm Value**

According to Fama & Jensen (1983), the main decision-makers in a firm are the members of its board of directors<sup>1</sup>. Evidence has shown that certain board characteristics may affect the effectiveness of the board's monitoring role, including gender diversity and the presence of foreign members. These characteristics may influence the way in which the board performs its functions, which determine firm performance and affect firm value. No single theory directly predicts the nature of the relationship between board diversity and firm value; however, several theories provide insight into this relationship, including agency theory, stakeholder theory, signaling theory, and resource dependence theory. This relationship will be analyzed in light of these theories.

#### **1.1.1 Gender Diversity on the Board and Firm Value**

From the perspective of agency theory, the presence of women on the board affects the board's monitoring role over executive managers' behavior, as it may contribute to increased profitability and the protection of their interests<sup>2</sup>. Such diversity strengthens board independence and enables it to perform its monitoring function more effectively, while also reducing agency costs<sup>3</sup>.

Stakeholder theory supports agency theory and suggests that women on boards may be attentive to the needs of all stakeholders and help understand and manage stakeholder relationships, thereby ensuring the realization of their different interests<sup>4</sup>. Moreover, including women on boards may convey a positive image of the firm's competitive advantage<sup>5</sup>. Signaling theory, meanwhile, considers gender diversity a distinctive means of sending credible signals to the market and building the firm's reputation, particularly in the presence of information asymmetry between external parties and firm management<sup>6</sup>.

From the perspective of resource dependence theory, board diversity can strengthen access to resources through the human and social capital required by boards. Such diversity provides a broad range of knowledge, ideas, and information that can foster creativity in thinking and the generation of ideas during corporate meetings, provide different opinions and perspectives, and improve boards' ability to deal with non-routine problems, thereby enabling high-quality decisions aimed at improving firm performance and maximizing firm value<sup>7</sup>.

In contrast, Williams and O'Reilly (1998) indicated that diversity may result in greater conflict and employee turnover<sup>8</sup>. Tasheva and Hillman (2018) also noted that gender diversity on the board may hinder strategic change because it generates a number of divergent views, which may lead to conflict and impede decision-making and problem-solving, in addition to women's greater tendency than men to take risks in leadership positions<sup>9</sup>.

Empirically, Juan Francisco Martín-Ugedo and Antonio Minguez-Vera (2014) examined gender diversity on boards using a sample of Spanish non-financial firms over the period 2003–2008. They found that the probability of women serving on the board increases with firm performance and also found a positive effect of female board membership on firm value<sup>10</sup>.



The positive effect of gender diversity on firm value was also confirmed by the empirical studies of Ayman Issa et al. (2019), which indicate that the presence of women on the board is likely to improve the quality of board decisions and consequently increase firm value<sup>11</sup>. David A. Carter et al. (2003), who examined a sample of U.S. firms, likewise found a positive relationship between board gender diversity and firm value<sup>12</sup>.

By contrast, Adams and Ferreira (2009) demonstrated a negative effect of women's presence on the board on firm value. They found that boards with greater gender diversity devote more effort to monitoring managers, but also identified a negative relationship between the proportion of women on the board and firm value, measured by Tobin's Q, in their analysis of U.S. firms<sup>13</sup>. Rose (2007) found no significant relationship between board gender diversity and Tobin's Q in a different sample of Danish firms<sup>14</sup>. The same result was reached by Rohail Hassan and Maran Marimuthu (2016), who found no effect of board gender diversity on firm value<sup>15</sup>.

### **1.1.2 Foreign Board Members and Firm Value**

From the perspective of agency theory, foreign board members are unlikely to collude with inside members to undermine shareholders' interests because foreign members have incentives to build their reputation as expert monitors<sup>16</sup>. The theory holds that a more diverse board may be a better monitor of management because individuals with different ethnic or cultural backgrounds may raise questions that would not be raised by managers from more traditional backgrounds<sup>17</sup>.

From the stakeholder theory perspective, boards that include members of foreign nationalities are more responsive to stakeholders' needs and may enhance the firm's reputation and its relationships with stakeholders, thereby improving performance and maximizing firm value<sup>18</sup>.

From the perspective of resource dependence theory, the board's role is to secure resources for the firm and provide strategic advice that supports its survival and performance. Accordingly, a board that is diverse in terms of members' nationalities may produce higher-quality decisions because cultural differences bring different perspectives that can generate diverse alternatives and enhance employees' overall creativity and innovation<sup>19</sup>.

