

**e-ISSN 2353-0758**

# **MODERN | MANAGEMENT | REVIEW |**

**Quarterly, Volume 28**

(January-March)

**Research Journal**

No. 1(2023)

**Volume Editor**

**Małgorzata Karpińska-Krakowiak**

**MMR Journal indexed, among others, on the basis of the reference of the Minister of Science and Higher Education in DOAJ, EBSCO, ERIH PLUS, NSD and Index Copernicus Journal Master List 2020**

Issued with the consent of the Rector

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The electronic version of the Journal is the final, binding version.

e-ISSN 2353-0758

Publisher: Publishing House of Rzeszow University of Technology

12 Powstańców Warszawy Ave., 35-959 Rzeszow (e-mail: [oficyna@prz.edu.pl](mailto:oficyna@prz.edu.pl)), <http://oficyna.prz.edu.pl>

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## **From the Editorial Committee**

We are giving you the next Vol. 28, No. 1(2023) issue of the Quarterly of the Faculty of Management of the Rzeszow University of Technology entitled “Modern Management Review”.

The primary objective of the Quarterly is to promote publishing of the results of scientific research within economic and social issues in economics, law, finance, management, marketing, logistics, as well as politics, corporate history and social sciences.

Our aim is also to raise the merits and the international position of the Quarterly published by our Faculty. That is why we provided foreign Scientific Council, as well as an international team of Reviewers to increase the value of the scientific publications.

The works placed in this issue include many assumptions and decisions, theoretical solutions as well as research results, analyses, comparisons and reflections of the Authors.

We would like to thank all those who contributed to the issue of the Quarterly and we hope that you will enjoy reading this issue.

With compliments  
*Editorial Committee*



Received: December 2022

Accepted: March 2023

DOI: 10.7862/rz.2023.mmr.01

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## EXTERNAL AUDITOR, BOARD ATTRIBUTES, ACCRUAL AND REAL EARNINGS MANAGEMENT LINKAGE: NEW EVIDENCE FROM EMERGING ECONOMY

This paper further examines the influence of external auditor and board attributes on incidence of discretionary accruals and real earnings management in Nigeria. The sample size comprises fifty (50) purposively selected quoted non-financial firms for a 7 year period (2014–2020), culminating into a 350 dataset. The descriptive statistics depict absence of both discretionary accruals and real earnings management with either classifications dependent upon the auditor-type, board independence and profitability among quoted non-financial firms in Nigeria. The regression results indicate reduction in discretionary accruals owing to concerted audit efforts and lower board size while large profitable firms still possess the tendencies to use discretionary accruals in manipulating earnings. On real manipulative propensities by management, audit fees contribute greatly while auditor-type and presence of female directors on corporate boards exhibit negative and statistically significant association with real earnings management.

**Keywords:** Audit Fees, Big4, Board of Directors, External Audit, Earnings Management.

### 1. INTRODUCTION

Earnings management has been in the accounting and audit literature till date. The renewed interest is consequent upon its effect, especially on going concern of entities. Earnings management is adjudged an opportunistic behaviour by managers entrusted with resources of the firm. Managers and those charged with governance know more about operations about entities. They have relied upon this information asymmetric propensities,

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as a result of massive information at their disposal, in undertaking manipulative tendencies, either through accrual or real earnings management. It is a widely held belief that managers of firms possess propensities to undertake over reporting or underreporting of earnings for particular purposes. This singular act of tampering with actual financials of firms is known as earnings management. It could be through the use of discretionary accruals or real manipulation of accounting transactions, account balances or inaccurate disclosure in the financial statements. While Beneish (2001) cited in Soyemi (2020) opines that manipulative behaviour by managers could as well be for beneficial purposes, most widely held beliefs regarding earnings management are deemed unethical. Consequently, concerted efforts are pointed at reducing the incidence of earnings management. Of the many ways of constraining managers' manipulative tendencies, certain attributes of corporate boards have been suggested which enhance their effectiveness and efficiency. The board is the highest organ of management where governance resides. It is composed of directors, executives and non-executives, as well as independent non-executives directors with no ownership shares in the firm. Aside from board characteristics, an internal corporate governance mechanism (Soyemi, 2020), a widely held belief is that this ugly incidence may be curtailed through a transparent financial reporting processes, guaranteed by audit/auditors, who must deliver on quality audit. Audit is an assurance engagement where auditors conduct tests and procedures, through systematic, objective gathering and evaluation of sufficient appropriate evidence about transactions, account balances and disclosures for the purpose of giving an opinion on whether the accounts are fairly presented in compliance with applicable financial framework. It is based on this background that this study seeks to examine the influence of auditor and board attributes on earnings management in an emerging economy, such as Nigeria, which is characterised by weak corporate governance structure, low investors' protection (especially minority investors) and relatively low litigation risk by auditors. Besides, the audit industry is also been dominated by the Big4 professional accounting firms. The remaining part of this paper is divided as follows: section two provides literature review, section three describes methodology adopted in this study. While section four presents results of descriptive statistics, alongside model estimation, section five provides summary, conclusion and recommendations emanating therefrom.

## **2. LITERATURE REVIEW**

### **2.1. Conceptual Review: Earnings Management**

There are various definitions of earnings management given by different scholars who have studied the phenomenon at different times. One common trait of all these definitions is that the objective of earnings management is to misrepresent the performance of a firm to shareholders and external stakeholders. Schipper (1998) cited in Yasser and Soliman (2018) describes earnings management as the deliberate and purposeful involvement in the preparation of financial reports to gain private benefit. Another widely accepted definition is that of Healy and Whalen (1999) as cited in Soyemi, Olufemi, Adeyemi (2020) which states that earnings management is the use of judgement by managers in reporting, valuation, and structuring financial transactions to mislead some stakeholders "about the underlying economic performance of the company or to influence" contractual agreements that relied on reported accounting figures. Obviously, the definitions given above have given negative meaning to the term earnings management. It highlights the intention of a manager to deliberately deceive and mislead stakeholders. Secondly, it brings to the fore



the managerial opportunism to obtain private gain(s). However, some researchers have pinpointed the informational and beneficial aspects of earnings management. Notable among them is Beneish (2001) cited in Idris (2012) who asserts that:

There are two perspectives on earnings management: the opportunistic perspective holds that managers seek to mislead investors, and the information aspect. Under which managerial discretion is a means for managers to reveal to investors the private expectation about the firm's future cash flow.

In the same vein, Fields, Lys, and Vincent (2001) cited in Idris (2012) describes earnings management as the use of discretion by managers in the recording and treatment of accounting transactions with the intent to improve the firm value or for their opportunistic gains. The point reflected in these definitions is that earnings management has some beneficial aspects. Managers use earnings management practices to convey relevant and necessary insider information, which may not be apparent in the published financial reports, to shareholders and other stakeholders to assist them when making investment decisions. However, Ronen and Yari (2008) cited in Sharma (2014) look at earnings management from three different perspectives and classify it using three different colours: white, gray and black. White is the use of flexibility and latitude provided in the accounting standards or in the Generally Accepted Accounting Standards (GAAP) in reported earnings to inform the stakeholders about the firm's potentials and future cash flow. This relates to earnings management that is of benefit to all stakeholders as contained in the definitions of Beneish (2001) and Fields et al. (2001). Gray, which is, choosing favourable accounting treatment for the benefit of management only. This is likened to tax avoidance whereby management exploits the loopholes in tax laws to reduce taxes payable. Black is described as misrepresentation of financial information in financial reports with intent to deceive. This is fraud.

## **2.2. Audit and Audit Attributes**

Modern-day corporations provide for separation of ownership from management. To protect interests of shareholders, reduce information asymmetry and most importantly protect the integrity and reliability of the financial statements, external audits of entities, especially public liability companies are mandated. The objective of an audit is to increase the level of confidence of users of financial information. The intended users' degree of confidence will be enhanced if an opinion expressed on the prepared statements conforms to audit evidence. It is very crucial that auditors exercise due care, professionalism and put on the garment of professional scepticisms during planning and performance of audit engagements. The importance of external audits cannot be overemphasized. Prior studies have used a variety of attributes to proxy audit features. These include auditor independence, audit tenure, audit fee, audit size and auditors' specialty industry.

## **2.3. The Board and Board Attributes**

The Board of directors is the highest decision-making organ of a company. It is responsible for providing effective and purposeful leadership for a firm towards fulfilling its mission and vision statements and it is "regarded as the most significant corporate governance structure" (Kurawa, Mohammed, 2020) in an organization. The Board is responsible for setting the tone at the top and serves as a link between stakeholders and the

company. The Code states that it is the responsibility of the board to exercise control of the company to ensure that the interests of shareholders and other stakeholders are well protected. The Board of directors is headed by the Chairman who provides overall leadership for the Board and the company as a whole. For effective functioning of the Board, executive directors, non-executive directors, and independent non-executive directors should possess different skills, experience, and knowledge. Empirical evidence suggests that several attributes of a board have a direct impact on their performances and effectiveness which in turn determine the extent to which management may engage in earnings management. In other words, possession of certain characteristics by the board may constrain or encourage earnings manipulation practices by the managers. These include but are not limited to board independence, board size, board meeting, possession of financial knowledge, and gender diversity.

## **2.4. Empirical Review**

This section reviews scholarly works previously conducted in the area under study. It is divided into reviews from developed and developing economies and Nigeria.

### *2.4.1. Evidence from Developed Economies*

Saona, Muro, Alvarado (2020) investigate the influence of ownership structure and board features on discretionary accruals among Spanish-listed firms for eight years covering 2006 to 2014. A sample of 120 non-financial firms was selected cutting across five sectors, totalling 877 firm-year observations. Using the Generalized Method of Moment (GMM) to analyze secondary data sourced from Thomson Reuters EIKON and Spanish Stock Exchange Commission, the findings reveal that board independence (higher number of independent directors), gender diversity, and board size exhibit negative and significant relationship with earnings management, which implies that the three independent variables constrain the level of earnings manipulation by the managers in listed firms in Spain. However, the CEO duality has a positive and significant relationship with discretionary accruals. Similarly, Luo, Jeyaraj (2019) examine the relationship between boards' characteristics and the level of earnings management of non-financial companies listed in Financial Times and Stock Exchange (FTSE) 350 in the United Kingdom for 5 years for the period 2012 to 2016. A sample size of 203 firms were selected out of a total population of 351 which translates to 1015 firm-year observations. The findings reveal that board size has an inverse and significant relationship with abnormal accrual. However, female directors and CEO with duality roles increase the practice of earning manipulation because both variables have a positive and significant relationship with earnings management.

Gull, Nekhili, Nagati, Chtioui (2018) focus on the statutory and demographic attributes of women directors and its impact on earnings management among French firms, with trading volume in excess of 5% of its share capital, listed on Euronext Paris CAC All-Shares Index for ten years spanning 2001 to 2010. A sample of 394 firms was selected, governance and annual reports data were collected from annual reports of sampled firms while the Thomson One database was used to retrieve information relating to the ownership structure. The findings reveal that board size has a negative and significant relationship with abnormal accruals while the female director and CEO duality have a positive and significant relationship with earnings management. Similarly, the presence of women on the audit committee and earnings management exhibits a negative and significant relationship. Contrary to expectation, however, there is a positive and significant relationship between

abnormal accrual and women occupying the top position in the board on one hand and the presence of experienced women, on the other.

Panzer, Muller (2015) examine the influence of gender diversity on the supervisory boards of German companies on earnings quality. In conducting the study, 64 companies listed in DAX 30, MDAX, and SDAX were sampled for six years covering 2006 to 2011. Data were analyzed using the panel regression method with a fixed-effects model. The findings reveal that the presence of women on the Supervisory board of German companies constrains earnings manipulation. Also, the female head and deputy female head of Supervisory boards have a negative and significant influence on the quality of earnings. Similarly, Lakhal et al. (2015) investigate the impact of women's representation on boards and in top management positions on earnings management of French non-financial firms listed on the CACALL shares index for the periods 2008 to 2011. The study measures earnings management proxied by discretionary accruals using Jones' Modified model (1995), Kothari et al. model (2005), and Raman, Shahrur model (2008). Using the regression approach in analyzing the data from 170 firms, the findings reveal that increasing the number of women's representation on board constrains the practices of earnings manipulation by managers. In the same vein, there exists a negative and significant relationship between the women as a chairman of the board and discretionary accruals. However, the results show a negative but insignificant relationship between women CFO and CEO and earnings management.

#### *2.4.2. Evidence from Developing Economies*

Mantonti, Luliano, Palazzi, Tucker (2021) examine the motivating factors that drive accrual and real earnings management among Italian unlisted firms. The study analyzed 75,312 firm-year observations translating to 9,414 firms for eight years spanning 2011 to 2018. Using the least-squares regression method, the results indicate that accrual earnings management has a positive and significant association with ownership concentration and a negative but significant relationship with leverage, Big4, and firm size. This implies that accrual earnings management is prevalent in firms with higher ownership concentration and lesser with highly geared firms, big-sized firms, and firms that engage one of the Big4 audit firms. Real earnings management, on the other hand, exhibits a positive relationship with ownership concentration and leverage and a negative relationship with Big4 and firm size. Mollik et al. (2020) investigate the effect of audit quality and audit committee attributes on earnings management of listed Australian firms during the global financial crisis. 503 firm-year observations from eight industries were studied from 2006 to 2009. Using multivariate fixed effect regression, the findings reveal that appointment of Big4 audit firms does not constrain the practices of discretionary accruals during the global financial crisis of 2008-2009. Similarly, possession of financial knowledge by audit committee members is found to have a positive and insignificant relationship with earnings management. Using Roychowdhury's (2006) models to estimate real earnings management, Rajeevan, Ajward (2020) seek to explore the impact of corporate governance attributes on real activities-based earnings management in listed firms in Sri Lanka. Seventy quoted firms in Colombo Stock Exchange (CSE) were selected spreading across six sectors for three years spanning 2015 to 2017. Ordinary least squares and panel least squares methods were adopted in analyzing the data. The findings reveal that number of independent directors on the board attenuates the degree of earning manipulation. However, CEO duality, unseparated CEO, and Chairman roles have a significant and positive association with earnings management.

Darmawan et al. (2019) investigate the effects of accrual and real earnings management on firm value in 54 out of 123 listed firms on the Indonesia Stock Exchange (IDX) from 2013 to 2017. The data obtained from the Indonesian Stock Exchange and Yahoo Finance websites were analyzed using a multiple linear regression approach. The firm value was gauged using Tobin Q ratio while independent variables of accrual earnings management and real earnings management were proxied by Modified Jones' Model and Roychowdhury's (2006) model respectively. The study found that accrual and real earnings management, firm size, leverage, return on asset, and audit quality can explain a 30.6% variation in firm value. Furthermore, the result shows that discretionary accrual earnings management does not influence earnings figures. However, real earnings show a negative and significant relationship with a firm value which indicates that real earnings manipulation opportunistically executed by the managers through manipulation of sales figures, excess production, and transaction in discretionary expenses have a negative influence on firm value.

In a study conducted by Hoang, Phung (2019) effects of leverage on accrual-based and real activities-based earnings management of firms listed in Vietnam Stock Markets (HAX and HOSE) for seven years covering 2010 to 2016 was investigated. Accrual earnings management was estimated using both the Kothari et al. (2005) Model and Raman & Shahrur (2008) Model and the two models were used separately in the analysis. Furthermore, real earnings management was calculated with the aid of the popular Roychowdhury (2006) Model. Secondary data was sourced from Thomson Reuters EIKON websites. Using the Generalized Method of Moment (GMM), the findings reveal that leverage has a positive and significant association with accrual-based earnings management. On the other hand, it shows a negative and significant relationship with real earnings management. Furthermore, leverage has a positive and negative relationship with accrual-based earnings management and real activity-based earnings management in highly levered firms respectively. Similarly, Al-Absy, Ismail, Chandren (2019) investigate the impact of corporate governance mechanisms in firms that have a well-established whistle-blowing policy on real earnings management of listed firms in Malaysian firms for three years covering 2013 to 2015. Out of a total population of 300 firms, a sample of 288 firms with positive reported earnings were selected for the study. The samples were classified into two: firms with established whistle-blowing policies and those without. Real earning was estimated using the Roychowdhury Model. Using feasible generalized least squares, the findings reveal that board independence has a positive association with real earnings in firms that have not instituted the whistle-blowing policy, while audit committee size, audit committee meeting, audit committee independence, and Big4 have an inverse and significant relationship with low earnings in firms that have a whistle-blowing policy.

#### *2.4.3. Evidence from Nigeria*

Yusuf (2021) investigates the influence of audit quality on earnings management of consumer goods companies quoted on the Nigerian Stock Exchange for the period 2006 to 2018. Like most studies of this nature, earnings management was represented by discretionary accruals and measured using modified Jones' model while audit quality was proxied by audit fees, audit firm size, audit tenure, and firm size. Secondary data was sourced from the annual reports of seventeen selected firms. Analysis of the data reveals that the higher the audit fees the lower the earnings manipulation by the management. However, audit firm size, audit tenure, and joint audit have a direct and significant

relationship with earnings management. The trio of Adewale, Olowookere, Bankole (2021) investigate the impact of board composition on earnings management among quoted non-financial firms in Nigeria for a period of ten years spanning from 2009 to 2018. Multiple regression techniques were adopted to analyze the secondary data obtained from the financial reports of selected firms. A total of 20 firms were selected, using the judgemental sampling method, out of a total population of 117. The findings show that board composition has a positive significant relationship with earnings management, proxied by discretionary accrual. Furthermore, board independence and board size exhibit a negative and significant relationship with earnings management. However, the inclusion of women in the board and board meetings do not exhibit a significant relationship with discretionary earnings management. The study, therefore, recommends that the appointment of independent directors with proficiency in finance into the board should be encouraged and enhanced because it tends to reduce the opportunistic behaviour of managers. Similarly, Oladejo, Akintude, Yinus, Akanbi, Olowokere (2021) study the influence of board and external audit attributes on the quality of earnings of listed firms in the foods and beverages industry in Nigeria. The researchers selected eight firms out of a total population of twenty-three companies in the sector. Using panel regression techniques on secondary data collected from annual reports of selected firms, the results indicate that auditor independence has a negative and significant relationship with earnings quality, while board size and company size exhibit a significant but negative association with earnings quality. Furthermore, the relationship between board independence and discretionary accruals was found to be positive and significant.

Soyemi et al. (2020) explored the nexus between audit quality and earnings management among non-financial firms listed on the Nigerian Stock Exchange for eleven years from 2008 to 2018. Out of 105 total population, the study sampled 30 non-financial firms using a stratified sampling method. Based on the results from the panel effects model, audit quality variables of firm size, audit tenure, auditor's independence, return on assets and total assets jointly explain 49% (adjusted  $R^2$ ) variations in the earnings management. Specifically, audit tenure and auditor's independence display a positive and significant relationship with earnings management, represented by discretionary accrual measured using modified Jones's model. Total assets, on the other hand, show a negative and significant relationship with earnings management. A study of corporate board attributes and earnings management in Nigerian banks for ten years covering 2009 to 2018 was conducted by Kajola et al (2020). A total of 10 deposit money banks were sampled out of a total population of 15. Using random-effects generalized least squares regression on the selected data, the findings show that board independence and size mitigate real activities earnings manipulation. Furthermore, gender diversity and board meetings show a negative and insignificant relationship with earnings management. Similarly, Manukaji (2018) studies the impact of corporate governance on earnings management among deposit money banks in Nigeria. Out of a total population of 22 banks comprising of "old" and "new" generation banks, 4 banks were selected for the study: two each from old and new generation banks. As a result of the multiple regression method used to analyze the sampled data, the findings show that ownership concentration and board size have a positive and insignificant influence on income smoothing. However, the duo of CEO duality and audit committee exhibit a negative and significant association with the dependent variable.

## 2.5. Theoretical Framework

Agency theory by Jensen & Meckling (1976) refers to a contract or relationship that subsists between two parties. One party called the principal appoints another party called the agent to execute certain tasks on his behalf. This implies that the agent performs the assigned tasks using the resources of the principal and decisions taken by the agent will directly have an impact on the principal as well. The agency theory is based on two fundamental assumptions: human beings are egoists, always considering their self-interests above any others [Eisenhardt (1989) cited in Darmawan et al. (2019)] and agents, by their vantage positions, have more information than the principal. The self-egoistic behaviour of individuals and information asymmetry between the principal and the agents create disputes, disagreements and conflicts called agency problems. The theory suggests that to solve the problem, the principal's interests should be adequately taken care of while the agents too should be well compensated. The shareholders (principal) enter into a contract with managers (agents) to run the affairs of the company on their behalf. Owing to the egocentric nature of human beings, managers will involve themselves in some activities to show to the shareholders their managerial prowess to retain their positions and signal to investors the viability of the company. These activities include the manipulation of earnings. Earnings, being one of the important indices that the market use to judge the profitability of a firm (Darmawan et al., 2019), the emphasis of the managers will be on it to meet/beat the expectation of investors and financial analysts' forecast.

## 3. METHODOLOGY

The correlational quantitative design is adopted as research design. Secondary data was sourced from the websites of the sample firms and also from African Financial websites. The population of this study comprised of 116 non-financial firms quoted on the Nigerian Stock Exchange. The sample size was 50 companies cut across 10 sectors for a period of seven years covering 2017 to 2020. A stratified probability sampling technique was adopted in selecting the 50 firms that make up the sample size.

Table 1. Break down of Industrial Sectors, Population and Sample Size

S/N	Sectors	Population	Sample
1	Consumer goods	28	11
2	Healthcare	11	5
3	Technology	10	4
4	Industrial Goods	24	10
5	Basic Materials	6	4
6	Oil and Gas	12	6
7	Consumer Services	25	10
	Total	116	50

Source: Authors' compilation (2022).

### 3.1. Description and Measurement of Variables

#### (a) Dependent Variables

Earnings management is the dependent variable. It is decomposed into discretionary accruals and real activities based earnings management. Dechow et al. (1995) Model

popularly known as Modified Jones Model was adopted as proxy for discretionary accruals. Previous studies that have adopted this model include Soyemi et al. (2020), Kajola et al. (2020) and Lopes (2018) among others. Discretionary accruals using Modified Jones Model are estimated using the equation below:

$$TA_{it}/A_{it-1} = \beta_0(1/A_{it-1}) + \beta_1(\Delta REV_{it}-\Delta REC_{it}/A_{it-1}) + \beta_2(PPE_{it}/A_{it-1}) + \varepsilon_{it} \quad (1)$$

Where:  $TA_{it}$  = Total accruals of company  $i$  in period  $t$

$A_{it-1}$  = Total assets of company  $i$  in period  $t-1$

$\Delta REV_{it}$  = Changes in company's  $i$  income in period  $t$

$\Delta REC_{it}$  = Changes in company's  $i$  receivables in period  $t$

$PPE_{it}$  = company's  $i$  tangible assets (Property, plant and equipment)

$\varepsilon_{it}$  = Error term

$\beta_0$ -  $\beta_2$  = Company's specific parameters.

Real activities-based earnings management was measured using Roychowdhury (2006) model. This model is popular among researchers studying real earnings manipulation. Rajeevan, Ajward (2020) and Darmawan et al. (2019) measured real earnings using this model. The model uses three regressions in calculating abnormal real earnings, namely cash flow from operating activities, production costs and discretionary expenditures. The cash flow from operating activities was estimated from equation 2.

$$CFO_{t}/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(S_t/A_{t-1}) + \beta_3(\Delta S_t/A_{t-1}) + \varepsilon_{it} \quad (2)$$

The second regression is the addition of change in stocks or inventories and cost of goods sold in estimating production costs. This produces equations 3 and 4 below:

$$COGS_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_1(S_t/A_{t-1}) + \varepsilon_{it} \quad (3)$$

$$\Delta INV_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(S_t/A_{t-1}) + \beta_3(\Delta S_t/A_{t-1}) + \beta_4(\Delta S_{t-1}/A_{t-1}) + \varepsilon_{it} \quad (4)$$

Combination of equations 3 and 4 give equation 5 thus:

$$PROD_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(S_t/A_{t-1}) + \beta_3(\Delta S_t/A_{t-1}) + \beta_4(\Delta S_{t-1}/A_{t-1}) + \varepsilon_{it} \quad (5)$$

The third regression is on discretionary expenditures. This produces equation 6 thus:

$$DEXP_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(S_{t-1}/A_{t-1}) + \varepsilon_{it} \quad (6)$$

From the regressions above, the coefficients  $\beta_0$  to  $\beta_4$  obtained in each of the model are used to estimate the normal operating cash flow, production costs and discretionary expenditures by re-entering the coefficients back into the models. The normal figures obtained for the three models are subtracted from the actual values for operating cash flows, production costs, and discretionary expenses. The addition of the results gives abnormal values which are then used as proxy for real earnings management. Absolute values of all the abnormal operating cash flows, production costs, and discretionary expenditures are used. The real earnings management is then expressed as in equation 7 as follows:

$$\text{REEM}_{it} = \text{ACFOA}_{it} + \text{APROD}_{it} + \text{ADEXP}_{it} \quad (7)$$

Where: REEM = Real earnings management  
 ACFOA = Abnormal cash flow from operating activities  
 APROD = Abnormal production cost  
 ADEXP = Abnormal Discretionary expenditures

(b) Independent Variables

The study has five independent variables. These include audit fees, auditor type, board size, board independence and board gender diversity. Table 2 describes these variables and their measurements.

(c) Control Variables

Extant literature reveals that there are other variables that have tendency of impacting on earnings management that are not included in the independent variables mentioned above. To ensure that these control variables do not affect the overall results, this study incorporates firm size, measured as total assets and profitability, proxied with Returns on Assets (ROA) in the model.

Table 2. Description and Measurement of Variables

Variables	Symbols	Description/Measurement	Source(s)
Dependent Variables			
Earnings Management	(a) DACC	Discretionary accruals is used as proxy for accrual based earnings management. Modified Jones model (1995) shall be used to estimate abnormal accruals.	Kurawa, Ahmed (2021), Soyemi et al. (2020), Mollik et al. (2020), Gull et al. (2017), Idris et al. (2018).
	(b) REEM	Three proxies are used. Abnormal cash flows from operating activities, Abnormal production costs, and abnormal discretionary expenditures. These proxies are based on Roychowdhury model (2006).	Darmawan et al. (2019), Rajeevan, Ajward (2019).
Independent Variables			
Audit Fees	AFES	Natural logarithm of total audit fees	Yusuf (2021), Soyemi et al. (2020), Tyokoso, Tsegba (2015).
Auditor-Type	ATYP	'1' if audited by any of Big4, otherwise '0'	Yusuf (2021), Rajeevan, Ajward (2019), Tyokoso et al. (2016), Idris et al. (2018).
Board Size	BSIZ	Total number of directors on the board	Kurawa, Ahmed (2021), Luo, Jeyaraj (2019), Rajeevan, Ajward (2019).
Board Independence	BIND	the ratio of independent non-executive directors on the board to the total number of directors	Kurawa, Ahmed (2021), Idris et al. (2018), Gull et al. (2017).



Table 2 (cont.). Description and Measurement of Variables

Variables	Symbols	Description/Measurement	Source(s)
Independent Variables			
Board Gender Diversity	GDIV	The ratio of women directors on the board to the total number of directors	Kurawa, Ahmed (2021), Saona et al. (2019).
Control Variables			
Firm Size	FSIZ	Natural logarithm of total assets	Yusuf (2021), Luo, Jeyaraj (2019), Rajeevan, Ajward (2019).
Profitability	ROA	Net income divided by total assets	Soyemi et al. (2020), Lopes (2018), Abubakar, Rokiah, Chandren (2017).

Source: Authors' compilation (2022).

### 3.2. Model Specification and Estimation Techniques

The model for the study is as specified below:

$$EM_{it} = \beta_0 + \beta_1 AFES_{it} + \beta_2 ATYP_{it} + \beta_3 BSIZ_{it} + \beta_4 BIND_{it} + \beta_5 GDIV_{it} + \beta_6 FSIZ_{it} + \beta_7 PROF_{it} + \mu_{it} \quad (8)$$

Where:  $EM_{it}$  is decomposed into discretionary accruals and real earnings management. Equations 9 and 10 evolve thus:

$$DACC_{it} = \beta_0 + \beta_1 AFES_{it} + \beta_2 ATYP_{it} + \beta_3 ATEN_{it} + \beta_4 BSIZ_{it} + \beta_5 BIND_{it} + \beta_6 GDIV_{it} + \beta_7 PROF_{it} + \mu_{it} \quad (9)$$

$$REEM_{it} = \beta_0 + \beta_1 AFES_{it} + \beta_2 ATYP_{it} + \beta_3 ATEN_{it} + \beta_4 BSIZ_{it} + \beta_5 BIND_{it} + \beta_6 GDIV_{it} + \beta_7 PROF_{it} + \mu_{it} \quad (10)$$

The Pooled Ordinary Least Square (POLS) method is adopted as analytical technique to estimate models specified for the study. The choice of fixed effects or random effects is dependent upon outcome of Hausman Test and Lagrange Multiplier Test.

## 4. RESULTS AND DISCUSSION OF FINDINGS

### 4.1. Descriptive Statistics

While table 3a depicts descriptive statistics for both dependent and independent (including control) variables covered in this study that were continuous, table 3b presents frequency table for the only binary variable in this study. These descriptive statistics include mean, minimum, maximum, standard deviation, skewness, kurtosis, Jacque-Bera alongside their probability values.

From table 3a, audit fees and proxy for firm size, that is total assets have the highest yearly means and discretionary accruals have the lowest mean. The standard deviation of audit fees and total assets are very high, implying that they deviated from their means with high discrepancies. For these reasons, the natural logs of audit fees and total assets are taken.

Besides, the remaining variables fall within their minimum and maximum values. Every variables have positive skewness values implying that they are all skewed to the right and their means are greater than the median and mode. This is an indication that all the variables are normally distributed. Furthermore, kurtosis was also used to test normality and kurtosis describes the degree to which scores cluster in the tails or the peak of a frequency distribution. The peak is tallest part of the distribution, and the tails are ends of the distribution. There are three types of Kurtosis which are mesokurtic, leptokurtic, and platykurtic. Mesokurtic occurs when the value is equal to 3 ( $=3$ ) and it is platykurtic when it is less than 3 ( $<3$ ) while greater than 3 ( $>3$ ) is leptokurtic. Variable like is discretionary accruals, real earning management and audit fees are platykurtic while variables like board size, board independence, board gender, diversity, firm size and profitability are leptokurtic.

Table 3a. Descriptive Statistics for Continuous Variables

Variables	Mean	Std. dev	Min.	Max.	Skew.	Kurt.	JB (p-value)
DACC	-0.000	0.148	-1.011	0.972	0.813	0.000	61.63 (0.00)
REEM	0.000	0.019	-0.784	0.994	0.337	0.000	30.51 (0.00)
AFES	41254.37	85713.07	900	695000	0.000	0.000	-
BSIZ	9.903	2.942	4	19	0.000	18.260	18.26 (0.00)
BIND	4.70	3.011	0	14	0.000	15.44	15.44 (0.00)
GDIV	0.173	0.124	0	0.667	0.000	26.45	26.45 (0.00)
FSIZ	110000000	260000000	564583	2,020,000,000	0.012	37.48	37.48 (0.00)
PROF	0.33	0.109	-0.544	0.539	0.00	68.68	68.68 (0.00)

Source: Stata output of data input by authors (2022).

