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DETERMINANTS OF ALGERIA NATURAL GAS EXPORTS: USING A VECTOR ERROR CORRECTION MODEL (VECM)

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Abstract

The present research tries to determine the cause and variables influencing Algeria's natural gas exports between 1980 and 2022. The Granger causality test was performed to ascertain whether there were causal linkages between the variable, and the vector error correction model (VECM) was used to assess whether there were long-and short-term relationships between the variables. According to the study's findings, the factors have just one cointegrating line. Natural gas production, internal gas consumption, and their effect on Algeria's natural gas exports were all statistically related, according to our research using the least squares method.

***Keywords**: Natural gas; Cointegration; VECM; Granger causality; Algeria.*
***JEL Codes :** C4, Q32, Q43*

Introduction

Algeria is one of the most prominent countries with a rentier economy, which depends mainly and heavily on depleted natural resources such as oil and natural gas, as hydrocarbon exports constitute more than 90% of total exports. In addition to that, Algeria is one of the largest producing and exporting countries of natural gas, as Algeria ranked tenth among the top 10 natural gas producers in the world during the year 2021, with a production capacity estimated at 100.8 billion M^3 (about 2.5% of global natural gas production). As for natural gas exports, Algeria ranked ninth in the world with a value of 39 billion M^3 and first in Africa. Natural gas exports in Algeria increased to 56 billion M^3 in 2022.

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This is due to factors determining natural gas exports, including production capacity, domestic consumption of gas, and total reserves of natural gas, in addition to other factors represented in the geopolitical factors the world is going through (Khelifa, Mezouaghi, & Bachouche, 2020).

At the end of 2022, Algeria's estimated natural gas resource value was 450 trillion cube meters (Tm^3), which places it 7th in the world. Additionally, domestic natural gas consumption rose by 6,5% in 2021 to a total of 17,9 million tons.

The volume of natural gas exports is determined by a set of factors. This research paper addresses the problem of identifying these factors and measuring their impact on natural gas exports.

In this context, the problem of our study revolves around the following question:

What elements influence Algeria's exports of natural gas?

The following theories were put up in an effort to provide an answer to the study's main question:

H1: Each production has a statistically significant correlation with each other;

H2: There is a cointegration relationship between the study variables in the long run.

Literature review

Concept of Natural Gas

Specialists define natural gas as a mixture of gaseous hydrocarbons that are found underground. It can exist with oil (called "associated gas") or in its fields (called "non-associated gas, and methane gas is considered one of the most essential and abundant components of natural gas, in addition to other components in the lowest percentage represented in ethane, propane, and butane. (Aktemur, 2017).

A descriptive study of the determinants of natural gas in Algeria during the period: 1980-2022

The following tables show the annual time series data for natural gas determinants in Algeria represented by: natural gas exports, natural gas production, natural gas consumption, and natural gas reserves in Algeria during the period 1980-2022, as follows:

Evolution of Natural Gas consumption in Algeria

Natural gas consumption in Algeria was estimated to be approximately 45.8 billion cubic meters (bcm) in 2021, or 1.1% of global consumption. The figure below shows the evolution of natural gas consumption in Algeria from 1980 to 2022.

Figure no. 1 Natural gas consumption in Algeria from 1980-2022.

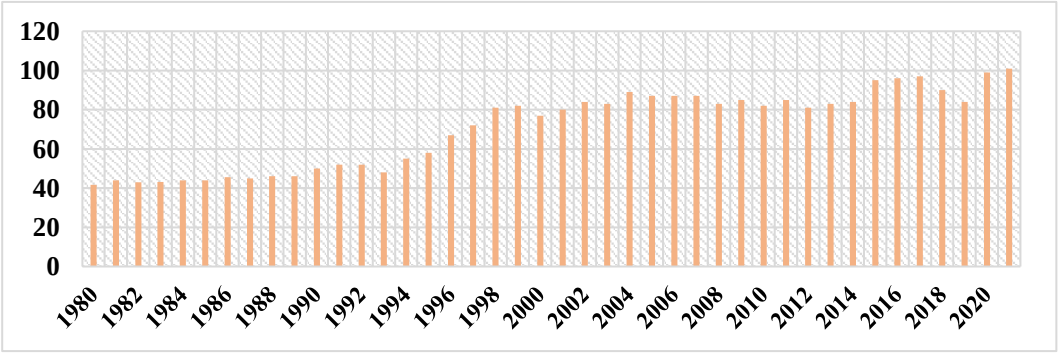
Source : Energy Institue, 2023

The figure shows that natural gas consumption in Algeria has been increasing steadily since 1980, from 12 billion cubic meters (bcm) to 46 bcm in 2022. This increase can be attributed to the parallel increase in natural gas production during this period.

Evolution of Natural Gas production in Algeria

The national company, Sonatrach, is considered among the most significant international companies exporting natural gas, as the latter expanded its gas facilities (Yekhtar & Abderrahmane, 2013) and thus increased production capacity, which amounted to approximately 100.80 billion M^3 in 2021, i.e., contributing 2 % to 5% of the global production of natural gas. The graph below shows the evolution of the quantities of natural gas produced in Algeria between 1980 and 2022.