In contrast, Westphal and Milton (2000) indicated that boards that are diverse in terms of the nationality of their members may encourage divergent thinking in the decision-making process. Campbell and Minguez-Vera (2008) added that such diversity generates numerous varied and conflicting opinions, making decision-making more time-consuming and less effective<sup>20</sup>.

Empirically, only a limited number of studies have examined the nature of the effect of foreign board members on firm value. Oxelheim and Randøy (2003) investigated the effect of foreign (Anglo-American) board membership on firm performance measured in terms of value (Tobin's Q), using a sample of firms headquartered in Norway or Sweden. The results showed significantly higher value for firms with foreign Anglo-American board members<sup>21</sup>. This finding is consistent with Vagner et al. (2021), who examined the relationship between the



foreign academic and professional experience of board members and the performance of 230 Brazilian firms over the period 2010–2016 and found a positive effect of an increase in the number of foreign board members on firms' market value<sup>22</sup>. In contrast, Kabara and Modibbo (2020), who examined the effect of ethnic diversity on the financial performance of 67 non-financial firms listed in Nigeria during 2012–2017, found that the presence of foreign board members negatively affects financial performance measured by ROA<sup>23</sup>. Rohail and Maran (2016), however, found no effect of foreign board members on firm value.

### 1.2 Analysis of the Effect of Agency Costs on Firm Value

According to Jensen and Meckling (1976), “an agency relationship is defined by a contract under which one or more persons, referred to as the principal, engage another person, referred to as the agent, to perform some service on their behalf, which involves delegating some decision-making authority from the principal to the agent”<sup>24</sup>. These two parties have different and conflicting personal objectives and interests, giving rise to a conflict known as the agency problem<sup>25</sup>. According to Jensen and Meckling (1976), the agency problem gives rise to agency costs, which consist of monitoring costs, bonding costs, and residual loss<sup>26</sup>. Monitoring costs represent the costs of control mechanisms designed to monitor agents' behavior in order to maximize shareholder value<sup>27</sup>. Bonding costs consist of expenditures incurred by the agent to assure the principal of the quality of the agent's behavior<sup>28</sup>. Residual loss refers to deviations between management decisions and owners' interests that result in unavoidable harm or losses to owners' wealth<sup>29</sup>.

The primary objective of corporations is to maximize owners' wealth; however, this may differ in practice, as corporate managers may prefer to pursue their own objectives, such as focusing on investments that generate high short-term profits rather than maximizing owners' wealth in the long term through investment in successful long-term projects. In addition, the agent may use the firm's resources to obtain personal benefits that destroy value, thereby adversely affecting firm value<sup>30</sup>. On the other hand, the relationship between agency costs and firm value can be analyzed through ownership concentration. Ownership concentration reduces agency costs by enabling shareholders to manage the firm and direct it toward investment development, thereby achieving better financial performance that positively affects firm value. The relationship between agency costs and financial performance has been examined in previous studies. Nuhu, Dandago, Lawal, Ado, and Abdulkarim (2020) analyzed the effect of agency costs on the financial performance of consumer-goods companies listed in Nigeria during 2007–2016 using panel models. The results indicated an inverse relationship between agency costs and financial performance, suggesting that agency costs reduce financial performance if they are not properly managed<sup>31</sup>. Rachid Khan et al. (2020) likewise indicated that agency costs negatively affect the financial performance of listed Chinese companies during 2008–2016. Baykara and Baykara found that the effect of agency costs, measured inversely by asset turnover, on financial performance, measured by return on assets, was not statistically significant<sup>32</sup>.



## 2. Research Methodology

This section presents the study population and sample, the study variables, and the adopted mathematical model.

### 2.1 Study Sample

The study population consists of 40 French joint-stock companies listed on the CAC40 Index of the Paris Stock Exchange during 2016–2025. The study sample comprises 23 companies listed on the same index that meet the following conditions: compliance with the French corporate governance regulations (Afep-MEDEF), inclusion in the index as of 31 December and availability of annual financial data throughout the study period, exclusion of financial companies due to the specific characteristics of this sector, and no involvement in acquisition or merger transactions.

