OWNERSHIP STRUCTURE, DIVIDEND POLICY, AND FINANCIAL PERFORMANCE: A CAUSALITY ANALYSIS

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Abstract

Most studies on corporate governance testing the relationship or correlation between ownership structure (OS), dividend policy (DP), and financial performance (FP). Little attention has, however, been paid to the direction of the causal relationship between financial performance and corporate governance variables (such as OS and DP). This study fills that gap by examining the direction of causality using the bootstrap panel Granger non-causality tests to analyze panel data on selected listed firms in an emerging economy, namely, Tunisia. Based on a sample of 154 firm-year observations during the period 1996–2017 and using both Kónya's (2006) and Dumitrescu and Hurlin's (2012) approaches, results show the existence of both unidirectional and bidirectional significant causal link between the pair of used variables. These findings agree with earlier studies that found that causality runs from some corporate governance measures to financial performance, from the latter to the former, or in both senses.

Keywords: Ownership Structure, Dividend Policy, Financial Performance, Bootstrap Panel Granger Non-Causality

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1. INTRODUCTION

In recent decades, many theoretical and empirical studies (Liargovas & Skandalis, 2010; Mirza & Javed, 2013; Omondi & Muturi, 2013; Akben-Selcuk, 2016; Batchimeg, 2017; Matar, Al-Rdaydeh, Al-Shannag, & Odeh, 2018; Apan & İslamoglu, 2018; Tabash, Al-Homaidi, Ahmad, & Farhan, 2020) in the financial literature have paid particular attention to company performance, and more specifically to factors that may influence the performance of the company. According to Ting, Kweh, and Somosundaram (2017), the ownership structure (OS) and the dividend policy (DP) could play a particularly important role in the financial performance (FP) of the company and offer useful information to the decision-makers interested in improving the corporate governance systems.

Empirically, the majority of the existing literature conducted so far mainly focuses primarily on studying the impact of OS and DP on performance or testing the relationship or correlation between OS, DP, and firm performance (Alslehat & Altahtamouni, 2014; Ehikioya, 2015; Rehman, 2016; Elvin & Hamid, 2016; Khan, Nadeem, Islam, Salman, & Gill, 2016; Leon, 2017; Ting et al., 2017; Bayero & Bambale, 2017; Rafindadi & Bello, 2019; Rajverma, Misra, Mohapatra, & Chandra, 2019; Kautsar, 2019; Khan et al., 2019; Iwasaki & Mizobata, 2020). But, the direction of causal relationship that may exist between the various dimensions of corporate governance (such as, OS, DP) and FP is ambiguous and until now has not been established (Olarewaju, Migiro, & Sibanda, 2018). According to Mhadhbi Terzi, and Bouchrika (2020), this suggests that the issue of causality is of great importance to firms in their evaluation as well as for managers in their decisions.

Concerning, the two-way causality nexus between OS and DP, theoretical results are mixed and until now do not confirm any sense of causality and continue to yield conflicting and inconsistent findings. The causal relationship predicted by traditional agency theory is that ownership is an important determinant of performance (causality of OS to FP). However, recent studies (Adhari & Viverita, 2015; Olarewaju, 2018; Rahmawati, Moeljadi, Djumahir, & Sumiati, 2018; Gunarsih, Setiyono, Sayekti, & Novak, 2018; Cyril, Emeka, & Cheluchi, 2020) highlight that causation could, under certain circumstances, be in the opposite direction (causality of FP to OS). The results of the causal analysis between these indicators diverge as the measurement indicators differ and vary from one study to another. Furthermore, the nature of the companies may appear at the sample level as well as the difference between the countries studied can also explain this discrepancy.

The direction of the causal link between OS, PD, and FP remains contradictory, inconsistent, and therefore remains divisive. Thus, given the absence of clear results in this direction and the continuous debate on OS, DP, and FP causal nexus, it is important and imperative to conduct empirical studies on the sense of causality between these variables. In this regard, Olarewaju et al. (2018) revealed that, on the theoretical level, a good understanding of finance phenomena requires a good knowledge of the causal relationship that may exist between them. In this sense, the authors believed that it is meaningful and essential to test for causation as opposed to correlation or regression because correlation/regression is a relationship that does not necessarily imply causation. In other words, causal analysis eliminates the effect of intervention between variables and shows the cause-and-effect relationship between them. Thus, the main objective of this study is to capture the existence and to determine the sense of causal nexus between OS, DP, and FP in applying the both newly Kónya's (2006) and Dumitrescu and Hurlin's (2012) techniques wish is superior to the traditional Granger causality test. Additionally, according to Olarewaju (2018), the nature of the relationship between these variables varies not only over time but also between countries, especially between both developed and developing countries. In this sense, our study focuses in particular on an emerging market namely the Tunisian context which still remains insufficiently investigated. In this country, the companies are characterized precisely by extensively concentrated ownership and weak corporate governance compared with those in other developed countries (Gana & El Ammari, 2013). The results of this study will be useful for financial analysts in the field of economics and finance in order to improve the firm performance since the Tunisian place continues to attract more and more foreign investors in this period of crisis after the revolution and especially during the crisis of COVID-19 pandemic.

Focusing on two key governance variables (OS and DP) and three selected indicators of financial performance, return on equity (ROE), return on asset (ROA), and Tobin's Q (QTobin), the empirical results of this study confirm that, for the Kónya's (2006) approach, there is a both the one-way and the two-way significant causal link between the pair of used variables. Additionally, for the Dumitrescu and Hurlin's (2012) approach, the overall test concludes that there is no causality running from OS to DP. The findings further reveal that a bidirectional causality nexus between DP and FP is more significant from DP to FP. Nevertheless, the comparison of results for both Kónya's (2006) and Dumitrescu and Hurlin's (2012) approaches show that there is no clear consensus on the direction of causality between all dimensions of corporate governance used in this study and it is also observed that the findings are company-specific. The findings of this study would be of importance to researchers as well as managers in their decisions in order to understand the direction of the causal link between the different dimensions of corporate governance. This allows them to make the best decisions in order to improve the performance of the company.

The major contributions of this paper to the existing literature are as follows. Firstly, to the best of our knowledge, this is perhaps the first study that examines exclusively the direction of causality link between the OS, DP, and FP in the case of Tunisia using both Kónya's (2006) and Dumitrescu and Hurlin's (2012) approaches. This allows comparing the causality between each pair of variables according to the two approaches, in order to provide more robustness to our results. Secondly, unlike previous studies, this study is the first that uses a bootstrap panel Granger non-causality test to explore the causal relationship between OS, DP, and FP[1]. Thirdly, from a methodological standpoint, this study employs the latest available econometric techniques and the most advanced causality framework, as recently developed by Kónya (2006) and Dumitrescu and Hurlin (2012), in order to overcome the technical problems associated with the traditional Granger non-causality test. Lastly, this paper incorporates cross-sectional dependence and firm-specific heterogeneity. Considering the importance of panel and individual results of Granger non-causality, both types of statistics seem to be important in providing robustness to the analysis.