Figure no. 2 Natural gas production in Algeria from 1980-2022.



Source : Energy Institue, 2023

The figure above shows that the production of natural gas in Algeria has been increasing steadily since 1980, when it was about 40.9 billion M^3, to reach 2022 approximately 100.8 billion M^3.

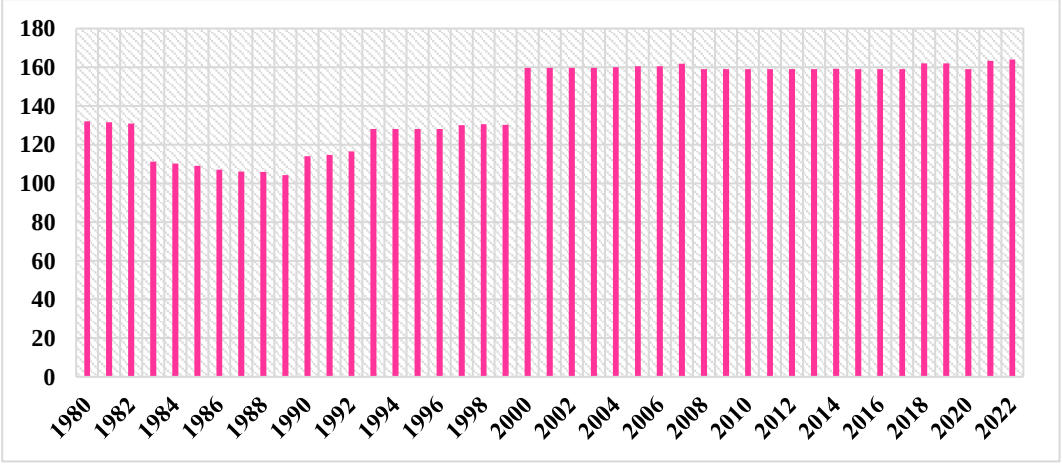
The legislation and laws reflected in the protective measures implemented in the year 2009, which specified the percentage of foreign investors' participation in the capital of significant projects, are what account for the slight decline in natural gas production that we observed between 2004 and 2014.

Production began to rise continuously and rapidly, especially since 2015, this is mainly due to the pace of intensive gas production pursued by the Ministry of Energy to value and exploit all discovered fields, and this is done according to two strategies: the first depends on exporting large quantities of natural gas to the European market through pipelines, and to other markets in the form of liquefied gas, and the second depends on the intensification of internal use and an increase in its consumption in the local market as an energy source. (Boulasal & Soufan, 2021).

Evolution of Natural Gas reserves in Algeria

Algeria's natural gas reserves amounted to about (4.5 trillion M^3) by the end of 2022. With the beginning of the current year of 2023, Algeria has made considerable investments in searching and exploring new fields to raise production and increase its reserves of natural gas. The graph below shows Algeria's natural gas reserves' evolution between 1980 and 2022.

Figure no. 3 Natural gas reserves in Algeria from 1980-2022.



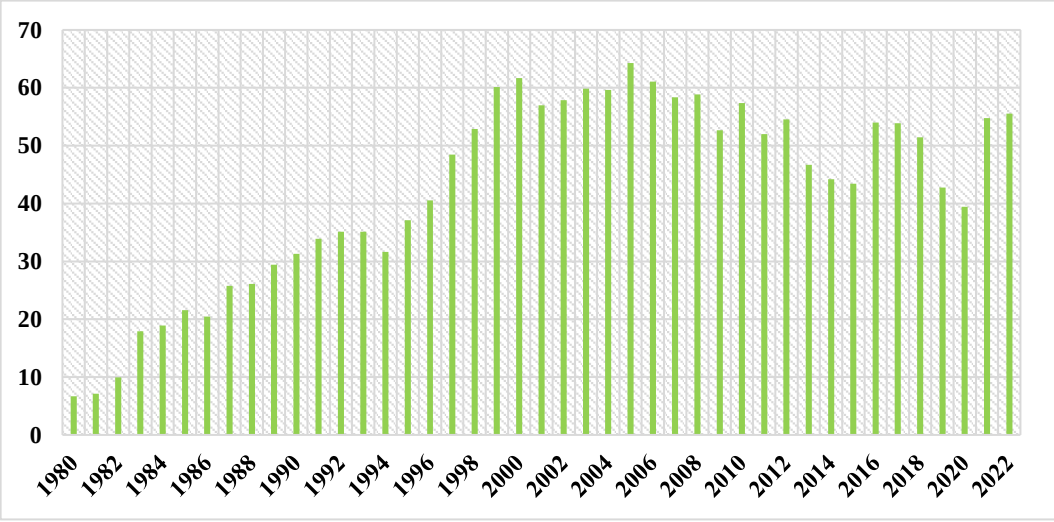
Source : Energy Institue, 2023

The graph shows that Algeria's natural gas reserves have remained relatively stable over the past four decades. From 2005 to 2019, the reserves stayed at around 4.3 (Tcm). There was also no significant change in the reserves during the period from 2001 to 2004, when they were estimated at 4.4 Tcm. In 2021, Algeria's natural gas reserves were estimated at 4.5 Tcm.