Data were collected from the official websites of the firms under study and their annual reference reports. Panel data were used, covering  $n$  cross-sectional units represented by 23 companies listed on the CAC40 Index, while each company simultaneously contains a time series covering  $t$  periods corresponding to 10 years. Accordingly, the model includes 230 observations ( $t \times n$ ).

### 2.2 Study Variables: The study model includes three types of variables:

#### 2.2.1 Dependent Variable:

The dependent variable is firm value, measured using Economic Value Added (EVA), calculated according to the following equation:

$$EVA = NOPAT - (WACC \times CI)$$

#### Where:

**NOPAT:** Net Operating Profit After Tax

**WACC:** Weighted Average Cost of Capital

**CI:** Invested Capital

This measure was used in the study by Bahri Hichem<sup>33</sup> (2017).

**2.2.2 Independent Variables:** The independent variables consist of agency costs and board diversity, represented by gender diversity on the board and foreign board members, as detailed below:

- Gender Diversity on the Board (Gender diversity)

This variable (GNDR) is measured by dividing the number of women on the board of directors by the total number of board members. This measure was adopted in the study by Ahmadi and Bouri<sup>34</sup> (2017).

- Foreign Board Members (Diversity Foreigners)

The foreign board member variable (DVRFR) is measured by dividing the number of foreign board members by the total number of board members.

- **Agency Cost:** This is measured by asset turnover (ASTR), which is an indicator of the effectiveness of firms' investment decisions and management's ability to direct assets toward the most productive uses. Firms with low asset turnover suffer from higher agency costs



because of suboptimal investment decisions or the use of funds to purchase non-income-generating assets<sup>35</sup>. This variable is calculated by dividing annual sales by total assets, following the measure adopted by McKnight and Weir (2009)<sup>36</sup>.

### 2.2.3 Control Variables

- Financial Leverage (LEV): calculated as total debt divided by total assets. This measure was used by Azar, Sayyar, Zakaria, and Sulaiman (2018)<sup>37</sup>.

- Firm Size (SIZE): calculated as the natural logarithm of the firm's total sales at the end of the year.

### - Board Meetings (MEET)

It is measured as total actual attendance divided by total expected attendance of board members. This measure was used by Lawrence Asare Boadi et al. (2023)<sup>38</sup>.

Measured by total actual attendance divided by total expected attendance  $\times 100$ .

## 2.3 Adopted Mathematical Model

To test the effect of ownership structure and agency costs on the profitability of French CAC40 companies, the following mathematical model was adopted:

$$EVA_{it} = \beta_{0i} + \beta_1 GNDR_{it} + \beta_2 DVRFR_{it} + \beta_3 ASTR_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + \beta_6 MEET_{it} + \varepsilon_{it}$$

## 3. Study Results

### 3.1 Descriptive Statistics

Table (01) presents the descriptive statistics of the dependent and independent variables of the study. The study variables are described below:

**Table (01): Descriptive Statistics of the Study Variables**

|                     | EVA       | GNDR     | DVRFR    | ASTR     | LEV      | MEET     | SIZE     |
|---------------------|-----------|----------|----------|----------|----------|----------|----------|
| <b>Mean</b>         | -0.201554 | 0.453056 | 0.339695 | 0.632643 | 0.695336 | 0.955774 | 4.453408 |
| <b>Median</b>       | 0.144303  | 0.450000 | 0.314145 | 0.557721 | 0.607422 | 0.960000 | 4.458594 |
| <b>Maximum</b>      | 33.17573  | 0.636364 | 0.777778 | 4.880089 | 8.656277 | 1.000000 | 5.448705 |
| <b>Minimum</b>      | -20.65276 | 0.250000 | 0.000000 | 0.033132 | 0.197240 | 0.850000 | 3.248047 |
| <b>Std. Dev.</b>    | 3.085397  | 0.065417 | 0.166777 | 0.477566 | 0.765482 | 0.033733 | 0.401858 |
| <b>Observations</b> | 230       | 230      | 230      | 230      | 230      | 230      | 230      |

**Source:** Prepared by the researcher based on the output of EViews 10.

### 3.2 Correlation Matrix

A correlation matrix was prepared among the study variables to ensure that there is no multicollinearity problem among them. Table (2) presents the results:

**Table (02): Correlation Matrix of the Study Variables.**

| variables           | EVA     | GNDR    | DVRF<br>R | ASTR   | LEV     | SIZE   | MEET | VIF    |
|---------------------|---------|---------|-----------|--------|---------|--------|------|--------|
| <b>EVA</b>          | 1       |         |           |        |         |        |      | -      |
| <b>GNDR</b>         | -0.1280 | 1       |           |        |         |        |      | 1.063  |
| <b>DVRF</b>         | 0.0159  | 0.0929  | 1         |        |         |        |      | 1.188  |
| <b>ASTR</b>         | 0.0051  | 0.0645  | -0.1546   | 1      |         |        |      | 1.773  |
| <b>LEV</b>          | -0.0546 | 0.0554  | 0.0277    | 0.5559 | 1       |        |      | 1.595  |
| <b>SIZE</b>         | -0.1674 | -0.0315 | -0.3598   | 0.3136 | -0.0638 | 1      |      | 1.367  |
| <b>MEET</b>         | -0.0387 | 0.02205 | 0.1216    | 0.0384 | 0.116   | 0.0730 | 1    | 1.081  |
| <b>Mean<br/>VIF</b> |         |         |           |        |         |        |      | 1.3445 |

**Source: Prepared by the researcher based on the output of GRETTL.**

The correlation matrix helps detect whether a multicollinearity problem exists among the explanatory variables. According to several researchers, multicollinearity arises when correlation coefficients exceed the threshold value of 0.8. The results in Table 1 show that the highest correlation coefficient is 0.5559; therefore, there is no multicollinearity problem among the explanatory variables. This result is further supported by the variance inflation factor (VIF) test, which should not exceed 10; values above this threshold indicate a multicollinearity problem among the explanatory variables. The results show that all VIF values for the explanatory variables are below 10, ruling out multicollinearity among these variables.

### 3.3 Selection of the Appropriate Model for the Study

The appropriate model for the study data is selected by comparing the three panel-data models:

the Pooled Regression Model (PRM), the Random Effects Model (REM), and the Fixed Effects Model (FEM), based on the Fisher test and the Hausman test.

#### 3.3.1 Restricted F-test for Comparing the Pooled Regression Model and the Fixed Effects Model:

This test is based on the following two hypotheses: the pooled model is appropriate.  $H_0$

$H_1$  The fixed effects model is appropriate.

**Table (03): Results of the Restricted F-test**

| The statistical test         | Chi square<br>value | tabular value | Degree of<br>freedom    | P- value    |
|------------------------------|---------------------|---------------|-------------------------|-------------|
| F-test<br>individual effects | 2.25                | 0.55          | Df 1 = 22<br>Df 2 = 201 | (0.0016986) |

**Source: Prepared by the researcher based on the output of Gretl.**

The results presented in Table (03) indicate that the probability value of the Fisher test is less than 0.05. The calculated Fisher value is 2.25, which is greater than the tabulated value of



0.55 at the 5% significance level. Therefore, we reject the null hypothesis and accept the alternative hypothesis stating that the fixed effects model is the appropriate model for achieving the objectives of this study compared with the pooled regression model.

### 3.3.2 Lagrange Multiplier (LM) Test:

To choose between the pooled regression model and the random effects model, the Lagrange Multiplier (LM) test proposed by Breusch-Pagan (1980) is used.

**Table (04): Results of the LM Test**

| The Statistical test | chi-square VALUE | DF degree of freedom | Probability value |
|----------------------|------------------|----------------------|-------------------|
| LM                   | 4.73437          | 1                    | 0.0295657         |

**Source: Prepared by the researcher based on the results of Gretl.**

The LM test results show that the calculated statistic is 4.73437, with a probability value of 0.0295, which is below the 5% significance level. Therefore, we reject the null hypothesis stating that the pooled regression model is appropriate, and the random effects model is more appropriate for addressing the study problem.  $H_0$

### 3.3.3 Hausman Test for Comparing the Fixed Effects and Random Effects Models:

This test is based on the following two hypotheses: the random effects model is appropriate.  $H_0$

The fixed effects model is appropriate.  $H_1$

**Table (05): Hausman Test Results**

| The statistical test | Chi square value | Degree of freedom | Probability value |
|----------------------|------------------|-------------------|-------------------|
| Hausman test         | 14.2656          | 5                 | (0.026806)        |

**Source: Prepared by the researcher based on the output of Gretl.**

The Hausman test results show that the probability value is 0.0268, which is below the 5% significance level. Therefore, we reject the null hypothesis stating that the random effects model is appropriate and accept the alternative hypothesis stating that the fixed effects model is the appropriate model for addressing the study problem compared with the random effects model.