Table 3b. Frequency Count for Binary Variable

AUTY	Frequency	Percentage (%)	Cumulative %
0	146	41.71	41.71
1	204	58.29	100.00
Total	350	100.00	

Source: Stata output of data input by authors (2022).

Table 3b shows frequency count for the only categorical variable in this study, that is, auditor type of either Big4 or non-Big4 auditor. Of the 350 total audit engagements sampled used for this study, the Big4 auditors were engaged 204 times (or 58%) while non-Big4 audit firms were engaged for 146 time (or 42%).

Further, table 4 shows the results for t-test of mean difference between each of the independent variables and the earnings management classifications, that is increasing income (positive) and decreasing income (negative) earnings management tendencies. This test allows a comparison of studied auditor and board attributes across signed earnings management practices usually encountered.

The outcome of the result shows that there is a significant difference between the mean of decreasing and increasing earning management with auditor-type, board independence and profitability. For other independent variables of audit fees, board size, gender diversity as well as control variable firm size, there were no significant difference between their means of decreasing and increasing earnings management. Impliedly, while auditor-type, board independence and profitability differ significantly between decreasing and increasing

earning management, it does not differ significantly along audit fees, board size, gender diversity and firm size.

Table 4. Test of Mean Difference along Earnings Management Classification

Independent Variables	EM	Obs.	Mean	t-test values ( <i>p</i> -value)
AFES	Decreasing (-)	183	39319.89	-0.4415 [0.6591]
	Increasing (+)	167	43374.19	
	Mean Difference		-4054.30	
ATYP	Decreasing (-)	183	0.539	-2.104 [0.0361]**
	Increasing (+)	167	0.641	
	Difference		-0.102	
BSIZ	Decreasing (-)	183	10.082	1.193 [0.2337]
	Increasing (+)	167	9.707	
	Difference		0.375	
BIND	Decreasing (-)	183	5.153	2.979 [0.0031]***
	Increasing (+)	167	4.204	
	Difference		0.949	
GDIV	Decreasing (-)	183	0.168	-0.876 [0.382]
	Increasing (+)	167	0.179	
	Difference		-0.011	
FSIZ	Decreasing (-)	183	7.398	1.608 [0.1088]
	Increasing (+)	167	7.259	
	Difference		0.139	
PROF	Decreasing (-)	183	0.008	-4.602 [0.0000]***
	Increasing (+)	167	0.060	
	Difference		-0.052	

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: Stata output of data input by authors (2022).

## 4.2. Test of Ordinary Least Squares (OLS) Assumptions

This section displays output of selected tests of basic assumptions underlying OLS. This is necessary prior to estimating the study models using OLS.

### 4.2.1 Normality Test of Distribution of Dependent Variables

The histogram for proxies of earnings management, namely discretionary accruals and real earnings management are as presented in figures 1 and 2.

From figure 1, it can be deduced that the histogram chart for discretionary accruals approximately mirror a normal curve. The histogram chart for real earnings management is as shown in figure 2.

Similar to discretionary accruals, figure 2 which depicts the distribution curve for real earnings management also reveals that the image mirror that of a normal distribution. By implication, these histogram charts further provide evidence in support of the normality of values of dependent variables as shown in descriptive statistics in table 3a.

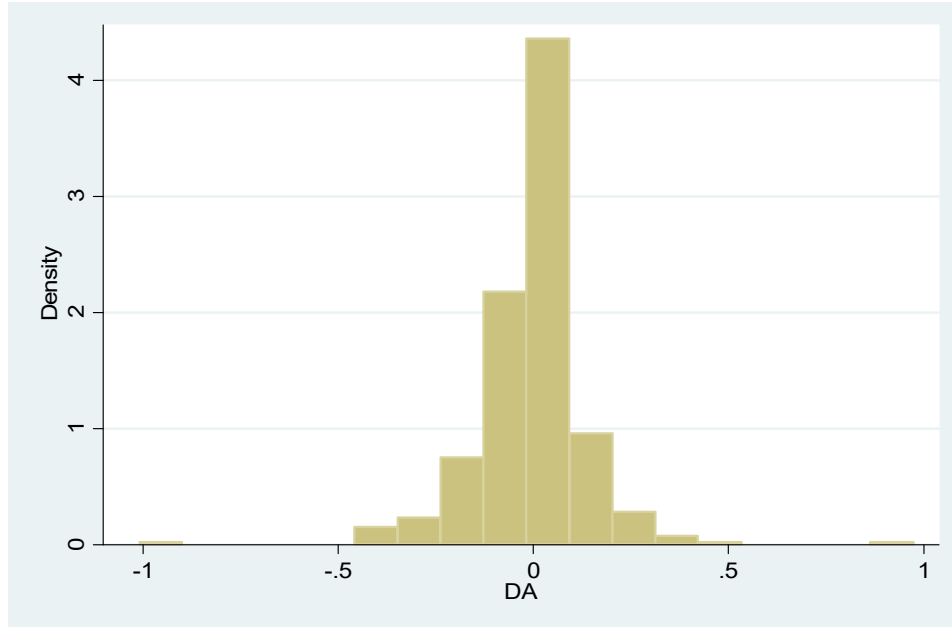


Figure 1. Histogram for Values of Discretionary Accruals

Source: Stata output of data input by authors (2022).

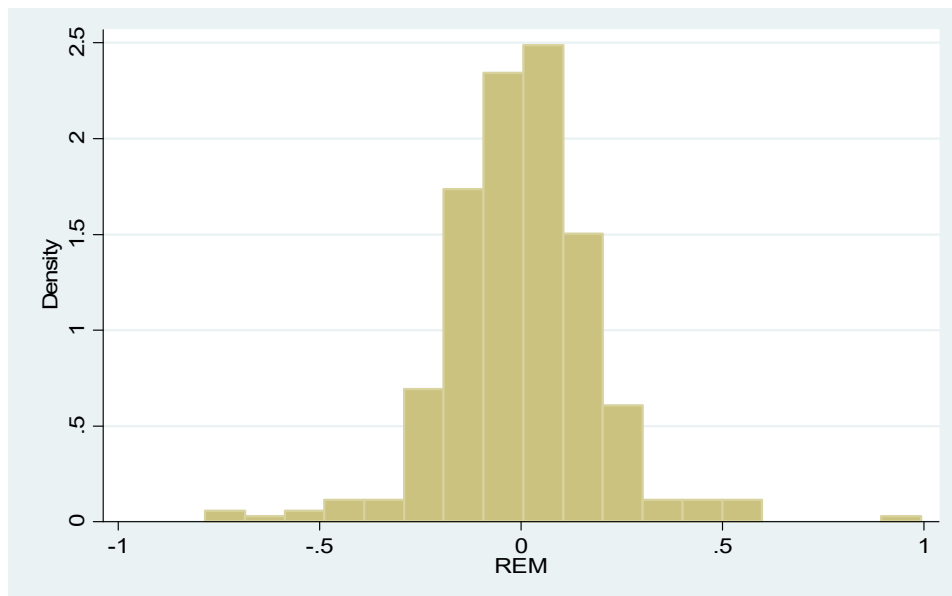


Figure 2. Histogram for Values of Real Earnings Management

Source: Stata output of data input by authors (2022).

#### 4.2.2. Multi-collinearity Test

Table 5 presents the result of Pearson correlation alongside Variance Inflation Factor (VIF) and 1/VIF.

Table 5. Pearson Correlations with VIF and 1/VIF

Variables	DACC	REEM	AFES	ATYP	BSIZ	BIND	GDIV	FSIZ	PROF
DACC	1								
REEM	-0.644	1							
AFES	-0.014	0.013	1						
ATYP	0.032	0.062	0.263	1					
BSIZ	0.023	-0.126	0.468	0.187	1				
BIND	-0.017	-0.144	0.220	0.263	0.582	1			
GDIV	0.049	0.088	-0.094	0.208	-0.099	-0.072	1		
FSIZ	0.018	-0.145	0.630	0.420	0.544	0.489	-0.062	1	
PROF	0.317	0.047	0.126	0.184	-0.184	0.013	0.001	0.154	1
VIF			2.37	1.93	1.84	1.74	1.35	1.09	1.06
1/VIF			0.422	0.518	0.542	0.573	0.742	0.918	0.942

Source: Stata output of data input by authors (2022).

Correlation is used to show the degree of linear association among the variables as well as, to detect the presence of multicollinearity. The correlation between discretionary accruals with pairs of auditor-type, board size, board gender diversity, firm size and profitability show a positive relationship while the correlation between discretionary accruals with pairs of real earning management, audit fees and board independence show a negative relationship. Further, the correlation between real earning management with pairs of audit fees, auditor-type, board gender diversity and profitability show a positive relationship while the correlation between real earning management with pairs of board size, board independence and firm size shows a negative relationship. The correlation analysis reveals that there is no presence of multicollinearity in the model. To further confirm the absence of multicollinearity, variance inflation factor (VIF) and 1/VIF were computed. The VIF is a measure of the amount of multicollinearity in a set of multiple regression variables. Multicollinearity exists when there is a linear relationship, or correlation, between one or more of the independent variables or inputs. Multicollinearity creates a problem in the multiple regression because the inputs are all influencing each other. A VIF of 1 indicates two variables are not correlated, a VIF between 1 and 5 indicates moderate correlation, and a VIF above 5 indicates high correlation. The result of VIF shows a moderate correlation among the variables.

#### 4.2.3. Heteroskedasticity Test

##### (a) Heteroskedasticity Test for Discretionary Accruals

Tables 6a and 6b display results of White test for heteroskedasticity for discretionary accruals (DACC) and real earnings management (REEM) respectively, the null the null hypothesis (Ho) being homoscedasticity and alternate (Ho) being unrestricted heteroscedasticity.

Table 6a. White test for Heteroskedasticity (DACC)

Chi <sup>2</sup> (34)	36.33		
Prob > Chi <sup>2</sup>	0.3606		
Cameron & Trivedi's Decomposition of IM- Test			
Source	Chi <sup>2</sup>	df	p-values
Heteroskedasticity	36.33	34	0.3606
Skewness	4.81	7	0.6834
Kurtosis	2.24	1	0.1344
Total	43.38	42	0.4124

Source: Stata output of data input by authors (2022).

There is absence of heteroscedasticity as the p-value (0.3606) is less than 5% ( $p < 0.05$ ) thereby not rejecting the null hypothesis and concluding homoscedasticity.

(b) Heteroskedasticity Test for Real Earnings Management

Similarly, table 5b depicts the results for heteroskedasticity test for real earnings management (REEM).

Table 6b. White test for Heteroskedasticity (REEM)

Chi <sup>2</sup> (34)	23.88		
Prob > Chi <sup>2</sup>	0.9018		
Cameron & Trivedi's Decomposition of IM- Test			
Source	Chi <sup>2</sup>	Df	p-values
Heteroskedasticity	23.88	34	0.9018
Skewness	5.97	7	0.5436
Kurtosis	3.49	1	0.0616
Total	33.35	42	0.8275

Source: Stata output of data input by authors (2022).

The p-value (0.9018) is not significant being less than 5% ( $p < 0.05$ ), thereby not rejecting the null hypothesis of homoscedasticity

### 4.3. Regression Results

Tables 7 and 8 present the results of the panel regression analysis. There are two models, model one is on discretionary accruals and two on real earning management. There are three (3) regressions for each of these models, namely pooled, fixed and random effects. The results of Hausman, Breusch & Pagan Lagrangian multiplier tests would assist in selecting the appropriate estimates upon which the study is hinged upon. The Hausman test is used to compare estimates of fixed and random effects, where it is significant, interpret the fixed effect and if otherwise, the random effect is appropriate. The Breusch & Pagan Lagrangian multiplier test compares estimates of pooled and random, such that where it is significant, interpret the random effect and if otherwise, the pooled estimate is considered appropriate.

For model one which is on discretionary accruals, the random effect is appropriate, as both Hausman ( $p = 0.2742$ ) and BP Lagrangian multiplier ( $p = 1.000$ ) tests are not significant ( $p > 0.05$ ). The outcome of the random effect revealed that audit fees, board size, firm size and profitability are statistically significant in determining discretionary accruals. While both audit fees and board size exert a negative significant impact, firm size and profitability

exert a positive significant impact on discretionary accruals. The F-statistics of the model was 47.48 with a probability value of 0.000 indicating that the overall model is statistically significant at 5% level of significance. Furthermore, the aggregate of explanatory variables account for 25% variations in discretionary accruals.

Table 7. Panel Regression Analysis (DACC)

Variables	Pooled	Random	Fixed
ln_AFES	-0.079 [-2.21]**	-0.079 [-2.21]**	-0.182 [-2.03]**
ATYP	0.011 [0.58]	0.011 [0.58]	0.074 [1.80]*
BSIZ	0.005 [1.49]*	0.005 [1.49]*	0.013 [1.69]*
BIND	-0.003 [-1.03]	-0.003 [-1.03]	-0.009 [-1.32]
GDIV	0.0058 [0.85]	0.006 [0.85]	0.011 [0.95]
LnTA	0.033 [1.47]*	0.033 [1.47]*	0.003 [0.04]
PROF	0.453 [6.38]***	0.453 [6.38]***	0.533 [5.24]***
Cons	0.025	0.025	0.583
Adj. R <sup>2</sup>	0.1039	0.2539	0.1255
F-statistics/ Wald chi <sup>2</sup>	6.78 (0.000)	47.48 (0.000)	6.01 (0.000)
Hausman test		8.71 (0.2742)	
B & P Lagrangian Multiplier test	0.00 (1.000)		

\*\*\* significant at 10%; \*\* significant at 5%; \* significant at 1%

Source: Stata output of data input by authors (2022).

Table 8. Panel Regression Analysis (REEM)

Variables	Pooled	Random	Fixed
Ln_AFES	0.144 [3.12]***	0.165 [2.60]**	0.155 [1.69]*
ATYP	0.019 [0.77]	-0.043 [-1.32]	-0.124 [-2.95]***
BSIZ	-0.005 [-1.08]	-0.006 [-0.93]	-0.006 [-0.73]
BIND	-0.004 [0.91]	-0.001 [-0.03]	0.002 [0.32]
GDIV	0.007 [0.82]	-0.007 [0.66]	-0.18 [-1.54]*

Table 8 (cont.). Panel Regression Analysis (REEM)

Variables	Pooled	Random	Fixed
LnTA	-0.111	-0.108	-0.097
	[-3.88]***	[-2.63]**	[-1.13]
PROF	0.081	-0.027	-0.106
	[0.88]	[-0.29]	[-1.02]
Cons	0.250	0.186	0.204
Adj. R <sup>2</sup>	0.0581	0.0581	0.049
F-statistics/ Wald chi <sup>2</sup>	4.08 (0.0003)	11.33 (0.1247)	2.17 (0.0372)
Hausman test	15.93 (0.0258)		
B & P Lagrangian Multiplier test	106.46 (0.0000)		

\*\*\* significant at 10%; \*\* significant at 5%; \* significant at 1%

Source: Stata output of data input by authors (2022).

In model two which is on real earning management, the fixed effect is appropriate, as both Hausman ( $p=0.0258$ ) and BP Lagrangian multiplier ( $p=0.000$ ) tests are significant ( $p<0.05$ ). The result of the fixed effect showed that audit fees, auditor-type and board gender are statistically significant in influencing real earning management. While audit fees displays positive impact, auditor-type and board gender exert negative significant effect on real earning management. In addition, F-statistics of the model was 2.17 with a probability value of 0.0372 indicating that the overall model is statistically significant at 5% level of significance. However, 5% variations in real earnings management were only accounted for by combination of independent variables studied.

#### 4.4. Discussion of Findings

The findings from these study appear consistent with previous empirical literature. However there are noticeable inconsistencies. On audit characteristics, this study provides empirical evidence to support a negative and statistical significant influence of audit fees on discretionary accruals. This implies that the higher the fees charged by external auditors, perhaps owing to huge audit efforts, the lower the incidence of discretionary accruals. However, auditor-type maintains a positive but non-significant effect. These are common measures typically found and adopted as auditor quality in audit literatures. Studies by Mantonti, Luliano, Palazzi, Tucker (2021) in Italy, Yusuf (2021) in Nigeria, Thuan (2020) in Vietnam and Zandi et al. (2019) in Pakistan have also found a negative association between audit fees and discretionary accruals. On the contrary, the following studies have also shown evidence of a direct relationship between audit fees and discretionary accruals. These among others are Khalil (2022) in Pakistan, Ozili (2021) in UK and within African continent, Mollik et al. (2020) in Australia, Abid et al. (2018) in Pakistan, and Soyemi et al. (2020) and Tyokoso et al. (2016) in Nigeria. Unlike findings on discretionary accruals, while audit fees display a positive and statistical influence on real earnings management, auditor-type exhibits a negative and statistical impact on real manipulative tendencies of managers. Impliedly, this study provides empirical evidence as to possibilities of a positive and negative significant influence of audit quality on real earnings management. Studies by Chowdhury, Eliwa (2021) in the United Kingdom, Soyemi et al. (2020) in Nigeria have reported a direct association between audit quality and real earnings management.



However, Al-Absy, Ismail, Chandren (2019) in Malaysia, Orazalin, Akhmetzhanov (2019) in Kazakhstan and Sitanggang, Karbhari, Matemilola, Ariff (2019) in the UK have also provided empirical evidences to prove an inverse relationship between audit quality and real earnings management.

Besides a few audit attributes that were selected for investigation, board characteristics, namely board size, board independence and board diversity also feature as part of explanatory variables which may affect earnings management. Findings from this study indicate that board size exhibits a negative but significant influence on discretionary accruals. This indicates the prominent role played by board size in mitigating the incidence of discretionary accruals among firms. This was also reported by Adeoye et al. (2021) and Kajola et al (2020) in Nigeria, Luo, Jeyaraj (2019) in the United Kingdom, Saona, Muro, Alvarado (2020) in Spain, Rajeevan, Ajward (2019) in Sri Lanka and Gull, Nekhili, Nagati, Chtioui (2018) in France. Similarly, female representation on board also displays a negative but significant influence on real earnings management. No doubt, this position provides evidence to support the recruitment of more female directors on corporate boards. Studies that were found to be consistent with this findings among others include Saona, Muro, Alvarado (2020) in Spain, Abubakar, Rokiah, Chandren (2017) in Nigeria and Panzer, Muller (2015) in Germany. However, studies by Luo, Jeyaraj (2019), Gull, Nekhili, Nagati, Chtioui (2018) and Zalata, Tauringana, Tingbani (2018) have also been documented with findings negating the influence of female representation on real earnings manipulations by managers.

Further, while returning a positive and statistically significant effect of both size of clients and profitability on discretionary accruals. This implies that managers of profitable large firms possess tendencies to engage in discretionary accruals type of earnings management. Additionally, there is also evidence emanating from findings from this study indicating a negative and non-significant relationship between the duo of clients' size and profitability and real earnings management by managers. Extant studies that have lent credence to direct relationship between firm size and discretionary accruals include Yusuf (2021) and Yasser, Soliman (2018) as well as, actual earnings management (Majid, Latif, Musa, 2022), while studies by Mantonti, Luliano, Palazzi, Tucker (2021), Oladejo, Akintude, Yinus, Akanbi, Olowokere (2021) and Soyemi et al. (2020) have documented contrary results. Similarly, with respect to positive association between profitability and discretionary accruals, the following studies, namely Almarayeh, Aibar-Guzmán, Abdullatif (2020), Agyei-Mensah, Yeboah (2019) and Lopes (2018) have also acknowledged similar findings, while studies by Firnanti, Pirzada (2019) and Khanh, Nguyen (2018) have reported contrary results.

## 5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study examines influence of auditor and board characteristics on two major categories of earnings management, namely discretionary accruals and real earnings management thereby providing further empirical evidence using latest data on emerging nation, such as Nigeria. There are diverse opinions as to whether Anglo-Saxon institutional settings of developed economies of Western European countries are applicable to developing nations. This present study has concludes that external auditor and board attributes are effective determinants of incidence of earnings management. As expected, audit efforts, proxied with audit fees and board size contribute to reduction of discretionary

accruals, with clear evidence of large and profitable firms retaining high predispositions towards undertaking discretionary accruals. Similarly, actual manipulation of earnings is drastically reduced by engagement of Big4 who may detect such practices, as well as presence of female directors on corporate boards. Nevertheless, audit fees as charged by external auditors, denoting audit efforts, further reinforces incidence of real earnings management.

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Received: January 2023  
Accepted: March 2023  
DOI: 10.7862/rz.2023.mmr.02

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## COLLABORATIVE APPROACH TO FLEXIBILITY, VISIBILITY AND VELOCITY IN SUPPLY CHAINS: A MULTI-GROUP ANALYSIS

The resilience of manufacturing supply chains have garnered a wide spread interest from researchers, however, most studies focus on developed economies when investigating resilience, creating a gap in research in developing countries. This study addresses that gap by examining supplier collaboration's effect on supply chain flexibility, visibility, and velocity in an African business environment. The study also fills another literature gap by uniquely assessing the relevance of company size to this relationship. This study employed a descriptive research design, with a population of 1332 and sample of 264. The analysis was based on 219 retrieved questionnaire copies, and it was performed using percentages and a structural equation model. The study reveals that resource sharing is the most effective strategy for improving supply chain resilience, and collaboration practices are most effective for supply chain flexibility. Organisations pursuing supply chain resilience should invest more in resource-sharing and information-sharing strategies because both strategies have the most positive impacts on resilience. Additionally, managers must note that supplier collaboration may not yield similar results across all resilience performance measurements. That said, medium-scale firms must focus on information sharing to improve the supply chain flexibility.

**Keywords:** Supplier collaboration, disruption, supply chain resilience, flexibility, visibility, information sharing.

### 1. INTRODUCTION

Disruptions occur, and in some cases, nothing can stop them. The best that can be done in such instances is to reorganise and re-strategise towards recovery. Such is the level of disruption triggered by Coronavirus. Disruption has occurred if there is an impromptu halt to the production and supply chain process (Revilla, Saenz, 2017). While there are studies on mitigating the possibilities of disruption (Polyviou, Croxton, Knemeyer, 2019), studies focused on developing flexibility, visibility, and velocity (resilience) in cases where management is powerless to disruption occurrence are limited (Ivanov, Dolgui, Sokolov,

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Ivanov, 2017), and only a few consider supplier collaboration. Collaboration is a concept that fosters the interdependence of firms to harvest the synergy between/among them to satisfy the end-users. It is a concept and strategy that has been investigated for several reasons, including internationalisation (Masiero, Ogasavara, Risso, 2017), improved society (Brown, Rizzuto, Singh, 2019), organisational performance (Tajeddini, Elg, Ghauri, 2015), market share growth (Ryan, Evers, Smith, Andersson, 2018), and modern slavery (Benstead, Hendry, Stevenson, 2018); to mention a few. However, the function of supplier collaboration in a bid to achieve supply chain flexibility, visibility and velocity to gain swift ample recovery from a supply disruption has been scantily researched (Duong, Chong, 2020). The novel coronavirus was an unprecedented event, and the level of disruption experienced was massive. Thus, studies that help navigate the current conditions of the business environment are essential. This study aims to investigate the role of supplier collaboration on supply chain flexibility, visibility and velocity. This is a response to contemporary calls for more empirical studies on supply collaboration and partnerships to improve resilience, especially from developing nations (Duong, Chong, 2020; Ali, Arslan, Chowdhury, Khan, Tarba, 2022; Spieske, Gebhardt, Kopyto, Birkel, 2022). The study also addresses a salient gap in supply chain resilience literature by assessing the relevance of company size on the relationship between supplier collaboration and resilience

## 2. LITERATURE REVIEW

### 2.1. Conceptual review

#### *Supplier Collaboration*

The network of manufacturing firms is a necessity for the achievement of company objectives in today's business environment. The dependence on supply chain partners in the delivery of customer satisfaction is becoming inevitable for manufacturing, especially big firms (Zhu, Krikke, Caniels, 2016). While collaboration in its essence is all-encompassing, including suppliers, distributors and customers, the major risk of disruption for any manufacturing firm is from the supply end (Scholten, Schilder, 2015), therefore, this study focuses on the collaboration between the focal firm and suppliers. The relevance of supplier collaboration to the success of supply chain and organisational performance is a growing concern with multiple researchers focusing on this niche (Mikkola, Skjøtt-Larsen, 2006; Cousins, Lamming, Lawson, Squire, 2008; Kähkönen, Lintukangas, Ritala, Hallikas, 2017). The goal to remain competitive in a contemporary business environment has continued to lend support to supplier collaboration. Competition is beyond focal firms in contemporary business spheres, it now resides in the effectiveness and efficiency of the supply chain (Puche, Ponte, Costas, Pino, Fuente 2016), therefore, the role of supplier collaboration is invaluable to the sustained competitiveness of a firm.

Kähkönen et al. (2017) measured supplier collaboration using green ethical supply management, early supplier involvement practice, systemic purchasing approach, and inter-firm learning. Cao, Vonderembse, Zhang, and Ragu-Nathan (2010) measured collaboration using information sharing, goal congruence, joint decision-making, resources sharing, incentive alignment, collaborative communication and joint knowledge creation. Simatupang and Sridharan (2004) used information sharing, decision synchronisation, and incentive alignment. A hierarchical model employed by Kumar and Banerjee (2012) to establish the rank of collaboration practices suggested collaborative culture, joint problem-solving and performance measurement, supplier joint planning, information-sharing and

resource-sharing practices as the most relevant collaboration practices. This study adopts information sharing, joint decision-making, joint planning, and resource planning.

**Supply chain resilience**

The year 2020 is one that most operations and supply chain managers will not forget soon, particularly because of the level of devastating disruption that was experienced in the year. Disruptions could be intentional (e.g., strikes), accidental (e.g., fire outbreak), or natural (e.g., earthquakes), the duration it takes to recover from the disruption experienced determines its longevity, after all, experiencing disruption is a matter of time. The Business Continuity Institute (BCI) in 2011 reported that only 15% of existing manufacturing firms are yet to experience a supply chain disruption. 10 years later (2021) they reported that 87.8% of manufacturers experienced disruption costing millions (BCI, 2021). Though there are studies that focus on disruption, post-disruption studies are still in their infancy (Kim, Hastak, 2018; Ivanov, Tsipoulanidis, Schönberger, 2019). Perhaps that is why most firms are somewhat ill-prepared to manage post-disruption in terms of recovery (Chen, Das, Ivanov, 2019). These surveys highlight the relevance of a recovery plan to supply chain disruptions.

It is often said that the bigger the firm; the bigger the supply chain, and the bigger the supply chain, the bigger the exposure to disruptions (Scheibe, Blackhurst, 2018). In other words, the nature of globalisation has fostered global supply chains for some firms, and being that big comes with the price of suffering supply chain disruptions periodically, recovery from disruption must be taken into consideration even more. Supply chain resilience can be described as how well an organisation recovers from a supply chain disruption (Golgeci, Ponomarov, 2013). The swiftness and extent of recovery from supply chain disruption is a testament to how well a supply chain is resilient. The parameters of supply chain resilience will be adopted from the study of Scholten and Schilder (2015), which are supply chain flexibility, supply chain visibility, and supply chain velocity.

**Conceptual Model**

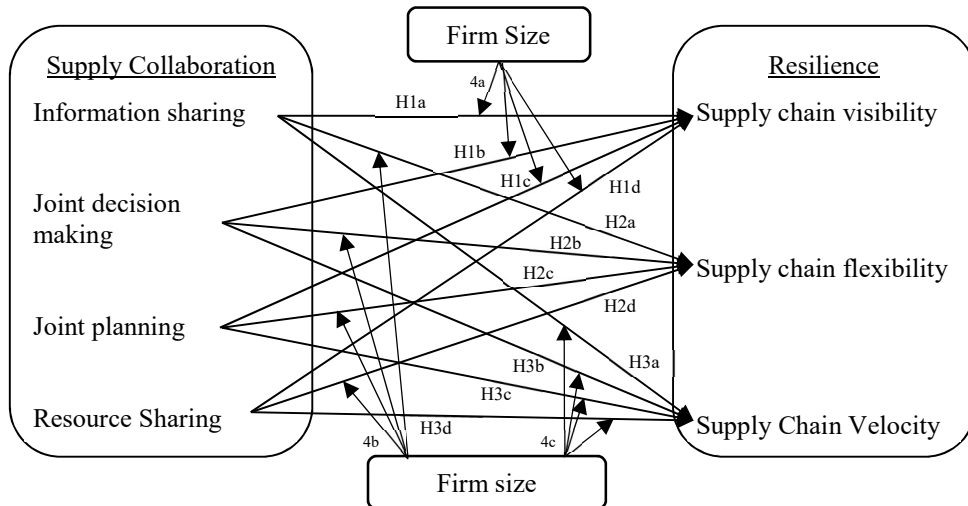


Figure 1. Conceptual model of Supplier Collaboration and Supply Chain Resilience relationship  
 Source: Authors, 2022.

### ***Hypothesis Development***

Golgeci and Ponomarov (2013) investigated the role of a firm's innovation in achieving supply chain resilience. While the study establishes the significance of innovation on disruption recovery, it begs the question of what role did the suppliers and distributors play to bring resilience to fruition, considering that supply chain resilience is a coordinated effort of supply chain members and not just the focal firm. As highlighted by Scholten and Schilder (2015), one firm cannot achieve supply chain resilience, it is a wrong approach to achieve resilience in manufacturing firms. Also, to emphasize the need for this study, Scholten and Schilder (2015), highlighted a need for quantitative empirical studies from developing nations to test the role of collaboration on supply chain resilience because theirs was qualitative, and based on a developed economy (Netherlands). This study answers that call by focusing on a developing economy (Nigeria).

Zhu et al. (2016) conducted a simulation on the relationship between collaboration and supply chain resilience; however, studies using data from major disruptions are needed to show how well collaboration aid the recovery process of manufacturing firms. It has also been established that studies on supply chain resilience and its parameters have been focused on the focal firm rather than the supply chain members (Manders, Caniels, Ghijsen, 2016; Rojo, Stevenson, Montes, Perez-Arostegui, 2018), thus, reducing the relevance of the findings. It is important that empirical studies on the buyer-suppliers relationship be done with firms on the chain, rather than just focal firms. In addition to these, the literature on supply chain resilience from the Nigerian front is very limited (if any exists). Which is one of the reasons why Chowdhury and Quaddus (2017) called for more empirical studies to be carried out for the enhancement of supply chain resilience knowledge.

In addition to the need for studies on developing economies. Prior studies on supplier collaboration and resilience (Scholten, Schilder, 2015; Duong, Chong, 2020; Spieske, Gebhardt, Kopyto, Birkel, 2022) do not establish the impact of the individual practices of supplier collaboration on the exclusive dimensions of supply chain resilience, that is, flexibility, visibility and velocity. This study goes beyond assessing supplier collaboration on flexibility, visibility and velocity. It also tests the exclusive roles of information sharing, joint decision-making, joint planning and resource sharing on the dimensions of resilience. These gaps have prompted the need to empirically test the role of supplier collaboration practices on supply chain resilience. From the discussion above, this study tests the following alternative hypotheses:

H1: Supplier collaboration has a significant impact on supply chain visibility.