Evolution of natural Gas exports in Algeria

The critical position Algeria currently holds, and the gas reserves it owns significantly contributed to the development of Algeria's natural gas exports to the largest global market for gas. As a result, Algeria is currently regarded as one of the most significant natural gas suppliers to the European market. Actually, Algeria achieved a record in its natural gas exports during the year 2022, with natural gas exports totalling about 56 billion M^3. The graph below illustrates the growth of Algeria's natural gas exports between 1980 and 2022.

Figure no. 4 Natural gas exports in Algeria from 1980-2022.



Source : Energy Institue, 2023

The above chart shows that natural gas exports in Algeria fluctuated significantly between 2000 and 2020. This was due to several factors, including geopolitical factors and the decline in production between 2004 and 2014, caused by the protective measures, legislation, and laws approved by the Algerian government in 2009.

Recently, Algerian liquefied gas exports recorded a qualitative leap, especially during the first quarter of 2023, and this is due to the increase in shipments to the European

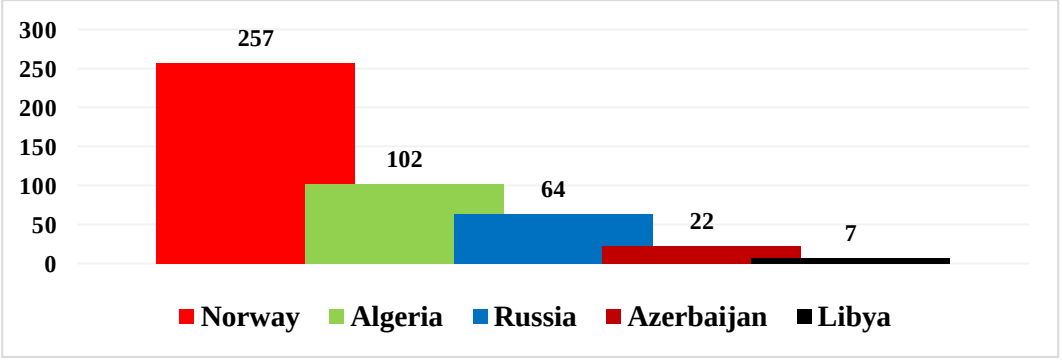
market, as exports rose to about 2.8 million tons during the first quarter of 2023. Gas exports also recorded that Algerian liqueurs decreased in 2022 by 12.8% compared to 2021, from 11.48 million tons to 10.2 million tons.

It is also mentioned that Algeria ranked fourth among the list of the largest exporters of liquefied natural gas to the European market, with a total value estimated at 10.2 million tons in 2021, behind Russia, Qatar, and the United States of America, which came on top of the list.

Algerian Natural Gas exports through pipelines

Algerian natural gas exports exceeded the barrier of 100 million M^3 per day during the first quarter of 2023, supported by Italian demand for energy supplies from Algeria. The graph below shows a map of natural gas orders through pipelines to European Union countries.

Figure no. 5 Algeria's ranking of natural gas exports through pipelines (million M3 per day)



Source : www.attaqa.com, Consultation Date : 04/08/2023

From the above figure, it is clear that: Algerian gas exports exceeded the exports of 3 major countries, Russia, Azerbaijan, (Hamidova, 2018), and Libya, and only Norway preceded them in the list, with total exports amounting to about 257 million M^3 of gas per day, as Algerian gas exports came by approximately 102 million M^3 per day, and ranked second.

Research methodology

A time series dataset of 42 years (from 1980 to 2022) was used for the independent and dependent variables to achieve the study's objectives. The data was collected from the World Energy Statistics reports (IEA, 2023; OPEC, 2023), the Worldometer, and previous studies.

This study employed a unit root test, cointegration test (Engle & Granger, 1987), VECM approach to lead the stationarity test to examine the short-run and long-run linearity relationship among the variable, and Granger Causality test (1969). (Meyer & Sanusi, 2019)

Results and discussion

Before discussing the results, we decided to build a standard model that shows the determinants of gas exports in Algeria: gas production, gas consumption, and gas reserves. Therefore, the model form would be:

$$\boldsymbol{EXGAS = f(CGAS; PGAS; RGAS)} \dots\dots\dots (\mathbf{1})$$

Where:

EXGAS: represents Natural gas exports.

CGAS: Domestic consumption of natural gas.

PGAS: Natural Gas production.

RGAS: Natural Gas Reserves.

Stationarity Tests

We use the Augmented Dickey-Fuller Test and Philips-Perron Test (ADF & PP) (Amassoma, Sunday, & Onyedikachi, 2018) (Dickey & Fuller, 1981) (Philips & Perron, 1988), the results of these tests are shown in Table 1 and Table 2:

Table no. 1 – Augmented Dickey-fuller (ADF) Test findings

Variable code	Level				First Difference			
	Constant		Constant, linear trend		Constant		Constant, linear trend	
	t-Statistics	P	t-Statistics	P	t-Statistics	P	t-Statistics	P
EXGAS	-2,1569	0,2245	-1,6887	0,7387	-6,1974	**0,0000**	-6,4310	**0,0000**
CGAS	1,3546	0,9985	-1,6517	0,7547	-5,7821	**0,0000**	-6,0652	**0,0000**
PGAS	-0,6250	0,8540	-2,1059	0,5276	-6,5006	**0,0000**	-6,4172	**0,0000**
RGAS	-1,1628	0,6816	-0,7030	0,9663	-6,8953	**0,0000**	-7,1575	**0,0000**