### 3.4 Results of the Multiple Regression Model Using the Fixed Effects Model

The results of the fixed effects model, which is the appropriate model for the study, are presented in the following table:

**Table (06): Results of the Multiple Regression Model Using the Fixed Effects Model**

| Dependent Variable : EVA                  |             |            |             |         |
|-------------------------------------------|-------------|------------|-------------|---------|
| Sample: 2016- 2025                        |             |            |             |         |
| Total panel (balanced) observations : 230 |             |            |             |         |
| Fixed Effects Model (FEM)                 |             |            |             |         |
| Variable                                  | Coefficient | Std. Error | t-Statistic | P-Value |
| C                                         | 3.175016    | 1.635802   | 1.940954    | 0.0537* |
| GNDR                                      | -1.267263   | 0.768488   | -1.649033   | 0.1007  |



|                                      |                  |                 |                  |                  |
|--------------------------------------|------------------|-----------------|------------------|------------------|
| <b>DVRFR</b>                         | <b>0.129144</b>  | <b>0.407067</b> | <b>0.317254</b>  | <b>0.7514</b>    |
| <b>ASTR</b>                          | <b>-1.036867</b> | <b>0.475747</b> | <b>-2.179451</b> | <b>0.0305</b>    |
| <b>LEV</b>                           | <b>0.338067</b>  | <b>0.165171</b> | <b>2.046774</b>  | <b>0.0420**</b>  |
| <b>SIZE</b>                          | <b>0.267831</b>  | <b>0.364352</b> | <b>0.735090</b>  | <b>0.4631</b>    |
| <b>MEET</b>                          | <b>-3.785587</b> | <b>1.255605</b> | <b>-3.014950</b> | <b>0.0029***</b> |
| <b>R-squared = 0.627019</b>          |                  |                 |                  |                  |
| <b>Adjusted R-squared = 0.575061</b> |                  |                 |                  |                  |
| <b>F-statistic = 12.06790</b>        |                  |                 |                  |                  |
| <b>Prob(F-statistic) = 0.000000</b>  |                  |                 |                  |                  |
| Note: *p<0.1 ; **p<0.05 ; ***p<0.01  |                  |                 |                  |                  |

Source: Prepared by the researcher based on the output of Gretl.

### 3.5 Testing the Model from a Statistical Perspective

#### 3.5.1 Overall Significance Test of the Model

The study model aims to test the effects of the independent variables—gender diversity on the board, foreign board members, and agency costs—in addition to the control variables of financial leverage, firm size, and board meetings, on the dependent variable, Economic Value Added, using a sample of 23 French companies listed on the CAC40 Index over a 10-year period. To test the overall significance of the model, the coefficient of determination and the Fisher test are used. The results of estimating the multiple regression model using the fixed effects model indicate that the coefficient of determination is 0.6270, meaning that the explanatory variables included in the model account for 62.70% of the variation in Economic Value Added among CAC40 firms. This is a high proportion indicating good model quality, while 37.30% is attributable to other variables not included in the study model. The probability value associated with the Fisher statistic, Prob (F-statistic), is 0.0000, which is less than 0.05. Therefore, we reject the null hypothesis and accept the alternative hypothesis, indicating that the estimated model is jointly significant.  $R^2$

#### 3.5.2 Testing the Model from an Econometric Perspective: After confirming the statistical quality and validity of the model, it must also be tested from an econometric perspective.

**First:** Autocorrelation Test: To ensure that there is no autocorrelation problem in the errors, the Wooldridge test is conducted. The test is based on the following two hypotheses:

There is no autocorrelation among the errors.  $H_0$

$H_1$  There is autocorrelation among the errors.

**Table 7: Results of the Wooldridge Test**

|                                                                   |
|-------------------------------------------------------------------|
| <b>Wooldridge test for autocorrelation in panel data</b>          |
| <b>Test statistic: <math>F(1, 22) = 3.79702</math></b>            |
| <b>p-value = <math>P(F(1, 22) &gt; 3.79702) = 0.064211</math></b> |

Source: Prepared by the researcher based on the Gretl program.