H2: Supplier collaboration has a significant impact on supply chain flexibility.

H3: Supplier collaboration has a significant impact on supply chain velocity.

In the literature on supplier collaboration and supply chain resilience, several studies have been conducted, both qualitative and quantitative (Scholten, Schilder, 2015; Chowdhury et al., 2019), yet, little or no research has been done to assess the possible influence of company size on the relationships. Chowdhury and Quaddus (2017) called for more extensive studies into the possible contrast in relationship to enrich the supply chain resilience literature. This study ascends to the call by enriching supply chain resilience literature in testing the possible similarities or contrast when size is specifically considered in these relationships. Supply chain resilience literature holistically lacks comparative analysis studies. More recent studies in supply chain resilience (Gu et al., 2021; Ali et al., 2022; Kazancoglu, Ozbiltekin-Pala, Mangla, Kazancoglu, Jabeen, 2022) looked into several relationships without empirically establishing the role of company size, though the



responses were from companies of different sizes. This, therefore, leads to the fourth hypothesis formulation in this study, which tests the impact of company size.

H4: The relationship between supplier collaboration and supply flexibility, visibility and velocity are significantly different among medium and big firms.

### 3. METHODOLOGY

In line with prior publications on supplier collaboration relevance and supply chain resilience (Kähkönen et al., 2017; Patrucco, Luzzini, Ronchi, 2017), this study adopts a descriptive research design and a cross-sectional survey approach to capture respondents' opinions on the variables under study. Data is retrieved from manufacturing firms domiciled in Lagos, Nigeria. The population of this study is made up of all the employees of eleven selected manufacturing firms in the food and beverage industry (one focal firm and ten first-tier suppliers). The first-tier suppliers chosen were the most critical suppliers of the focal firm. The staff strength of all 11 selected firms was 1332. Employing a stratified sampling procedure, the sampling was limited to the Executive (Chief Executive officer, Chief Operating Officer, President, Vice President, Managing Director) officers and decision-making staff of the production, supply chain, and operations departments of the chosen firms. Provision was made for 3 Executives and 7 staff (Directors, Deputy Directors, Managers, Assistant Managers, and 3 Supervisors) in each department. It is assumed that they are more conversant with the variables under study. The sample for the study was 264 respondents.

Table 1. Measurement Items

Supply Collaboration dimensions	
Information sharing (IS)	
IS1 My company and its supply partners exchange relevant and timely information	Cao et al. (2010)
IS2 My company and its supply partners exchange accurate and complete information	Cao et al. (2010)
IS3 My company and its supply partners exchange information on inventory levels, delivery schedules, and cost of inventory warehousing	Kumar, Banerjee (2012)
IS4 My company and its supply partners exchange information on users' feedback on products and services	Kumar, Banerjee (2012)
Joint decision making (JDM)	
JDM1 Joint decision on optimal order quantity	Simatupang, Sridharan (2004)
JDM2 Joint decision on product quality and market segmentation	Simatupang, Sridharan (2004)
JDM3 Joint decision in resolving production related problems	Simatupang, Sridharan (2004)
JDM4 Joint decision on goals, objectives, and reward for good performance	Kumar, Banerjee (2012)
Joint planning (JP)	
JP1 My company makes plan to purchase raw materials and other required goods with good quality, and maintain relationships with suppliers	Kumar, Banerjee (2012)

Table 1 (cont.). Measurement Items

Supply Collaboration dimensions	
Joint planning (JP)	
JP2 New Product Development in my company integrates suppliers into its planning	Kumar, Banerjee (2012)
JP3 My company jointly plan demand forecasts with its suppliers	Kumar, Banerjee (2012)
JP4 My company develops promotional and advertising strategies of product lines in conjunction with suppliers	Kumar, Banerjee (2012)
Resource Sharing (RS)	
RS1 We have shared all required technology and machinery with our partners	Kumar, Banerjee (2012)
RS2 Use cross-organisational teams frequently for process design and improvement	Cao et al., (2010)
RS3 We offer technical support to our suppliers	Cao et al., (2010)
RS4 We offer financial and non-financial resources to supply partners to enable them meet deliveries.	Cao et al., (2010)
Supply Chain Resilience dimensions	
Supply chain visibility (SCV)	
SCV1 Our supply partners have real time data to aid observation of a change in strategy	Chowdhury, Quaddus, Agarwal (2019)
SCV2 All supply partners can see updated fluctuations in stock	Brandon-Jones, Squire, Autry, Peterson (2014)
SCV3 Required investments in IT system have been made by partners along the chain for tracking goods	Mandal et al. (2016)
SCV4 We get information from various sources to understand the changing market conditions	Mandal (2017)
Supply chain flexibility (SCF)	
SCF1 Our firm has the ability to manufacture a variety of goods with minimal change in the production setup	Zhang, Vonderembse, Lim (2003)
SCF2 We have the capacity to tweak delivery time for expected inventories to manage a disruption	Mandal et al. (2016)
SCF3 Staff are well trained in handling different types of production systems and tasks	Chowdhury, Quaddus (2017)
SCF4 The suppliers react well to changes in product design while maintaining minimal losses in time or finances	Chiang, Kocabasoglu-Hillmer, Suresh (2012)
Supply chain velocity (SCVe)	
SCVe1 Our firm's supply chain practices a hands on rapid approach to deal with threats in our environment	Scholten, Schilder (2015)
SCVe2 The partners of the firms supply line understand and react swiftly to the dynamism of the business environment.	Mandal et al. (2016)
SCVe3 When opportunities for the firm come into the business space, supply chain partners quickly latch unto such and exploit it	Mandal et al. (2016)

Source: Literature review, 2022.

A questionnaire was developed using existing scales from supply chain literature. Cao et al. (2010) and Kumar and Banerjee (2012) provided measurement scales for information

sharing. Simatupang and Sridharan (2004) provided measurement scales for joint decision-making. Measurement items from Kumar and Banerjee (2012) and Cao et al. (2010) measured joint planning and resource sharing respectively. Zhang, Vonderembse, and Lim (2003), Chiang, Kocabasoglu-Hillmer, and Suresh (2012), Brandon-Jones, Squire, Autry, and Peterson (2014), Scholten and Schilder (2015), Mandal et al. (2016), and Chowdhury and Quaddus (2017) provided measurement items for supply chain flexibility, visibility and velocity. The research instrument was distributed to all 264 respondents that make up the sample. The items adapted were done because of their simplistic nature and specificity on the sub-variables of this study. The items were slightly modified for the suppliers to reflect a relationship with a customer (focal firm). It had a return rate of 82.95%, that is, 219 questionnaire copies. The data were analysed using frequencies and a structural equation model (SEM).

#### 4. DATA ANALYSIS AND RESULTS

Table 2. Construct assessment

Construct	items	Factor loading	CFI	RFI	RMR	NFI	<i>p</i>	Cronbach $\alpha$	AVE	CR
Information Sharing	IS1	.945	.977	.928	.041	.976	.021	.832	.811	.918
	IS2	.917								
	IS3	.819								
	IS4	.883								
Joint Decision Making	JDM1	.932	.988	.961	.021	.987	.110	.813	.754	.793
	JDM2	.785								
	JDM3	.929								
	JDM4	.818								
Joint Planning	JP1	.509	.997	.985	.010	.995	.050	.853	.711	.847
	JP2	.953								
	JP3	.897								
	JP4	.983								
Resource Sharing	RS1	.916	.994	.980	.033	.993	.002	.875	.875	.926
	RS2	.949								
	RS3	.988								
	RS4	.965								
Supply Chain Visibility	SCV1	.884	.913	.737	.032	.912	.030	.812	.833	.931
	SCV2	.934								
	SCV3	.951								
	SCV4	.973								
Supply Chain Flexibility	SCF1	.660	.978	.899	.025	.966	.062	.701	.797	.831
	SCF2	.680								
	SCF3	.773								
	SCF4	.689								
Supply Chain Velocity	SCVe1	.742	.908	.923	.023	.917	.097	.732	.783	.900
	SCVe2	.673								
	SCVe3	.611								

Source: Field Survey, 2022.

### Measurement model

The measurement model was tested for multivariate normality, unidimensionality, reliability, multicollinearity, using factor analysis (EFA), and confirmatory factor analysis (CFA). Multivariate normality was satisfied by conducting a Mahalanobis test to reveal a Mahalanobis range of 3.618-100.830. The critical value was calculated to be 40.113, thus, eliminating 11 respondents from the survey because their Mahalanobis values were higher than the critical value. Unidimensionality was tested to examine the factor loadings of the items of the major constructs. While constraining the highest factor loading of the measurement items to 1, the loadings were good, as revealed in Table 1. The reliability assessment revealed that all constructs had values above .70 (see Table 1). Multicollinearity was assessed through the Tolerance and VIF figures of the items. The items had Tolerance values above .2 and VIF values below 5.

Table 3. Discriminant Validity

Constructs	Mean	SD	IS	JDM	JP	RS	SCV	SCF	SCVe
Information Sharing	3.86	.92	<b>.901</b>						
Joint Decision Making	3.60	.85	.762**	<b>.868</b>					
Joint Planning	3.62	.96	.654**	.826**	<b>.843</b>				
Resource Sharing	3.67	.96	.719**	.805**	.790**	<b>.935</b>			
Supply Chain Visibility	3.63	.86	.584**	.734**	.632**	.734**	<b>.913</b>		
Supply Chain Flexibility	3.86	.67	.053*	.165**	.120*	.046*	.214**	<b>.893</b>	
Supply Chain Velocity	3.59	1.05	.319**	.428**	.369**	.316**	.332**	.521**	<b>.885</b>

\*\*/\* significant at 0.01 and 0.05 respectively (2-tailed). Bold diagonal values are AVE square root values

Source: Field Survey, 2022.

Exploratory factor analysis carried out was in a bid to affirm no positive definiteness in the study data set. The factor extraction was set at 7; mirroring the study's main variables, and varimax rotation had its condition to suppress any rotation values beneath 0.3. There was a need to conduct the EFA because though measurement items were adapted, they were applied to a different and very developed business environment. The positive definiteness assumption was not violated as the determinant value was 4.360 (above 0) (Lowry, Gaskin, 2014). In addition, the Kaiser-Meyer-Olkin (KMO) value was 0.796, and Bartlett's test of sphericity (BTS) was significant at .001 (.000). KMO value above 0.5 is considered good and indicates an adequate sample size (Hair, Anderson, Tatham, Black, 1998). Confirmatory factor analysis tested both convergent and discriminant validity. The average variance extracted and composite reliability values were within the range to establish convergent validity, given that they were above 0.50 and 0.70 respectively (Dubey, Gunasekaran, Childe, Wamba, Roubaud, Foropon, 2021). The discriminant validity confirmation was established through the comparison of the squared root AVE values and the squared correlation values. Once it is established that Squared AVE values surpass the all-squared correlation values, discriminant validity is satisfied (Hair et al., 1998).

Table 4. Brief description of respondents' bio-data and distribution across firms and positions

		Frequency	Valid Percent	Cumulative %				
Gender	Male	165	75.3	75.3				
	Female	54	24.7	100				
	Total	219	100					
Department	Production	64	29.22	29.22				
	Supply chain	69	31.51	60.73				
	Operations	59	26.94	87.67				
	Executive	27	12.33	100				
	Total	219	100					
Company Size	Medium	71	32.42	32.42				
	Big	148	67.48	100				
	Total	219	100					
Firm Distribution	Company A (Focal firm)	20	09.13	09.13				
	Supplier 1	22	10.05	19.18				
	Supplier 2	22	10.05	29.22				
	Supplier 3	19	8.68	37.90				
	Supplier 4	15	8.65	44.75				
	Supplier 5	21	09.59	54.34				
	Supplier 6	22	10.05	64.39				
	Supplier 7	20	09.13	73.52				
	Supplier 8	20	09.13	82.65				
	Supplier 9	17	07.76	90.41				
	Supplier 10	21	09.59	100				
	Total	219	100					
<b>Firms</b>	<b>Size</b>	<b>E</b>	<b>D</b>	<b>DD</b>	<b>M</b>	<b>AM</b>	<b>S</b>	<b>Total</b>
Company A (Focal Firm)	Big	3	2	2	3	1	9	20
Supplier 1	Big	3	3	3	3	1	9	22
Supplier 2	Big	3	2	2	3	3	9	22
Supplier 3	Medium	2	3	3	3	3	5	19
Supplier 4	Medium	1	2	3	3	3	3	15
Supplier 5	Big	2	3	3	3	1	9	21
Supplier 6	Big	3	3	3	3	1	9	22
Supplier 7	Medium	3	3	3	3	3	5	20
Supplier 8	Big	1	3	3	3	1	9	20
Supplier 9	Medium	3	3	3	1	3	4	17
Supplier 10	Big	3	3	2	3	1	9	21
Total Medium/Big		9/18	11/19	12/18	10/21	12/9	17/63	71/148
Total Male/Female		24/3	30/0	27/3	19/12	12/9	53/27	165/54
Total		27	30	30	31	21	80	219
Supervisor (S), Departmental Assistant Manager (AM), Departmental Manager (M), Departmental Deputy Director (DD), Directors (D), Executive (E)								

Source: Field Survey, 2022.

80 supervisors (36.53%), 21 assistant managers (9.58%), 31 managers (14.16%), 30 deputy directors (13.70%), 30 directors (13.70%), and 27 executives (12.33%) made up the respondents for the study. 71 respondents (32.42%) were from medium firms, while 148 respondents (67.48%) were from big firms. The focal firm, supplier 7 and supplier 8 had 20 respondents (9.13%) each, and 22 respondents (10.05%) each came from Suppliers 1, 2, and 6. Supplier 3 had 19 respondents (8.68%), while suppliers 4, 5, 9 and 10 had 15, 21, 17, and 21 respondents respectively, constituting 8.65%, 9.59%, 7.76%, 9.59%. All directors in this study were male employees of the production department. 27 deputy directors (90% of deputy directors) were male, while 3 deputy directors were female. These statistics support the male dominance and physicality involved in working in a manufacturing firm in Nigeria, especially in medium-scale firms; where everyone might need to get their hands dirty in labour support (occasionally) to meet up with customer demands. The data shows that 7 firms in the study were big-sized, while 4 firms were medium-sized. The big firms include the focal firm, suppliers 1, 2, 5, 6, 8 and 10. The medium-scale firms include suppliers 3, 4, 7, and 9. The analysis also shows that out of the 80 supervisors among the respondents, 63 were employees of big firms, while 17 were the medium firm staff. While on contrast, big firms had only 9 assistant managers out of the 21 assistant managers in the study. This implies that because of the multi-specialised activities in big departments, big firms focus on having more specialist supervisors than assistant managers. These specialist supervisors then serve as assistants to the manager.

Table 5. Hypotheses test result

Hypothesis	Path	Standardised Coefficient	t-values	Result
H1	SC → SCV	.245**		Supported
H1a	IS → SCV	.024*	2.451	Supported
H1b	JDM → SCV	.010 <sup>ns</sup>	1.582	Not Supported
H1c	JP → SCV	.101**	5.337	Supported
H1d	RS → SCV	.110**	3.156	Supported
H2	SC → SCF	.312**		Supported
H2a	IS → SCF	.060**	3.941	Supported
H2b	JDM → SCF	.008**	2.217	Supported
H2c	JP → SCF	.107*	2.174	Supported
H2d	RS → SCF	.137*	5.915	Supported
H3	SC → SCVe	.186**		Supported
H3a	IS → SCVe	.166**	3.891	Supported
H3b	JDM → SCVe	.006**	2.017	Supported
H3c	JP → SCVe	.008**	4.874	Supported
H3d	RS → SCVe	.006**	2.315	Supported

\*\*/\* significant at 0.01 and 0.05 respectively.

SC = Supplier collaboration, IS = Information sharing, JDM = Joint decision making, JP = Joint planning, RS = Resource sharing, SCV = Supply chain visibility, SCF = Supply chain flexibility, SCF = Supply chain flexibility, SCVe = Supply chain velocity.

Source: Field Survey, 2022.

The accepted thresholds for model indices are CFI  $\geq$  0.90, GFI  $\geq$  0.90, IFI  $\geq$  0.90, NFI  $\geq$  0.90, RMR  $\leq$  0.08, RMSEA  $\leq$  0.08, and  $\chi^2/df \leq 5$  (Bagozzi, Yi, 1988; Hair, Anderson,

Tatham, Black, 1998; Hair, Black, Babin, Anderson, Tatham, 2010). The model fit indices for the model (CMIN/df 2.999, NFI .995, RFI .985, IFI .997, TLI .990, CFI .997, RMSEA .081) were acceptable because they were above the threshold recommended. The result showcases the relationships among the major constructs of the study. First, the supply collaboration and supply chain visibility hypothesis test. The individual practices of supply collaboration selected for this study were information sharing, joint decision-making, joint planning, and resource sharing. They accounted for 2.4 percent, 1.0 percent (though insignificant), 10.1 percent, and 11 percent respectively in the influence of supply chain visibility. In totality, the study shows that supply collaboration accounts for 24.5 percent of supply chain visibility. The study accepts that the results being positive and significant establish a significant relationship between supply collaboration and the supply chain visibility of manufacturing firms in Nigeria. Therefore, the hypothesis is retained. Secondly, the supply collaboration and supply chain flexibility hypothesis test. The individual practices of supply collaboration accounted for 6 percent, 0.8 percent, 10.6 percent, and 13.7 percent respectively in their influence on supply chain flexibility. The study shows that supply collaboration accounts for 31.2 percent of supply chain flexibility. The results were positive and significant, thereby establishing a significant relationship between supply collaboration and the flexibility of the supply chain of Nigerian manufacturing firms. Therefore, the hypothesis was retained. Lastly, the supply collaboration and supply chain velocity relationship was tested. Information sharing accounted for a 16.6 percent influence on supply chain velocity, joint decision-making accounted for a 0.6 percent influence on supply chain velocity, joint planning predicted a 7.8 percent change in supply chain velocity and resource sharing had a 0.6 percent influence on supply chain velocity. In totality, the study shows that supply collaboration is capable of influencing 18.6 percent of supply chain velocity. All tests were positive and significant, which shows that supply collaboration is significantly influencing the supply chain velocity of manufacturing firms in Nigeria. The hypothesis was retained.

To test hypothesis four, a multigroup analysis (via SEM) was conducted on the existing conceptual model for hypotheses testing. Two groups were created in the SEM to reflect the company sizes. Group 1 was Medium, while group 2 was Big. The data file was aligned to these groups by using the categorical variable Company Size. For testing the hypothesis, structural covariances as well as structural residuals were deleted from the parameter constructs revealed by the multigroup analysis. This enables the test to confine its assessment to the similarity between unconstrained values and constrained values (structural weights). In essence, the test tells us if there is a difference when company size is factored into the relationship between supplier collaboration and supplier resilience. Standardised estimates and squared multiple correlations were highlighted as needed outputs for the test. Results show that there is a significant difference (DF = 18, CMIN 94.23,  $p = .000$ ) between the models when company size is considered.

This result prompted a more in-depth analysis to reveal the relationship between supplier collaboration practices and supply resilience dimensions. To do this, the parameter constraints for exclusive relationships (e.g., between information sharing and supply chain flexibility) were retained, while all others were deleted from the parameter constraints list to capture specific relationships tested. For medium firms, the findings reveal that on the relationships between all supplier collaboration practices and flexibility, all relationships were insignificant except information sharing. Supplier collaboration practices and

visibility proved insignificant across all relationships. This was also the case with supplier collaboration and velocity.

The reverse was found in the relationships between supplier collaboration practices and flexibility, visibility, and velocity among big firms. The results show that supplier collaboration practices all had significant relationships with flexibility, visibility and velocity. The findings of the multigroup analysis prompt the acceptance of H4 which states that the relationship between supplier collaboration and supply flexibility, visibility and velocity are significantly different among medium and big firms.

## 5. DISCUSSION OF FINDING

The study revealed that supply collaboration had positive and significant effects on supply chain disruption recovery. Supply collaboration was measured by information sharing, joint decision-making, joint planning, and resource sharing. The first hypothesis tested supply collaboration and supply chain visibility, and the result was significantly positive. This is in line with the findings of Scholten and Schilder (2015), and Botes et al. (2017) who found significant relationships between supplier collaboration and visibility. The second hypothesis tested supplier collaboration and supply chain flexibility. The finding revealed that supplier collaboration is a reliable predictor of supply chain flexibility. This finding aligns with other studies, such as Scholten and Schilder (2015), and Gu et al. (2021) where collaboration efforts lead to improvement in supply chain flexibility; among other things. The final hypothesis of this study was to test the effect of supplier collaboration on supply chain velocity. The final hypothesis equally had positive significant results, aligning with studies like Botes et al. (2017) and Chen et al. (2019) who opined that supplier collaboration was a great way forward for firms who pursue supply chain resilience.

The findings of the study also present an interesting angle to research in supply chain disruption recovery and resilience, as it presents the individual effect of supplier collaboration constructs on resilience, which is lacking in prior research, such as Scholten and Schilder (2015) and Botes et al. (2017). Prior studies did not empirically establish which constructs deserved the most investment to yield the best results in the supply chain resilience quest. The study reveals that among all constructs used in measuring supplier collaboration, the most influential construct was resource sharing, with a 25.3 percent effect on supply chain disruption recovery holistically. The next influential constructs were information sharing (25 percent), joint planning (21.6 percent), and joint decision making having the least effect on supply chain disruption recovery with 2.4 percent. This supports the findings of Li et al. (2017) and Chen et al. (2019), as both studies established the critical role information sharing among collaborators in the supply chain played in the actualisation of swift disruption recovery.

Another interesting aspect of the findings of this study is that though the study shows a significant relationship holistically when considering firm size categories as a moderation, there is a significant difference in the interaction between the variables under study. The study reveals that when the medium-scale firms are isolated to investigate the relationship, it exhibits no significant relationship between all supplier collaboration practices and supply chain visibility and velocity. However, when examining supplier collaboration and supply chain flexibility (among medium firms alone), information sharing had a significant relationship with it, while all other supplier collaboration practices had no significant effect on supply chain flexibility. On the contrary, when testing big firms in



isolation, supplier collaboration practices retain significant effects on supply chain visibility, flexibility and velocity. This is a very interesting finding worth further investigation.

Overall, the finding of the study indicates a significant relationship between supplier collaboration and supply chain disruption recovery. This is evident in the effect of supplier collaboration on all the dimensions of supply chain disruption recovery adopted in the study. The study result highlights the relevance of the theory of constraint to the business environment, especially in the relationship between focal firms and suppliers. Constraint theory encourages business managers to see suppliers as part of a broader system essential to their performance, rather than see them as easily dispensable sources of input. Because, on one hand, the suppliers are capable of posing major constraints to production processes, and, on the other hand, capable of improving the resilience and overall organisational performance significantly. Thus, collaboration efforts must be intensified to minimise constraints and reap the benefits of collaboration practices such as a resilient supply chain simultaneously.

## 6. CONCLUSION

The focus of this study was to assess the role of supplier collaboration on the supply chain resilience of manufacturing firms. Three main hypotheses were tested and the results were all significant and positive. The study concludes that supplier collaboration had a significant effect on supply chain visibility, supply chain flexibility, and supply chain velocity.

The study makes valid contributions to the understanding of supply chain resilience from an African perspective. The literature on supply chain resilience is concentrated on developed economies and a few on developing economies. This study highlights the Nigerian and by extension, West-African perspective to supply chain resilience, as it reveals that supplier collaboration affects the flexibility, visibility and velocity of supply chains to enable resilience. Nigeria being the biggest economy in West-Africa to some extent reflects the sub region in the relationship between business concepts because the peculiarities among the countries (in the sub region) in business are similar. The study also establishes that supplier collaboration had the most effect on supply chain flexibility. The study reveals that resource sharing and information sharing had the most effect on the resilience of manufacturing firms. Prior studies conducted on resilience were not explicit on which parameter under supplier collaboration had the most effect on supply chain resilience. In addition, and more interestingly, the study reveals that among medium-scale firms, supplier collaboration practices did not affect supply chain visibility and supply chain velocity. Though there is a significant relationship between information sharing and supply chain flexibility, all other practices of supplier collaboration did not affect supply chain flexibility.

The relevance of this study to industry practitioners is that manufacturing organisations that intend to pursue a resilient supply chain to quickly and swiftly recover from disruptions can implement supplier collaboration strategies to achieve this feat. But more importantly, the focus must be on optimising resource sharing and information sharing to have the most resilient supply chains. As suggested by Gu et al. (2021), conscious efforts must be made in the acquisition of IT infrastructure to enable information sharing in real-time to aid the visibility and flexibility of supply chains to recover from disruption. Information such as product germane ingredients, inventory levels, demand predictions, point-of-sale data,

changing preferences in customer taste and feedback, as well as predicted disruptions are all critical information to be shared among supply chain members to facilitate flexibility, visibility, and velocity across the chain. Resource in terms of human capital and equipment can be shared by partner firms to achieve the overall objective of customer satisfaction. Tangible assets such as buildings, superior technology, and facility sharing greatly influence supply chain performance (Cao et al., 2010; Kumar, Banerjee 2012), they are significantly related to supply chain visibility (Maghsoudi, Pazirandeh, 2016), therefore, manufacturing supply chain members must imbibe the culture of resource sharing if resilience is the goal. Medium-scale manufacturers should focus more on enhancing information-sharing capacities between them and their supply chain partners because all other practices did not affect resilience measurement constructs.

Despite the contributions of this study, it does hold some limitations. First, the study focuses on a network of focal firms and suppliers. Further studies should endeavour to expand its scope to capture multiple supply networks, perhaps, two or three focal firms and their suppliers. Further studies could also research the intricacies of second-tier suppliers of a manufacturing firm, and how these supplier collaboration strategies affect resilience when they are considered. The study is also limited to manufacturing firms in Lagos. Further studies could investigate manufacturing firms outside the economic capital of the nation, and or outside the food and beverage industry. Finally, future studies are encouraged to further explore the impact of different business sizes on the relationship outcomes in supplier collaboration and disruption recovery context.

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Received: January 2023  
Accepted: March 2023  
DOI: 10.7862/rz.2023.mmr.03

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## WISE LEADERSHIP: CONSTRUCTION AND VALIDATION OF A SCALE

Given the importance of wisdom in leadership and the crucial role that wise leaders play within organizations, this study aimed at developing a psychometrically valid scale measuring wise leadership. Data were collected from three independent samples from France and Morocco (N=626). Exploratory factor analysis, first- and second-order confirmatory factor analyses, and structural equation modeling established the convergent and discriminant validities of the new wise leadership scale. Review of the extant literature, expert judgment technique and quantitative analyses across four studies yielded a 16-item scale designed to measure wise leadership (Wise Leadership Questionnaire [WLQ]). The driving forces of this pattern of leaders' values, cognitions and behaviors are intellectual shrewdness, spurring action, moral conduct, and virtuous humility. This new wise leadership measure will be valuable for researchers and practitioners in understanding the pattern of wise leaders.

**Keywords:** Wise leadership, Scale development and validation, Wise Leadership Questionnaire (WLQ).

### 1. INTRODUCTION

The notion of wisdom has ancient philosophical and theological underpinnings (Baltes, Glück, Kunzmann, 2002), which constitute its prominent intellectual hub (Kekes, 1995). In fact, wisdom's historical developments stretch from the ancient civilizations to the modern era and encompass the Egyptian work, the Instruction of Ptahhotep, the Akkadian work, the Counsels of Wisdom, the Sumerian collections of proverbs, and the Aramaic Words of Ahiqar (Hall, 2010). These historical developments have been pivotal to the current literature on wisdom (Takahashi, Overton, 2005). Particularly, Greek philosophers Socrates, Plato, and Aristotle are considered the classical figures that have widely influenced the development of the concept of wisdom (Holliday, Chandler, 1986).

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Although the emphasis on specific aspects of wisdom varies across cultures and eras, various conceptions of wisdom have more similarities than differences (Meeks, Jeste, 2009) owing to its agreed universal principles (Biloslavo, McKenna, 2013).

Wisdom plays a prominent role in leadership (Elbaz, Haddoud, 2017) and is vital for organizations (Vasconcelos, 2022) given that it oftentimes leads to organizational excellence (Chia, Holt, 2007), and sound judgment and decisions represent the most important components of good leadership (McKenna, Rooney, 2019). Conversely, many companies face corporate fiascos because of imprudently foolish practices and unwise decisions made by their leaders (Jordan, Sternberg, 2007; Rooney, McKenna, 2007) who promote personal gain-seeking behaviors and cultures, rather than what is good, right, and just for all stakeholders (Nonaka, Takeuchi, 2011).

Further, contemporary realities in the world are experiencing what has been termed an era of discontinuity, referring to a time characterized by unpredictable chaos, turbulence, and volatility (Intezari, Pauleen, 2014) that presents leadership opportunities, which consequently prompt new ways of thinking and doing business (Takeuchi, 2013). While leadership represents a complex task within organizations, present-day circumstances exacerbate the challenge and have spurred a need for wise leaders in organizational action (Hassi, Storti, 2019; Kilburg, 2012; McKenna et al., 2009), especially that extant leadership theories cannot entirely explicate the problematic and ineffective conduct of numerous leaders (Rooney et al., 2021). In fact, wise leaders are needed nowadays as the world is marked by uncertainty, new technology, shifting demographics, and rapidly changing consumption trends (Nonaka, Takeuchi, 2011).

Nonetheless, research has not followed these profound transformations by addressing the need pertaining to wisdom in organizations and leadership (Küpers, 2007), even though wisdom is considered a crucial factor for leadership (Yang, 2011). Along the same lines, although practitioners and researchers alike contend that wise leaders are indispensable to organizations (Rooney, McKenna, 2007; Weick, 2007), and some insightful conceptualizations of wise leadership have been proposed, they however do not suggest measurable dimensions and indicators of wise leaders.

To address this gap, the present paper aims at developing a reliable and psychometrically valid measure of wise leadership to assess the wisdom of managers and leaders. Further, this paper intends to expand the scope of leadership conceptualizations by virtue of core aspects of wise leadership, namely judging, action, morality and humility. From a methodological point of view, wisdom will be assessed based on the level of wisdom apparent in the behaviors of leaders and managers as reported by their subordinates, rather than by resorting to fictitious situations or the self-report approach.

The new wise leadership construct will allow working along the lines of establishing complementarity with existing leadership models in order to reach a more comprehensive understanding of leadership-related dynamics in the workplace, especially that bridging wisdom and leadership underscores the key role of judgment in the field of leadership.

The main purpose of this paper is hence to develop a wise leadership scale (Wise Leadership Questionnaire [WLQ]) for leadership research and practice. To this end, we present the concept development of wise leadership; then, we propose a measure of the wise leadership construct; further, we determine the validity of the construct; and lastly, we discuss the findings, implications and limitations of this research, and suggest directions for future research.



## 2. PHASE 1: CONSTRUCT DEFINITION

### 2.1. *Phronesis* or Practical Wisdom

The wise leadership concept can be grounded on Aristotle's thesis on *phronesis* or practical wisdom; a notion concerned with applying experiential knowledge in efforts to reach the most fitting judgment while implementing appropriate action to serve the common good (Nicomachean Ethics, 1106a26-b28).