Source: The outputs Eviews.12

Table no. 2 – Phillips-Perron (PP) Test findings

Variable code	Level				First Difference			
	Constant		Constant, linear trend		Constant		Constant, linear trend	
	t-Statistics	P	t-Statistics	P	t-Statistics	P	t-Statistics	P
EXGAS	-2,2952	0,1782	-1,6141	0,7704	-6,1959	**0,0000**	-8,1866	**0,0000**

CGAS	1,3546	0,9985	-1,6676	0,7479	-5,7674	**0,0000**	-6,0652	**0,0000**
PGAS	-0,5089	0,8793	-2,2016	0,4764	-6,5870	**0,0000**	-6,4880	**0,0000**
RGAS	-0,7190	0,8309	-2,4041	0,3723	-6,2249	**0,0000**	-6,1931	**0,0000**

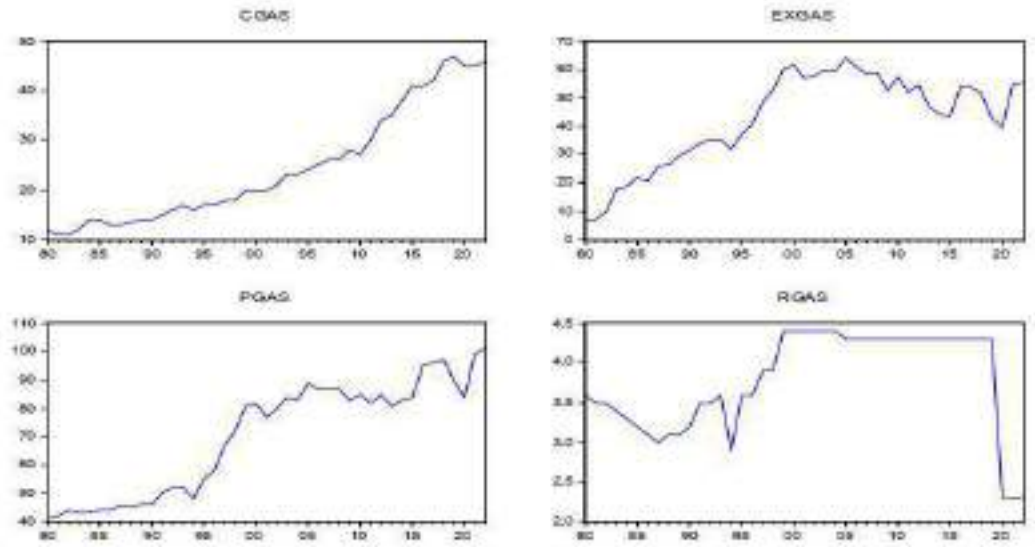
Source: The outputs Eviews.12

Is can be seen from the results of the unit root for all-time series that it is unstable at the level, meaning stable at the first difference, and this indicates the presence of the unit root.

After making the first differences on the time series after entering the logarithm and re-testing the stability, we noticed that the series does not have a unit root, and it stabilized after we made the first difference.

It was possible to draw observations of the variables to know their general trend, as the chart below shows some of the characteristics of the studied time series. It can be seen from Figure.6 that it suffers from the problem of the general trend, which indicates the instability of the analyzed time series.

Figure no. 6 shows the trend of the study variables in time.



Source: The outputs of Eviews.12

Studying the association between the study variables

After testing the stability of the time series of the study variables, we will try in this step to test the degree of correlation between the study variables. The obtained results are shown in Table 3.

Table no. 3 – The degree of correlation between the study variables

	CGAS	EXGAS	PGAS	RGAS
CGAS	1	0,54537423508	0,84853664491	0,76657436701
EXGAS	0,54537423508	1	0,87652068502	0,75608161867
PGAS	0,84853664491	0,87652068502	1	0,91529843554
RGAS	0,76657436701	0,75608161867	0,91529843554	1

Source: The outputs of Eviews.12

From the results of the above table, it is clear that:

- There is a medium positive relationship between the consumption and exports of natural gas in Algeria, with a value of (0.5453).
- There is a strong direct relationship between the production and exports of natural gas in Algeria, with a value of (0.8765).
- There is a strong direct relationship between natural gas reserves and exports in Algeria, with a value of (0.7560).

Cointegration Test- Johansen-Juselius

After verifying the first condition, the stability of variables of the same degree, we estimate the long-term relationships using the ordinary least squares method— Here, we use the Johansen-Juselius Cointégration test to study the relationship in the long run because time series are unstable over time (Ferdousi & Qamruzzaman, 2017) or using the (Johansen (Johansen & Juselius, 1990) eigenvalue test and the most significant plausibility ratio test (the most excellent probability) to find out the order of simultaneous integration.

Determine the number of rays of co-integration

In the following, we aim to determine the number of rays of co-integration between the study variables using the Johansen test, which is based on the effect test, and the maximum eigenvalue test.