The Wooldridge test results show that the test probability (P-value) is 0.064211, which is greater than the 5% significance level. Accordingly, the null hypothesis is accepted and the



alternative hypothesis is rejected, indicating that there is no autocorrelation problem among the errors.

**Second:** Heteroskedasticity Test: The Wald test is used to determine whether the error variance is constant. The test is based on the following two hypotheses:

The error variance is constant.  $H_0$

$H_1$  The error variance is not constant.

**Table 8: Results of the Wald Test**

| Distribution free Wald test for heteroskedasticity |
|----------------------------------------------------|
| Chi-square(23) = 216290                            |
| p-value = 0                                        |

**Source:** Prepared by the researcher based on the Gretl program.

The results show that the p-value is below the 5% significance level. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, indicating the presence of heteroskedasticity across the cross-sectional units in the fixed effects model.

To address the heteroskedasticity problem affecting the fixed effects model, as identified by the Wald test, the PANEL EGLS method with cross-section weights was adopted, together with Panel-Corrected Standard Errors (PCSE) following the Beck and Katz (1995) approach. The following table presents the results of the corrected fixed effects model using this method.

**Table (9): Corrected Fixed Effects Model**

| Dependent Variable: EVA                    |             |            |             |           |
|--------------------------------------------|-------------|------------|-------------|-----------|
| Method: Panel EGLS (Cross-section weights) |             |            |             |           |
| Sample: 2016 2025                          |             |            |             |           |
| Total panel (balanced) observations: 230   |             |            |             |           |
| Variable                                   | Coefficient | Std. Error | t-Statistic | Prob.     |
| C                                          | 3.175016    | 1.201841   | 2.641794    | 0.0089*** |
| GNDR                                       | -1.267263   | 0.483783   | -2.619484   | 0.0095*** |
| DVRFR                                      | 0.129144    | 0.322902   | 0.399947    | 0.6896    |
| ASTR                                       | -1.036867   | 0.460129   | -2.253424   | 0.0253**  |
| LEV                                        | 0.338067    | 0.160980   | 2.100053    | 0.0370**  |
| SIZE                                       | 0.267831    | 0.344941   | 0.776456    | 0.4384    |
| MEET                                       | -3.785587   | 1.121758   | -3.374692   | 0.0009*** |
| R-squared = 0.627019                       |             |            |             |           |
| Adjusted R-squared = 0.575061              |             |            |             |           |
| F-statistic = 12.06790                     |             |            |             |           |
| Prob(F-statistic) = 0.000000               |             |            |             |           |
| Note:* p<0.1 ; **p<0.05 ; ***p<0.01        |             |            |             |           |



**Source: Prepared by the researcher based on the output of EViews 10.**

#### **4. Discussion of Study Results:**

##### **4.1 Board Gender Diversity**

The results presented in Table (09) show a negative and statistically significant effect at the 1% significance level between the presence of women on the board (GNDR) and Economic Value Added (EVA) in the firms under study. This means that a one-unit increase in women's representation on the board leads to a decrease of 1.267263 units in Economic Value Added.

This result is inconsistent with the propositions of agency theory, which assumes that gender diversity strengthens board independence and complements its monitoring role. It is also inconsistent with stakeholder theory and resource dependence theory, both of which assume that board diversity can contribute diverse perspectives, skills, and expertise that ensure the quality of board discussions and decisions and strengthen the firm's ability to create value.

The negative effect of gender diversity on the value of CAC40 firms may be explained by the possibility that gender diversity may, in some cases, lead to differences in viewpoints, increasing the time required to reach consensus within the board and affecting decision-making speed. On the other hand, this effect may reflect the specific characteristics of the firms under study and their institutional environment, such that greater female representation on the board does not necessarily translate into improved Economic Value Added.

##### **4.2 Foreign Board Members**

The study results show no statistically significant effect of foreign board members (DVRFR) on Economic Value Added (EVA) in the firms under study. This means that changes in the number of foreign board members do not play an important role in creating and maximizing firm value.

This result is inconsistent with agency theory, which assumes that foreign board members have incentives to build their reputation as expert monitors. It is also inconsistent with resource dependence theory, which suggests that foreign members bring valuable experience and facilitate the exchange of information and resources not possessed by local members. It likewise conflicts with stakeholder theory, which argues that the presence of foreign members results in a better response to stakeholders' needs. This result may be explained by the possibility that the benefits of such experience and resources are limited by cultural differences and difficulties in communication and coordination. Moreover, the presence of foreign board members does not necessarily guarantee their effective participation in strategic decision-making in a manner that contributes to enhancing firm value.