The remainder of this paper is organized as follows. Section 2 develops a literature review. Section 3 describes the data sources and variables description. Section 4 explains the methodology. Section 5 presents the results and discussion. Finally, Section 6 provides the conclusion and the implications of the paper.

2. LITERATURE REVIEW

This section presents the results of some empirical work that has focused especially on the analysis of causality nexus between two of the three variables

[1] This bootstrap panel Granger non-causality approach allows to detect for how many and for which variables of the panel there exists unidirectional Granger non-causality, bidirectional Granger non-causality or no Granger non-causality (Mhadhbi et al., 2020).

retained such as OS, DP, and FP. In the South Korean setting, Lee (2008) used data from 579 publicly traded companies over the period 2000–2006. He showed that the Granger causality test provides strong evidence that ownership concentration influences company performance, but not the other way around. In other words, there is a one-way causal relationship between the OS and FP. Similarly, Hu and Izumida (2008) examined the causal relationship between ownership concentration and corporate performance (using ROA as a measure of performance) by employing Granger causality tests in panel data models. The results obtained indicate the existence of a unidirectional causal relationship between the OC and the ROA. Makni, Francoeur, and Bellavance (2008) conducted a study of 179 Canadian companies between 2004 and 2005 in order to assess the causal nexus between the social performance of the company and FP. The results obtained did not allow the detection of any causal relationship in Granger's sense except for market returns. The topic of this study has also been elucidated by De Wet and Mpinda (2013). Their study is based on a sample of 46 companies listed on the Johannesburg Securities Exchange (JSE) during the period from 1995 to 2010. The main results highlighted that there is a bidirectional Granger causality between the market price per share and the dividend per share of South African companies. In the same vein, Wrońska-Bukalska and Golec (2015) conducted the analysis for all the listed companies present on the Polish stock market in the period 2005–2013 and obtained a one-way causality from FP to OS. Likewise, Pedersen and Thomsen (2001) investigated the causal link between insider ownership and market valuation for a sample composed of 214 largest non-financial companies in continental Europe (including Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden) for the period 1992–1995. Their empirical results confirmed presumably the presence of a bidirectional causality relationship between financial insider ownership and market valuation. Based on the aggregate monthly data for Nordic countries of Denmark, Norway, and Sweden for the period 1969 to 2010, Liljeblom, Mollah, and Rotter (2015) investigated the causality nexus between dividends and earnings. The main results obtained by the authors indicate that dividend payout conveys information about future earnings in Sweden, while some support of Granger-causality is also obtained for Norway. But there are no significant Granger-causal relationships between dividends and earnings for Denmark.

Recent empirical research which focused on the causality link between managerial ownership structure, leverage, and DP, Rahmawati et al. (2018) used data between 2010 and 2015 from 33 companies listed on the Indonesian Stock Exchange by applying the Granger two-way/simultaneity analysis. The results show the presence of bidirectional causality between managerial ownership and DP, but there is no causality effect of managerial ownership on leverage. Similarly, the study by Olarewaju et al. (2018) explored data from 250 commercial banks in 30 countries in Sub-Saharan Africa (SSA) for a ten-year period (2006–2015) to establish the causal relationship between the use of two major dividend policies and financial performance. Notably, the main empirical results of the pair-wise Granger causality test reveal that only retention policies cause performance (ROA), even though the two major policies postulate a positive relationship to performance (ROA) in the estimation of the vector error correction model (VECM). Therefore, commercial banks in SSA should use their free cash flow wisely by exploring all available viable investment opportunities. In doing so, not only the profits of the owners but also the wealth are fully maximized, so that their survival, value creation, and future growth are fully justified.

In another complementary study and using the same sample but with different measures, Olarewaju (2018) also showed that there is a one-way causality link between the ROE and the dividend payout ratio. Specifically, He concludes that the widely adopted model for the payment of dividends in the SSA banking market is a win-lose game, as there is no causality nexus between the payment of dividends and the performance of banks. As such, the author recommends exploring other dividend policies that can reduce future funding costs, increase bank assets and improve the region's future growth prospects. In the same order of ideas, Gunarsih et al. (2018) examined the sense of causality between OS and FP. Using a sample composed of manufacture listed companies in the Indonesian Stock Exchange during 2012–2016, the results of their study show that there is a bi-causality relationship between OS and FP: ownership is causing firm performance and firm performance is causing ownership. These suggest that both the monitoring function and the market for corporate control were implemented as a corporate governance mechanism in Indonesia. These results give a contribution in ownership and firm performance relationship base on agency problem in the perspective of monitoring function and the market for corporate control.

Another study in the United Arab Emirates (UAE) was conducted by Owusu-Antwi, Banerjee, and Ofei (2018). This study presents an empirical analysis of OS and bank performance in the UAE banking system. To examine the control exerted by owners on bank performance, Owusu-Antwi et al. (2018) employed panel data on selected banks in the UAE from 2011 to 2017. The authors use reverse causality to account for any endogeneity issues between OS and bank performance. Their results found no reverse causality between ownership structure and bank performance. The study registered OS to be a driver of bank performance but recorded bank performance not to be a driven factor of OS. More recently, Cyril et al. (2020) analyzed the same topic on data from 5 consumer goods manufacturing firms in Nigeria between 2009 and 2018. The pairwise granger causality test revealed that there is no directional relationship between DP and FP.

According to the above discussions, the causality nexus between OS, DP, and FP is still an open topic, in particular since a very small number of studies have focused on developing countries. Therefore, this work aims at filling this gap by addressing the above issue in the case of an emerging economy, namely, Tunisia context; while taking into account the recent methodological developments.

3. DATA SOURCES AND VARIABLES DESCRIPTION

This section provides information about the sample, data sources, and variables description.

3.1. Sample and data sources

To detect the causal nexus between OS, DP, and FP, the companies listed on the Tunis stock exchange (TSE) represent our total population. The data collected for the time period 1996 through 2017 were taken from the financial statements of the selected companies, annual activity reports, and TSE guides published by the Financial Market Council (FMC). The accounting and financial data were collected from the financial statements and functional balance sheets. OS data was collected from TSE annual reports and guides. We retain companies listed the overall period and their number accounts for 33 firms. Then, we remove 8 companies with missing data over the examined period and 7 companies with nil dividend payout ratios for at least three years. Finally, we eliminate 11 financial companies (e.g., banks and insurance) as these sectors are highly regulated and have divergent features as compared to other companies. Thus, our final sample includes 7 companies listed from 1996 to 2017. Accordingly, our sample consists of 154 firm-years observations.