Cultivating practical wisdom is carried out through knowing the ways to achieve the common good in all situations (Mele, 2010) such as through situational appreciation, which is the capacity to recognize the salient facets of a given situation prior to taking decisions and actions (Price, 2000). Hence, judgment is central in wise leadership as it is not merely about knowing how to act in the right way and having the necessary skills and competencies, but, more importantly, it entails possessing the capacity of taking the right action at the right moment or *kairos* (Bartunek, Necochea, 2000), upon considering the specific circumstances. Leaders exercise judgment as required by a given situation in order to reach desired individual and organizational outcomes; this assertion is particularly interesting and promising because leadership scholars oftentimes focus more on investigating the characteristics and behaviors of people at the top of the organization, rather than the context surrounding the circumstances, timing and tools of leaders' actions (Boal, Hooijberg, 2001).

The current research uses Aristotle's thesis on *phronesis* as a backdrop given that Aristotle is one of the classical figures that have substantially influenced the development of the concept of wisdom (Holliday, Chandler, 1986). *Phronesis* entails the capacity to respond in an appropriate way in various circumstances to the purpose of a fulfilled life (O'Grady, 2019). As such, Aristotle's virtues are beneficial to humans both individually and as a community (Foot, 2002) as they revolve around acting well in hopes of the fulfillment of a good life or "eudaimonia" (Beadle, Moore, 2006) such a life that fulfills human deprivations and expectations as well as augments human strengths and tackles human weaknesses (Solomon, 2003). In the world of business, *phronesis* helps individuals to make decision that are both effective and morally sound (Bardon Brown, Pez , 2017).

### 2.2. Conceptual Development

There is a general agreement among scholars that wisdom is a multidimensional and multifaceted construct (Ardelt, 2003) whose dimensions and aspects strengthen one another (Baltes, Staudinger, 2000) and are necessary for the manifestation of wisdom (Gl ck, 2018).

Researchers concur on the importance of wisdom to the understanding of leadership (e.g., Bennis, 2007) and several authors have linked the concepts of wisdom and leadership. However, the construct of wisdom within organizations has yet to receive the necessary attention from management and leadership scholars (McKenna et al., 2009), especially that existing scales and measures of wisdom have not turned their attention to leadership styles embodied by wise leaders.

The construction of the wise leadership scale will be accomplished by relying on Aristotle's thesis on *phronesis* or practical wisdom as well as wise leadership constructs identified by wise leadership researchers. Additionally, to enhance the comprehensiveness of the wise leadership scale, the expert judgment method will be used to assess the validity of the measure. In so doing, we ensure that the newly developed wise leadership scale encompass the spectrum of behaviors that are required for effective wise leaders.

An investigation of the extant literature pertaining to wisdom and leadership yielded studies that addressed ways wisdom is displayed through leadership (Yang, 2011), defining principles of wise leadership (McKenna et al., 2009), core abilities of wise leaders (Nonaka, Takeuchi, 2011) and fallacies of unwise leaders (Sternberg, 2005).

***Manifestations of Wisdom through Leadership.*** Yang (2011) conducted an extensive literature review about the relations of leadership and wisdom and concluded that wise leader behaviors, practices and actions are displayed through the following:

- (1) personality attributes: Wisdom, viewed as a personal quality, is considered as a crucial element of eminent leadership that appears when leading subordinates;
- (2) knowledge, skills and expertise: Wisdom is expected to be reached through learning from accumulated experiences and leaders become wise as they successfully lead and guide generations of subordinates;
- (3) interpersonal dynamics as leaders develop, nurture, and exhibit their wisdom as they act in a wise manner in face of the challenges and opportunities they encounter; and
- (4) positive actions. Leaders who succeed in achieving desired outcomes for their organizations and society, are likely to attain wisdom. The latter is manifested through the positive effects related to aspiring and maintaining the common good for the self (leaders) and others (organization and society).

***Defining Principles of Wise Leadership.*** McKenna et al. (2009) elaborated a framework of five defining principles of wise leadership in the organizational context. These include:

- (1) *Wise leaders use reason and careful observations* to establish facts and provide deductive explanations. To make decisions, leaders exhibit wisdom by resorting to rules of reason, as well as *soft data* such as the interactions between the intellectual, affective, motivational and intuitive spheres of human functioning;
- (2) *Wise leaders allow for non-rational and subjective elements when making decisions.* They contend that leading institutions require the promotion and protection of values with the latter constituting the core of all organizations and work, particularly across different cultures and value systems;
- (3) *Wise leaders value humane and virtuous outcomes.* Wisdom is defined in terms of values, ethics and virtue; it encompasses an important constituent element that forms ethical judgment. Wise leaders promote socially valued behaviors and actions that are noble and worthwhile;
- (4) *Wise leaders and their actions are practical and oriented towards everyday life, including work.* Wisdom is fundamentally practical as it involves taking action in day-to-day activities. Wise leaders are cognizant of absolute principles, but they know how and when to put them into practice in complex and uncertain contexts; and
- (5) *Wise leaders are articulate, understand the aesthetic dimension of their work, and seek the intrinsic personal and social rewards of contributing to the good life.* This implies that wisdom is vital in decision making given that wise leaders are able to practically articulate wise judgments to others. Formulating wise judgment also requires an aesthetic capacity.

***Core Abilities of Wise Leaders.*** Based on Aristotle's thesis on *phronesis* or practical wisdom about applying experiential knowledge in order to make the most appropriate judgment and implementing the timeliest action to serve the common good, Nonaka and Takeuchi (2011) identified six core abilities of wise leaders.

- (1) *Wise leaders can judge goodness.* They are able to distinguish what is good for their organization and society based on their values and ethics. Their goals are morally set while they intend to achieve desired organizational and shareholders outcomes;
- (2) *Wise leaders can grasp the essence.* They intuitively sense what lies behind any situation, quickly envisage its implications, craftily formulate a vision of the future, and promptly make an adequate decision about the appropriate action required to achieve optimal desired outcomes. Wisdom permits grasping the essence by means of comprehending people, things and events;
- (3) *Wise leaders can create shared context or “ba”* as they create formal and informal opportunities for all organizational members, including executives and subordinates, to learn from each other. To do so, knowledge sharing, relationship building, and favoring interactions are carried out and promoted, which, in turn, contribute to the creation of a sense of purpose that consequently yields adequate alternative solutions to problems faced by organizations and their members;
- (4) *Wise leaders can communicate the essence.* They are able to translate the nucleus of their expertise into tacit knowledge and effectively communicate it to others in a way that everyone is able to understand. They effectively encode their message to the point that receivers, even though from various contexts and with diverse backgrounds, can smoothly grasp the quintessence of the communication;
- (5) *Wise leaders can exercise political power.* They can bring together individuals with varying interests and conflicting goals and entice them to act. They do so by mobilizing them to adhere to the same vision and pursue common goals. They are able to grasp the perspectives and emotions of other people and connect with them in the timeliest manner by resorting to dialectical reasoning. This ability goes one step further beyond effective communication as it presupposes a thorough understanding of the good and bad of the human condition, and it entails operating in a creative and successful way while dealing with opposing viewpoints; and
- (6) *Wise leaders can foster practical wisdom in others.* They are able and willing to share their knowledge and expertise within their organizations by using their honed mentoring and coaching skills as well as nurture and create learning opportunities. This practice allows subordinates to acquire some of the leader’s wisdom.

**Fallacies of Unwise Leaders.** Sternberg (2005) describes six common leadership flaws or fallacies through which unwise leaders demonstrate poor reasoning and which are the opposite of wise leadership. These flaws are:

- (1) ‘unrealistic-optimism fallacy’, which occurs when leaders believe that they are so effective that they can act as they please and they are so intelligent that they can overcome any obstacle.
- (2) ‘egocentrism fallacy’ where leaders resort to self-importance and believe that they only matter, rather than prioritizing people that they lead or taking their responsibility towards them.
- (3) ‘omniscience fallacy’, when leaders think that they know everything and, as a consequence, lose sight of the limitations of what they know.
- (4) ‘omnipotence fallacy’, when leaders believe they are all-powerful and do things as they wish.
- (5) ‘invulnerability fallacy’, when leaders contend that they can get away with any mistake they make because of their perceived intelligence and position of authority.

(6) ‘moral disengagement’ fallacy, where leaders consider themselves above moral concerns as they believe that morality is important for others but not for themselves.

This body of work contains a plethora of behaviors reflecting wise leadership which are grounded on the following core aspects: 1) judging: a central theme in Aristotle’s thesis on *phronesis* or practical wisdom and one of the McKenna’s et al. (2009) main principles of wise leadership; 2) positive action: is at the heart of the Nonaka and Takeuchi’s (2011) core abilities of wise leaders; 3) morality: is an integral part of the Sternberg’s (2005) fallacies of unwise leaders as well as Nonaka and Takeuchi’s (2011) core abilities of wise leaders; and 4) humility: is at the core of the Sternberg’s (2005) fallacies of unwise leaders. Therefore, four categories were identified as appropriate for being the pillars of the wise leadership scale which are: 1) intellectual shrewdness, 2) spurring action, 3) moral conduct, and 4) virtuous humility.

These categories contribute to a thorough understanding of wise leadership processes and outcomes. Hence, these four manifestations of wise leadership will be taken into account in the process of generating items for the wise leadership scale in the present study. This perspective is designed to integrate all views and streams of the concept of wisdom by including the cognitive, emotional, behavioral, and virtuous aspects of leaders in order to reflect a balance between a leader’s character, intellect, and actions. All these aspects are vital to our understanding of wise leadership.

In light of the above, we define wise leaders as *individuals who operate in a normatively positive way by exhibiting intellectual shrewdness, moral conduct, virtuous humility and spurring action*. We retain on these four components, namely exhibiting intellectual shrewdness, moral conduct, virtuous humility and spurring action as dimensions of wise leadership. We will elaborate on them further and describe the item development and validation process adopted to evaluate the derived structure.

We posit that expecting and requiring leaders to be wise may only be effective if adequate scales to measure the characteristics of wise leadership are provided. Thus, empirical investigations are much needed in order to allow organizations to identify and develop wise leaders (McKenna, Rooney, 2019). To overcome this shortage, the current paper aims to develop a measure for wise leadership.

In the following sections, we present the studies that yielded the development and validation of the new wise leadership construct.

### 3. PHASE 2: VALIDATION STUDIES

The aim of this section is to create a parsimonious scale of wise leadership and assess its constituting dimensions which appropriately characterize this specific style of leadership. Overall, the process that was followed to construct and validate the wise leadership scale is aligned with the recommended procedures by scholars in the area of scale development (e.g., DeVellis, 2012; Hinkin, 1995; Johnson, et al., 2012; Netemeyer et al., 2003). With the use of this research strategy as a backdrop, four studies were carried out to construct and validate the wise leadership scale.

#### 3.1. Study 1: Construct Definition, Dimension Specification and Item Generation

Several scholars posit that the concept of wisdom is integrative in nature as it encompasses cognitive, affective, and reflective dimensions (Ardelt, 2003; Clayton, Birren,

1980). We corroborate this paradigmatic stance and assess the multidimensionality and the higher order nature of the wise leadership construct.

The domain specification and item generation process began through a deductive approach given that advances in theory and research of the key concepts under study (i.e., wisdom and leadership) constitute a promising base in which to search relevant construct dimensions (see Netemeyer et al., 2003).

A review of relevant and related literature was conducted by searching management, business and social sciences databases, namely Science Direct, JSTOR, Business Source Complete, Ebsco, and SSRN in order to identify the body of knowledge in which the construct of wise leadership was situated. No time limit was imposed as the notion of wisdom has ancient philosophical and theological underpinnings that constitute its prominent intellectual hub (Kekes, 1995). Various wise leadership-related expressions such as wise leadership, wise leaders, wisdom in leadership, were entered as subject themes to search the databases (Knapp, 2000).

Overall, 136 references were shortlisted. They were mostly conceptual and case-based, including essays and professional magazines articles. None of these references included any measurement instrument of wise leaders. Most of these references did not encompass any relevant components, categories, elements or items of wise leadership. Hence, only 15 studies were useful for item generation as items could be sourced from definitions, abstract conceptualizations, quotes of respondents, or pertinent explanations and qualitative insights of experts.

This review of the leadership literature reveals that wise leadership outcomes are generally sourced from literature on leadership (McKenna et al., 2009; Yang, 2011), strategic management (Boal, Hooijberg, 2001), business (Garick, 2013; Nonaka, Takeuchi, 2011), tourism (e.g., Elbaz, Haddoud, 2017), psychology (Sternberg, 2007), education (Sternberg, 2008), military context (e.g., Zacher, McKenna, Rooney, Gold, 2015), and philosophy, religion and spirituality (Kriger, 2013). This search process yielded studies that addressed defining principles of wise leadership in the organizational context (McKenna et al., 2009), the ways wisdom is displayed through leadership (Yang, 2011), the core abilities of wise leaders (Nonaka, Takeuchi, 2011) and the traits of wise leaders (Kaipa, Radjou, 2013).

The deductive approach allowed identifying an initial pool of 44 items as indicators to measure the following four dimensions of wise leadership.

Intellectual shrewdness refers to knowing, understanding and judging in the face of regular as well as ambiguous or uncertain circumstances. It is about sensing situations beyond insights and facts in a timely manner, and anticipating challenges and consequences (Longman, 2002). They know what needs to be done and are fully aware that their actions and judgments have consequences (Tichy, Bennis, 2010). Wise leaders' resort to reason and cautious observations to establish facts and provide deductive explanations (McKenna et al., 2009) without jumping to conclusions (Peterson, Seligman, 2004). They are cognizant of absolute principles and know how and when to put them into practice in complex and uncertain contexts (McKenna et al., 2009) as they are able to perceive variation in the environment and deal with its complexity (Malan, Kriger, 1998). Their conduct is practical in nature and fundamentally directed to everyday life and work (McKenna et al., 2009). In this regard, wise organizational figures are expected to master their subject area, understand all the issues related to their work, provide answers to all questions posed to them, and anticipate counterparts' questions (Hassi et al., 2011). Further, wise leaders have the

practical intellectual skills to execute the intended vision (Sternberg, 2008) by deciding on the right action at the right moment as required by a given situation (Bartunek, Necochea, 2000).

Spurring action refers to leadership behavior that inspires and rallies subordinates around a desired vision by sharing knowledge, guiding subordinates towards the action needed to achieve desired outcomes and motivating them to act in the right direction. By exhibiting these behaviors and qualities, leaders behave in a way that subordinates regard and consider as wise (Nonaka, Takeuchi, 2011). Spurring action arises from providing a shared sense of purpose to subordinates and sharing knowledge with them, which allows aligning individual and organizational desired outcomes. Thus, adhering to and achieving a positive vision of the future appear to subordinates as an inviting way of expanding one's knowledge while behaving in a specific goal-directed manner. To do so, wise leaders have the ability to convince followers of the value of their vision (Sternberg, 2008) by, *inter alia*, matching their behaviors with their words (Tichy, Bennis, 2010), building relationships, and creating knowledge sharing opportunities for all organizational members (Nonaka, Takeuchi, 2011). Lastly, wise leaders raise followers to higher levels and expand their capacities (Steed, 2017). All these qualities are facilitated by the wise leaders' ability to comprehend the diverse social actors and their various relationships (Boal, Hooijberg, 2001) as well as offering wise counsel to others and adopting viewpoints that make sense not only to the self but also to others (Peterson, Seligman, 2004).

Moral conduct describes the guiding role of morals, values and principles in the way wise leaders behave and lead in everyday activities with all stakeholders in a consistent, sincere, and moral manner. Wise leaders behave this way because they strongly believe that all their actions should have a moral purpose (Nonaka, Takeuchi, 2011); they hence uphold ethics (Steed, 2017) and value virtuous outcomes (McKenna et al., 2009). Concretely, wise leaders advance common goods not just their own good, balance their own interests with others' interests, consider the moral side of everything they do, and live up to their principles and standards (Sternberg, 2008; Tichy, Bennis, 2010). To do so, wise leaders resort to a moral compass that sets clear parameters for their actions, honor their commitments and match their doings with their sayings (Tichy, Bennis, 2010). By rooting themselves in such a noble purpose, including bringing benefit to the greatest number of people (Kaipa, Radjou, 2013), and by shying away from excess and greed, their organization lives in harmony with society (Garick, 2013). Conversely, unwise leaders tend to espouse the moral disengagement mode, which is about neglecting the moral aspect of what they do and reasoning only in terms of what is expedient (Sternberg, 2007), that is convenient, but possibly immoral action.

Virtuous humility, as conceptualized in Aristotle's virtues, involves a stable sense of self-worth, and represents a mid-point between two extremes, namely the vices of deficiency and excess (Irwin, 1999). Virtuous humility implies a great deal of humility on the part of leaders who appreciate their knowledge, skills, and abilities, while regularly questioning them (Weick, 2007). Wise leaders commit themselves to continuous learning by demonstrating an interest in all experience and enjoying all topics (Peterson, Seligman, 2004). They admit that they do not know everything and willingly learn from others (Sternberg, 2008), including their own subordinates. In doing so, they avoid confining themselves into inaction and ignorance (Pfeffer, Sutton, 2006). True wisdom does not arise from the sheer accumulation of knowledge, but from a genuine respect for and sincere inquisitiveness about the still unconquered aspects of knowledge (Pfeffer, Sutton, 2006).

Further, the humility of wise leaders is reflected in acknowledging errors they make and learning from their mistakes (Tichy, Bennis, 2010).

We identified initial content specifications by means of a thorough review of the literature related to wisdom and leadership. In the subsequent sections, we will test the wise leadership construct as a higher order, multidimensional and latent model. It will be defined based on the commonality among its various dimensions, which are expected to correlate in order to support the summation of constituting elements into one single representation of these components. While each of these components contribute uniquely and individually to the overall construct, discriminant validity for these components should be supported. In sum, wise leadership is comprised of related, but distinct components that are required for a leader to be considered as wise.

### **3.2. Study 2: Content Validity Assessment**

The deductive approach was complemented with the expert judgment method and two expert judgment sessions were organized with the objective of assessing and improving the content validity (Netemeyer et al., 2003) of the four-dimensional 44 items generated in Study 1.

The first session was comprised of four practitioners and four academics from eight different countries, who specialize in management and leadership. The purpose of this assessment was to improve the accuracy, clarity and comprehensiveness of the 44 items (Netemeyer et al., 2003) about wise leadership. To achieve this objective, the participants were requested to identify: (a) items that should be kept without modification; (b) items that should be changed; (c) items that should be removed; and (d) new items that could be added to the initial pool.

First, a short description of the four categories of wise leadership was provided to the participants. Then, from a list where the items were randomly ordered, the participants assigned each item into one dimension. Only items that mostly matched the a priori dimension were selected for subsequent analyses. The review by experts in Pretest 1 yielded removing 15 items and changing 9 items. The total number of items was thus reduced from 44 to 29 items.

Pretest 2 included a different group of experts consisting of three academics and three professionals, from six different countries, with the objective to evaluate the content validity of the 29 items that were retained from Pretest 1. This procedure allowed refining the pool of 29 to 20 items which matched their appropriate dimensions. Nine items were not appropriately assigned to any of the four a priori dimensions and were henceforth removed from the pool, yielding a final list of 20 items. Based on experts' feedback, two of the items were rephrased in order to eliminate redundancy and unclear wording (DeVellis, 2012).

The 20 items retained adequately grasped the suggested contents and were deemed the least equivocal. Each of the four categories (i.e., intellectual shrewdness, spurring action, moral conduct, and virtuous humility) encompassed five items. In the subsequent phases, we will quantitatively establish the evidence for validity of the wise leadership construct as it constitutes a crucial step in the scale development process (Hinkin, 1995).

As the original version of the questionnaire was developed in English, the survey was translated into French as the latter is the mean of communication widely used in the Moroccan workplace (Benzakour, 2007). The back-translation method was used (Brislin, 1986). The questionnaire was pre-tested to make sure that the questions were adequately interpreted by the respondents. The pre-tests did not yield any major changes to the items.

### 3.3. Study 3: Item Reduction and Refinement

#### *Method*

The factor structure of the 20 items generated through the deductive and inductive approaches was assessed using an exploratory factor analysis (EFA; Aldhaferi, 2020) with Promax rotation, which is the recommended technique in scale development (Netemeyer et al., 2003).

To gather data, we resorted to a database of a Moroccan Government directory of the construction and civil engineering industry. Potential respondents from 170 businesses were contacted to discuss the purpose of the study, their willingness to participate in the research, and the way to proceed. Explicit instructions about the research and the questionnaire were provided to the participants on-site. Respondents were guaranteed confidentiality and anonymity for the analysis of the data. The sample consisted of 207 full-time employees representing 65 different businesses operating in Morocco (38.23% response rate).

Respondents assessed the wise leadership of their supervisors along a 5-point scale, where 1 = strongly disagree and 5 = strongly agree. Respondents were between the ages of 18 and 63, with an average of 30.29 years ( $SD = 9.20$ ) and an average work experience of 7.93 years ( $SD = 8.014$ ). About half of the respondents (49.8%) were men. All respondents had a degree: 35.7% had a high school degree, 42% a college degree, and 21.3% a university degree.

#### *Results and discussion*

***Exploratory factor analysis (EFA).*** Items were factor analyzed using the Promax rotation. To be retained for further analyses, items had to have a minimum loading weight of .50 on a single factor and a maximum of .32 on another factor as well as factors with eigenvalues greater than 1.0 (Tabachnick, Fidell, 2013).

***Dimensionality and reliability assessment of the wise leadership model.*** In the 4-factor solution, the 20 items were projected to load on four distinct factors, with a maximum cross-loadings of .32. However, one item of each of the other four dimensions did not properly load on their appropriate a priori factors and were thus deleted.

A second EFA was conducted and produced a four-factor structure comprising the four expected dimensions, namely intellectual shrewdness, spurring action, moral conduct and virtuous humility. The most interpretable solution was a 4-factor structure (Table 1). All items loaded on their appropriate dimensions and the highest cross-loading was .29; it explained 62.52% of the total variance.

We hence retained 16 of the strongest items, 4 items for each dimension. These 16 items met all the requirements of loading weights.

The reliability tests indicated coefficient Cronbach's alphas for all the dimensions greater than the .70 cutoff point (Nunnally and Bernstein, 1994): intellectual shrewdness (Cronbach's  $\alpha = .76$ ), spurring action ( $\alpha = .77$ ), moral conduct ( $\alpha = .80$ ), and virtuous humility ( $\alpha = .84$ ).

These EFA results show that the four dimensions of the wise leadership construct can be conceptualized under one higher order construct to assess wise leadership.

Study 4 will investigate various types of validity of the wise leadership scale and relationships between its four factors and other theoretically relevant variables.



Table 1. Exploratory factor analysis (EFA): 4-factor solution (Study 3)

Factors and items	F1	F2	F3	F4
<b>F1: Intellectual shrewdness</b>				
Anticipates what will happen	<b>.86</b>	.26	.24	.19
Takes the appropriate action in the right moment	<b>.80</b>	.24	.20	.15
Quickly senses what lies behind a situation	<b>.73</b>	.12	.21	.17
Exhibits sound judgment	<b>.64</b>	.26	.24	.27
<b>F2: Spurring action</b>				
Guides towards the action needed to achieve a desired outcome	.26	<b>.84</b>	.23	.20
Motivates subordinates to act	.19	<b>.81</b>	.17	.12
Voluntarily shares knowledge with others	.27	<b>.76</b>	.25	.22
Rallies others around his/her vision	.15	<b>.67</b>	.23	.16
<b>F3: Moral conduct</b>				
Constantly considers the morality of what he/she does	.23	.27	<b>.89</b>	.23
Balances his/her own interests and other people's interests	.28	.23	<b>.85</b>	.29
Puts the greater good of the organization first	.26	.22	<b>.79</b>	.17
Consistently links saying and doing	.14	.17	<b>.62</b>	.01
<b>F4: Cultivating humility</b>				
Regularly questions what he/she knows	.19	.16	.21	<b>.84</b>
Recognizes that he/she does not know everything	.16	.21	.17	<b>.84</b>
Admits errors and mistakes that he/she makes	.27	.17	.23	<b>.82</b>
Willingly learns from everyone	.19	.17	.10	<b>.77</b>
<b>Eigenvalues</b>	4.42	2.1	1.76	1.67
<b>Total variance explained by each factor</b>	27.62	13.37	11.00	10.54

Note: N = 207. All the factor loadings are significant at  $p < .001$ . Items sorted by their loadings on each factor.

Source: Table compiled by the authors.

### 3.4. Study 4: Scale Validation

In this study, the aim is to provide further empirical evidence for the convergent and discriminant validities of the second-order wise leadership model, which constitute a *condition sine qua non* for the process of validating theoretical constructs (Hinkin, 1995). We included the concepts of transformational leadership and authentic leadership in this study as they constitute related measures of the wise leadership construct; despite some conceptual overlap between these three leadership styles, the wise leadership construct upholds a unique distinctiveness (see Table 2). Furthermore, hypotheses will be developed pertaining to the relationships between transformational, authentic, and wise leadership.

Table 2. Comparisons of wise leadership, transformational leadership and authentic leadership

Theoretical Components	Wise Leadership	Transformational Leadership	Authentic Leadership
<i>Wise Leadership</i>			
Intellectual shrewdness	✓		*
Spurring action	✓	*	
Moral conduct	✓		*
Cultivating humility	✓		
<i>Transformational Leadership</i>			
Inspiring motivation	*	✓	
Intellectual stimulation		✓	
Idealized influence		✓	
Individualized consideration		✓	
<i>Authentic Leadership</i>			
Balanced processing	*		✓
Internalized moral perspective	*		✓
Relational transparency			✓
Leader self-awareness			✓

✓ = focal component; \* = minor or implicit component.

Source: Table compiled by the authors.

### 3.4.1. Convergent validity

Examined through the lens of its effects, transformational leadership aims at transforming followers' priorities and inspiring them to accomplish targets beyond their potentials and expectations (Bass & Bass, 2008). The model of transformational leadership primarily includes four fundamental components. Inspirational motivation refers to leaders who articulate a compelling vision for the future to their subordinates, express confidence that desired outcomes will be achieved, build team spirit, and create enthusiasm (Bass and Bass, 2008). Intellectual stimulation is concerned with leaders encouraging their followers to think on their own, reframe problems, and resort to novel perspectives as they deal with regular everyday workplace challenges (Bass and Riggio, 2006). Idealized influence is about leaders' qualities of envisioning, exerting confidence, and their ability to setting high standards for emulation (Bass and Bass, 2008). Individualized consideration entails organizational leaders playing the role of a coach or mentor for their followers with the objective to help them nurture and achieve their full potential (Bass and Riggio, 2006). Based on the above description, there seems to be a small overlap between wise leadership and transformational leadership pertaining to inspiring and rallying subordinates around a desired vision as encompassed by the inspirational motivation dimension of transformational leadership and the spurring action dimension of wise leadership.

Authentic leadership originates from studies postulating authenticity as a key to self-esteem and encompasses several aspects of leadership, ethics, and productive behavior at work (Walumbwa et al., 2008). Walumbwa et al. (2008) operationalized authentic leadership as an organizational leader's set of behaviors that cultivate positive psychological capabilities and an ethical climate, to nurture the following four mechanisms.

Balanced processing is concerned with objectively analyzing pertinent data upon making decisions. The internalized moral perspective is about the internal moral standards that direct and auto-regulate individual behaviors. Relational transparency involves displaying authenticity by sharing adequate information and feelings as well as avoiding ill-suited emotions. Self-awareness is tantamount to comprehending one's strengths and weaknesses, and the way a person constructs a meaning of the world (Walumbwa et al., 2008).

It is clearly evident that the concepts of wise leadership and authentic leadership have a partial theoretical overlap. First, both constructs emphasize the role of morals and principles in guiding leaders' behaviors while conducting business. Second, displaying authenticity by sharing adequate information and feelings is aligned with connecting the saying and the doing as part of wise leadership. Third, the balanced processing dimension of authentic leadership consisting of objectively analyzing pertinent data before making decisions converges with the aspect of wise leadership of exhibiting sound judgment. Empirically, leaders' wisdom has been found to be positively associated with the individualized consideration dimension of transformational leadership (Zacher et al., 2014).

As wise leadership shares some conceptual aspects with both transformational and authentic leadership styles, we expect the second-order wise leadership construct to relate positively to transformational leadership and authentic leadership.

#### **3.4.2. Discriminant validity**

Although there is an overlap between wise leadership and transformational leadership, it is worth noting that the suggested dimensions of wise leadership are not subsumed in transformational leadership. In this respect, a principal difference lies in the fact that wise leaders exhibit intellectual shrewdness which consists of knowing, understanding and judging in the face of regular as well as ambiguous and uncertain circumstances. As such, wise leadership is far from fully operationalizing the dimensions of transformational leadership as the overlap is only partial.

Similarly, as the wise leadership construct is operationalized in this paper, several of its aspects are not reflected in the authentic leadership concept. The intellectual shrewdness of wise leadership goes a few steps further compared to the balanced information processing dimension of the authentic leadership (i.e., objectively analyzing pertinent data) owing to the situational appreciation mechanism; the latter involves sensing situations beyond facts and anticipating challenges and implications (Longman, 2002; Nonaka, Takeuchi, 2011), identifying the key aspects of a given situation (Price, 2000), and taking the right action at the right moment (Bartunek, Necochea, 2000). Further, wise leaders resort to spurring action in order to rally subordinates around a desired vision by sharing knowledge, guiding followers towards the action needed to achieve desired outcomes and motivating them to act in the right direction. Wise leaders cultivate virtuous humility by regularly questioning their knowledge, skills and abilities. They admit that they do not know everything (Tichy, Bennis, 2010) and voluntarily learn from others (Sternberg, 2008), including their own followers. In doing so, they avoid limiting themselves into inactivity and ignorance (Pfeffer, Sutton, 2006).

Based on this reasoning, although wise leadership shares some conceptual aspects with both transformational and authentic leadership styles, it nonetheless remains different in scope. Wise leadership encompasses distinct and additional dimensions as compared to what has been included and measured by transformational leadership and authentic leadership.

### 3.4.3. Method

**Participants and procedures.** We gathered data from two independent samples from France and Morocco. The two different samples allowed the focal measures to be completed by distinct sets of raters, a process that enhances the response rate and reliability of the study (Hinkin, 1995). We surveyed working individuals who were attending executive education seminars in two different universities in both countries. It is worth noting that France and Morocco served just as the fieldwork for the present research to collect data about observable behaviors and practices at work. The construct definition, the dimension specification and item generation were made based on the world literature – though mostly Western. The assessment of the content validation resorted to experts from 14 different countries.

The France sample included 205 full-time employees among a total of 300 potential respondents that were initially approached; this constitutes a 68.33% response rate. Respondents evaluated their supervisors' wise leadership pattern. The mean age of these participants was 30 years ( $SD = 5.39$ ), with 5.54 mean years ( $SD = 3.37$ ) of organizational tenure; 57% of the participants were female. All respondents had a degree: 1.5% a high school degree, 59.5% an undergraduate degree, and 39% a master's degree.