##### **4.3 Agency Cost**

The results presented in Table (9) show a negative and statistically significant effect at the 5% significance level between asset turnover (ASTR), which represents agency cost, and Economic Value Added (EVA) for the firms under study. This means that as asset turnover increases, reflecting lower agency costs, the Economic Value Added of the firms under study decreases. In other words, as agency costs decrease, the Economic Value Added of the firms under study decreases. This may be explained by the possibility that management may have been driven to



make unprofitable investment decisions without intending to pursue personal interests, perhaps in order to satisfy certain shareholders, thereby reducing agency problems between these shareholders and management, in addition to insufficient commitment and weak monitoring, which adversely affect Economic Value Added.

#### **4.4 Financial Leverage**

The results presented in Table (09) show a positive and statistically significant effect at the 5% significance level between the control variable financial leverage and Economic Value Added (EVA) in French companies included in the CAC40 Index. A one-unit increase in financial leverage leads to an increase of 0.338067 units in Economic Value Added.

This result can be explained by creditors' ability to exercise control and discipline managers as the level of debt increases. Periodic payment of debt-servicing charges and principal to creditors makes managers more cautious about making inefficient decisions that may hinder firm profitability, thereby improving performance and maximizing value in the firms in the study sample.

#### **4.5 Firm Size**

The study results show no statistically significant effect of firm size on Economic Value Added (EVA) in the firms under study. This means that firm size does not play an important role in creating and maximizing value in the firms under study.

#### **4.6 Board Meetings (MEET)**

The study results show a negative and statistically significant effect at the 1% significance level of board meetings (MEET) on Economic Value Added (EVA) in the firms under study. This means that an increase in the actual attendance rate of board members at meetings leads to a decrease in Economic Value Added. This result may be explained by the fact that high attendance does not necessarily imply high-quality participation or an effective monitoring role. Board members may have high attendance without effective intervention in strategic decisions or improvements in management monitoring mechanisms. The result may also reflect the specific characteristics of the CAC40 sample and the nature of its boards, where high meeting attendance may be associated with the complexity of decisions and monitoring tasks and does not necessarily lead to improved Economic Value Added.

#### **Conclusion**

The study sought to analyze and test certain factors that may affect firm value, focusing on board diversity (gender diversity and foreign members) and agency costs as two of the most important factors affecting it. This was achieved through an econometric study of 23 French companies listed on the CAC40 Index over the period 2016–2025. Panel data were used, and the fixed effects model was applied as the appropriate model, followed by tests of its statistical and econometric validity. The study produced the following results:

- There is a negative and statistically significant effect of board gender diversity on the value of the economic enterprises in the study sample, measured by Economic Value Added (EVA), meaning that an increase in the number of women on the **board leads to a decrease in these firms' Economic Value Added.**



- There is no statistically significant effect of foreign board members on the value of the economic enterprises in the study sample, measured by Economic Value Added (EVA). This means that changes in the number of foreign board members do not play an important role in creating and maximizing firm value.

- There is a negative and statistically significant effect of asset turnover, representing agency costs, on firm value measured by Economic Value Added (EVA) in firms included in the CAC40 Index. This means that as asset turnover increases, reflecting lower agency costs, the Economic Value Added of the firms under study decreases.

- There is a positive and statistically significant effect of the control variable financial leverage on the value of the economic enterprises in the study sample, measured by Economic Value Added (EVA).

- There is no statistically significant effect of the control variable firm size on the value of the economic enterprises in the study sample, measured by Economic Value Added (EVA).

- There is a negative and statistically significant effect of board meetings on the value of the economic enterprises in the study sample, measured by Economic Value Added (EVA).

Based on the findings, the following recommendations can be made:

- Gender diversity on the board should be accompanied by cognitive diversity in order to further enhance the alignment of the interests of the parties to agency relationships and strengthen the governance of French companies listed on the stock exchange.

- Improve mechanisms for integrating foreign board members by strengthening coordination between them and the other board members.

- Reduce agency costs by strengthening monitoring and transparency mechanisms, thereby improving the efficiency of resource use and creating value.

- Improve the quality of board meetings so that attention is not limited to attendance rates but extends to the quality of discussions and decisions made.

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