3.2. Variables description

Table 1 presents the definitions and the proxies of the different variables retained in this study.

Table 1. Variables definition

Variables	*Definition*	*References*
Ownership concentration (*OC*)	Herfindahl concentration index = sum of the squared ownership shares by the 5 largest shareholders	Mossadak, Fontaine, and Khemakhem (2016), Kulathunga, Weerasinghe, and Jayarathne (2017), Gonzalez Molina, Pablo, and Rosso (2017), Krismiaji and Jati (2018)
Institutional ownership (*IO*)	Total percentage of equity of stocks held by institutional investors	Al-Najjar and Kilincarslan (2016), Abdullah, Ahmad, and Roslan (2012), Al-Gharaibeh, Zurigat, and Al-Harahsheh (2013), Kouki and Guizani (2009), Fairchild, Guney, and Thanatawee (2014)
Managerial ownership (*MO*)	Percentage of the shares held by top management (CEO)	Kulathunga and Azeez (2017), Krismiaji and Jati (2018), Daadaa and Jouini (2018)
Dividend yield (*DY*)	Dividend on the share price	Mancinelli and Ozkan (2006), Al-Najjar and Kilincarslan (2016), Daadaa and Jouini (2018)
Dividend payout ratio (*DPR*)	The ratio of dividend per share to profit per share	Rahmawati et al. (2018)
Return on assets (*ROA*)	The ratio of EBIT to total assets	Fama and French (2000), Shabbir (2018)
Return on equity (*ROE*)	Net earnings-to-shareholders equity ratio	Aivazian, Booth, and Cleary (2003), Shabbir (2018)
Tobin's Q (*QTobin*)	Market capitalization plus total assets minus fund own divided by total assets	El-Habashy (2019), Shabbir (2018)

4. METHODOLOGY

This study tries to apply two tests of non-causality of the second category. It applies the non-causality test in the sense of Granger (1969) in heterogeneous panels according to the work of Kónya (2006) and Dumitrescu and Hurlin (2012). These approaches are used to test the existence of a causal linkage between OS, DP, and FP in our sample.

Recent advances in panel causality analysis have highlighted two fundamental econometric issues that cannot be ignored while performing panel Granger non-causality tests. The first concerns the question of cross-sectional dependence and the second question of slope heterogeneity between individuals. According to Ouattara (2020), detecting for cross-sectional dependence and slope homogeneity are fundamental in panel data study. The change in the economic situation in a country following crises can easily transfer the turbulence from one company to another. As Pesaran (2006) has pointed out, ignoring cross-sectional dependency leads to significant biases and size distortions. This means that testing for cross-sectional dependence is a crucial step in any analysis of panel data (Nazlioglu, Lebe, & Kayhan, 2011; Chu & Chang, 2012; Boubtane, Coulibaly, & Rault, 2013; Chang, Simo-Kengne, & Gupta, 2013).

To this end, the next subsections display a brief discussion of the cross-sectional dependence test, the slope heterogeneity test, and the bootstrap panel Granger non-causality test newly developed by both Kónya (2006) and Dumitrescu and Hurlin (2012).

4.1. Cross-sectional dependence tests

The first step in Granger causality analysis for panel data is to test for cross-sectional dependence. The current econometric literature offers a field of research on the strategies of cross-sectional dependency testing (Kónya 2006; Kar, Nazlioglu, & Agir, 2011; Boubtane et al., 2013; Chang et al., 2013). A battery of four tests is developed to check the cross-sectional dependence. The first is the Lagrange multiplier (LM) test developed by Breush and Pagan (1980). It is important to note that the LM test is applicable with N relatively small and T large enough. To overcome this problem, Pesaran (2004) proposed the LM statistic for the cross-sectional dependence test (the CD_{LM} test). The third test is also proposed by Pesaran (2004). However, the CD test lacks power in some situations where the mean pair-wise population correlations are zero, but the underlying correlations between individual populations are nonzero (Pesaran, Ullah, & Yamagata, 2008). In addition, when the mean of the factor loads is zero in the transverse dimension, the CD test cannot reject the null hypothesis (H_0) in stationary (Sarafidis & Robertson, 2009). To solve these problems, Pesaran et al. (2008) propose a bias-adjusted test which is a modified version of the LM test but which uses the exact mean and variance of the LM statistic.

Each of these tests is based on certain assumptions about N and T. However, since in the context of our study $N = 7$ and $T = 22$, only the LM test of Breush and Pagan is reasonable. Application of this test requires estimation of the following panel data model:

$$y_{i,t} = \alpha_i + \beta_i x_{i,t} + \varepsilon_{i,t} \quad (1)$$

for $i = 1,\ldots, N$; $t = 1,\ldots, T$.

In this equation, $y_{i,t}$ is the endogenous variable, i is the individual dimension, t is the time dimension, $x_{i,t}$ is the vector of exogenous variables, α_i and β_i are respectively the individual constants and individual coefficients which may differ from state to state. The null hypothesis (H_0) of no cross-sectional dependence (H_0: $Cov(\varepsilon_{i,t}, \varepsilon_{j,t}) = 0$, for all t and $i \neq j$) is tested against the alternative hypothesis (H_1) of cross-sectional dependence (H_1: $Cov(\varepsilon_{i,t}, \varepsilon_{j,t}) \neq 0$, for at least one $i \neq j$). To test H_0, Breush and Pagan (1980) developed the following LM test.

$$LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{i,j}^2 \quad (2)$$

In equation (2), $\hat{\rho}_{i,j}^2$ is the estimator of the pair-wise correlation of the ordinary least squares (OLS) residuals of equation (1) for each under H_0 of no cross-sectional dependency. The statistic of this test has an asymptotic Chi-square distribution with $\frac{N(N-1)}{2}$ degrees of freedom (Greene, 2003, p. 350). It is important to note that in the case of the presence of the dependency (rejection of H_0, the bootstrap procedure becomes useful.