Table no. 4 – Johansen-Juselius Cointegration tests results

Trace Test			
Null	**Trace Statistic**	**5% critical value**	**Prob.**
$r = 0$	**60,959338**	**47,85613**	**0,0019**
$r \leq 1$	26,75980	29,79707	0,1076
$r \leq 2$	5,922826	15,49471	0,7046
$r \leq 3$	0,056322	3,841466	0,8124
Maximum eigenvalue Test			
Null	**Max-Eigen Statistic**	**5% critical value**	**Prob.**
$r = 0$	**34,19958**	**27,58434**	**0,0061**

$r \leq 1$	20,83697	21,13162	0,0549
$r \leq 2$	5,866503	14,26460	0,6304
$r \leq 3$	0,056322	3,841466	0,8124

Source: The outputs of Eviews.12

Because the Maximum Eigenvalue and trace statistic value are greater than the Critical Value at 5% ($60{,}959338 > 47{,}85613$); ($34{,}19958 > 27{,}58434$) and are significant($0{,}0019 < 0{,}05\,;\ 0{,}0061 < 0{,}05$). Since the variables are co-integrated, we proceed to model the chosen variables using the Restricted VAR Model (VECM) rather than the Unrestricted VAR model.

Model estimation

Choosing the optimum Lag

The first step in VECM model validation, which is essential for time series data analysis, is to select the optimal lag by comparing each lag to the chosen criterion. The results in Table 4 show that the optimal lag is 1 according to the LR, FPE, AIC, SC, and HQ selection criteria. (Akaike, 1974). The maximum values from each of the information criteria are marked with an asterisk (*), which indicates that these are the preferred models. We carried out additional tests using a delay of 1 and one cointegration between the variables to verify the VECM model.

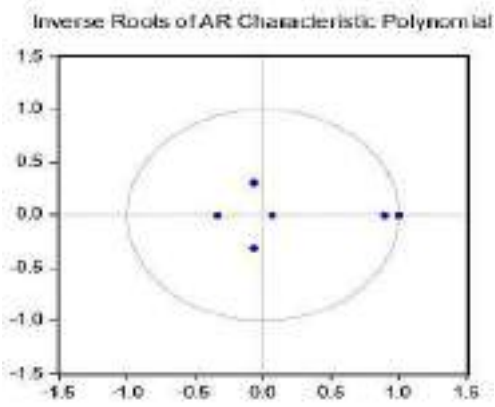
Table no. 5 – Results of LB (Q-statistics)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-413,3310	NA	23158,77	21,40159	21,57221	21,46281
1	**-233,4873**	**313,5738***	**5,225311***	**12,99935***	**13,85246***	**13,30544***
2	-222,0582	17,58324	6,794439	13,23375	14,76935	13,78471
3	-207,0439	20,01897	7,680757	13,28430	15,50239	14,08013
4	-188,4562	20,97080	7,769052	13,15160	16,05217	14,19230

Source: The outputs of Eviews.12

The Roots of characteristic Polynomial Stability Conditions Tests for Model stability, the Breusch-Godfrey Serial correlation LM, the Breusch-Pagan-Godfrey Heteroscedasicity Test, and the Jaque-Bera Test for Normality Tests were used to evaluate the sufficiency of the VECM model. The Roots of the characteristic Polynomial Stability Conditions analysis results (Figure 7) show that the VECM model satisfies stability conditions because all of the roots are situated in the unit circle.

Figure no. 7 Stability graph for VECM



Source: The outputs of Eviews.12

Granger Causality Test

After performing the co-integration Test, which reveals a relationship between the variable over the long term, we will us the Granger-Causality test to determine the direction of this relationship. (Patonov, 2020) This is illustrated in Table 6.

Table no. 6 – Results of Granger-Causality examination

	EXGAS	**CGAS**	**PGAS**	**RGAS**
EXGAS	-----	0.64808 (0.5290)	0.01200 (0.9881)	1.72076 (0.1933)
CGAS	1.80108 (0.1797)	-----	2.29974 (0.1148)	2.25638 (0.1193)
PGAS	0.01650 (0.9836)	0.75518 (0.4772)	-----	3.96723 **(0.0277)***
RGAS	3.75539 **(0.0330)***	0.81353 (0.4513)	5.43980 **(0.0086)***	-----

Source: The outputs of Eviews.12

Given the above Granger causality test results for the short term, which show that there a bilateral relationship (in both directions) between natural Gas production and natural gas reserves, the null hypothesis can be rejected and the alternative hypothesis can be accepted ($Prob = 0{,}0277 < 0{,}05$) and ($Prob = 0{,}0086 < 0{,}05$). Therfore, it may be claimed that natural gas reseves cause gas production and vice-versa. Additionally, there is a one-way relationship ($Prob = 0{,}0330 < 0{,}05$) between natural gas reserves and natural gas exports, i.e., natural gas reserves cause natural gas exports.