The Morocco sample was comprised of 214 employees with a 71.33% response rate given that 300 employees were asked to participate in the current research. Their average age was 36 years ( $SD = 7.23$ ), with an average of 7.86 years ( $SD = 5.5$ ) of organizational tenure; 53% of the respondents were female. Among the sample, 0.5% of the respondents had a high school degree, 57.9% a bachelor's degree, and 41.6% a master's degree. In both samples, we controlled for the participants' age, gender and education.

To reduce the common method bias, data were gathered in two occasions separated by a four-day lag in both samples. In day 1, participants provided data pertaining to their supervisor's wise leadership style. In day 5, respondents answered questions related to transformational and authentic leadership styles. Statistically, we tested for potential common method bias using the Harman's single-factor test (Podsakoff et al., 2003). The largest factor explained 36.71% in the France sample and 29.73% of the variance in the Morocco sample, which is less than the 50% threshold in both samples. Thus, there is no threat of common method bias in the dataset.

### Measures

As Tables 3 and 4 show, all the measures used in this study achieved very good reliability as their reliability coefficients are greater than the recommended cut-off level of .70 (Nunnally and Bernstein, 1994). Responses to items consisted of a Likert scale with response options ranging from 1, "strongly disagree" to 5, "strongly agree". The following measures were used.

**Leadership variables.** To measure wise leadership, the 16-item WLQ was utilized. To measure transformational leadership, 16 items from the MLQ (Bass and Avolio, 2004) were used. We included the 16-item scale of the authentic leadership measure (Walumbwa et al., 2008).

### 3.4.4. Results and discussion

**Descriptive analysis.** Tables 3 and 4 show the descriptive statistics for all Study 4 scales and for both the France and Morocco samples. All of Cronbach's alphas are above the recommended cut-off level of .70 (Nunnally & Bernstein, 1994).

Table 3. Means, reliabilities, standard deviations and correlations among the variables – France sample (Study 4)

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Intellectual shrewdness (WL)	3.50	.93	(.86)										
2. Spurring action (WL)	3.48	.91	.61**	(.86)									
3. Moral conduct (WL)	3.53	.96	.26**	.34**	(.85)								
4. Cultivating humility (WL)	3.35	1.09	.54**	.44**	.29**	(.88)							
5. Inspirational motivation (TFL)	3.47	.86	.13	.16*	.27**	.16*	(.73)						
6. Intellectual stimulation (TFL)	3.77	.89	.23**	.28**	.22**	.21**	.43**	(.79)					
7. Idealized influence (TFL)	3.73	.81	.17*	.16*	.14*	.20**	.55**	.64**	(.78)				
8. Individualized consideration (TFL)	3.49	.88	.21**	.14*	.17*	.28**	.57**	.57**	.72**	(.79)			
9. Organizational citizenship behavior	3.96	.73	.33**	.30**	.29**	.29**	.32**	.22**	.25**	.26**	(.84)		
10. Affective commitment	3.87	.88	.41**	.36**	.32**	.34**	.23**	.16*	.19**	.12	.47**	(.90)	
11. Supervisor-related identification	3.42	.88	.38**	.30**	.21**	.29**	.20**	.05	.11	.18*	.35**	.46**	(.80)

Note: N=205; Cronbach  $\alpha$ S are reported on the diagonal in parentheses; \*\*p < 0.01; \*p < 0.05.

Source: Table compiled by the authors.

Table 4. Means, reliabilities, standard deviations and correlations among the variables – Morocco sample (Study 4)

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Intellectual shrewdness (WL)	3.61	.90	(.82)										
2. Spurring action (WL)	3.51	.91	.49**	(.85)									
3. Moral conduct (WL)	3.57	.92	.28**	.25**	(.82)								
4. Cultivating humility (WL)	3.45	.73	.33**	.26**	.48**	(.83)							
5. Self-awareness (AL)	3.5	.71	.15*	.14*	.18*	.18**	(.70)						
6. Relational transparency (AL)	3.35	.76	.09	.15*	.07	.21**	.27**	(.71)					

Table 4 (cont.). Means, reliabilities, standard deviations and correlations among the variables – Morocco sample (Study 4)

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
7. Internalized moral perspective (AL)	3.7	.71	.15*	.09	.32**	.23**	.48**	.46**	(.71)				
8. Balanced processing (AL)	3.44	.77	.19**	.16*	.30**	.26**	.55**	.58**	.59**	(.72)			
9. Organizational citizenship behavior	3.95	.68	.40**	.25**	.27**	.26**	.27**	-.04	.27**	.30**	(.85)		
10. Affective commitment	3.90	.84	.32**	.24**	.24**	.32**	.18**	.06	.18**	.17*	.34**	(.89)	
11. Supervisor-related identification	3.42	.68	.20**	.30**	.35**	.39**	.13	.09	.22**	.22**	.35**	.29**	(.72)

Note: N=214; Cronbach  $\alpha$ S are reported on the diagonal in parentheses; \*\*p < 0.01; \*p < 0.05.

Source: Table compiled by the authors.

**Measurement model.** Prior to testing the hypothesized model, a CFA was carried out to gauge the associations between latent constructs and their manifest indicators for both samples. The findings confirm that the model fits the data – with both the predictor and outcomes measures – as seen in the following indices. France sample:  $\chi^2 = 710.50$ ;  $\chi^2/df = 1.59$ ; CFI = .93; TLI = .92; RMSEA = .05. Morocco sample:  $\chi^2 = 664.29$ ;  $\chi^2/df = 1.49$ ; CFI = .93; TLI = .93; RMSEA = .05.

We hypothesized that the second-order wise leadership measure relates positively to authentic and transformational leadership constructs. As displayed in Tables 3 and 4, overall, the dimensions of the wise leadership are positively associated with the dimensions of both authentic and transformational leadership.

**Convergent validity.** To evaluate the convergent validity of the wise leadership construct, the following criteria were observed: (1) high factor loadings of indicators on their respective construct exceeding the 0.40 cut-off point as measured using CFA (DeVellis, 2012); (2) a minimum requirement for composite reliability (CR) of 0.7. (Hair et al., 2014); (3) an average variance extracted (AVE) of more than 0.50 as a threshold; and (4) the value of CR has to be greater than the AVE (Fornell & Larcker, 1981).

As Table 5 displays, all the statistics meet the indicated requirements in both samples. The item loadings to their respective factors are higher than the 0.40 threshold and range between .59 and .94; all the CRs are greater than the recommended value of 0.7 and range between .82 and .88; all the AVEs are higher than the 0.5 cut-off point; and every CR is greater than the AVE of the same factor. Convergent validity is then established indicating that the second-order wise leadership construct relates positively to authentic leadership and transformational leadership.

Table 5. Factor loadings, average variance extracted and composite reliability for both samples (Study 4)

Factors	Items	Factor Loading		Average Variance Extracted (AVE)		Composite Reliability (CR)	
		France Sample	Morocco Sample	France Sample	Morocco Sample	France Sample	Morocco Sample
Intellectual shrewdness	IS4	0.85	0.82	0.61	0.54	0.86	0.82
	IS3	0.76	0.70				
	IS2	0.70	0.67				
	IS1	0.81	0.74				
Spurring action	IG4	0.94	0.67	0.62	0.55	0.86	0.83
	IG3	0.93	0.74				
	IG2	0.60	0.82				
	IG1	0.59	0.73				
Moral conduct	MC4	0.82	0.69	0.57	0.55	0.84	0.83
	MC3	0.82	0.72				
	MC2	0.63	0.71				
	MC1	0.74	0.83				
Cultivating humility	VH4	0.81	0.72	0.64	0.56	0.88	0.84
	VH3	0.79	0.72				
	VH2	0.79	0.71				
	VH1	0.82	0.84				

Source: Table compiled by the authors.

**Discriminant validity.** A series of CFAs were carried out in order to examine the correlations of the second-order wise leadership construct with related constructs, namely authentic leadership and transformational leadership in the two distinct samples as shown in Table 6. This approach consists of comparing the chi-square values of two structural equation modelling (SEM) models: in the first one, the higher-order construct was distinct from another construct, whereas in the second, both constructs merged in a unitary one-factor model (Bagozzi et al., 1991).

Nested models were created where the four dimensions of wise leadership along with their items loaded onto the second-order wise leadership construct and the indicators for transformational and authentic leadership loaded on a distinct factor in, respectively, the France and Morocco samples. This procedure of discriminant two-factor models was compared to a unitary one-factor model procedure where all the indicators loaded on the higher order wise leadership.

As Table 6 shows, the discriminant two-factor models yielded a more acceptable fit with the data compared to the unitary procedure. The chi-square differences were statistically significant:  $\Delta\chi^2(2) = 292.85$ ,  $p < .01$ , for the comparison of wise leadership with transformational leadership in the France sample and  $\Delta\chi^2(2) = 193.88$ ,  $p < .01$  in the Morocco sample. All the  $\Delta CFI$  values exceeded the .01 cut-off point.

Table 6. Test of convergent and discriminant validity for the higher-order wise leadership construct in France and Morocco samples (Study 4)

Models	$\chi^2$ (df)	$\chi^2/df$	$\Delta\chi^2$ (df)	CFI	TLI	RMSEA
<b>France sample (N=205)</b>						
Discriminant two-factor model: Higher order wise leadership construct and transformational leadership	1584.10 (1050)	1.51	-	.91	.90	.05
Unitary one-factor model: Merging Higher order wise leadership construct and transformational leadership	1876.95 (1062)	1.77	292.85**	.86	.85	.06
<b>Morocco sample (N=214)</b>						
Discriminant two-factor model: Higher order wise leadership construct and authentic leadership	1551.12 (1049)	1.48	-	.90	.89	.05
Unitary one-factor model: Merging Higher order wise leadership construct and authentic leadership	1745 (1063)	1.64	193.88**	.86	.85	.06

Note: CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation. \*\* $p < .01$  (two-tailed).

Source: Table compiled by the authors.

Discriminant validity was also established using the AVE value approach which holds that discriminant validity exists if the AVE of a given construct is higher than the square of the correlation of that construct and another construct (Fornell, Larcker, 1981). In Study 4, the AVE of the wise leadership factor exceeds the squared correlation of the latter and other leadership styles included in the study: AVE = 0.61 (France sample) and 0.55 (Morocco sample); squared correlation of wise leadership with both transformational leadership and then with authentic leadership is 0.10.

These results support the discriminant validity of the higher-order wise leadership measure stating that the second-order wise leadership construct is partially related to but distinct from authentic leadership and transformational leadership.

The higher-order wise leadership construct is in general positively and significantly associated with authentic leadership and transformational leadership but remains empirically distinct. Study 4 therefore supports evidence of the convergent and discriminant validities of the higher-order wise leadership construct. It has also provided supplementary evidence of validity for the construct and the content of the wise leadership construct. Further, Tables 4 and 4 show that while the dimensions of wise leadership generally correlate positively with the dimensions of authentic and transformational leadership, the correlations coefficients are low to moderate; these levels of correlation are not strong enough to signal construct redundancy.

#### 4. DISCUSSION AND CONCLUSION

The current research yielded the development of a measure of wise leadership and hence made several contributions to the management literature. First, the newly developed WLQ is a theory-driven, reliable and psychometrically valid measure to assess the wise leadership



style. The results of the current research show that the four dimensions of intellectual shrewdness, spurring action, moral conduct and virtuous humility can be reasonably conceptualized under one superordinate construct and form a higher order construct to assess wise leadership; particularly that the dimensions were moderately to highly correlated ( $r = .26$  to  $.61$  across the research samples) and generally shared similar relationships with the outcomes (Johnson et al., 2012).

Second, the new wise leadership approach has the potential to contribute to advancing leadership research; it is different than existing leadership approaches such as authentic and ethical leadership, in that it expands the scopes of these leadership conceptualizations by virtue of its core aspects, namely judging, action, morality and humility. Wise leadership will provide insightful accounts of leadership aspects that have yet to be covered by existing theories such as anticipating what will happen, the willingness to learn from everyone, acknowledging mistakes, balancing one's own interests with other people's interests and acting in the right way, at the right moment and while considering the particularities of the circumstances. Chiefly, situational appreciation and judgment, considered as key mechanisms of wise leadership, enable leaders to adjust to the organizational and environmental setting, rather than imposing the required style of leadership.

Third, from a methodological standpoint, self-report measures of wisdom suffer from multiple limitations because: (1) they may engender self-deception and impression management biases (Maercker, Zoellner, 2004); and (2) wise leaders are likely to describe themselves as less wise than others as they are more critical of themselves than others (Aldwin, 2009). To overcome these methodological shortcomings, subordinate ratings of wise leadership were used as recommended by Redzanowski, Glück (2013). Further, real, factual, and work-related questions were asked, rather than fictitious situations and problems in order to construct an ecologically valid measure of wise leadership (Glück, 2018). As such, wise leadership was assessed based on the level of wisdom apparent in the behaviors of leaders as reported by their subordinates.

Fourth, the suggested 16-item measure has sound psychometric properties, as evidenced across three independent samples from France and Morocco ( $N=626$ ), pertaining to content, convergent, and discriminant validities. Study 4 indicates that the higher-order wise leadership construct has positive associations with three outcome variables, namely OCB, affective commitment, and supervisor-related identification; it also supports the discriminant validity of the higher-order wise leadership construct and confirms that the second-order wise leadership construct is related to, yet distinct from, authentic and transformational leadership.

By building a wise leadership scale, the current research has practical implications for both organizations and leaders. First, the suggested wise leadership model bridges a glaring gap in management and leadership practice at an opportune time. The model is a reliable and sound measure that allows assessing the level of wise leadership displayed by organizational members. It also has the potential to serve as a practical tool for organizations and managers to develop wise leaders through training and development activities.

Second, several organizations were subject to failures because of recklessly rash practices and unwise actions made by their own leaders (Jordan, Sternberg, 2007) in a business environment marked by scandals, inefficiencies and imbalances (Rooney, McKenna, 2007). Nonetheless, research has yet to follow these profound transformations by addressing the need pertaining to wisdom in organization and leadership (Küpers, 2007). Given this context, the wise leadership model may be useful in identifying unwise leaders

who would not exhibit wise behaviors be it during the hiring process of potential leaders/managers or as part of need analyses prior to planning leadership development activities with the objective of designing adequate interventions aimed at adjusting leaders' unwise patterns.

Lastly, it is promising that the second-order wise leadership construct was positively associated with various subordinate outcomes, namely OCB, affective commitment, and supervisor-related identification because these associations indicate that developing wise leaders can potentially yield positive results pertaining to training and development interventions.

The various studies of the current research have been instrumental in the development of the wise leadership scale and provide preliminary evidence of its construct validity. However, this is only a first step in the validation process of the scale as building up and demonstrating the psychometric properties of new measures is a demanding and complex procedure (Hinkin, 1995). Future research is a required next step to continue assessing the discriminant, convergent, incremental, and predictive validities of the wise leadership scale using a broader array of samples and settings. On another note, although Study 4 data were gathered in two measurement waves separated by a four-day lag in both the France and Morocco samples in order to reduce or avoid the same-source problem (Podsakoff et al., 2012), dataset may have been affected with the same-source bias as the respondents' completed measures of the independent, dependent and control variables. Future studies ought to examine different criterion variables rated using objective measures carried out by multiple respondents such as supervisors, subordinates, and peers to limit or control the effects of potential biases associated with common method variance.

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Received: January 2023

Accepted: March 2023

DOI: 10.7862/rz.2023.mmr.04

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## **THE EU ECOLABEL AS A MARK OF ENVIRONMENTAL EXCELLENCE – A LITERATURE REVIEW**

Sustainable development and the reduction of the use of non-renewable resources are gradually becoming central issues for the EU growth plans. In the face of those inevitable changes, the voluntary labeling system – EU Ecolabel – is gaining importance. The study aimed to conduct a systematic review of the scientific literature on the EU Ecolabel labeling system and to identify and evaluate the existing trends. In the course of the study, the main research trends regarding labeling were determined. Among the most popular research topics were those relating to a specific category of products. Within this group, the largest number of studies in the analyzed period concerned issues related to tourism. Of particular value are the publications introducing the basis for defining criteria for new products, which so far have not been subject to the EU Ecolabel certification. A negative conclusion from the conducted review is the low involvement of researchers from Poland in the studies on the EU Ecolabel.

**Keywords:** EU Ecolabel, labeling, environmental management, market communication.

### **1. INTRODUCTION**

Growing consumerism is becoming a great threat to societies when considering the limited natural resources of the Earth and their inevitable depletion. The constant development of trade, the growing demand for consumer products and the ever-expanding offer of goods on the market pose great challenges to producers, who increasingly resort to exploring so far untouched sources of raw materials. This brings on the declining ability of the environment to regenerate resources and leads to a climate crisis (Kirchmeier-Young et al., 2019; Schoolmeester et al., 2019). What is more, the effects of over-exploitation of the Earth's resources are most visibly manifested in places such as Pakistan, East Africa, and China, which are far from the areas of greatest consumption, and thus largely remain overlooked (5 ways countries can adapt..., 2022).

The current situation should draw consumers' attention towards buying more sustainably. Yet, this is not often the case; that is why environmental labeling schemes

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developed in accordance with the standards of the International Organization for Standardization can prove a very useful tool. Similar conclusions can be drawn from the report (Altenburg, Assmann, 2017) – according to which, the introduction of mandatory labeling schemes will help ensure transparency in markets and enable consumers to recognize products with different environmental impacts. One example of such a labeling system is the EU Ecolabel. It is a laudable initiative of the European Commission, launched already in 1992 (Council Regulation (EEC) No 880/92). In its original version, the label was intended to: promote the design, production, marketing, and use of products that have a reduced environmental impact (compared with similar goods) throughout their life cycle and provide consumers with better information about the environmental impact of products. Over time, the criteria underwent the process of gradual reassessment and change, coming closer to the currently prevailing concepts of environmental protection; particularly, to the concept of the circular economy.

Due to the growing role and importance of the EU Ecolabel, the aim of the study was to conduct a systematic review of the scientific literature on the EU Ecolabel labeling scheme and to assess the existing trends.

## 2. THE EU ECOLABEL AS THE EUROPEAN LABELING SYSTEM

The EU Ecolabel is completely voluntary, and its certification process is carried out by an independent authorized entity. To date, there are about 60 designated entities in the European Union, whose main tasks are: carrying out the certification procedure and regularly verifying whether a given product consistently meets the criteria of the EU Ecolabel (Regulation 66/2010). The regulations applied during the certification process make the EU Ecolabel classified as the first type of environmental labeling scheme according to ISO 14050:2020. The overarching aim of eco-labeling is to promote products characterized by a high level of ecological efficiency and which are in line with the EU policy of sustainable consumption, limiting the negative impact on the environment, citizens' health, climate, and natural resources.

The graphic form of the EU Ecolabel is specified in Annex II to the European Commission Regulation 2017/1941 (Fig. 1). It may also take the form of a graphic object with a text field, as specified in the criteria for a given product group.

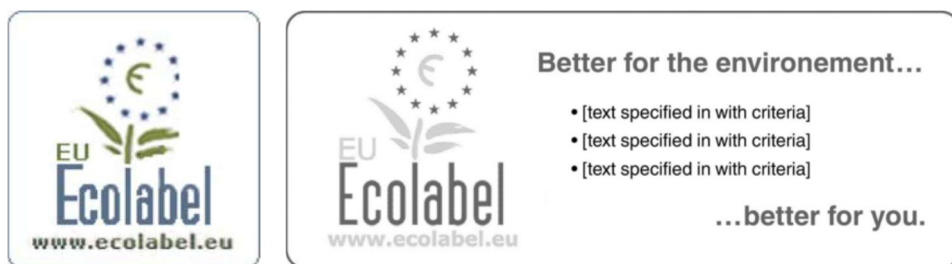


Figure 1. The graphic form of the EU Ecolabel

Source: (Commission Regulation (EU) 2017/1941 of 24 October 2017).



Currently, certification for the EU Ecolabel is possible for 12 product groups, some of which also include subgroups. These are (The EU Ecolabel Product Catalogue, 2022):

- Cleaning up, including Detergents for Dishwashers, Hard Surface Cleaning Products, Industrial and Institutional Automatic Dishwasher Detergents, Hand Dishwashing Detergents, Laundry Detergents, Industrial and Institutional Laundry Detergents, Indoor Cleaning Services,
- Clothing and Textile Products, including: Textile Products, Footwear,
- Coverings, including: Wood-, Cork- and Bamboo-Based Floor Coverings, Hard Covering Products,
- Do-It-Yourself, including: Indoor and Outdoor Paints and Varnishes,
- Electronic Equipment, including: Electronic Displays,
- Furniture,
- Gardening, including: Growing Media, Soil Improvers and Mulch,
- Lubricants,
- Other Household Items, including: Bed Mattresses,
- Paper Products, including: Graphic Paper, Tissue Paper and Tissue Products, Printed Paper, Stationery Paper, Paper Carrier Bag Products,
- Personal and Animal Care Products, including: Absorbent Hygiene Products; Animal Care Products; Cosmetic Products; Rinse-off Cosmetic Products,
- Tourist Accommodation, including: Hotels; Camp Sites.

According to the latest data update, as of September 2022, as many as 87 485 products (goods and services) have obtained the right to use the EU Ecolabel mark (EU Ecolabel key figures..., 2022). In the last 6 months, the largest increase in ecological products offered on the market has been observed in the following categories: Indoor Cleaning Services (+24%), Lubricants (+13) and Industrial and Institutional Laundry Detergents (+11%). Figure 2 shows the number of certified products in each category.

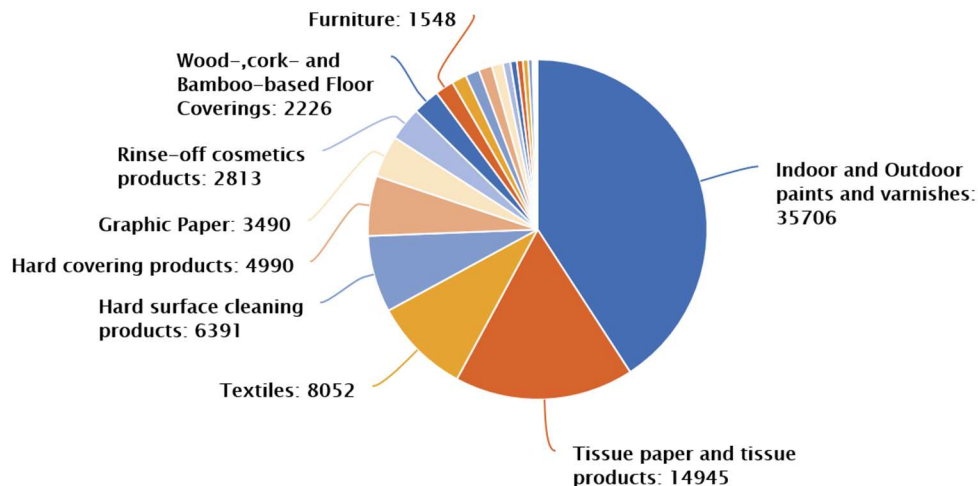


Figure 2. Distribution of the EU Ecolabel certified products per product group

Source: (EU Ecolabel facts and figures, 2022).

In the longer term, certification of the following products is planned to be introduced: solar photovoltaic modules, toys, food retail stores, cartridges, and renewable energy from new installations (Strategic Working Plan..., 2020). The establishment of the criteria and conditions for possible assessment of these products are now widely discussed.

### 3. MATERIALS AND METHODS

To achieve the research objective of the study, the method of systematic literature review (SLR) was adopted (Lenart-Gansinieć, 2021). It is a method that allows for the critical evaluation and synthesis of publications that meet a set of predefined eligibility criteria. In this case, the study aimed to find and analyze scientific papers that concerned the EU Ecolabel labeling scheme. Conducting such a review helps assess the state of knowledge, identify existing publications, and defining research issues or problems (Tranfield et al., 2003).

For the purposes of this study, the publications were searched for using three international databases: ScienceDirect, Scopus, and Web of Science. In the search, the following keywords were used: “EU Ecolabel” in titles, abstracts, and keywords. The period from 2019 inclusively up to 2022 was analyzed. To classify and present the results, the diagrams and guidelines from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses were applied (PRISMA) (Page et al., 2021).

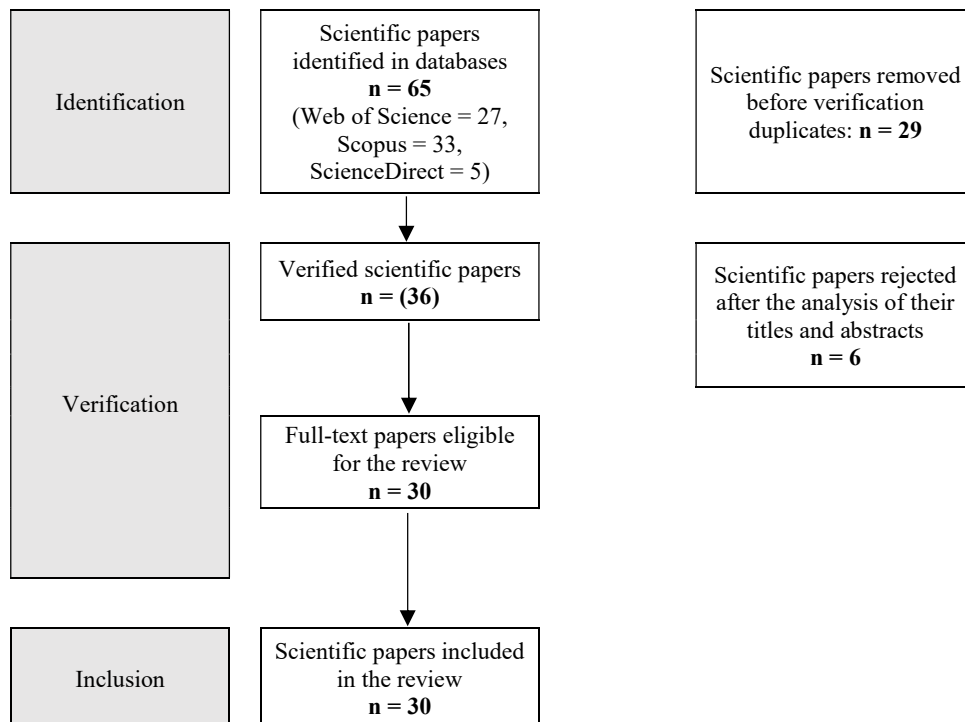


Figure 3. The PRISMA diagram

Source: own elaboration based on (Page et al., 2021).

On completing the search for publications, they were further analyzed, and the duplicate papers were removed from the collection. In the last stage, after reviewing the papers, those publications which, despite containing the term “EU Ecolabel”, were not related to the labeling system, were rejected.

The search yielded a total of 65 entries with the term “EU Ecolabel” in the abstract, title or keywords. In the first stage, 29 papers turned out to be duplicated and were excluded from further analysis. Therefore, only 36 scientific publications were verified in the next stage. The verification stage consisted in reading the content of the articles. As a result, 6 papers that referred to the EU Ecolabel logo only were rejected. After this stage, the process of selecting scientific publications was completed and the substantive content analysis began.

#### 4. RESULTS

A systematic review of the available literature has led to the identification of 30 (n=30) publications that concerned the EU Ecolabel. These studies can be divided into two groups:

1. Research papers related to a specific product category (n=18).
2. General research papers without specifying product categories (n=12).

The first group included 18 publications. The most frequently examined product category within the EU Ecolabel labeling scheme was tourism (hotels, accommodation, etc.). As many as 9 publications dealt with this topic. Other specific thematic areas included: construction, household goods, cosmetics, photovoltaic/solar panels, paper products, oils, furniture, textiles, and growing media. The percentage share of each of the product groups identified during the study is shown in Fig. 4.

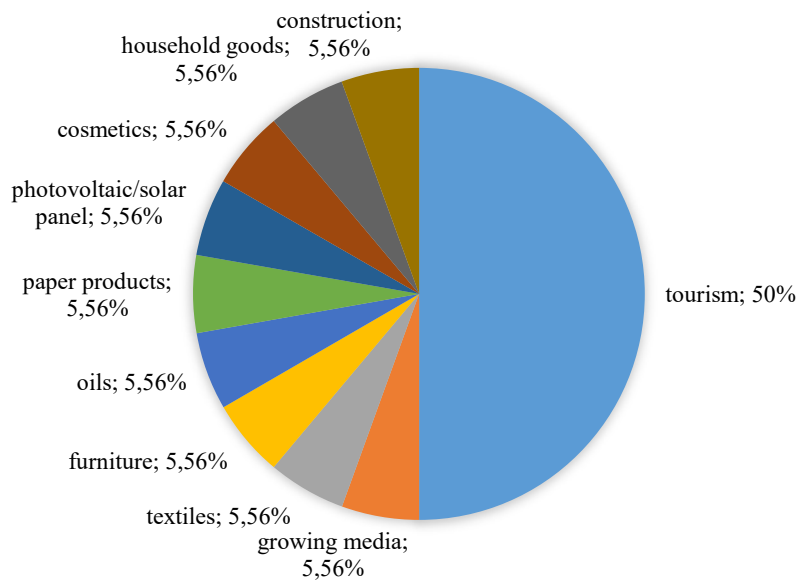


Figure 4. A pie chart representing the most frequently examined individual product categories as part of studies on the EU Ecolabel labeling scheme

Source: own elaboration.

The studies which, during a systematic review of the literature, were marked as papers focusing on a specific product category, can be classified into three sub-categories in terms of their subject matter and purpose of the research:

- studies on improving the criteria for already existing product groups,
- studies on the creation of criteria for new product groups,
- studies on the role of the EU Ecolabel in the market of a given product.

Improving the criteria for granting the EU Ecolabel was postulated, among others, by Merino and Prats (2020). The authors pointed to a particularly high level of environmental friendliness of the sea beaches that received the Blue Flags certificate. It was further recommended that the criteria of this voluntary certificate should be included in the EU Ecolabel requirements. In the field of tourism, two more publications dealt with the topic of reducing the impact of this industry on the natural environment. L. Cirrincione et al. (2020a) focused on creating a tool for more economical management of electricity. In turn, L. Cirrincione et al. (2020b) pointed to the need of changing the certification requirements, which should also cover the construction infrastructure used in tourism. Other proposed changes to the existing criteria include suggestions for the household category. The authors of the paper drew attention to the consumption footprint indicator, which can describe the impact of household consumption on the environment in Europe. According to the authors of this study, apart from the characteristics of a given good, the intensity of consumption also has an impact on the environment (Castellani et al., 2021). Some papers also addressed the subject of improving the criteria in the cosmetics category. More specifically, the authors postulated the introduction of a ban on the use of plastic microspheres in cosmetic products (Anagnosti et al., 2021). Similar publications concerned the paper industry. In the criteria for granting the EU Ecolabel, Ribeiro et al. (2020) proposed setting limits as well as discussed specific methods for the removal of AOX from production wastewater.

Similar research, but on the subject of furniture, was conducted by Donatello et al. (2021). The authors proposed introducing some changes in the future updates of the EU Ecolabel criteria for this category. It was suggested that such revisions should address more balanced and flexible requirements for potential applicants.