4.2. Slope homogeneity tests

Another important point of the bootstrap panel causality approach is the test for heterogeneity between individuals. In order to take into account the specific characteristics of each company, this approach does not allow capturing heterogeneity if the slope homogeneity is presumed without empirical evidence (Breitung, 2005; Menyah, Nazlioglu, & Wolde-Rufael, 2014). Furthermore, Granger (2003) stated that causality from one variable to another is a strong null hypothesis (H_0) because it imposes the joint restriction for the entire panel. H_0 of slope homogeneity and the alternative hypothesis of heterogeneity can be described as follows: $H_0: \beta_i = \beta$, for all i, $H_1: \beta_i \neq \beta_j$ for a nonzero fraction of pair-wise slopes for $i = j$. To test H_0, the usual approach is to follow the Wald principle. According to this principle, the slope homogeneity test is $\beta_1 = \beta_2 = \cdots = \beta_N$, where the Wald statistic is asymptotically distributed according to Chi-squared with $N - 1$ degree of freedom (Mark, Ogaki, & Sul, 2005). Fisher's exact test (F) is valid for cases where the cross-sectional dimension (N) is relatively small and the time dimension (T) of the panel is large. The explanatory variables are strictly exogenous and the error variances are homoscedastic. In order to relax the hypothesis of homoscedasticity in the F-test, Swamy (1970) developed a slope homogeneity test to detect cross-sectional heteroscedasticity. However, the Wald and Swamy tests are applicable for panel data models where N is small compared to T. This test is formulated as follows:

$$\tilde{S} = \sum_{i=1}^{N} (\hat{\beta}_i - \hat{\beta}_{WFE})' \frac{x' M_T x_i}{\tilde{\sigma}_i^2} (\hat{\beta}_i - \tilde{\beta}_{WFE}) \quad (3)$$

In equation (3), $\hat{\beta}_i$ and $\tilde{\beta}_{WFE}$ are the OLS and fixed effects estimators of the coefficients β_i of equation (1), respectively, M_T is an identity matrix and $\tilde{\sigma}_i^2$ is the estimator of σ_i^2. In the case of a small sample like our case and when the errors are normally distributed, we can use:

$$\tilde{\Delta}_{adj} = \sqrt{N} \left(\frac{N^{-1}\tilde{S} - E(\tilde{Z}_{it})}{\sqrt{V(\tilde{Z}_{it})}} \right) \quad (4)$$

where, we denote by $E(\tilde{Z}_{i,t}) = k$ and $V(\tilde{Z}_{i,t}) = 2k\frac{T-k-1}{T} + 1$ If H_0 of transversal dependence and homogeneity are rejected then the shock affects as well as the heterogeneity occurs across the firms. The result shows that the panel causality test is appropriate for the causal link tested.

4.3. Bootstrap panel Granger non-causality test

To our knowledge, the current study is the first that implements a bootstrap panel Granger non-causality test to examine the causal nexus between OS, DP, and FP for Tunisian companies. The empirical analysis presented in this study has two stages. First, as a prerequisite for our Granger non-causality tests, we perform both cross-sectional dependence test and slope homogeneity test. Then, from the results of the preliminary analysis, we apply the bootstrap panel non-causality tests of Kónya (2006) and Dumitrescu and Hurlin (2012), the approaches of which are explained as follows.

4.3.1. Kónya's (2006) panel causality approach

Kónya (2006) adopted a method based on a dynamic panel seemingly unrelated regression (SUR) system and on the Wald test using the bootstrap technique to obtain the critical values of this test. This bootstrap, which simulates the empirical distribution of the statistic under consideration, does not require the stationarity of the variables being tested for non-causality. This approach makes it possible to calculate individual statistics. Empirically, Kónya (2006) used a SUR system in order to estimate his model (time dimension greater than the individual dimension) to test the non-causality in the sense of Granger between exports and growth. In this system, the individual equations are instantly correlated with each other by the residual term. There are two stages to applying the Kónya method. At the level of the first, it is a question of testing the individual restrictions imposed on the parameters of the exogenous variable by a Wald test and then testing the non-causality between the two variables. In the second step, bootstrap techniques are used to simulate on the one hand the theoretical values of the endogenous variable and on the other hand the empirical distribution of the Wald statistic in order to extract the critical values of the test.

For our sample and in order to examine the causality nexus between the variables which measure OS, DP, and FP and which verify the preliminary tests (dependence and homogeneity), our approach is based according to Kónya (2006) on the following bivariate vector autoregressive (VAR) model:

$$\begin{cases} y_{i,t} = \alpha_{1,i} + \sum_{s=1}^{ly_i} \beta_{1,i,s} y_{i,t-s} + \sum_{s=1}^{lx_1} \gamma_{1,i,s} x_{i,t-s} + \varepsilon_{1,i,t} \\ x_{i,t} = \alpha_{2,i} + \sum_{s=1}^{ly_2} \beta_{2,i,s} y_{i,t-s} + \sum_{s=1}^{lx_2} \gamma_{2,i,s} x_{i,t-s} + \varepsilon_{2,i,t} \end{cases} \quad (5)$$

In this equation system (5), y and x are the two variables subject to the non-causality test. They are chosen from among the variables that measure OS, DP, or FP (they do not have to measure the same concept). Index i refers to the companies (i = 1,..., 7) and t are the years (t = 1996,..., 2017), s is the delay and ly_1, lx_1, ly_2, lx_2 correspond to the number of delays. The error terms are assumed to be white-noises (i.e., they have zero means, constant variances, and have no individual serial correlations). They can be correlated with one another for a given company, but not between companies.

Since for a given company in the sample, the two equations of system (5) admit the same predetermined exogenous and lagged endogenous variables, the estimators of the parameters by the OLS are consistent and asymptotically efficient. This suggests that the 14 (2 * 7) equations of the system can be estimated one-by-one, in any order. So, instead of 7 VAR systems in equation system (5), we consider the following two sets of equations:

$$\begin{cases} y_{1,t} = \alpha_{1,1} + \sum_{s=1}^{ly_1} \beta_{1,1,s} y_{1,t-s} + \sum_{s=1}^{lx_1} \gamma_{1,1,s} x_{1,t-s} + \varepsilon_{1,1,t} \\ y_{2,t} = \alpha_{1,2} + \sum_{s=1}^{ly_1} \beta_{1,2,s} y_{2,t-s} + \sum_{s=1}^{lx_1} \gamma_{1,2,s} x_{2,t-s} + \varepsilon_{1,2,t} \\ \quad\quad \ldots \\ y_{7,t} = \alpha_{1,7} + \sum_{s=1}^{ly_1} \beta_{1,7,s} y_{N,t-s} + \sum_{s=1}^{lx_1} \gamma_{1,7,s} x_{7,t-s} + \varepsilon_{1,7,t} \end{cases} \quad (6)$$

and

$$\begin{cases} x_{1,t} = \alpha_{2,1} + \sum_{s=1}^{ly_2} \beta_{2,1,s} y_{1,t-s} + \sum_{s=1}^{lx_2} \gamma_{2,1,s} x_{1,t-s} + \varepsilon_{2,1,t} \\ x_{2,t} = \alpha_{2,2} + \sum_{s=1}^{ly_2} \beta_{2,2,s} y_{2,t-s} + \sum_{s=1}^{lx_2} \gamma_{2,2,s} x_{2,t-s} + \varepsilon_{2,2,t} \\ \quad\quad \ldots \\ x_{7,t} = \alpha_{2,7} + \sum_{s=1}^{ly_2} \beta_{2,7,s} y_{7,t-s} + \sum_{s=1}^{lx_2} \gamma_{2,7,s} x_{7,t,s} + \varepsilon_{2,7,t} \end{cases} \quad (7)$$