Table no. 7 – Results of the Least Square Method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15.60446	4.840060	-3.224023	0.0026
CGAS	-1.039736	0.149424	-6.958313	0.0000
PGAS	1.230109	0.095303	12.90733	0.0000
RGAS	-0.749007	1.607578	-0.465923	0.6439
R-squared	0.909361	Mean dependent var		42.58949
Adjusted R-squared	0.902388	S.D. dependent var		16.41334
S.E. of regression	5.127999	Akaike info criterion		6.195716
Sum squared resid	1025.559	Schwarz criterion		6.359549
Log likelihood	-129.2079	Hannan-Quinn criter.		6.256133
F-statistic	130.4254	Durbin-Watson stat		0.209653
Prob(F-statistic)	0.000000			

Source: The outputs of Eviews.12

The results of the table show that natural gas reserves are not a significant factor affecting gas exports in Algeria, as the p-value is 0.6439, which is greater than the significance level of 0.05. However, natural gas consumption is a significant factor affecting gas exports, as the p-value is 0.000, which is less than the significance level of 0.05. This means that an increase in natural gas consumption in Algeria by one unit is associated with a decrease in the volume of gas exports by 1.03 units.

The study also found that natural gas production is a significant factor affecting gas exports, as the p-value for natural gas production is statistically significant, with a value of 0.0000, which is less than the significance level of 0.05. This indicates that there is a positive relationship between increasing natural gas production and exports.

The correlation coefficient between the variables in the model is also strong, as confirmed by the results of the correlation test and the simultaneous integration test. The adjusted R-squared value indicates that the relationship between the independent variables (natural gas consumption, natural gas production, and natural gas reserves) and the dependent variable (natural gas exports) is estimated to be 90.23%. This means that only 9.77% of the variation in natural gas exports is due to variables outside the model.

Conclusion

Our study found that natural gas exports in Algeria are primarily influenced by three factors: production, consumption, and natural gas reserves. These factors account for 90% of the variation in natural gas exports, with the remaining 10% due to other factors.

The study also found that there is a statistically significant positive correlation between natural gas production and exports, and between natural gas consumption and exports. This confirms the first and second hypotheses of the study.

The study did not find a statistically significant correlation between natural gas reserves and exports, which negates the third hypothesis.

Finally, the study found that there is an inverse relationship between domestic consumption of natural gas and natural gas exports. This means that an increase in consumption of natural gas in Algeria is likely to be followed by a decrease in the volume of exports of natural gas.

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A DIRECT SURVEY ON SHADOW ECONOMY AND ITS CAUSES: THE CASE OF NORTH MACEDONIA

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Abstract

The goal of this research paper is to assess the magnitude of the shadow economy and identify its main causes by a direct survey approach. The survey is designed to extract information needed to estimate the shadow economy by assessing the main types of economic activities that are carried out in the parallel economy based on the responses of the owners/managers, considering that they are most acquainted with the informal economic activities in their industry. The obtained results show that the magnitude of shadow economy in North Macedonia is about 21%. The index exposes that the shadow economy is relatively high, but it is lower compared to previous estimates using the indirect methods of estimation. The findings also reveal that bribery and corruption, the low quality of public services, the burden on social security contributions and the lack of sound policies to support small and medium businesses are the main factors that continue to lie at the roots of shadow economy in North Macedonia.

Keywords: *shadow economy; direct method; magnitude; causes.*
JEL Codes: *H26, H32*

Introduction

Research on the shadow economy and informal economic activities began to attract attention around the beginning of the 1960s. However, in the last two decades, economic

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researchers express more interest in estimating it, for both developing and developed countries (see estimates of Schneider et al. 2010; Medina and Schneider, 2018; Elgin et al. 2021). Statistical data and estimates at the world level show that the shadow economy is becoming a real socio-economic phenomenon of modern times. Thus, there is common agreement among the research community and economic policy makers that the share of economic activities that take place outside the official economy is significantly large, so that the presence and prevalence of the shadow economy is a reality throughout the world. Moreover, Sadiku et al. (2015) point out that shadow economies are an integral part of most countries of the world, regardless of their respective level of development. However, in developing and transition countries, the informal economic sector is almost institutionalized, thus there is a qualitative difference between the informal economic sector of developed countries and the informal economic sector of less developed economies. Gërxhani (2004) provides a comprehensive study on differences between the shadow economy in developed and developing countries.

Based on the recent estimates of Medina and Schneider (2018), the shadow economy has reached high proportions at the world level, in an average value of 31.9% of GDP over 1991 to 2015, including 158 countries. However, Europe is characterized by a decline of the level of shadow economy, from about 25.79% of GDP over 1991-1999, to about 20.20% of GDP over 2010-2015 period.

As for the Republic of North Macedonia, which is the focus of this research, according to Elgin et al. (2021), is characterized by a high degree of shadow economy of about 33.6% of the official GDP in 2018. While, according to other recent research by national institutions and authors, estimates vary depending on the used estimation approach, from 20%-45% of GDP for different time periods. Unanimously, studies show that the main causes of the shadow economy of North Macedonia are bribery and corruption, taxes and social contributions, the intensity of regulation, bureaucracy, and the high unemployment.