The second direction observed in the literature on the EU Ecolabel were publications in which it was postulated to extend the scope of certified categories to include further products. The proposals encompassed marble products and photovoltaic/solar panels. Capitano et al. (2022) reviewed the requirements and the evaluation of the marble production process. In the course of the research, simplified methods for assessing pollutant emissions have been proposed, which can be included in the EU Ecolabel certification criteria. In turn, Polverini et al. (2021) assessed the possibilities of technical development and innovations that can be implemented in environmental policies, including the EU Ecolabel certification criteria. This analysis has led to the identification of key performance indicators of solar panels that can be included in the EU Ecolabel criteria.

The third group of studies related to the EU Ecolabel are papers primarily focusing on the role of the EU Ecolabel certificate on the market. Consumers are among the most important market participants. Therefore, Dragomir et al. (2020), in a study conducted in Romania focused specifically on this group. It turned out that ecolabels boasted a high level of publicity among consumers in this country; however, they were also characterized by some levels of ambiguity and uncertainty. On the other hand, Preziosi et al. (2019), on

examining the behaviour of consumers in Portugal, confirmed that the EU Ecolabel certificate is noticed by hotel guests and influences their loyalty towards thus certified hotels.

Other market participants, namely managers and executives, became the object of attention in the research of Barbulescu et al. (2019) and Vesce et al. (2019). Research by Barbulescu et al. (2019) made it possible to determine the pro-environmental measures that should be undertaken in the operation of the managed enterprises – in this case, hotels, and the EU Ecolabel criteria which are most difficult to be met. In turn, Vesce et al. (2019) conducted research with the participation of managers who decided not to implement the EU Ecolabel. This point of view is most useful in terms of understanding the phenomenon of non-acceptance of the label. The authors of the paper identified and presented the strengths and weaknesses of the EU Ecolabel. An interesting perspective was presented by Koszewska (2019), who focused on the market participants from the public sector. The paper described the role of labels in EU public procurement. As is well known, this section of the market has substantial means, but at the same time, it does not become a frequent subject of research.

The second group of reviewed scientific publications included papers that did not concern specific products but covered the topic of the EU Ecolabel in general. This group included 12 publications. For this part of the EU Ecolabel literature, a division into two subgroups was proposed: research papers (n=6) and conceptual and review papers (n=6).

The research papers covered a wide range of topics related to the EU Ecolabel. Among others, Luceri et al. (2021) assessed the impact of the EU Ecolabel for consumer products on decision-making among Italians. Research results have shown that the level of information on environmental issues, concern for the environment and the perceived usefulness of the EU Ecolabel positively influence the willingness to use products bearing the logo. Marrucci et al. (2021) examined the customers of the EU Ecolabel licensed and non-licensed companies. The conducted analysis identified the market factors at play and the benefits for the EU Ecolabel holders. However, the lack of a marketing and communication policy coordinated at the European level was indicated as a weakness of the certification scheme.

Very interesting conclusions were drawn from the research by Pineiro-Villaverde and Garcia-Álvarez (2020). It was proposed to promote the use of recycled raw materials in public works and to impose the need for Ecolabel certification in order to conclude a contract with public administration bodies. It should be remembered though that the above-mentioned studies were general, they did not apply to specific products or services, the range of certification of which is very wide (12 categories of products and services).

The last group of identified publications were so called conceptual and review papers. Among the publications qualified for this group were papers by Sala et al. (2021), focusing on current legal acts of the European Union (EU) and the communications on the issues of: LCT, LCA, life cycle costs (LCC) and environmental footprint. All of these were reviewed from the perspective of recent years. In turn, Cordella et al. (2020) analyzed material efficiency requirements within the EU Ecolabel criteria. The authors drew attention to the need to urgently implement the requirements regarding, for example, the minimum lifetime of products. Pollex and Lenschow (2020) dealt with a slightly different topic. They focused on legislative policies in the areas that are addressed to producers and consumers. The activity of the decision-makers in terms of environmental protection most visibly manifests itself in the form of the instruments introduced by them, namely legal acts, which mainly

shape the current reality. Legal issues related to the EU Ecolabel were the subject of research by Du (2021), who analyzed the principles of the EU Ecolabel labeling scheme from the point of view of international trade law. The author concluded that it is highly unlikely that the EU Ecolabel certification would be incompatible with the TBT (Technical Barriers to Trade) agreement.

A graphical summary of the conducted literature review is presented in Fig. 5.

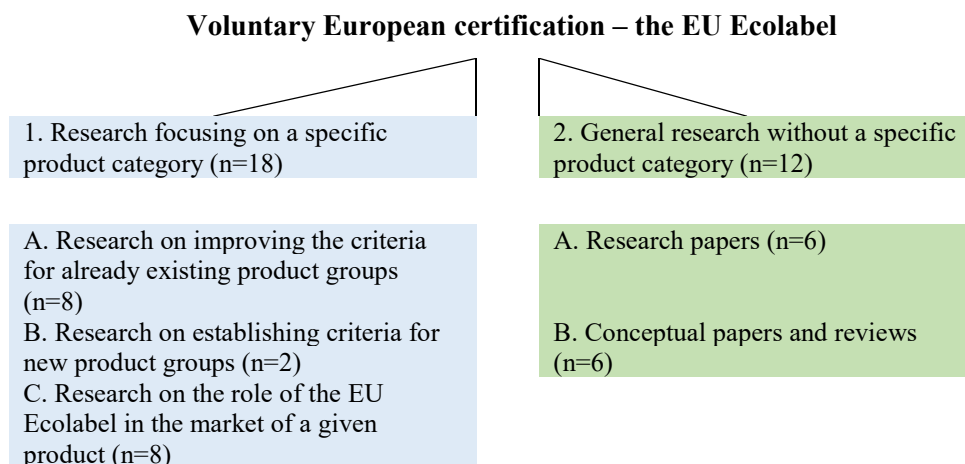


Figure. 5. The classification of scientific papers related to the EU Ecolabel, published from 2019 onwards

Source: own elaboration.

## 5. CONCLUSIONS

The presented systematic literature review concerns a very important problem, which is environmental protection. All citizens of the European Union should be made aware of the threats resulting from the rapid degradation of the environment, but they should also have the knowledge and opportunities to choose products with the least negative impact during everyday shopping. The EU Ecolabel system seems to be an excellent tool for implementing these postulates. The review of the latest publications has made it possible to determine the main international trends and research directions related to the EU Ecolabel. Especially papers related to specific categories of certified products deserve high praise. Certainly, many of these studies set new standards and requirements of environmental friendliness for various products. Attempts to lay the groundwork for future requirements for a growing family of products that can be certified in the future (e.g., solar panels) are also very welcomed. Research conducted on various market participants (e.g., consumers, enterprises) is also an interesting direction. In the group of studies concerning specific product categories, most attention was devoted to research related to tourism. Undoubtedly, this is the result of a large share of this sector in the economy of several European Union countries.

The second direction of the reviewed papers were general studies without specifying the products that are subject to voluntary EU Ecolabel certification. Some of the research

papers assigned to this group seem to be too general. As a result, its contribution to the improvement and development of the EU Ecolabel is rather low in the author's opinion. With the current number of 12 categories, which are a cross-section of many products and services, research with general characteristics seems to be poorly suited to the real problems and challenges of the EU Ecolabel scheme. The shortcoming of these works is also their narrow scope, limited to one country. The results of the systematic review suggest a paucity of publications on the EU Ecolabel that would encompass the entire EU.

On the other hand, conceptual papers and reviews are undoubtedly very important, as they allow to assess the progress and directions when it comes to eco-friendly products in the perspective of recent decades. Conclusions and observations collected in this way constitute valuable foundations for designing and setting new directions for environmental protection.

From the perspective of Poland, the review showed a lack of published research papers that would concern Polish society or enterprises. It seems that the aim of increasing the popularity and effectiveness of the EU Ecolabel instrument should be undertaken on a wider scale, especially in countries on the verge of transforming their energy sector.

The limitations of this study include the time range from which publications were searched (from 2019 onwards), which can be extended in future research. In addition, a characterization of the countries in which the research was conducted and the countries of origin of the authors of the publications should be considered. When analyzing the EU Ecolabel labeling scheme, it should be noted that even its continuous improvement will not in itself improve the situation of the environment. The most important element of this system are responsible and ethical companies and conscious consumers. Only the balanced actions of both of these entities will substantially contribute to slowing down the climate catastrophe that may be approaching the entire humanity.

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Received: December 2022

Accepted: March 2023

DOI: 10.7862/rz.2023.mmr.05

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## PROPERTIES OF EARNINGS AND CASH FLOWS IN ALGERIAN COMPANIES

This paper aims to analyze the properties of earnings compared to cash flows based on persistence and predictive ability as fundamental attributes of relevance. Therefore, we collected financial data of 20 Algerian companies from 2011 to 2020, where 200 observations were employed using the model of Sloan (1996) that was adjusted by sales. According to the results, the earnings of Algerian companies are highly persistent, but their predictability is weak. However, cash flows are not persistent and have no predictive ability. Consequently, earnings quality in Algerian companies is better than the quality of cash flows. Based on our results, users of financial reports in Algerian companies should focus on earnings when making decisions and be cautious when using cash flows.

**Keywords:** Earnings; Cash flows from operations; Persistence; Predictability.

### 1. INTRODUCTION

Financial statements are the most important channels of financial communication and the most prominent mechanisms of financial reporting for general purposes as a means to provide useful information to a wide range of users who cannot require companies directly provide information to them. According to the conceptual framework of the International Accounting Standards Board (IASB), the objective of financial reporting for general purposes is to provide useful financial information to the primary users. Therefore, financial information must be high quality by having the required qualitative characteristics (IASB, 2018).

Enhancing the quality of financial reporting is the objective pursued by accounting standard-setters to support confidence by increasing transparency and protecting market participants. That requires providing relevant and faithful financial information about the economic resources of companies and claims against them (IASB, 2018). Identifying and measuring economic resources and claims is a way to assess the company's financial performance, which is summarized in loss or profit. Consequently, enhancing the quality of earnings is a means to improve the quality of financial reporting.

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Profit or loss is among the items that users are becoming increasingly interested in, as it is the result of the company's activity and a measure of management's efficiency in employing economic resources and its effectiveness in achieving the set objectives. However, the importance of profit or loss depends on the information about cash flow that improves the informational content of accrual-based information by information about the ability of the company to generate and use cash, providing guarantees about the company's ability to meet its obligations towards the related parties.

To make their decisions, the users of financial information need to assess the prospects for cash flows (amount, timing, and uncertainty) and evaluate the management's stewardship of the company's economic resources. The Financial Accounting Standards Board (FASB) reinforced this trend early in the Statement of Financial Accounting Concepts No. 1 (SFAC No. 1) by identifying the determination of earnings and their components as the primary objective of financial statements. The FASB stated that in addition to net cash flows, users rely on current earnings to ascertain the company's ability to generate future earnings (FASB, 1978).

The quality of financial reporting is determined by several factors, including the quality of accounting standards and the quality of the accounting system of the company, as well as the external environment, particularly users and their aspirations. The accounting system remains the most determinant, where the quality of financial reporting depends mainly on the characteristics of financial figures summarizing how the items are recognized, measured, and presented. Earnings have attracted attention since they are a proxy of the company's performance and the management's efficiency in employing the available resources. Cash flows are complementary to the informational content of earnings and are a proxy of the company's liquidity and ability to meet its obligations.

Since the end of the 1990s, Algeria has worked hard to develop accounting practices and improve the quality of financial reporting. That is the result of the economic and institutional environment's requirements, which have undergone radical changes since the beginning of the 1990s, leading to the shift from socialism towards liberalism, in addition to accounting transformations at the international level and the increasing trend toward globalization of accounting practices. These transformations have forced the Algerian regulators to review the National Accounting System (PCN), which reflects the socialist orientation, to respond to the requirements of the new environment. Therefore, the Algerian regulator adopted the international solution through the Financial Accounting System (SCF), derived from International Financial Reporting Standards (IFRS).

The new accounting reference (SCF) adopted in 2010 has provided many unusual accounting practices compared to the previous reference (PCN), specifically its focus on measuring profit or loss, providing a faithful presentation of the company's performance. The SCF also introduced the statement of cash flows among the essential financial statements to provide relevant and reliable information about how the company generates and uses cash flows. Therefore, this study analyzes the properties of earnings compared to net cash flows from operations in Algerian companies after the 2010 accounting reform.

## **2. THEORETICAL BACKGROUND**

There is no consensus about what accounting quality or quality of financial reporting is; while some literature still views accounting quality as a concept that is defined from different points of view, so many researchers have introduced different dimensions to

measure accounting quality (Kamarudin, Wan Ismail, 2014). The most notable are those based on the quality of earnings and cash flows since they are two important accounting figures attracting the users' attention as a basis for making decisions.

Dechow, Ge, and Schrand (2010) classified earnings quality measures into three categories: accounting properties of earnings, market response to the earnings announcement, and other external indicators. The first category includes several earnings attributes that are expected to be related to their benefits for making decisions, specifically: earnings management, earnings persistence, income smoothing, and conservatism. The second category consists of measures that focus on the reactions of investors or financial markets to the disclosed earnings, based on the idea that high-quality earnings provide pertinent information for the company's valuation (Holthausen, Watts, 2001). The third category includes the other external indicators, such as the application of Financial Market Authority issues, the review of negative audit opinions, and weaknesses in internal control (Licerán-Gutiérrez, Cano-Rodríguez, 2019).

According to Jelodari and Kordshouli (2016), earnings quality refers to two fundamental attributes: the first relates to usefulness in decision-making, and the second relates to the relationship between this concept and economic profits. In other words, earnings quality indicates the usefulness of information about earnings and its consistency with the concept of economic profit. However, the first concept is more practical and measurable, unlike the second concept relating to real profit, which is an unverifiable theoretical concept. Therefore, earnings quality from the view of financial analysts requires that earnings be persistent, frequent, and able to predict future cash flows.

Managers are very concerned with meeting the aspirations of financial analysts by maintaining sustainable growth in earnings with a consistent rhythm as a way to protect their positions. On the other hand, financial analysts are interested in the best way to measure earnings quality, allowing them to make decisions that serve the interests of investors and maximize returns from their portfolios. Consequently, it is difficult for analysts, managers, and investors to ignore the role of earnings quality in allocating resources. Many studies have suggested that a high level of earnings quality is associated with low capital costs, especially in developed economic environments.

Literature has used several measures of earnings quality, some of which rely on the response of investors, which requires the availability of an active financial market. Some other measures rely on the attributes that increase the usefulness of earnings for making decisions through several characteristics, most notably: persistence, predictability, income smoothing, conservatism, timeliness, and earnings management (Kamarudin, Wan Ismail, 2014). These characteristics have great importance because they do not require the availability of an active financial market and only depend on financial statements.

Persistence and predictability are among the most important measures of earnings quality. They relate to relevance, which refers to "financial information that can make a difference in the decisions of users if it has a predictive value or a confirmatory value, allowing users to make new predictions or confirm or correct previous expectations" (IASB, 2018). On the other hand, persistent earnings are considered high-quality earnings and referred to as sustainable, so they are not occasional (Bissessur, 2008).

Literature provides evidence that persistence is a desirable feature in earnings and positively relates to its relevance. Financial analysts and investors prefer persistent earnings because they provide a reference basis for their predictions. Many studies show that the persistence of earnings positively affects their relevance; and thus positively influences their

quality (Cheng, Liu, 2016). Predictability also enhances the usefulness of earnings because persistent earnings are expected to be a better indicator of future cash flows, which improves the ability of investors to assess the company's value.

Earnings sustainability is related to its persistence and is defined as the extent to which current earnings predict future earnings (Licerán-Gutiérrez, Cano-Rodríguez, 2019). The most widely used indicator for earnings persistence is the autoregressive coefficient of current earnings over delayed earnings. Many studies extended this model by classifying earnings into cash flows and accounting accruals, based on the idea that the cash flow component of earnings has more predictive ability than accruals (Sloan, 1996). The second widely used indicator of persistence and predictability is earnings volatility, so when the fluctuation of earnings is high, their predictive ability is low (Clubb, Wu, 2014).

Finally, due to their opposing effects on earnings quality, the ambiguity between persistence and predictability (of earnings and cash flows), on the one hand, and earnings management and income smoothing, on the other, should be noted. Unlike earnings management and income smoothing, persistence and predictability are required attributes of earnings quality. In addition, persistence and predictability can be easily achieved through earnings management and income smoothing practices, and the available models cannot determine whether persistence and predictability are the results of the company's performance or just the accounting composition of managers (Li, 2019; Potharla, 2022; Khuong et al., 2022).

### 3. LITERATURE REVIEW

There are many studies about the properties of a company's performance measures that provide mixed results. According to Ball and Watts (1972), the annual income time series follows a sub-martingale process, but Watts and Leftwich (1977) provided evidence that net income follows a random walk. However, Lipe (1986) identified some differences between earnings components in terms of persistence; he found that earnings of the current period are not a better predictor of future cash flows when compared to the current cash flows. On the other hand, Dechow, Kothari, and Watts (1998) showed that current earnings predict future cash flows better than current cash flows. The results of Barth, Cram, and Nelson (2001) indicated that cash flows and accruals as components of current earnings have a better predictive ability of future cash flows when compared to earnings.

Cupertino and Galimberti (2009) tested the hypothesis that the increase in accrual accounting decreases earnings persistence, which is raised with the rise of the cash component. They adopted the autoregression method for a sample of 126 Brazilian companies from 1995 to 2007. The results indicated that earnings persistence is heterogeneous between companies and that the previous hypothesis is not valid for Brazilian companies, especially the effect of accruals on earnings persistence.

Amor Tapia and Tascón Fernández (2011) examined the properties of earnings and their components in private companies. They used the data of non-listed European companies available on the AMADEUS database from 1995 to 2006. The results suggested differences between private and public companies in terms of persistence and that these differences are significant when accruals are extreme. The results also indicated that earnings persistence relative to cash flows in European companies follows a different pattern when compared to US companies. However, differences in persistence are not significant when companies report positive versus negative earnings.

Doukakis (2010) examined the persistence of earnings and their components after the IFRS adoption. The study included 956 firm-year observations obtained from the DataStream-WorldScope database during the period 2002-2007. The study included two years before and two years after the IFRS adoption and suggested that the IFRS guidelines did not improve earnings persistence and their components.

Kabir and Laswad (2011) explored the characteristics of net income and comprehensive income in New Zealand companies. The study relied on cross-section data for companies listed during 2010, using 89 companies to examine persistence, volatility, and predictive ability and 81 companies to measure the relevance. According to the results, net income is more persistent and value-relevant when compared to total comprehensive income. However, the study did not record significant differences between net income and comprehensive income in terms of volatility and predictive ability.

Ebaid (2011) examined the persistence of earnings in Egyptian companies and whether it is attributable to the accrual or cash flow component of earnings. The study used 74 listed companies from 1999 to 2007, revealing that earnings of Egyptian companies are persistent and that the persistence of earnings is attributed to the cash flow component more than the accrual component.

Lyimo (2014) analyzed the consistency between the various measures of earnings quality for companies listed on the Bombay Stock Exchange between 2006 and 2012, based on several widely used measures of earnings quality, such as persistence, predictive ability, smoothing income, and accrual quality. The results found incomplete consistency between earnings quality measures, which requires analysts, investors, and other market participants to use more than one measure of earnings quality.

Ahmadpour and Shahsavari (2016) were interested in the relationship between earnings management and earnings quality in companies listed on the Tehran Stock Exchange during 2007-2012. The study included 55 financially distressed companies and 198 non-financially distressed companies. The results showed that distressed companies tend to practice opportunistic earnings management, while non-distressed companies practice effective earnings management.

Jelodari and Kordshouli (2016) were concerned with the role of earnings quality in the reliability of operating cash flow forecasts for companies listed on the Tehran Stock Exchange, using 50 companies from 2009 to 2013. The results showed that the increase in earnings quality improves the accuracy of cash flow and operational forecasts, and thus earnings quality is a reliable criterion for the accuracy of financial forecasts.

An (2017) analyzed the earnings quality over time for companies listed on the Korean financial market using 9,584 firm-year observations during 1995-2006. According to the results, the earnings quality of Korean companies is lower when compared to companies in developed countries.

Adiati, Rahmawati, and Bandi (2018) investigated the impact of deferred taxes and accounting accruals on earnings persistence for companies listed on the Indonesia Stock Exchange, using 1,609 firm-year observations from 2007 to 2014. The results indicated a negative impact of deferred taxes and accounting accruals on earnings persistence, while the impact of deferred taxes is positive when dividing the sample into two subsamples according to the deferred tax sign.

Dimitropoulos and Koronios (2018) investigated the persistence and predictability of earnings in European football clubs and whether UEFA's Financial Fair Play (FFP) requires clubs to produce high-quality earnings. The study included 109 top-tier European clubs

during 2008-2016 and provided empirical evidence that cash flows have more ability to predict one-year-ahead earnings. The results also showed that the FFP installation enhanced the predictive ability of cash flow, especially for the smaller clubs.

Senan (2019) examined the ability of current earnings, cash flows, and accounting accruals to predict future operating cash flows based on 45 Saudi companies from 2006 to 2015. According to the results, current cash flows are more able to predict future operating cash flows compared to current earnings, and accounting accruals increase the predictive ability of current cash flows.

Focusing on persistence and predictability as fundamental attributes of relevance and considering the literature, this study starts from the following hypotheses:

- **Hypothesis (1):** Earnings are more persistent than net cash flows from operations.
- **Hypothesis (2):** Earnings have more predictive ability than net cash flows from operations.

#### 4. METHOD AND MATERIALS

This study relies on a descriptive approach to test the hypotheses by selecting 20 Algerian companies as a field of study from 2011 to 2020. The statistical method is also used through four multiple linear regression models.

##### 4.1. Model specification

The study research design includes four models; two of them are used to measure the persistence of earnings and cash flows, and the others are used to measure their predictability. These models are multiple linear regressions starting from Sloan (1996), which are adjusted by annual sales as a control variable following previous studies that used sales to express the company's size or activity level.

Model (1) is used to measure the persistence of earnings:

$$NI_{it+1} = \alpha_0 + \alpha_1 NI_{it} + \alpha_2 REV_{it} + \varepsilon_{it} \quad (1)$$

Model (2) is used to measure the persistence of operating cash flows:

$$OCF_{it+1} = \beta_0 + \beta_1 OCF_{it} + \beta_2 REV_{it} + \mu_{it} \quad (2)$$

Model (3) is used to measure the predictive ability of earnings:

$$OCF_{it+1} = \delta_0 + \delta_1 NI_{it} + \delta_2 REV_{it} + \gamma_{it} \quad (3)$$

Model (4) is used to measure the predictive ability of operating cash flows:

$$NI_{it+1} = \sigma_0 + \sigma_1 OCF_{it} + \sigma_2 REV_{it} + \eta_{it} \quad (4)$$

Where:

$NI_{it}$ : is the period's net income, measured as the profit or loss.

$OCF_{it}$ : is the net operating cash flows for the period.

$REV_{it}$ : is the total company's sale during the period.

$\alpha_0, \beta_0, \delta_0, \sigma_0$ : are intercepts.

$\alpha_1, \alpha_2, \beta_1, \beta_2, \delta_1, \delta_2, \sigma_1, \sigma_2$ : are parameters.

$\varepsilon_{it}, \mu_{it}, \gamma_{it}, \eta_{it}$ : are errors terms.

After collecting the data of variables directly from the financial reports of companies, they weighted using total assets to avoid the dispersion effect.



#### 4.2. Data collection

To collect the required data, 20 non-financial Algerian companies were selected depending on the availability of their financial statements. The study period was extended from 2011 to 2020 to obtain sufficient observations (200 firm-years). We exclude financial companies due to the specifications of their accounting systems, where earnings and cash flows are calculated differently. We collect the financial data from the database of the National Centre for Commercial Register (CNRC portal: <https://sidjilcom.cnrc.dz>).

### 5. RESULTS AND DISCUSSION

#### 5.1. Descriptive statistics

It is clear from Table 1 that the total observations reached 200 and relate to 20 companies from 2011 to 2020. Comparing the mean with the median, we observe a convergence between them for all variables, which means that the data distribution is close to the normality. The minimum values indicate the existence of negative values for earnings (NI) and operating cash flows (OCF), while there are no negative values for sales (REV). It also appears from the table that sales for the period are the most dispersed, followed by earnings and then operating cash flows, respectively. The high dispersion of sales is due to the several affecting factors that usually relate to the external environment, so sales tend to be more volatile, considering that they are the fundamental determinant of earnings and operating cash flows.

Table 1. The results of descriptive statistics

	N	Mean	Median	Standards deviation	Minimum	Maximum
NI	200	0.047	0.039	0.052	-0.053	0.209
OCF	200	0.072	0.065	0.010	-0.193	0.354
REV	200	0.492	0.402	0.390	0.005	1.500

Source: Author calculation.

#### 5.2. The persistence of earnings and cash flows

Models (1) and (2) were estimated to measure the persistence of earnings and operating cash flows, respectively. Before all, it is necessary to test the homoscedasticity of the standardized residuals of the two models. From Table 2, it appears that the significance levels for Breusch-Pagan and Koenker were much greater than the 5% level in both cases, which means that the two tests are not significant. Therefore, the standardized residuals of both Model (1) and Model (2) are homoskedastic.

Table 2. The results of Breusch-Pagan and Koenkertestes for Models (1) and (2)

	Model (1)		Model (2)	
	LM Statistic	Sig.	LM Statistic	Sig.
Breusch-Pagan	1.567	0.457	0.286	0.867
Koenker	1.166	0.558	0.180	0.914

Source: Author calculation.

Table 3 shows the estimation results of Model (1) and suggests that Model (1) is significant at the level of 1%. The determination coefficient reached 0.66, indicating that current earnings and sales explain the next period's earnings. The calculated Durbin-Watson is very close to the value of two (2), which means that the standardized residuals of Model (1) are not autocorrelated. Concerning the regression coefficients, the intercept is significant at the 10% level and presents a weak value. The sales parameter is statistically significant at the 5% level and indicates a positive and weak effect of current sales on the next period's earnings. The parameter of current earnings is statistically significant at the 1% level and suggests a positive and strong impact of current earnings on the next period's earnings. Due to the absence of perfect multicollinearity between the two independent variables in Model (1), as the Variance Inflation Factor (VIF) is close to one (1), the explanatory power is due to current earnings. Consequently, earnings of Algerian companies are persistent, and thus they are continuous over periods, which is a required characteristic that allows the improvement of the quality of financial reporting.

Table 3. Model (1)'s results summary

	Coefficient value	T	Sig.	VIF	Adjusted R squared	F	Sig.	Durbin-Watson
Intercept	0.008	1.682	0.095	-				
NI <sub>it</sub>	0.625	11.010	0.000	1.498	0.660	113.534	0.000 <sup>a</sup>	2.023
REV <sub>it</sub>	0.018	2.055	0.042	1.498				

a. Dependent variable: NI<sub>it+1</sub>.

Source: Author calculation.

Table 4 summarizes the estimation results of Model (2), which measures the persistence of operating cash flows. According to the results, Model (1) is insignificant as the significance level is more than 5%, and the determination coefficient is very close to zero, which means that the operating cash flows and sales for the current period do not explain operating cash flows for the next period. From the table, we also note that the calculated Durbin-Watson reached 1.945 and is very close to the value of two (2), which means that the standardized residuals of Model (2) are not autocorrelated. The results indicate that only the intercept is significant at the 1% level since the parameter of current sales is statistically significant at the 10% level, and the parameter of current operating cash flows is insignificant. Finally, the Variance Inflation Factor (VIF) is very low, indicating the absence of perfect multicollinearity between the two independent variables in Model (2). Based on these results, it appears that the operating cash flows of Algerian companies are not persistent, so they are occasional and unsustainable.

Table 4. Model (2)'s results summary

	Coefficient value	T	Sig.	VIF	Adjusted R squared	F	Sig.	Durbin-Watson
Intercept	0.049	3.313	0.001	-				
OCF <sub>it</sub>	0.031	0.778	0.438	1.003	0.019	2.106	0.126 <sup>a</sup>	1.945
REV <sub>it</sub>	0.044	1.853	0.066	1.003				

a. Dependent variable: OCF<sub>it+1</sub>.

Source: Author calculation.

Comparing the results of Model (1) with Model (2), Hypothesis (1) is confirmed, and thus earnings are more persistent than net cash flows from operations. That result is consistent with Cupertino and Galimberti (2009), who indicated heterogeneity in earnings persistence between companies. However, it differs from Ball and Watts (1972), who found that annual income follows a sub-martingale process, and Watts and Leftwich (1977), who provided evidence that annual income follows a random walk.

### 5.3. The predictive ability of earnings and cash flows

Models (3) and (4) were estimated to measure the predictive ability of earnings and operating cash flows, respectively. First, we tested the homoscedasticity of the standardized residuals as shown in Table 5, which shows that the significance levels of Breusch-Pagan and Koenker are more than 5% for the two tests, suggesting that the standardized residuals of each model are homoskedastic.

Table 5. The results of Breusch-Pagan and Koenker tests for Model (3) and Model (4)

	Model (3)		Model (4)	
	LM Statistic	Sig.	LM Statistic	Sig.
Breusch-Pagan	0.066	0.967	0.166	0.867
Koenker	0.034	0.983	0.134	0.883

Source: Author calculation.

Model (3) measures the ability of current earnings to predict future cash flows. Table 6 shows that the model is significant at 1%, with a very weak determination coefficient, which means that the ability of earnings and sales to predict cash flows is very weak. Additionally, the calculated value of Durbin-Watson is very close to the value of two (2), indicating that the standardized residuals of Model (3) are not autocorrelated. Table 6 shows that the intercept is significant at the 1% level with a very weak value and that the sales parameter is insignificant, indicating that current sales do not predict cash flows for the next period. However, the earnings parameter is significant at the level of 5% with a value of 0.428, revealing a positive effect of current earnings on cash flows for the next period. Therefore, current earnings can predict one-year-ahead cash flows, although this predictive ability is very weak. Finally, the Variance Inflation Factor (VIF) indicates the absence of perfect multicollinearity between the two independent variables in Model (3).

Table 6. Model (3)'s results summary

	Coefficient value	T	Sig.	VIF	Adjusted R squared	F	Sig.	Durbin-Watson
Intercept	0.049	3.376	0.001	-				
NI <sub>it</sub>	0.428	2.354	0.020	1.498	0.059	4.652	0.011 <sup>a</sup>	1.966
REV <sub>it</sub>	0.006	0.227	0.821	1.498				

a. Dependent variable:  $OCF_{it+1}$ .

Source: Author calculation.

Model (4) measures the ability of current cash flows to predict future earnings. Table 7 shows that Model (4) is significant at 1% with a medium predictive ability as suggested by the determination coefficient. The Durbin-Watson is close to the value of two (2), so the

standardized residuals of Model (4) are not autocorrelated. The intercept and the parameter of cash flows are not significant; hence current cash flows do not predict one-year-ahead earnings. However, the sales parameter is significant at the 1% level, revealing that sales predict one-year-ahead earnings, so the predictive ability of Model (4) is due to sales. Finally, the Variance Inflation Factor (VIF) suggests the absence of any perfect multicollinearity between the independent variables in Model (4).