In this system, each equation has different predetermined variables. The only possible relationship between the individual regressions is the simultaneous correlation within the systems. Therefore, the equation system (6) and (7) must be estimated by the regression procedure without apparent relation SUR, which is more efficient than the OLS estimator, in order to account for the simultaneous correlation within the systems (in the presence of simultaneous correlation, the SUR estimator). Also according to Kónya (2006), we use firm-specific bootstrap Wald critical values to implement Granger causality. This procedure[2] has several advantages. First, it does not assume that the panel is homogeneous, so it is possible to test Granger causality on each panel member separately. However, since simultaneous correlation is allowed between companies, it allows the additional information provided by tuning the panel data to be exploited. As a result, all firms-specific bootstrap critical values are generated. Second, this approach does not require pre-testing for unit roots and cointegration, although it still requires the specification of the lag structure. This is an important characteristic since unit root and cointegration tests in general, suffer from low power, and different tests often lead to contradictory results. Third, this panel Granger causality approach will allow us to distinguish between companies with unidirectional causality, companies with bidirectional causality, and companies without causality in the sense of Granger (Mhadhbi et al., 2020). Regarding the system of equation systems (5) and (6), we assume that for each firm, one of the following four possible hypotheses[3] can be derived. The first hypothesis (*H1*) is that there is a unidirectional Granger causality from x to y if not all $\gamma_{1,i,s}$ are zero, but all $\beta_{2,i,s}$ are zero. The second hypothesis (*H2*) is that there is a unidirectional Granger causation from y to x if all $\gamma_{1,i,s}$ are zero, but not all $\beta_{2,i,s}$ are zero. The third hypothesis (*H3*) is that there is a bidirectional Granger causality between y and x (both causality from y to x and causality from x to y) if neither $\gamma_{1,i,s}$ nor $\beta_{2,i,s}$ are zero. Finally, the fourth hypothesis (*H4*) corresponds to the non-Granger causality between y and x (both non-causality from y to x and non-causality from x to y) if all $\gamma_{1,i,s}$ and $\beta_{2,i,s}$ are zero (Chang et al., 2013).

[2] For the details and exposition of the estimation and testing procedures, see Kónya (2006) and Kar et al. (2011).

[3] Bootstrap panel causality hypothesis.

4.3.2. Dumitrescu and Hurlin's (2012) approach

The method, which represents an extension of the classical tests of non-causality in time series, is essentially based on the empirical mean of individual statistics Wald. They constructed their test by assuming a fixed-effect panel whose residuals are independently distributed among individuals for stationary variables. They did a bootstrap by accepting individual dependency. This approach was developed and evaluated in order to obtain an empirical mean statistic of the individual statistics. To test causality in the sense of Granger from y to x, the Dumitrescu and Hurlin's (2012) approach is based on the following model:

$$y_{i,t} = \alpha_i + \sum_{l=1}^{L} \beta_{i,1} y_{i,t-1} + \sum_{l=1}^{L} \gamma_{i,l} x_{i,t-1} + \varepsilon_{i,t} \quad (8)$$

In equation (8), y and x are the two variables subject to the non-causality test. They are chosen from among the variables that measure OS, DP, or FP (they do not have to measure the same concept). Index i refers to the companies (i = 1,…, 7), and t are the years (t = 1996,…, 2017) l represents the delay and L corresponds to the number of delays. In this approach, this number is the same for all companies and also for both variables. In the context of the panel non-causality test, Hurlin and Venet (2001), Hurlin (2004), Dumitrescu and Hurlin (2012) studied the following four types of hypotheses. First, the homogeneous non-causality (HNC) (subject to the model-specific error components, there is no individual causal relationship). Second, the homogeneous causality (HC) (there are 7 causal relationships, the individual predictors obtained by the lagged values of the two variables are identical and the model is completely homogeneous (except for the individual effects)). Third, heterogeneous causality (HEC) (there are 7 causal relationships, but the individual predictors obtained by the lagged values of the two variables are heterogeneous). Fourth, heterogeneous non-causality (HENC) (assumes that there is at least one causal relationship for a subgroup of individuals). In our study inspired by Dumitrescu and Hurlin (2012), the null hypothesis (H_0) corresponds to HNC against the alternative hypothesis HENC.

$$\begin{cases} H_0: \gamma_{i,l} = 0 \quad \forall_i = 1,2,\dots,7 \quad x \text{ does not cause } y \text{ for the 7 companies} \\ H_1: \gamma_{i,l} = 0 \quad \forall_i = 1,2,\dots,n_1 \quad \text{with } n_1 < 7 \quad x \text{ does not cause } y \text{ for subgroups } n_1 \\ \gamma_{i,l} \neq 0 \quad \forall_i = n_1+1, n_1+2,\dots,7 \quad x \text{ does not cause } y \text{ for subgroups } 7-n_1 \end{cases} \quad (9)$$

Because it is possible to have a causal link between two economic variables for a group of companies and not for another, we notice that the hypotheses of the Dumitrescu and Hurlin (2012) test take into account the heterogeneity of the existence of a causal nexus between individuals.

5. RESULTS AND DISCUSSION

As indicated above, the two Granger non-causality tests with bootstrap[4] (Kónya, 2006; Dumitrescu & Hurlin, 2012) will be applied for our sample in order to detect a possible causality between two of the three concepts OS, DP, and FP. In this step, we mentioned that three measures are retained for the OS (ownership concentration (*OC*)), institutional ownership (*IO*) and managerial ownership (*MO*)), two measures for the DP (dividend yield (*DY*) and dividend payout ratio (*DPR*)) and three measures for FP (return on assets (*ROA*), return on equity (*ROE*) and Tobin's Q (*QTobin*)).

Before applying the Granger causality tests, the dependency and homogeneity tests will allow us to maintain variables among these different measures and exclude others. The measures to be retained are those which favor the rejection of these two tests in the case of the Kónya (2006) test and those which favor the rejection of the second test only in the case of the Dumitrescu and Hurlin's[5] (2012) test. It should be noted that the Kónya's (2006) procedure does not require the stationarity of the test object variables so we are working with the level variables for this test. For the Dumitrescu and Hurlin test which requires the condition of stationarity, we use the first difference variables for all the measurements except for *QTobin* which is stationary in level. To do this, and since the *xtgcause* command of the Dumitrescu & Hurlin non-causality test does not accept the first differences calculated by the STATA software, the first differences of these variables are computed as follows: $dx_{i,t} = x_{i,t} - x_{i,t-1}$. These first differences will then be used because they are stationary[6]. For these tests, the number of delays was defined by Akaike Information Criterion (AIC) which chooses the optimal number of delays among the delays from 1 to 5. STATA and TSP[7] software were used to develop all the tests that appear in this paper.