The shadow economy is a complex phenomenon, determined by numerous economic, institutional, regulatory, social, and cultural factors. These factors generally influence individuals and firms in deciding whether to remain formal or informal. Moreover, the activities carried out in the shadow economy have serious economic, social, and political implications, that include, among others, the following: lower tax revenues from economic activities, inadequate penetration and slower growth of the official banking sector, inadequate economic planning based on incomplete information, unfair competition, lack of protection of workers' rights, and perverse synergy of the shadow economy with other illegal activities (Sadiku et al. 2015). Also, the large shadow economy represents a serious problem for public finances, and as a result, negatively affects the

provision and quality of public goods (Johnson et al. 1997). Moreover, the large presence of the shadow economy in a country causes enormous difficulties in the process of designing and implementing national economic policies, so it is very important to estimate its size to avoid disturbing the balance of the economy. Therefore, due to its multidimensional and complex nature, research on the shadow economy presents a huge challenge to the research community trying to assess its size through the various approaches available in the literature (see Schneider and Buehn, 2016). While there are several multinational studies involving the Republic of North Macedonia, very few domestic researchers have attempted to estimate the size of the shadow economy. Despite the economic, social, and political importance of the problem, so far there is a very limited number of research articles on this phenomenon. As a result, the main goal of this paper is to offer interested readers and policy makers an insight into the magnitude and causes of the shadow economy based on the direct method.

Literature Review

In recent years, the interest in estimating the size of the shadow economy for the Republic of North Macedonia is starting to grow. It contributed to gradually alleviate the lack of literature on this topic, which characterized the previous period. The previous research produces different estimates, even for the same year depending on the used method. But without doubt, despite different estimates, the shadow economy of the country is large, at least by European standards, and it fluctuates between 26%-35% of GDP. Among the multinational studies of a group of countries in which North Macedonia is included is that of Schneider, Buehn and Montenegro (2010), in which the shadow economy in 2007 was estimated at about 35% of the official GDP. Surprisingly, Elgin and Oztunali (2012) arrive at the same figures for the same year, but through a different approach. Observing in their results, the size of the shadow economy changes in minimal percentages during the years 2000-2008. The most recent estimates of shadow economy conducted by Elgin et al. (2021) suggest a slight decrease of the same, being 33.6% of GDP.

Regarding the national studies, it has been used both the indirect and direct estimation approaches. Based on indirect approaches, Nikolov (2005) tries to estimate the size of the shadow economy through the method of electricity consumption for the period 1996-2004. He first estimates the shadow economy as a percentage of GDP, and then uses these estimates to estimate informal employment. The obtained results show that the shadow economy is declining from 40.3% of GDP in 1996 to 35.5% in 2004. Using the obtained results and under the assumption that unofficial economic output (added value) and unofficial employment have the same percentage share in the economy, which is

equivalent to the assumption that productivity is identical in the official and unofficial sectors. In this way, the author comes to the results that in 2004 in North Macedonia there were 109,300 people employed in the informal sector. This allows him to recalculate the unemployment rate, and gets it to be 24% for 2004, instead of the official unemployment rate of 35.3% for the same year.

Sadiku (2015) estimates the size of the shadow economy of North Macedonia for the period 1998-2014 through the indirect methods of the monetary approach and MIMIC method. The results show that the shadow economy was large in the period 1996-2003, but it decreased afterwards, reaching about 30% of the official GDP in the period 2010 - 2014. This was confirmed by both methods of the monetary approach and MIMIC method. The paper concludes that this reduction was attributed to the simplification of the tax system, regulatory reforms to start new business, customs reforms, and an improved transition index.

Garvanlieva, Andonov and Nikolov (2012) use two indirect methods for estimating the shadow economy of North Macedonia, that is, the method of electricity consumption and the method of multiple causes and multiple indicators (MIMIC) for the period 2000-2011. They get remarkably different results, even contradictory, between one approach and another. The electricity consumption method shows a decrease in the shadow economy after 2003, while the MIMIC method produces results with an increasing trend.

The most recent research by Bexheti, Sadiku and Alija (2021) provides evidence to interested readers and policy makers into the dynamics of the shadow economy of the Republic of North Macedonia, through a rigorous assessment using the MIMIC method and the latest data starting from 1998 to 2020. They found that during 1998-2002, the average value of the shadow economy was estimated to be about 42% of GDP, from 2003-2007 the average value was about 38%, from 2008-2012 about 33%, while from 2013-2017 about 31% of GDP, estimates for the last period 2018-2020 amount to about 31.5% of GDP, so in the last period the shadow economy recorded a slight increase of 0.5%.

Other research has been conducted by direct methods and are mainly concentrated on sectoral analysis of the shadow economy, such as the informal sector and undeclared employment, as well as other experiences of firms and households in informal economic activities.

For instance, Ristevski (2009) conducted research through the direct approach of the craft shadow economy, where 85 households from Skopje and other 10 largest cities of the country were surveyed. The purpose of the paper was to estimate how much households spend annually without receiving a fiscal bill, and that in nine different services, such as: education, cleaning services, car repairs, home maintenance, shopping at the green market, hairdressing services, software and hardware services, firewood cutting and fortune tellers.

The research showed that households spend about 23% of their income in the "handicraft" shadow economy, of which 10.6% is spent on the green market to buy fruits and vegetables from unregistered traders. While in other types of services, households spend less than 4% of their income.