Table 7. Model (4)'s results summary

	Coefficient value	T	Sig.	VIF	Adjusted R squared	F	Sig.	Durbin-Watson
Intercept	0.010	1.540	0.126	-				
OCF <sub>it</sub>	0.005	0.268	0.789	1.003	0.299	25.699	0.000 <sup>a</sup>	2.182
REV <sub>it</sub>	0.074	7.139	0.000	1.003				

a. Dependent variable: NI<sub>it+1</sub>.

Source: Author calculation.

The comparative results of Models (3) and (4) confirm Hypothesis (2), even though the predictive ability of earnings is very weak, cash flows have no predictive ability. These results confirm the findings of Dechow, Kothari, and Watts (1998) that showed the superiority of earnings compared to cash flows when predicting future operating cash flows. Contrarily, these results differ from those of Bowen, Burgstahler, and Daley (1986), who found that current cash flows have a higher predictive ability compared to current earnings, and Barth, Cram, and Nelson (2001), who found that cash flows and accruals are the best measures of future cash flows. These results also differ from Senan (2019), who recorded a superiority of current cash flows in predicting future cash flows compared to current earnings.

## 6. CONCLUSION

Earnings and operating cash flows are the most important accounting items and are widely used to assess the financial performance of companies. They are also the principal sources for abstracting many other indicators. Earnings are a proxy for the ability of a company to generate value and a measure to assess the stewardship role of management and its ability to use the company's resources efficiently. Cash flows from operations are a measure of the liquidity of the company and its ability to meet financial obligations against related parties; they are also an indicator of the management's ability to generate and efficiently use cash.

Consequently, literature has focused on earnings quality as a measure of the quality of financial reporting, which has become a target for accounting standard-setter bodies to meet the users' needs and achieve fair disclosure and transparency. Due to the weaknesses that characterize accrual-based earnings, especially earnings management and accounting manipulation, the reliance on net cash flows from operations has become a tool to improve the informational content of earnings and enhance the quality of financial reporting.

Persistence and predictive ability are among the most reliable measures of accounting quality due to their high relationship with relevance as a fundamental qualitative characteristic for useful financial reporting. Previous studies have mainly focused on earnings when measuring persistence and predictive ability, while some studies divide

earnings into their components (cash flows and accruals) to assess the two attributes. Therefore, this study attempted to measure the persistence of earnings and their predictive ability compared to cash flows. The study was conducted using Algerian companies to bridge the research gap due to the lack of studies on that subject in Algeria, through 20 companies, during 2011-2020.

Based on the model of Sloan (1996) adjusted by the total annual sales, the results provide empirical evidence that:

- Earnings of Algerian companies are persistent (continuous from one period to the next), so they are sustainable and not occasional or intermittent, which indicates that earnings are determined by factors under the control of companies. However, their predictive ability is very weak, as they predict a modest part of future cash flows.
- Operating cash flows of Algerian companies are not persistent and unsustainable, and thus they are occasional or highly volatile. They also are subject to factors that are not under the control of companies, which explains why the ability of current earnings to predict future cash flows is very weak. Operating cash flows of Algerian companies also have no predictive ability since they do not affect future earnings.
- Earnings have higher quality than operating cash flows in Algerian companies since earnings are more persistent and have high predictability than operating cash flows.

These results require users of financial reports in Algerian companies to focus on earnings when making their decisions since they have high quality. Users must carefully use cash flows because they are occasional and not persistent with any predictive ability and use other accounting items to support the informational content of earnings. These results also require other related parties to employ several measures of accounting quality due to the inconsistency between different measures.

Despite the contributions of this study, it is subject to some limitations. On the one hand, the model used cannot separate the part of persistence that represents the sustainability of earnings as a proxy for earnings quality from the other part of persistence that can be assigned to earnings manipulation, especially income smoothing. Therefore, future studies must use or develop other models to avoid that gap. On the other hand, the small sample size used in this study does not allow applying the results to a broader context, which requires future studies to use a larger sample size.

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Received: December 2022

Accepted: March 2023

DOI: 10.7862/rz.2023.mmr.06

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## **IMPROVEMENT OF PARTNERSHIP RELATIONS BETWEEN THE MANAGING ORGANIZATION AND THE OWNERS OF PREMISES IN AN APARTMENT BUILDING**

In the article the system of monitoring and estimation of quality as the major element of realization of the client-oriented approach in the sphere of housing and communal services is considered. The proposed system of monitoring and evaluation of service quality is aimed at customer evaluation and integrated consideration of communal, housing, organizational, informational components and allows you to determine the effectiveness of the managing organizations. The organizational structure, based on the creation of two main units – back and front offices, which allows to implement a customer-oriented strategy, is also considered. Within the limits of the new organizational structure the system of revealing of need and opinions of owners of rooms in apartment houses by means of absentee voting with application of new information technologies is offered. Thus, the given system of monitoring and estimation of quality of housing and communal services will allow to realize feedback between consumers and the managing organizations, and to increase customer satisfaction of quality of services.

**Keywords:** housing and communal services, customer-oriented approach, monitoring, partnership relations, managing organization, consumers, organizational structure.

### **1. INTRODUCTION**

Relevance of the topic is associated with the era of relationships that emerged at the end of XX century and continues to this day, characterized by the transformation of consumer orientation of organizations. Increased attention was paid to the establishment and maintenance of relationships with consumers, so this approach is called customer oriented. Increasing competition in the market of housing and communal services (HCS) equalizes the proposals of management organizations in terms of price, quality and the list of services

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offered, forcing them to look for new ways to compete for attracting and retaining customers. The attention is gradually shifting from the services to the consumer, who is becoming a legislator in the market, dictating his conditions, and expecting special treatment. The approach, based on the increased attention to the establishment and maintenance of relations with consumers, was called client oriented. A distinctive feature of housing and communal services is that the processes of their production and consumption are inextricably linked. This leads to the increasing importance of the orientation of the organization to the maximum satisfaction of the needs of consumers. Thus, in the emerging market relations success of management organizations in the market of housing and communal services is directly determined by the degree of compliance of the quality of services provided expectations and needs of consumers (Burmenko, Danilenko, Turenko, 2019).

Housing and communal services are the result of one of the life-supporting sectors of the national economy. By the number of consumers these services occupy a leading position and have a significant impact on the quality of life of the Ukrainian population. Historically, the radical changes in the sector of housing and communal services (HCS) were primarily associated with the formation of a new model of management, reflecting the market relations between the subjects and objects of management. The necessity of transition to the new model of management of housing and communal services was conditioned by demonopolization of the sector, division of functions of owners, customers, and contractors – suppliers of housing and communal services, as well as appearance of private ownership of objects of housing and communal services.

Model of management in housing and communal services formed nowadays is characterized by low level of population's satisfaction with quality of provided services, lag of technologies of services provision from the modern requirements of the society and irrational “price-quality” correlation from the point of view of consumers. This situation is directly related to the features of the current management system, focused primarily on combating utility problems “as they arise”, rather than on long-term planning and the creation of conditions for minimizing the possibility of problems and sustainable development of the industry (Antonov, Bradul, Slavenko, 2020).

The relevance of the topic of the study is dictated by the need to improve the management of housing and communal services based on the formation of customer-oriented model that provides the needs of consumers of housing and communal services in the composition, performance, quality.

The purpose of the article is to improve the partnership relations between the managing organization and the owners of premises in an apartment building in the sphere of housing and communal services.

The object of the study is managing organizations of housing and communal services.

The subject of the study is a set of organizational and economic relations arising in the process of management of housing and communal services.

Theoretical and methodological basis of the study were the scientific works of domestic and foreign scientists devoted to the theory, methodology and practice of management of housing and communal services organizations. In solving the problems of the study were used dialectical methods (analysis and synthesis, detailing and generalization, analogy, and modeling), as well as economic and statistical methods, methods of expert evaluations, observation, questioning.

## 2. STATEMENT OF THE PROBLEM

In modern scientific literature the study of quality and efficiency of management at different levels are devoted to the works of such Ukrainian and foreign scientists as D. Aaker, I. Ansoff, L.V. Bezzubko, Bondarenko, V.A. Vinokurov, E.V. Dolgaleva, P. Drucker, N.D. Zakorin, H. Iosihara, A.A. Kleiman, V.M. Kolpakov, V.I. Korolev, P.V. Magdanov, M.V. Melnik, D. Mercer, G. Mintzberg, T. Peters, A.G. Porshnev, B.A. Reisberg, A. Svirina, A.J. Strinkland, F. Taylor, A. Thompson, R. Waterman, G. Ford, G. Emerson, S. Young.

The specifics of management in the sphere of housing and communal services are reflected in the scientific works of V.V. Akimkin, S.I. Bazhenov, I.V. Genzler, S.N. Glazunov, M. Yeshchenko, T. Fasolko, H. Mukhalchenko, I. Udovychenko, M. Grossmann.

However, even though a significant number of scientific works are devoted to the theoretical foundations of management, their study revealed the lack of validity of management models in the sphere of housing and communal services. There are not enough works, which consider customer-oriented management in organizations of housing and communal services in the context of its development, structural dynamics, peculiarities of manifestation of interrelations of its elements. Solving the above problems is of scientific interest, requires further theoretical and methodological justification, as well as practical implementation with respect to the current stage of development of organizational and economic relations in housing and communal services in Ukraine, which distinguishes the research of the author of this article from the studies previously performed in this subject area.

## 3. MAIN RESULTS

Radical changes carried out in the sector of housing and communal services are primarily associated with the formation of a new model of management, which reflects market relations between the subjects and objects of management. The necessity of transition to a new model of management in housing and communal services is conditioned by: demonopolization of the branch; division of functions of the owner, customer, and producers-suppliers of housing and communal services; formation of private property on the objects of housing and communal services.

The problem situation in the housing and communal sector of Ukraine is well known. It is largely related to the conflict of goals and interests of the parties concerned. For example, owners of residential buildings are concerned that the quality of housing and communal services is decreasing while tariffs are growing. Resource supplying and contracting (servicing) organizations are dissatisfied with untimely and incomplete payment for the provided resources and services, and the state is concerned about the reduced availability of housing and utility services for most of the population (Selezneva, 2020).

In turn, the management companies (MC) believe that their interests are infringed by the state and local authorities. Dissatisfaction is experienced by management organizations, which qualitatively fulfill contractual obligations to resource suppliers, contractors, and owners of residential premises, but, nevertheless, are a constant object of criticism.

The author of the article proposes to use client-oriented approach in relation to housing and communal services as building partnership relations between the management organization and the owners of premises in an apartment house (MAB), aimed at meeting the quality of housing and communal services consumers and receiving a sustainable profit

by the management organization in the long term through the implementation of key competencies.

One of the main elements of building partnerships in the client-oriented approach is a system of monitoring and quality assessment of housing and communal services, which allows to build feedback between the consumers and the managing organization, improve information transparency, quality of services and competitiveness of the managing organizations themselves. The system of monitoring and quality assessment of housing and communal services means organized systematic observation of the satisfaction of owners of premises in MFBs with quality of housing and communal services.

Monitoring and assessment of quality of housing and communal services is carried out for objective solution of the following main tasks: provision and management of quality; selection of the best (optimal) option of service provision; planning of quality indicators; quality control; analysis of quality level changes.

In general, the system of monitoring and quality assessment should perform the following functions:

- Informational (serves to inform management organizations about the quality of services provided);
- Stimulating (encourages managing organizations to develop and implement measures aimed at maintaining and improving the quality of housing and utility services);
- Control (research of the dynamics of quality indicators of housing and utility services will enable managing organizations to control the process of reaching the goals and targets set);
- Mediatory (serves as feedback between the managing organizations and consumers of housing and utility services);
- Management (based on the quality indicators received, managing organizations will be able to develop preventive and corrective measures in the field of quality).

The main component in the monitoring system is assessment of the quality of housing and utility services. In the modern world the practice of assessing the quality of various services has become widespread enough. However, the study of domestic experience in assessing the quality of housing and communal services suggests that in most cases there is a general rating assessment of the activities of management organizations, but not the quality of services provided by them (Tebekin, 2021).

This is caused by the fact that managing organizations do not realize that assessment of the quality of housing and utility services is an important aspect on the way to improve the quality of services and competitiveness of the managing organizations themselves. That is why many management organizations are characterized by low information transparency, lack of desire to work more closely with consumers, violation of norms, standards, and rules of provision of housing and utility services. Quality assessment of housing and communal services is essentially a set of consistently performed stages, including selection of a method of quality assessment, a set of indicators of properties of assessed housing and communal services, determination of their values and calculation of the complex indicator of quality.

The main purpose of quality assessment is to obtain information about the quality of services provided by management organizations from consumers for targeted activities aimed at meeting quality requirements of housing and communal services and their improvement.

The choice of indicators to assess the quality of housing and utility services was based on the following methodological principles: consistency (the selected indicators must characterize the object of research as a system and have an ordered structure); representativeness (adequacy of the choice of indicators for the complex assessment of the quality of housing and utility services in the absence of overlapping indicators); objectivity of the assessment; understandability of the evaluation methods (consumers of housing and utility services are representatives of different social strata, age, education levels, so the methodology must be understandable to everyone); regularity of the assessment (it means that for the timely response to the changes in the quality of housing and utility services it is necessary to regularly assess their quality).

It is worth noting that the level of quality of housing and communal services may be affected by the following factors:

- infrastructural (quality of housing and utility services will be most likely higher in the areas of new buildings, and lower in the areas of the old buildings, which can be explained by different level of housing amenities);
- socio-economic (consumers' personal attitudes and beliefs, their income level);
- psychological (previous experience of similar services in other cities, districts; time of residence of the consumer in a particular place) (Larin, 2013).

The proposed algorithm for assessing the quality of housing and communal services includes the following steps:

1. Choice of a method for assessing the quality of housing and communal services. Since management organizations need to identify the opinion of consumers about the quality of services provided, accordingly, a sociological survey is the most appropriate for this purpose. It should consider the fact that consumers of housing and utility services are representatives of different social strata, have different levels of education, and the method of quality assessment must be understandable to everyone. That is why it is suggested to define the assessment of quality on a five-point scale.
2. Determination of the number of survey participants. A selective method of polling is offered, for example, five representatives of each entrance from among the most active owners of premises in the apartment building.
3. Definition of directions of quality assessment as well as indicators included in each direction and periodicity of assessment. Now there is no unified standard or algorithm of assessment, so the author's method suggests determination of quality indicators in six areas (Table 1) with each area having different number of indicators.

Table 1. Directions for assessing the quality of housing and communal services

No.	Name of direction	The content of the direction
1	Utilities	Utilities
2	Residential	Residential
3	Household	Household
4	Organizational	Organizational
5	Informational	Informational
6	Social and Psychological	Social and Psychological

Source: personal contribution of the authors.

Thus, the total number of indicators reaches thirty (Table 2). The frequency of the assessment is supposed to be once a quarter since the collection and processing of the results is quite time-consuming.

Table 2. Indicators for assessing the quality of housing and communal services

No.	Indicators
<b>1. Ensuring the proper quality of public services</b>	
1	Cold water supply (compliance with standards and regulations; composition and properties of water; water pressure; water supply interruptions)
2	Hot water supply (observation of standards and norms; composition and properties of water; water pressure; water supply interruptions)
3	Wastewater supply
4	Heating (observation of standards; timely heating season start; temperature regulation depending on the outside temperature)
5	Electricity supply (presence of interruptions)
6	Gas supply (no interruptions; ensuring of the normative pressure)
<b>2. Ensuring the proper condition of the apartment building</b>	
1	Cleaning of garbage chutes
2	Condition of House Communal Infrastructure
3	Maintenance of attic and basement facilities
4	Maintenance of the roof (sweeping the snow in winter)
<b>3. Ensuring the proper condition of the adjacent territory</b>	
1	Timeliness of garbage removal
2	Improvement of the adjacent territory
3	Cleaning of the adjacent territory
<b>4. Organizational and managerial activities of the managing organization</b>	
1	Provision of additional services
2	Timeliness and accuracy of charging for housing and utility services
3	Promptness of execution of requests from residents
4	Management of debtors and defaulters of housing and utility services
5	Participation in city and district contests
<b>5. Level of information provision</b>	
1	Availability of up-to-date information on stands, bulletin boards, etc.
2	The quality of the website of the managing organization.
3	Availability of contact information.
4	Disclosure of information about the work of the managing organization.
<b>6. Interaction with consumers of housing and utility services</b>	
1	Regularity of tenant meetings.
2	Attendance of meetings by tenants.
3	The culture of interaction between the employees and the management of the management organization.

Source: personal contribution of the authors.

4. Outreach work with consumers of housing and communal services. This work involves reporting at the annual meeting of owners and the managing organization of the implementation of assessment of the quality of housing and communal services by consumers. Representative of the management organization explains the purpose, objectives, frequency of quality rating of housing and communal services.
5. Collection and processing of quality indicators of housing and communal services.
6. Definition of a complex index of quality. The complex assessment of quality is calculated by the following formula:

$$Q_0 = \sum_1^n K_i \cdot Q_i \quad (1)$$

where  $Q_i$  – the value of directions on a five-point scale;  
 $K_i$  – value of the weighting coefficient of the indicator  $Q_i$ , with the sum of all weighting coefficients

$$\sum_1^n K_i = 1 \quad (2)$$

Values of weighting coefficients of indicators  $Q_i$  are calculated according to the following formula:

$$K_i = \frac{2(n - k_i + 1)}{n(n + 1)} \quad (3)$$

where  $k_i$  – rank number of the  $i$ -th direction;  
 $n$  – the total number of directions to assess the quality of housing and communal services (Grossman, 2000).

The indicator  $Q_i$  will be calculated as follows:

$$Q_i = \frac{\sum_1^n q_i}{n} \quad (4)$$

where  $q_i$  – value of indicators on a five-point scale in each area;  
 $n$  – the total number of indicators to assess the quality of housing and communal services in each area.

During the study, the expert method determined the numbers of ranks  $k_i$  in all areas of assessment, then calculated the value of  $K_i$  – weighting factor of the indicator  $Q_i$ .

Thus, a comprehensive indicator of the quality of housing and communal services can be calculated by the following formula:

$$Q_0 = 0,26 Q_1 + 0,2 Q_2 + 0,152 Q_3 + 0,21 Q_4 + 0,11 Q_5 + 0,068 Q_6 \quad (5)$$

where  $Q_1$  – communal;  $Q_2$  – housing;  $Q_3$  – housekeeping;  $Q_4$  – organizational;  $Q_5$  – information;  $Q_6$  – socio-psychological direction.

The implementation of customer-oriented strategy by the managing organization depends on its organizational structure. The author offers the organizational structure based on creation of two main divisions (fig. 1):

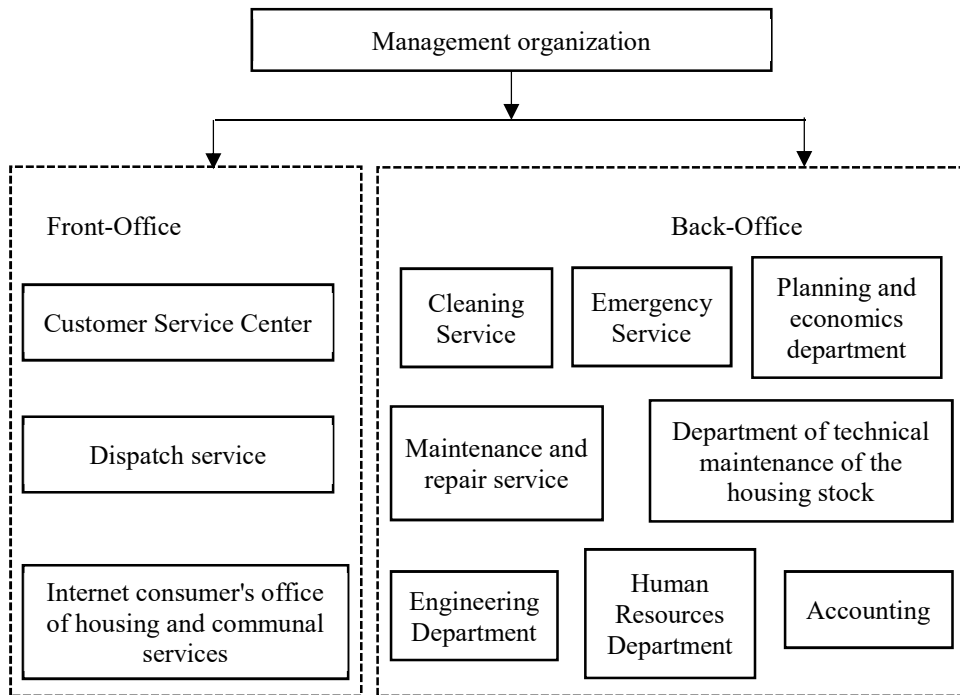


Figure 1. An example of solving a problem using the dynamic programming method

Source: personal contribution of the authors.

1. Division on work with clients (front-office) is engaged in interaction with clients, development of client-oriented strategies. The head of front-office and his subordinates are responsible for profitability of relations with clients. Tasks of front-office are definition and the analysis of requirements of clients to quality of housing and communal services, coordination of contracts on management of MFB, realization of monitoring of satisfaction of consumers of quality of housing and communal services, including their estimation by owners of premises in MFB on various directions.
2. Internal service units (back office) support front office activities with their services. The head of the back-office and his subordinates are responsible for projecting services at the prices set by the head. When applying the client-oriented approach in the process of providing housing and communal services, the introduction of new information technologies is important. Practice shows that the procedure for holding meetings in person to discuss arising issues and problems in the management of MFBs is complicated by the lack of space and enough attendees for a quorum. This leads to lack of mutual understanding between employees of management



organizations and premises owners in MFBs, as well as numerous violations in the process of providing housing and communal services. In particular, the creation within the front and back office organizational structure of an Internet consumer's cabinet is caused by the need to make decisions on various issues related to management of the MFB, which can take place in the form of absentee voting of premises owners. This will make it possible to identify the needs and opinions of premises owners in the MFB through absentee voting.

In general, the system of monitoring and evaluation of the quality of housing and communal services will allow:

- determine the effectiveness of organizations to manage the property of apartment buildings, to ensure the quality provision of housing and communal services;
- at regular assessment of the quality of housing and communal services it will be possible to identify the best managing organizations, which will allow others to be guided by them and to adopt the best practices in this sphere;
- to build feedback between the consumers and the managing organizations, which will lead to greater satisfaction with the quality of the housing and communal services;
- timely development and implementation by management organizations of preventive and corrective measures aimed at maintaining and improving the quality of services.

The difficult economic situation in the housing and communal economy is compounded not only by the state of the national economy of Ukraine but also by the natural monopoly of suppliers of goods and services in this sphere (providers of housing and communal services). Due to ineffective regulation of their activities by the state, providers of housing and communal services shift their economic problems to consumers and the state, but their activities tend to be ineffective. As a result, this hinders not only the social, but also the economic development of the national economy.

Among the directions of socio-economic reforms that have been taking place in Ukraine in recent years, an important place belongs to the reform and development of housing and communal services in general and one of its leading components – housing. The urgency of the urgent task of reforming the housing and communal economy is determined by the severity of the problems that have accumulated in this sector. In 2021, the draft “Strategy for the development of housing and communal services for 2022–2027” was developed. (minregion.gov.ua, Housing and communal services development strategy for 2022–2027, 2021). The provisions of this project note the directions of formation, implementation, and coordination of state policy in the field of housing and communal services.

According to this document to the main strategic objectives of the further development of housing and communal services should include the following:

- Ensuring the preservation of the proper technical condition of the country's housing stock and its improvement.
- Achieving effective management of apartment buildings.
- Introduce a client-oriented approach to providing communal services.
- Creating conditions for stabilizing the financial and economic condition of heating, centralized water supply and centralized drainage enterprises.
- Heat energy is affordable for consumers, and the processes of its supply are climate neutral.
- Ensuring sustainable development of affordable and safe centralized water supply and centralized drainage in settlements of the country.

- Ensure prevention of domestic waste generation and increase the volume of separate collection of their resource-valuable components and develop infrastructure for their treatment and disposal.

However, it is difficult to implement them in conditions of non-transparency and unreliability of information of suppliers of housing and communal services. This also hinders the regulation of their activities by the state. To solve these problems, we have developed an appropriate monitoring methodology, which is based only on subjective assessments of experts on the condition of housing and communal services in cities that do not consider economic performance of suppliers. As a result, there are no grounds for economic regulation of their activities, but it is on them should be based new approaches to the state regulation of the socio-economic efficiency of suppliers of housing and communal services in the national economy.

Providers of housing and communal services are natural monopolists for services on maintenance of houses and buildings and adjacent territories, water supply and sewage, heat, gas, and electricity supply. Their activities in this area are determined by the Law of Ukraine “On housing and communal services” with amendments introduced by the Laws of Ukraine of December 2020 N 1060-IX (minregion.gov.ua, 2020). On the part of the state the regulation of suppliers of housing and communal services is performed by local administrations, and state regulation in the sphere of housing and communal services is aimed at:

- achieving mutual alignment of interests of consumers (affordable prices) and service providers (financial results attractive to creditors and new investors);
- creation of a favorable regime for the functioning and development of natural monopolies for the public benefit;
- determination of the real structure of tariffs based on the principle of effective and equitable allocation of costs to the cost of services for different types of consumers;
- encouraging suppliers to cut costs and reduce excessive employment, improve the quality and reliability of services provided to consumers, increase the efficiency of investments, etc;
- creating conditions for the development of competition to the extent that it is possible under the existing economic conditions (for example, ensuring free and open access of competitors to infrastructure networks).

However, implementation of the above tasks is complicated by an objectively existing contradiction between consumers and suppliers of the housing and utilities sector regarding the cost of goods and services. Lack of effective methods of state regulation in the conditions of their natural monopoly leads to the deepening of contradictions. For instance, because of an unjustified increase in tariffs, the economic efficiency of housing and utilities providers increases, but the living standards of the population and, consequently, the social efficiency of the national economy decrease.

Unlike other sectors of the national economy, the formation of tariffs in the sphere of housing and communal services is inherently subjective. For example, electricity tariffs for the population are fixed and set by the state, while water and heat tariffs are regulated by local governments and vary by oblasts, districts, and cities. But the cost of services for consumers in the sphere of housing and communal services is determined not only by the value of the tariff, but also by the volume of consumption, which is regulated by the state.

As a result of exaggerated norms, for example, for water consumption, the cost of consumed water increases significantly (Ruzhynska, 2019).

Increase of tariffs is beneficial to providers of housing and communal services, but besides subjective, there are also objective conditions of their overestimation. First, it is commercial losses of heat, electricity, and water due to the high degree of wear and tear of transmission devices. However, most suppliers do not use funds received from tariff increases to improve their condition. Meanwhile, the economic efficiency of housing and utilities providers is determined not only by their profits, but also by the corresponding costs. The only way to solve the above-mentioned contradictions is to stimulate the state to lower them.

Incentives should be targeted and aimed at achieving certain results aimed not only at increasing the economic efficiency of providers of housing and utility services but also at improving the quality and reducing the cost of services for the population. With a permanent deficit in the state budget and budgets of local governments, the only source of incentives is incomes of providers of housing and utility services. They can only be regulated by changing the tariffs for services. That is why it is necessary to introduce some order into the tariffs.

To regulate tariffs, there should be a set of tariff ceilings - lower and upper limits for tariffs set by the government and local authorities. Within the lower and upper limits of tariffs, the activities of providers of housing and public utilities are incentivized. Their increase is carried out on the condition that the provider of housing and communal services has achieved certain positive results. If he has not obtained them, the tariffs are reduced. This approach is adequate to the problem with feedback, known as the problem of adaptation, (Dolgalova, 2018).

To solve such a problem, the actual values of the performance of housing and utilities providers must be constantly compared with the baseline. For this purpose, it is necessary to carry out their current monitoring. It should be conducted for providers of services on maintenance of houses and buildings and adjacent territories, water supply and drainage, heat, gas and electricity supply, and comparison of results should be carried out only within the framework of one type of economic activity.

The results of activity of suppliers of housing and communal services are the consequence of different factors and are characterized by appropriate factor indicators. If because of monitoring we choose the best values of factor indicators, their totality will characterize the results of activity of conditional reference supplier (CRP) of housing and communal services. They are basic for analysis, control, and decision-making on the part of the state and local authorities to stimulate the activity of real providers of housing and communal services.

The results are used to determine the following indicators:

$$f_{ij}, i = \overline{1, n}, \quad j = \overline{1, k}$$

– is the absolute indicator of the rating by  $j$ -th factor, which shows the proximity of the  $i$ -th housing and communal services provider to the CRP in points ( $f_{ij} \in [0, 1]$ );

$$r_{ij}, i = \overline{1, n}, \quad j = \overline{1, k}$$

– relative (weighted) rating indicator for the  $j$ -th factor indicator, which determines the distance of the  $i$ -th housing and communal services provider from CRP for the  $j$ -th factor indicator as a percentage ( $r_{ij} \in [0, 1]$ );

$b_{ik}$  – is a generalized indicator of the rating score, which considers the significance of the factor indicators of the  $i$ -th housing and communal services provider, which are determined by expert judgment. It determines its rating score by the maximum distance from the origin (CRP factor indicators). The necessity of introducing such an indicator appears with the differentiation of the aggregate assessment of housing and communal services suppliers. The highest value of the indicator corresponds to the best performance in the delivery of service in the sphere of housing and communal services;

$R_i$  – total rating score of the  $i$ -th housing and communal services provider. It considers the significance of various indicators when calculating the proximity rating for CRP. The supplier with the lowest value of the total expert rating has the highest rating.

The following methodology is used to calculate the absolute and relative rating indicator.

*First step.* The values of their rating score ( $F_j$ ) are determined by expert method within the framework of one type of economic activity of  $n$  providers of housing and communal services for  $k$  factor indicators ( $a_{ij}$ ) and an appropriate array of data is formed:

$$\begin{cases} \Pi_1 = (a_{11}; a_{12}; \dots; a_{1k}), \\ \dots \\ \Pi_n = (a_{n1}; a_{n2}; \dots; a_{nk}). \end{cases} \quad (6)$$

*Second step.* For each factor indicator ( $F_j$ ) he maximum value of the rating score is found, which is the corresponding characteristic of CRP:

$$CRP = (\max(a_{11}, \dots, a_{n1}); \dots; \max(a_{1k}, \dots, a_{nk})). \quad (7)$$

*Step three.* The absolute ranking score ( $f_{ij}$ ) is used to determine the distance of housing and utilities suppliers from CRP for each factor indicator ( $F_j$ ):

$$\begin{cases} f_{i1} = \max(a_{11}, \dots, a_{n1}) - a_{i1}, \dots, & f_{ik} = \max(a_{1k}, \dots, a_{nk}) - a_{ik}, \\ \dots & \dots \\ f_{n1} = \max(a_{11}, \dots, a_{n1}) - a_{n1}, \dots, & f_{nk} = \max(a_{1k}, \dots, a_{nk}) - a_{nk}, \end{cases} \quad (8)$$

The result is such an array of data:

$$\begin{cases} \Pi_1 = (f_{11}; f_{12}; \dots; f_{1k}), \\ \dots \\ \Pi_n = (f_{n1}; f_{n2}; \dots; f_{nk}). \end{cases} \quad (9)$$

*Fourth step.* The values of the relative indicators of the rating of housing and communal services providers ( $r_{ij}$ ) are determined and summarized in Table 3 ( $F_j$ ):

$$\begin{cases} r_{i1} = \frac{f_{i1}}{\max(a_{11}, \dots, a_{n1})}, \dots, & r_{ik} = \frac{f_{ik}}{\max(a_{1k}, \dots, a_{nk})}, \\ r_{n1} = \frac{f_{n1}}{\max(a_{11}, \dots, a_{n1})}, \dots, & r_{nk} = \frac{f_{nk}}{\max(a_{1k}, \dots, a_{nk})}. \end{cases} \quad (10)$$

Table 3. Relative indicators of the rating assessment of factor indicators

No.	Utility company	Indicators by factor		
		$F_1$	.....	$F_k$
1	$UC_1$	$r_{11}$	.....	$r_{1k}$
...		.....	.....	.....
n	$UC_n$	$r_{n1}$	.....	$r_{nk}$

Source: personal contribution of the authors.