This section presents the results of the dependence test and the homogeneity test. Secondly, it displays the results of both Kónya's (2006) and Dumitrescu and Hurlin's (2012) tests of non-causality between OS, DP, and FP for the measures selected.

5.1. Cross-sectional dependence and slope homogeneity tests

The results of these tests are shown in Tables 2 and 3 presented below. For these two tables, *yes* means that the test rejection condition is verified at 5%; *no* corresponds to the fact that the test rejection condition is not verified. Empty fields are not the subject of this test because they correspond to combinations (endogenous-exogenous) between measurements of the same characteristic.

[4] The number chosen for bootstrap is 10,000 replications.

[5] The dependency test is not performed for Dumitrescu and Hurlin because the Monte Carlo simulation showed the good performance of the statistics in the presence of individual dependencies.

[6] All the variables are integrated of order 1 and therefore not stationary in level and become stationary after differentiation except *QTobin* which is stationary in level.

[7] Only the Kónya's Granger non-causality test was done by TSP software. We thank Chokri Terzi who shared with us the TSP codes for this test. The TSP codes used in the bootstrap panel Granger non-causality approach is offered by the courtesy of Laszlo Kónya.

Table 2. Cross-sectional dependence test results

Breush and Pagan (1980): Cross-sectional dependence test for Kónya (2006)								
Test statistics	***LM***							
Endogenous variables	*OC*	*IO*	*MO*	*DY*	*DPR*	*ROA*	*ROE*	*QTobin*
OC				yes	yes	yes	yes	yes
IO				yes	yes	yes	yes	yes
MO				yes	yes	yes	yes	yes
DY	yes	yes	yes			yes	yes	yes
DPR	no	no	no			yes	yes	no
ROA	yes	yes	yes	yes	yes			
ROE	yes	no	yes	no	no			
QTobin	yes	yes	yes	yes	yes			

Note: OC: Ownership concentration; IO: Institutional ownership; MO: Managerial ownership; DY: Dividend yield; DPR: Dividend payout ratio; ROA: Return on assets; ROE: Return on equity; QTobin: Tobin's Q.

The results of this test, which focus on the endogenous variable, allow the exclusion of the *DPR* variables which measures the DP, and the *ROE* variable which measures FP.

As stated earlier, testing for dependence during panel causality analysis is of crucial importance in selecting the appropriate estimator. The rejection of the null hypothesis of non-dependence between the individuals in the panel implies that the SUR method is appropriate rather than the estimation of OLS company by company. The cross-sectional dependence between the seven selected companies indicates that a shock to one company is likely to affect other companies.

For this test which rather focuses on the first exogenous variable and taking into account the results of the first test (exclusion of *DPR* and *ROE*), the results only assess the exclusion of the variable *OC* which measures the OS.

Finally, we perform bidirectional Kónya Granger non-causality tests on the combinations of the following measures: *IO* and *MO* for the OS; *DY* for *DP* and *ROA*, and *QTobin* for FP.

Table 3. Slope homogeneity test results

Swamy (1970): Slope homogeneity test for Kónya (2006)								
Test statistics	$\hat{\Delta}_{adj}$							
Endogenous variables	*OC*	*IO*	*MO*	*DY*	*DPR*	*ROA*	*ROE*	*QTobin*
OC				no	no	yes	yes	yes
IO				yes	no	yes	yes	yes
MO				yes	no	yes	yes	yes
DY	no	yes	yes			yes	yes	yes
DPR	no	no	no			yes	yes	no
ROA	yes	yes	yes	yes	yes			
ROE	yes	no	yes	no	yes			
QTobin	yes	yes	yes	yes	no			
Swamy (1970): Slope homogeneity test for Dumitrescu and Hurlin (2012)								
Test statistics	$\hat{\Delta}_{adj}$							
Endogenous variables	*dOC*	*dIO*	*dMO*	*dDY*	*dDPR*	*dROA*	*dROE*	*QTobin*
dOC				no	no	no	no	no
dIO				no	no	no	no	no
dMO				no	no	no	no	no
dDY	no	yes	no			yes	yes	no
dDPR	no	no	no			yes	no	no
dROA	no	no	no	yes	yes			
dROE	no	no	no	yes	no			
QTobin	no	no	no	no	no			

Note: OC: Ownership concentration; IO: Institutional ownership; MO: Managerial ownership; DY: Dividend yield; DPR: Dividend payout ratio; ROA: Return on assets; ROE: Return on equity; QTobin: Tobin's Q.

The results of this test, which looks at the first exogenous variable, exclude the *dOC* and *dOM* variables which measure the OS, and the *QTobin* variable which measures financial performance. Furthermore, the results show that the possible Granger non-causality tests according to Dumitrescu and Hurlin (2012) are as follows: a unidirectional test from *dIO* to *dDY* and bidirectional tests between *dDY* and *dROA*; between *dDY* and *dROE* and between *dDPR* and *dROA*. Nevertheless, the results also showed that the causality test between OS and FP cannot be applied.

The null hypothesis (H_0) of this slope homogeneity test developed by Swamy (1970) is that after performing the regression analysis, the slope coefficients of the explanatory variables are the same for all the firms studied. Rejecting H_0 of homogeneity and supporting the alternative hypothesis that heterogeneity exists between firms means that inaccurate results would be obtained if we imposed the slope homogeneity constraint. So each business is affected by its own specific characteristics.

5.2. Bootstrap panel Granger non-causality tests (Kónya, 2006)

Tables 4, 5, 6, and 7 relate to the results of the Granger non-causality test company by company. For all of these tables, dnGc designates do not Granger cause and *, ** and *** respectively present the significance thresholds of 10%, 5%, and 1%.

Table 4. Panel Granger non-causality test results based on bootstrapped Wald statistics: OS (*IO* or *MO*) and DP (*DY*)

Companies	***Wald test statistics***			
	IO* dnGc *DY	***DY* dnGc *IO***	***MO* dnGc *DY***	***DY* dnGc *MO***
AIR LIQUIDE	0.161	0.001	0.810	0.141
ICF	1.450	10.984***	0.204	27.003***
MONOPRIX	4.606**	1.006	4.043**	0.223
PLACEMENT SICAF	0.314	1.556	0.549	0.338
SFBT	1.114	0.143	1.222	0.426
SIMPAR	3.780*	0.100	8.658***	1.348
SOTUVER	6.646***	0.828	4.679**	3.091*

Notes: IO: Institutional ownership; MO: Managerial ownership; DY: Dividend yield.
****, ** and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.*
Bootstrap critical values are obtained from 10,000 replications.
Source: Author's calculations.

Table 5. Bootstrap panel Granger non-causality test between SP (*IO* or *MO*) and FP (*ROA*)

Companies	***Wald test statistics***			
	IO* dnGc *ROA	***ROA* dnGc *IO***	***MO* dnGc *ROA***	***ROA* dnGc *MO***
AIR LIQUIDE	6.890***	0.353	5.084**	1.153
ICF	0.121	3.518*	0.100	7.418***
MONOPRIX	0.041	7.622***	9.392***	0.023
PLACEMENT SICAF	10.620***	0.305	5.734**	4.956**
SFBT	70.010***	13.924***	4.644**	15.411***
SIMPAR	0.227	10.097***	1.822	3.259*
SOTUVER	0.288	1.547	0.380	4.675**

Notes: IO: Institutional ownership; MO: Managerial ownership; ROA: Return on assets.
****, ** and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.*
Bootstrap critical values are obtained from 10,000 replications.
Source: Author's calculations.

Table 6. Bootstrap panel Granger non-causality test between OS (*IO* or *MO*) and FP (*QTobin*)

Companies	***Wald test statistics***			
	IO* dnGc *QTobin	***QTobin* dnGc *IO***	***MO* dnGc *QTobin***	***QTobin* dnGc *MO***
AIR LIQUIDE	13.711***	2.096	10.211***	3.374*
ICF	0.029	9.315***	2.487	3.627*
MONOPRIX	11.282***	65.981***	7.414***	0.268
PLACEMENT SICAF	1.868	0.521	0.404	1.186
SFBT	5.458**	0.477	0.560	2.337
SIMPAR	4.098**	0.646	4.817**	0.038
SOTUVER	0.390	3.698*	0.532	6.184**

Notes: IO: Institutional ownership; MO: Managerial ownership; QTobin: Tobin's Q.
****, ** and * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.*
Bootstrap critical values are obtained from 10,000 replications.
Source: Author's calculations.

Table 7. Bootstrap panel Granger non-causality test between DP (*DY*) and FP (*ROA* or *QTobin*)

Companies	***Wald test statistics***			
	DY* dnGc *ROA	***ROA* dnGc *DY***	***DY* dnGc *QTobin***	***QTobin* dnGc *DY***
AIR LIQUIDE	0.296	0.291	0.207	1.672
ICF	8.820***	0.601	0.138	0.556
MONOPRIX	3.690*	2.314	0.068	5.534**
PLACEMENT SICAF	1.358	0.298	1.960	0.025
SFBT	3.291*	0.112	0.001	0.287*
SIMPAR	0.707	0.910	0.00005	0.423
SOTUVER	0.073	3.914**	0.001	0.540

Notes: DY: Dividend yield; ROA: Return on assets; QTobin: Tobin's Q.
****, ** and * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.*
Bootstrap critical values are obtained from 10,000 replications.
Source: Author's calculations.

The tables above include the results of the bootstrap panel Granger non-causality test according to the Kónya's (2006) procedure between OS, DP, and FP taken in pairs for each of the companies in our sample, have revealed the existence of:

1) Unidirectional causality from OS to DP for MONOPRIX and SIMPAR versus causality in the other direction for ICF and bidirectional causality between OS and DP for SOTUVER. Concerning the other companies of the panel, there is no causality between OS and DP.

2) Unidirectional causality from FP to OS for ICF and SOTUVER against one-way causality in the other direction for AIR LIQUIDE and two-way causality between OS and FP for other companies.

3) The existence of an unimportant unidirectional causality from DP to FP for ICF versus unidirectional causality in the other direction for SOTUVER and bidirectional causality between DP and FP for MONOPRIX and SFBT.

5.3. Bootstrap panel Granger non-causality tests (Dumitrescu & Hurlin, 2012)

Table 8 shows the results of the Granger global non-causality test. For Table 8, dnGc designates do not Granger cause and *, ** and *** indicate significance at the 1, 5, and 10 percent levels, respectively.

Table 8. Overall results of the Granger non-causality test

	W-bar	*Z-bar*	*Z-bar tilde*
dIO dnGc *dDY*	2.9129	1.2076	0.5942
dDY dnGc *dROA*	13.8866**	7.4351**	1.6793**
dROA dnGc *dDY*	6.6598	2.4880	0.7441
dDY dnGc *dROE*	17.5845***	10.5290***	2.6516***
dROE dnGc *dDY*	1.1499	0.2804	0.0375
dDPR dnGc *dROA*	19.5051***	14.5037***	7.0449***
dROA dnGc *dDPR*	14.6495*	8.0733*	1.8799*

*Notes: ***, ** and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.*
Bootstrap critical values are obtained from 10,000 replications.
Source: Authors' calculations.

The results of Table 8 show the absence of causality from the OS to the DP. In addition, they also show the existence of a two-way causality between DP and FP. This causality is more significant from DP to FP than the other way around. Table 8 shows the results of the Granger causality test company by company. For Table 8, dnGc designates do not Granger cause and *, ** and *** respectively present the significance thresholds of 10%, 5%, and 1%.

Table 9a. Company-by-company results of bootstrap panel Granger non-causality test

Companies	*dIO* dnGc *dDY*		
	W-bar	*Z-bar*	*Z-bar tilde*
AIRLIQUIDE	3.0637	0.5318	0.2805
ICF	7.1806	0.6896	-0.0317
MONOPRIX	0.3425	-0.4649	-0.4463
PLACEMENT SICAF	1.6405	-0.1797	-0.2476
SFBT	7.5079	1.2402	0.4385
SIMPAR	0.0669	-0.6598	-0.6035
SOTUVER	8.3314**	3.1657**	2.2353**

Notes: IO: Institutional ownership; DY: Dividend yield; DPR: Dividend payout ratio; ROA: Return on assets; ROE: Return on equity.
****, ** and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.*
Bootstrap critical values are obtained from 10,000 replications.
Source: Author's calculations.