To calculate the generalized rating indicators ( $b_{ik}$ ) in addition to the rating values ( $a_{ij}$ ) of factor indicators ( $F_j$ ) their weighting coefficients ( $p_{ij}$ )

$$p_{ij} \in [0,1], \sum_{j=1}^n p_{ij} = 1): \quad (11)$$

$$p_{ij} = \frac{a_{ij}}{\max a_{ij}}$$

Table 4 forms the corresponding data set of the complex evaluation of factor indicators ( $F_j$ ).

For each of the  $i$ -th enterprise of housing and communal services using the data from Table 4 are determined and summarized in Table 5 generalized indicators of the rating ( $b_{ik}$ ).

$$b_{ik} = \sqrt{p_{i1}a_{i1}^2 + p_{i2}a_{i2}^2 + \dots + p_{ik}a_{ik}^2} \quad (12)$$

Table 4. Rating estimates of factor indicators

Estimates	$F_1$	$F_2$	...	$F_k$
Preliminary estimates	$a_{i1}$	$a_{i2}$		$a_{ik}$
Weighting factors	$p_{i1}$	$p_{i2}$		$p_{ik}$

Source: personal contribution of the authors.

Table 5. Generalized rating indicators

No.	Utility company	Factors			
		F <sub>1</sub>	F <sub>2</sub>	...	F <sub>k</sub>
1	UC <sub>1</sub>	b <sub>11</sub>	b <sub>12</sub>	....	b <sub>1k</sub>
...		....	.....	.....	.....
n	UC <sub>n</sub>	b <sub>n1</sub>	b <sub>n2</sub>	.....	b <sub>nk</sub>

Source: personal contribution of the authors.

The overall rating of the  $i$ -th housing and communal services provider ( $R_i$ ) is performed using the data in Table 5 in this sequence.

*First step.* For each indicator ( $b_{ik}$ ) in the column ( $F_j$ ) there is a maximum value, which is the corresponding result of CRP activity:

$$\overline{CRP} = (\max(b_{11}, \dots, b_{n1}); \dots \max(b_{1k}, \dots, b_{nk})) \quad (13)$$

*Second step.* Regarding the CRP indicators are determined and summarized in Table 6 standardized values ( $x_{ij}$ ) indicators  $b_{ik}$ :

$$x_{ij} = \frac{b_{ij}}{\max_k b_{nk}} \quad (14)$$

Table 6. Standardized indicators of rating grades

No.	Utility company	Factors			
		F <sub>1</sub>	F <sub>2</sub>	...	F <sub>k</sub>
1	UC <sub>1</sub>	x <sub>11</sub>	x <sub>12</sub>	....	x <sub>1k</sub>
...		....	.....	.....	.....
n	UC <sub>n</sub>	x <sub>n1</sub>	x <sub>n2</sub>	.....	x <sub>nk</sub>

Source: personal contribution of the authors.

*Step three.* For each  $i$ -th supplier of housing and communal services the value of the rating score ( $R_i$ ) is determined:

$$R_i = \sqrt{\sum_{j=1}^k (1 - x_{ij})^2} \quad (15)$$

*The fourth step.* Housing and utilities suppliers are ranked. The supplier with the lowest  $R_i$  value has the highest rating.

The given algorithm of the rating assessment of housing and utilities suppliers is used both statistically and dynamically. In the first case the indexes of rating scores are determined as of the end of the period, in the second case they are calculated as ratios (growth rates or rates of growth) by the ratio of absolute values of indexes of rating scores at the end and beginning of the analytic period. In the complex such estimation allows to

control the results of functioning and development of housing and communal services suppliers.

#### 4. CONCLUSIONS

In conclusion, it is worth noting the advantages of the above methodology of monitoring of providers of housing and utility services, because:

- it is based on a comprehensive, multidimensional approach to performance assessment;
- it uses a flexible computational algorithm, which implements the capabilities of the economic-mathematical model based on the equalized comprehensive assessment.
- the results of the corresponding type of economic activity of all providers of housing and communal services within a certain administrative territory are used, which makes monitoring objective.

Thus, we can conclude that targeted incentives for housing and utilities suppliers, aimed at their achievement of conditional benchmark enterprise performance, in conjunction with an improved methodology for monitoring their condition is an innovative approach to state regulation of their activities. However, its implementation requires prompt receipt of relevant information. This necessitates the creation of a certain information-analytical system (IAS) in the relevant institutions of local government and public authorities. Scientific and methodological basis of its formation is the direction of further research.

The article shows that the housing and communal services (HCS) is a system of business processes as a set of interrelated areas of implementation of services and production of works aimed at creating a living environment for consumers. Given that modern public policy is aimed at the transition to align all services of the state around the needs of the people, and the digital transformation activates the use of more effective management models, the article explores the task of transition from the principles of customer centricity to customer centricity, which allows to form a target focus in the activities of organizations and enterprises on a set of actions that ensure increased satisfaction of comfort and strengthen the interaction with consumers.

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Received: November 2022  
Accepted: March 2023  
DOI: 10.7862/rz.2023.mmr.07

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## **PRINCIPLES OF FUNCTIONING OF THE INSTITUTION OF SELF-EMPLOYMENT IN UKRAINE**

The article is devoted to the formulation and systematization of the principles of functioning of the institution of self-employment as a specific institutional socio-economic system. The improvement of the existing approach to the dichotomy of the institution of self-employment into formal and informal institutional components due to the identification of semi-formal institutional formations in the field of self-employment is substantiated. Semi-formal institutional formations mean informal institutions in the field of self-employment, which have certain features of formal ones, and are formed in response to the functional insufficiency of formal institutions of self-employment, in particular, web portals and online freelance exchanges. The principles of functioning of formal, informal and semi-formal components of the self-employment institution are formulated, common features and differences in forming systems of principles of different components of the self-employment institute are determined, which can become the basis for resolving contradictions that arise in the field of self-employment between informal and formal institutions in Ukraine.

**Keywords:** principles of functioning of institutional systems, institution of self-employment, formal institution of self-employment, informal institution of self-employment, semi-formal institutional formations.

### **1. INTRODUCTION**

The principles of the functioning of institutional economic systems occupy a special place in the processes of their institutionalization, which means the process of regulating the behavior of socio-economic subjects. From this point of view, economic institutions can be divided into formal and informal, while the principles of their functioning differ significantly. Considering the institution as a system of formal and informal norms and rules that allow to regulate the activities and interaction of socio-economic subjects, special attention should be paid to the study of the principles of its functioning.

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The study of the principles of functioning of the informal institution of self-employment in the broad sense and the formal institution of the self-employed in a narrower sense, on this basis, is a relevant and timely task, especially taking into account the fact, that the above mentioned institutional systems are currently undergoing a period of significant transformation. The study is aimed at formulating the principles of functioning of the self-employment institution and its institutional components.

## 2. LITERATURE REVIEW

Some issues of institutionalization of self-employment have been solved in the works of Ukrainian scientists, in particular, Varga N., Grabovetska O., Kutsevolova M., Malik M., Mamchur V., however, there is still a lack of research devoted to the principles of functioning of the self-employment institution.

In some works, the processes of institutionalization of informal practices that permeate all forms of economic reality, which are a natural response to the lag of formal institutions from the real development of social relations, interests and needs (Varga, 2016), were considered, as well as the problems of regulatory and legal support of self-employment in modern conditions (Grabovetska, 2015).

In the article (Varga, 2016), the author pays attention to the processes of institutionalization of informal practices, which include, in particular, informal self-employment. The author notes that informal practices are based on the existence of a gap between the legal and regulatory framework and unwritten rules of behavior. It is substantiated that the deeper the gap, the weaker and less effective the law enforcement mechanism will be, and the more informal practices will spread. The author demonstrates that the spread of informal social practices is a natural response to the significant lag in the development of formal state authorities from the development of real social relations, needs and interests.

In the article (Grabovetska, 2015) the author examines the regulatory and legal aspects of the development of the institution of self-employment in Ukraine, on the basis of which the need for legal reforms in this area is justified. The author proposes a number of measures to improve the legal and regulatory framework in the field of self-employment regulation as the basis of the formal institution of self-employment in Ukraine in order to increase its efficiency. To develop and improve the formal institution of self-employment, the author proposes to adopt the Law „On Individual Labor Activity”, which should specify the rights and obligations of self-employed persons. In addition, the author proposes to create a professional union of the self-employed, which could become a tool for protecting their interests. The author's proposals for making appropriate additions to the laws of Ukraine „On Employment of the Population”, „On Labor Protection”, „On Pension Provision”, „On Remuneration of Labor”, „On Collective Contracts and Agreements” are also of interest. The author also substantiates the idea of improving the Tax Code, where the peculiarities of the self-employed taxation should be specified in detail, which could be useful from the point of view of „unshadowing” of individual labor activity.

In some papers attention was also paid to the study of the peculiarities of the development of self-employment in Ukraine, as well as the existing system of taxation of self-employed persons (Kutsevolova, 2018). A thorough work was carried out to clarify the content of the definition of self-employment (Malik, Mamchur, 2019).

The article (Kutsevolova, 2018) examines the peculiarities of the development of self-employment in Ukraine, in particular, analyzes the main indicators of the individual labor activity sector, which allowed to identify a tendency towards the reduction of this sector of the economy. In addition, the author conducted a social survey on the desire of people to engage in self-employment activities, which made it possible to determine a complex of main reasons that hinder the opening of their own business. The author examines the existing system of the self-employed taxation, on the basis of which the investigator proposes to solve the issue of support for the self-employment sector by the state, which should ensure a positive impact on the national economy.

In the article (Malik, Mamchur, 2019), the authors paid attention to the revealing of the category of self-employment as structured and defined by law, as well as institutional and economic criteria of the form of business. The authors define self-employment as a category of entrepreneurship, which in some industries is a formalized and institutionalized form of manifestation of entrepreneurial initiatives, and in others – an informal and non-institutionalized form of management in the market environment.

Siryi, Zaslavska (2022) in their study of the level of institutional support for youth self-employment in Ukraine note that the issue of institutional assistance to small businesses in general and self-employed youth in particular remains a major problem for Ukraine. State support for small business is limited in almost all aspects. This situation is a consequence of the absence of a clear state policy in the field of employment.

On the other hand, Pazyokha (2016), investigating the problems of youth self-employment in the modern economy (especially relevant against the background of the general trend of transformation of the labor institute into self-employment), notes that the solution to the problem of self-employment and the involvement of the youth of Ukraine in this sector requires the development of measures to prepare for successful individual activity and monitoring the dynamics of the youth's experience in the field of self-employment.

However, due attention to studying the principles of functioning of the self-employment institution has not been paid yet.

The principle of functioning of an institutional system, formal or informal, is the main feature of its mechanism organization that determines its work in historically formed socio-economic conditions. Taking into account that neo-institutional economic theory considers the concept of an institution in terms of restrictive frameworks and rules designed to regulate the economic behavior of society members, the system of principles that determine their functioning is based on the insufficiency of purely market mechanisms that determine economic expediency in its pure form.

Therefore, understanding the theoretical and methodological foundations of institutional systems should be based on the study of the mechanisms of their functioning, and the institution of self-employment (including its formal and informal components) is no exception.

Among modern Ukrainian institutionalists, it is customary to divide socio-economic institutions into formal and informal ones, in particular, this approach is followed by numerous Ukrainian specialists (Prushkivska, 2013, Rybiy, 2011, Stryzhak, 2016). However, the development of technology has led to the formation of semi-formal institutional formations in many socio-economic spheres, which are especially actively developing in those areas where the development of formal institutions occurs with some

delay. In particular, this concerns the institution of self-employment, which now has not even two, but three components: formal, informal and semi-formal.

### **3. MAIN RESULTS OF THE STUDY**

#### **3.1. Features of forming the system of principles of functioning of institutional systems in the field of self-employment**

The formal institution of self-employment is based on normative and legislative acts regulating the sphere of employment, as well as on formal economic mechanisms used for such regulation.

The informal institution of self-employment is formed by traditions, customs and norms of behavior that have been developed in the process of economic interaction between self-employed persons (partners, competitors), as well as between the self-employed and other economic actors (clients, the state, infrastructure agents, partners and competitors who are not self-employed).

The informal institution of self-employment is formed by traditions, customs and norms of behavior that have developed in the process of economic interaction between self-employed persons (partners, competitors), as well as between self-employed and other economic subjects (clients, the state, infrastructure agents, partners and competitors that are not belong to the self-employed).

Semi-formal institutional formations were formed in response to the insufficiency of formal institutions and their lagging behind the transformation processes taking place in the field of labor relations. Semi-formal institutions form unstipulated by law, but formalized rules, in particular, the rules of freelance exchanges and other Internet platforms used by the self-employed to search for orders and interact with clients, which are prescribed in the user agreement.

It should be taken into account that institutionalization implies not only the existence of rules and restrictions, but also sanctions that can be applied to their violators. A formal institution may contain sanctions such as fines and other financial penalties, prohibition to business activity for a certain period or permanently, other forms of administrative or even criminal liability. Sanctions of an informal institution are based on public condemnation, they may be manifested in the unwillingness to be a counterparty of an entity with a damaged business reputation, as well as in other forms of social pressure. A semi-formal institution uses the same economic sanctions as a formal institution (fines, penalties, prohibition of activity), but only within the subsystem in which it is formed (for example, a semi-formal exchange institution of self-employment provides for monetary penalties or prohibition of activity for a violator of the rules, but these rules are limited to the Internet platform (freelance exchange): a self-employed person may not pay a fine, but simply leave the platform, thereby avoiding financial liability, and the ban does not prevent the violator from registering on another freelance exchange or carrying out his/her labor activity in other ways).

Studying the principles on which formal, informal and semi-formal institutions operate is extremely important, especially if we take into account the fact that the rules and restrictions, the set of which forms one or another institution, can either coincide for formal, informal and semi-formal institutions, or differ significantly, or even contradict each other.

In particular, an example of the latter situation can be the adoption of legal acts designed to regulate the economic activities of self-employed persons in terms of taxation. The

formation of the formal institution of self-employment, which provides for tax liability for the self-employed, is in conflict with the informal institution of the self-employed, which has been spontaneously formed for a long period of time, during which the legal regulation of self-employment was not paid due attention.

Therefore, the study of the differences in the basic principles of formal, informal and semi-formal components of self-employment can bring practical benefits: on this basis, it is possible to develop measures for smoothing out the contradictions between the formal, informal and semi-formal systems of rules and restrictions governing the sphere of self-employment.

The principles of the self-employed institution functioning, as well as the principles of functioning of any other socio-economic institution can be classified in relation to such components of the institution as a socio-economic phenomenon forming it, namely:

- a set of rules and restrictions;
- a set of sanctions for their non-compliance (violation);
- a set of mechanisms for applying sanctions (mechanisms of enforcement to comply with rules and restrictions).

It should be taken into account that a number of principles of the functioning of institutional systems can simultaneously affect two or even three of the above components. An institution, first of all, is a system, the decomposition of which, even if it is mental, can lead to an insufficiently deep understanding of the principles of its functioning (if to consider the system, on the one hand, as a set of components that lose their functional qualities when taken outside the system itself, and on the other hand, as a set that also loses its functional qualities when physically or mentally divided into such components).

In other words, rules make sense only in case of simultaneous existence of sanctions and mechanisms for their implementation, that's why many principles of functioning of socio-economic institutions simultaneously relate to rules and sanctions, sanctions and mechanisms for their implementation, or rules, sanctions and mechanisms.

Let's consider the principles of functioning of formal, informal and semi-formal components of the self-employment institution.

Based on the authors' long-term study of the peculiarities of the institutionalization of self-employment in Ukraine, as well as on the research of Ukrainian scholars, in particular (Varga, 2016, Grabovetska, 2015, Kutsevolova, 2018, Malik, Mamchur, 2019, Siryi, Zaslavska, 2022, Pazyokha, 2016), we have formulated the following principles of the functioning of formal, informal and semi-formal components of the institution of self-employment.

### **3.2. The system of principles of functioning of the formal institution of self-employment**

Considering that the formal institution of self-employment is the result of law-making as a function of public administration (legislative branch of power), we will formulate the principles of the formal institution of self-employment, based on the positive experience of countries that have created effective formal institutional systems in the field of self-employment.

The principles of functioning of the formal institution of self-employment can be derived from the positive experience of economically developed countries:

- the principle of efficiency – functioning of the formal institution of self-employment should have a positive socio-economic effect (decrease in the level of unemployment,

reducing of the state budget expenditures on the social sphere, increase in the budget revenues at the expense of tax payments), which exceeds the state expenses for ensuring the functioning of the formal institution itself;

- the principle of legal transparency and absence of contradictions in the regulatory framework – without observing this principle, the real effective functioning of any formal institutions becomes impossible: if the set of formal rules contains internal contradictions, the main legal categories are not defined clearly enough, different interpretations of legislative norms are possible, the formal will give way to the informal or semi-formal;
- the principle of priority of state guarantees over restrictions: in order for restrictive rules and financial requirements not to cause rejection by self-employed persons, which can lead to tax evasion and circumvention of tax legislation, it is necessary to introduce supportive rules in advance, only in this case restrictive rules will be perceived as a natural and logical payment for benefits;
- the principle of financial support: in order to stimulate the transition from the category of unemployed to the category of self-employed, it is necessary to provide the latter with a guarantee that their income will not be less than that of the unemployed; otherwise, it will be economically inexpedient for the unemployed to become self-employed, to make efforts and risk their savings; an example of the implementation of this principle can be a one-time payment of all appropriate unemployment benefits in the form of start-up capital for the transition to self-employment;
- the principle of conformity of rules and sanctions: in history, there are many examples when sanctions for violating the rules were unreasonably harsh, this always leads to open or hidden resistance to the formal institution, significantly reducing its effectiveness; finding a balance between the rule and sanctions for its violation is quite a difficult task, since too weak sanctions, which are not particularly tangible for the violator, also lead to non-compliance with formal rules;
- the principle of justice: guarantees and restrictions of the formal institution of self-employment should be consistent with other interrelated institutions (the institution of entrepreneurship, the institution of labor relations, the institution of consumer rights protection, etc); rules, guarantees, restrictions, sanctions for self-employed persons should correspond to the rules, guarantees, restrictions, sanctions for small businesses, for employees, for corporate employers, and the differences are legitimate only to the extent that formal institutions are designed to stimulate or restrain a particular economic sphere. Otherwise, such phenomena as, for example, pseudo-self-employment are possible (in particular, it occurs when it is more profitable for a small or medium-sized business with hired labor to register the owner as a self-employed individual entrepreneur – lessor of premises and means of production and several self-employed individual entrepreneur tenants);
- the principle of the effectiveness of the existing mechanisms for the application of sanctions – if it is impossible to actually apply sanctions to a self-employed person in the presence of a system of restrictive rules and sanctions (for example, due to an insufficiently efficient judicial system or due to an undeveloped mechanism for collecting the evidence base in the event of a violation), the rules and restrictions will not be observed;

- the principle of effective guarantee mechanisms – if state guarantees for self-employed persons (or citizens in general) are not practically implemented (insufficient pension provision, inefficiency of the mechanism of insurance medicine, lack of real support from the state for individual entrepreneurs, etc.), this creates psychological prerequisites for non-compliance of the self-employed person's part of the social contract (tax evasion in response to the insufficient efficiency of formal institutions, the financial basis for the functioning of which is tax payments);
- the principle of compliance with existing tendencies in economic and technological development: the formal institution of self-employment should take into account the dynamics of the labor market, new tools of searching orders by self-employed persons, fintech innovations, sites and platforms that unite customers and freelancers, etc.
- the principle of compliance with the actual informal institution of self-employment: informal institutions are primary in relation to formal institutions, therefore, if the rules of the formal institution contradict the rules of the informal one, the effectiveness of the former will be significantly reduced.

Undoubtedly, the formal institution of self-employment can be formed without taking into account these principles, but the level of its efficiency will be low (namely, efficiency should be a measure of the expediency of formal institutions, the support of which is actually paid for by taxpayers).

### **3.3. The system of principles of functioning of the informal institution of self-employment**

Unlike the formal institution of self-employment, the informal component of this institutional system is formed spontaneously, and sanctions arising in case of violation of informal rules and restrictions are usually softer for the violator. Nevertheless, there are often exceptions when sanctions of informal institutions can be much harsher than formal sanctions: for example, a driver who created an accident in a state of intoxication can be beaten or even crippled by an angry crowd, while on the part of formal institutions it can result in a fine and deprivation of rights; serious troubles from the informal institutional system can also await a trader of low-quality food, especially if it ended in mass poisoning.

Particularly harsh sanctions on the part of informal institutions take place in a situation of weak formal institutions, disproportionately weak sanctions for violations or non-functional mechanisms of their applying to violators.

All sanctions of informal institutions can have three sources, which determines the mechanism of their application:

- sanctions on the part of the violator – include reproaches of conscience, feelings of guilt, intrapersonal conflicts and other similar manifestations of personal ethics as a form of internalization of rules and restrictions of formal institutions;
- sanctions from the contractors of the violator – such sanctions are applied within the contract, voluntarily or with the participation of judicial institutions; in this case, the contract signed by both parties acts as a kind of local „law” for two counterparties; in addition, a systematic violation of informal rules by one of the counterparties can cause another counterparty to be reluctant to cooperate with him in the future;
- sanctions from third parties – damaged business reputation, information about low-quality goods or services is spread among potential counterparties, clients, buyers,

as a result, the violator staying without necessary business partnerships and sales markets.

Based on this, the following principles of functioning of the informal institution of self-employment can be formulated:

- the principle of compliance with the ethical imperatives of a particular community: if tax evasion is condemned in society and, at the same time, denunciation of neighbors is welcomed, self-employed persons will have more motivation to operate exclusively within the framework of the legal field than in a society where tax evasion is welcomed, and denunciation on neighbors and acquaintances is condemned (in this case, self-employed persons will prefer to work „in the shade”).
- the principle of compliance with the market laws: self-employment is an integral component of the market economy, therefore the formation of the price of a service, focus on customer needs, the rules of fair competition – all these aspects are integrated into the informal restrictions of this institutional system;
- the principle of priority of contractual obligations: regardless of whether a formal contract is concluded or not, in the self-employment segment, an insufficiently responsible approach regarding compliance with deadlines, declared quality parameters, volumes, as well as terms and methods of payment by the customer is not welcomed; violators of such obligations are „punished” by the informal institution of self-employment, first of all, by reducing the number of clients or counterparties ready for cooperation;
- the principle of „workshop fraternity” – mutual support of independent professionals, entrepreneurs working in the same economic sphere, handmade masters and other self-employed persons is manifested in the organization of informal communities in social networks, members of which share personal experience and life hacks with each other, as well as in a kind of territorial mini-clustering, in establishing informal standards and rules that ensure a balance between competition and benefits from unity and cooperation;
- the principle of „transition” of informal norms into formal ones – social norms arising in professional communities have a tendency to later become established as norms of formal institutions;
- the principle of sensitivity of informal norms to the rules and restrictions of formal institutions: in the long run, formal norms tend to be internalized by society, integrating into informal institutions (in particular, the standards of taxpayer responsibility inherent in economically developed countries have been inculcated as a norm of informal institutions for quite a long time).

Among the principles of the informal institution of self-employment, there is no principle of efficiency, since informal rules and restrictions have sufficient flexibility, they are formed evolutionarily under the direct influence of socio-economic phenomena of a certain historical period, therefore they are a priori effective within a specific society. If later some informal norms, rules and restrictions lose their relevance, they can be transformed in accordance with new realities. In particular, this can be traced on the example of changes in the social status of private entrepreneurs in the post-Soviet economic space.



### **3.4. The system of principles of functioning of semi-formal institutional formations in the sphere of self-employment**

The principles of functioning of semi-formal self-employment institutions are partly borrowed from the principles of formal institutions, but mostly coincide with informal ones:

- the principle of efficiency – since semi-formal institutions, like formal ones, are secondary to informal ones, they should be based on the principles of efficiency, otherwise they will not be accepted by the society; for example, such semi-formal institutional formations as freelance exchanges are in demand by both self-employed and clients only as long as they benefit both parties, and only then the latter will agree to follow the semi-formal rules of such platforms;
- the principle of competition – unlike formal and informal institutions, semi-formal institutional formations do not occupy a monopoly position, therefore their rules and restrictions are automatically standardized;
- the principle of priority of advantages over restrictions: on the one hand, it is a consequence of the previous principle (competition between semi-formal institutional formations in the field of self-employment forces them to improve the service, usability of sites, expand the set of useful tools, apply elements of gamification), and on the other hand, it corresponds to the principle of priority of guarantees over restriction inherent in the formal institution of self-employment;
- the principle of guaranteeing the material interests of self-employed people and their clients: working through freelance platforms protects the self-employed from the risk of non-payment for quality work, and their clients from the risk of missing deadlines and the risk of low-quality work, therefore the rules of such semi-formal institutional formations clearly stipulate and standardize the main points of such interaction;
- the principle of payment: unlike formal self-employment institutions, semi-formal institutions cannot guarantee income and should not do so, since their task doesn't include reducing unemployment or social tension; moreover, semi-formal self-employment institutions are services that serve the interests of the self-employed and clients on a paid basis (most often in the form of commissions);
- the principle of conformity of rules and sanctions: as well as the principle of priority of advantages over restrictions, it corresponds to the principles of an effective formal institution of self-employment and, at the same time, is dictated by the competitive situation in the market of freelance services – the discrepancy between the importance of the rules and possible sanctions for their violation can repel a significant part of the potential audience of self-employed and those interested in their services;
- the principle of justice: the rules and restrictions should be the same for all users of the service, which is a semi-formal institutional formation in the field of self-employment, guarantees and advantages may differ for different categories of users (this serves as an incentive to improve their professional level and acts as an element of gamification), but the algorithm of moving from one category to another should be open and transparent (users should understand what should be done in order to receive more benefits and guarantees);
- the principle of the effectiveness of sanctions mechanisms - some of the rules and restrictions of semi-formal institutional formations in the form of online services can be ensured by automatic sanctions built into the software part of the online platform

(for example, automatic downgrading in case of insufficient quality and/or insufficiently active work, which leads to a reduction in available benefits and opportunities), and some require a staff of moderators to resolve conflict situations in manual mode (application of financial sanctions, partial or full ban); an effective sanctioning mechanism is designed to prevent insufficiently responsible attitude to the obligations assumed (which is possible both on the part of self-employed persons and their clients);

- the principle of effectiveness of the mechanisms for providing benefits and guarantees – is also partially implemented in the form of automatic transition of the user to a higher category, provided that certain results are achieved, and partially may require direct moderation (in particular, when providing guarantees in the event of a conflict situation between a self-employed person and his client);
- the principle of compliance with existing tendencies in economic and technological development – semi-formal institutional formations are particularly sensitive to the development of technology, for example, in recent years, in addition to freelance platforms implemented in the form of Internet sites, appropriate smartphone applications have appeared to facilitate the work of self-employed persons, and semi-formal communities implemented in messengers are gradually gaining strength as a competing technology;
- the principle of conformity with the formal and informal institution of self-employment: semi-formal institutional formations in the field of self-employment arise in response to the inadequacy of the formal institution, which „does not keep up” with the labor relations market, which is dynamically developing; at the same time, they are based on the informal institution, which is not always able to provide sufficiently significant (and, at the same time, balanced) sanctions for violators of rules and restrictions; at the same time, informal institutional formations operate within the framework of the formal legal field of a specific country, therefore they should not contradict formal institutions;
- the principle of compliance with the laws of the market: semi-formal institutional formations, represented mainly by online freelance exchanges and Internet platforms, where the interests of the self-employed as service providers and companies-consumers of such services intersect, work according to the principles of the market, where supply and demand meet, forming average prices for the services of self-employed persons of a particular qualification level;
- the principle of priority of contractual obligations: failure to comply with the requirements of the contract (technical specifications) in terms of time or quality parameters by the self-employed leads not only to direct financial sanctions (no payment), but also to indirect ones: deterioration of business reputation (negative feedback in the profile), downgrading (reduction of available benefits), temporary or permanent ban (loss of access to the platform);
- the principle of „workshop fraternity”: is implemented through the mechanism of mutual information and methodological support of participants of a semi-formal institutional formation by means of communication on the forum of the Internet platform;
- the principle of absorption of norms, rules, and restrictions from formal and informal self-employment institutions: semi-formal institutional formations that exist in the

modern self-employment segment are secondary in relation to the formal and informal components of the self-employment institution, so most of the norms, rules, and restrictions adopted in them are borrowed from formal and informal institutions;

- the principle of flexibility and adaptability – the successful functioning of semi-formal institutional formations in the field of self-employment is possible only under the condition of rapid response to both socio-economic and technological tendencies and legislative innovations in the field of the formal institution of self-employment;
- the principle of globalization – semi-formal institutions of self-employment often go beyond the borders of a single state, uniting the self-employed and the corporate segment interested in their services in several countries at once; this is especially true for the IT sphere.

#### 4. CONCLUSIONS

Thus, speaking about the principles of functioning of the institution of self-employment, it is necessary to have a clear understanding of which component of this institution – formal, informal or semi-formal – is meant, because the principles of functioning of each of these components have significant differences, although some of the principles are common (especially for semi-formal institutional formations, the principles of functioning of which largely overlap with both the formal institution, functional deficiency of which such formations are designed to fill, and with the informal institution of self-employment, which is a direct source of semi-formal formations).

Understanding the principles of functioning of all three components of the institution of self-employment can be the basis for resolving the contradictions arising in the sphere of self-employment between formal and informal institutions. Semi-formal institutions, unlike the informal self-employment institution, have more effective and logical mechanisms for applying sanctions to violators of norms, and unlike the formal institution, they have a much higher level of flexibility and adaptability. The emergence of semi-formal institutional formations in the evolution of the institution of self-employment should be the subject of deeper scientific research as a potential source of forming a more effective model of the institution of self-employment that corresponds to the realities of the socio-economic system that is developing in the context of forming the Industry 4.0 paradigm.

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