Table 9b. Company-by-company results of bootstrap panel Granger non-causality test

Companies	*dDY* dnGc *dROA*			*dROA* dnGc *dDY*		
	W-bar	*Z-bar*	*Z-bar tilde*	*W-bar*	*Z-bar*	*Z-bar tilde*
AIRLIQUIDE	3.8599	-0.3605	-0.3618	1.7876	0.5569	0.3779
ICF	33.6444***	9.0582***	2.5983***	5.1953	0.4226	0.0079
MONOPRIX	0.1699	-0.5870	-0.5448	5.3512	0.4777	0.0386
PLACEMENT SICAF	7.8134	0.8897	0.0312	0.0882	-0.6447	-0.5914
SFBT	0.0091	-0.7007	-0.6365	22.1340*	6.4114*	3.1501*
SIMPAR	42.8723***	11.9763***	3.5153***	0.6115	-0.2747	-0.2929
SOTUVER	1.5060	-0.8818	-0.6743	3.1414*	1.5142*	1.1501*
Companies	*dDY* dnGc *dROE*			*dROE* dnGc *dDY*		
	W-bar	*Z-bar*	*Z-bar tilde*	*W-bar*	*Z-bar*	*Z-bar tilde*
AIRLIQUIDE	3.5870	-0.4468	-0.3889	1.6999	0.4949	0.3279
ICF	26.7665**	6.8832**	1.9147**	4.2648	0.0936	-0.1628
MONOPRIX	0.0055	-0.7032	-0.6385	0.1358	-0.6111	-0.5642
PLACEMENT SICAF	10.1351	1.6239	0.2619	0.0330	-0.6838	-0.6229
SFBT	0.0158	-0.6959	-0.6327	3.4056	-0.2101	-0.3221
SIMPAR	71.1906***	20.9313***	6.3293***	1.1484	0.1049	0.0133
SOTUVER	2.0531	-0.6883	-0.5728	3.2875*	1.6175*	1.2335*
Companies	*dDPR* dnGc *dROA*			*dROA* dnGc *dDPR*		
	W-bar	*Z-bar*	*Z-bar tilde*	*W-bar*	*Z-bar*	*Z-bar tilde*
AIRLIQUIDE	75.3706***	25.2333***	13.0199***	74.4699**	21.9683**	6.6555**
ICF	10.8171	1.8395	0.3297	0.0042	-0.7041	-0.6393
MONOPRIX	7.2366	07073	-0.0262	3.4923	-0.1795	-0.3060
PLACEMENT SICAF	3.5106	-0.1730	-0.3026	14.8679	3.8424	1.8030
SFBT	0.4022	-0.4227	-0.4123	3.9431	0.9716	0.6069
SIMPAR	1.5367	-0.8709	-0.6686	5.2522	0.9194	0.4409
SOTUVER	47.3791***	15.3368***	7.8304***	1.6528	0.4616	0.3010

Notes: IO: Institutional ownership; DY: Dividend yield; DPR: Dividend payout ratio; ROA: Return on assets; ROE: Return on equity.
****, ** and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.*
Bootstrap critical values are obtained from 10,000 replications.
Source: Author's calculations.

The interpretation of Tables 9a and 9b indicates the absence of causality from the OS to the DP for all companies except SOTUVER which confirms the result of the overall test. Regarding the causality between the DP and FP, the Dumitrescu and Hurlin's (2012) test revealed bidirectional causality for AIR LIQUIDE and SOTUVER. Moreover, a unidirectional causality is documented of the DP towards FP for ICF and SIMPAR and one-way causality in the other direction for SFBT. Nevertheless, in the remaining two companies, namely MONOPRIX and PLACEMENT SICAF, there is no causality.

6. CONCLUSION

The relationship between OS, DP, and FP has long remained an important issue of debate in the literature. With the emergence of endogenous performance theories that implicitly assume a causal relation from OS and DP to FP, the direction of causality is still an empirical issue. This paper tries to study the causal nexus between the selected corporate governance measures and financial performance indicators in emerging market economy namely the Tunisia context. To achieve the main objective, a bootstrap panel non-Granger causality test developed by both Kónya (2006) and Dumitrescu and Hurlin (2012) is used, which takes into account cross-sectional dependence and heterogeneity in a panel.

Findings show that under the Kónya's (2006) approach, the results for individual panel members indicate the presence of unidirectional causality runs mostly from OS to FP for AIRLIQUIDE and SIMPAR implying that the OS of these companies granger causes their performance but not vice versa. Conversely, it was found that FP causes OS only in the case of SOTUVER and ICF. In addition, the evidence revealed bidirectional causality between OS and FP for two companies (PLACEMENT, SICAF and SFBT). Second, the findings also detected one unidirectional causality runs from DP to FP for ICF. These results imply that dividend payout is an essential element in reflecting the performance of a company to shareholders and potential investors. It was also recommended that managers ensure that they have well-structured dividend policies in place as this will make the company shares attractive to investors and however lead to increased stock prices and enhanced profitability. In contrast, it was found that the direction of causality runs from FP to DP in the case of SOTUVER implying that DP does not create value because the unidirectional causality was from firms' FP to DP. Moreover, two-way causality is identified between DP and FP in the case of MONOPRIX and SFBT. Third, there is one-way causality running from OS to DP for MONOPRIX; reversely, DP only granger causes to OS in ICF. Furthermore, evidence pieces reveal bidirectional causality between OS and DP for SOTUVER. It indicates that OS and DP can be considered as a mechanism to mitigate agency costs and, consequently, improve the performance of the company.

Under the Dumitrescu and Hurlin's (2012) approach, the test has two dimensions, overall and by company. The overall test concludes that there is no causality from OS to DP. In this way, the change in OS does not have any effect on DP. Nevertheless, the overall test emphasises also that there is bidirectional causality between DP and FP more significant from DP to FP. The test by the company revealed single bidirectional causality between DP and FP for AIR LIQUIDE. Conversely, for ICF there is a single unidirectional causality from DP to FP. Furthermore, only for two companies of the sample, the "neutrality" hypothesis is validated since there was no causality in any direction between DP and FP (MONOPRIX and PLACEMENT SICAF). For SFBT there is a single unidirectional causality from FP to DP. However, the reverse unidirectional causality runs from DP to FP are identified for SIMPAR. Lastly, the results also indicate that there are both unidirectional causality running from OS to DP and granger causality bidirectional between DP and FP for SOTUVER.

Nevertheless, the comparing of empirical results for both Kónya's (2006) and Dumitrescu and Hurlin's (2012) approach showed that there is no clear consensus on the direction of causality between all variables used in this study and it is also observed that the findings are company-specific. The lack of convergence between the results makes the generalization of results a difficult task.

The findings of this study would be of importance to researchers as well as corporate managers in order to understand the direction of the causal link between the different dimensions of corporate governance. This allows them to make the best decisions in order to improve the performance of the company.

The major limitation of the study is the inability to incorporate all the firms due to a dearth of data. Accordingly, future empirical enquiry on this subject may extend the scope of the study by including other countries and more observations in the sample. Future research perspectives may also examine the effect of various ownership structures (e.g., foreign ownership, institutional ownership, employee ownership, state ownership) on dividend policy and how performance level may affect those relationships in emerging markets. Furthermore, since the sense of causality between OS and DP is not clear, a simultaneous equation approach is recommended to deepen the analysis and get a clearer picture of these variables in Tunisia.

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