The research of Stankovic and Stankovic (2012) is based on primary data collected through a direct survey of 1200 respondents nationwide, on a representative sample including: gender, ethnicity, age and regional distribution of the population. The survey was conducted directly with the respondents on a "door to door" basis. The purpose of the research was to evaluate the attitude of citizens towards undeclared work and its consequences. The results show that 14% of respondents had experience with undeclared work. Respondents were also asked what they would do if they were employed in the shadow economy, 48% percent said they would keep quiet to keep their job, 20% would report the employer and only 15% would quit their job.

Novkovska (2013) using the Labor Force Survey (LFS) conducted by the State Statistics Office, presents the results of the size of informal employment in the agricultural sector. The author emphasizes that the share of informal employment in the agricultural sector is significant and ranges between 86.1% and 82.4% of total agricultural employment in the period 2008-2012. The data show that the trend is decreasing and that women are more involved in agricultural informal employment, from about 90% of the total employees in the agricultural sector, while the informal employment of men ranges between 76.5% and 81.4%. In addition, the author presents the level of undeclared work in non-standard employment (part-time, fixed time and self-employed).

Nenovski (2012) using qualitative data through descriptive analysis and comparative methodology, tries to locate the main causes, consequences, and extent of the shadow economy in North Macedonia. The author tries to shed light on the basic characteristics of the country's shadow economy to propose well-founded recommendations for its reduction.

Dzekova et al. (2014) provide a detailed report of the available literature and various records regarding the size and nature of the shadow economy (the undeclared economy as they call it) of North Macedonia, from existing sources. They also analyse the institutional actors involved in dealing with the phenomenon, their political measures, and approaches.

Petreski and Petreski (2022) conduct research on unregistered micro – performers of business activity in North Macedonia, namely the reasons of staying informal. The survey research was performed on 151 unregistered micro-enterprises and included questions about the costs of being formal, the benefits from formalization and the costs for staying informal.

This study differs from the ones briefly summarized above for two reasons: first, it provides an assessment of the magnitude of shadow economy based on business

perceptions; secondly, apart from estimating the shadow economy, it identifies what are its main causes based on the opinions of the business owners and managers, considering that they are most acquainted with the informal economic activities in their industry.

Research Methodology

In this part, the methodology of research and assessment of the magnitude of shadow economy of the Republic of North Macedonia is elaborated, which is based on the direct survey approach. The direct approach has not been used extensively until recently (Reilly and Krstic, 2019). Hence, there are a small number of studies that use this approach, especially analysing enterprises and businesses that are partially or fully involved in the shadow economy. Also, an earlier study of Williams (2006) emphasizes the absence of direct survey evidence on shadow economy, even those that exist are small-scale direct surveys of localities, sectors, or occupations. His research relies on the survey on business perceptions of the prevalence of the shadow economy, namely the Small Business Service's (SBS) 2004/2005 for UK. The most recent research using the direct method is conducted by the authors Putniņš and Sauka (2016) for the Baltic countries, who estimate the index of shadow economy from 2009 to 2015 for Estonia, Latvia, and Lithuania, based on data collected through surveys in each year. Also, the same approach was used to assess the shadow economy of Serbia by the authors Krstic and Schneider (2015), in Kosovo by the Reinvest Institute (2013) and in Bulgaria by "The Center for the Study of Democracy" (2016).

The scarce use of the direct methods is attributed to the underestimation of the share of shadow economy because they do not cover all its aspects and dimensions. So, given the difficulties in estimating the shadow economy, researchers are increasingly faced with several limitations of estimation methods. Particularly, survey research is subject to serious shortcomings, primarily due to budget limitations for providing a representative sample. Also, the collected quantitative estimates of the shadow economy depend on the willingness of the respondents to cooperate and provide accurate information about hidden economic activities.

The scope of this study is limited to selected components of the shadow economy. The two sectors included in this research cover the productive activities carried out in the hidden and informal sectors. While illegal activities, as well as domestic production for own use, are ignored in the estimates. As a result, in this research the shadow economy is defined as all legal economic activities, which are not included in national official data (or measured GDP). This is a narrow definition of the shadow economy because it is focused on productive activities that are carried out in an unofficial way to avoid paying taxes.

The first part mainly includes undeclared employment, where entrepreneurs do not report employees or part of them or declare only part of their wages to avoid or reduce the tax burden. Among other economic sectors, this is more characteristic of manufacturing, service sector, construction, agriculture, and retail trade. According to Schneider (2009), this part amounts to an average of two thirds of the shadow economy. The other category of under-reporting or non-reporting refers to skimming (absorption), that is, to unreported or insufficiently reported income by companies. The same research by Schneider (2009) reveals that this part covers one third of the shadow economy.

Survey Design

The survey of this research consists of the opinions of managers and entrepreneurs, considering that the managers or owners of the enterprises surveyed are the most familiar with the hidden economic activities in their sector (Reilly and Krstic, 2017). Therefore, the survey allows us to explore the shadow economy from a business perspective, unlike some surveys that are based on surveys of households or workers. According to our knowledge, this is the first attempt to assess the shadow economy of the Republic of North Macedonia through this approach. Namely, the survey is designed to extract information needed to measure the shadow economy by assessing the main types of economic activities that are carried out in the parallel economy based on the responses of the owners/managers.

The survey was conducted on a sample of 100 business entities, of which 64 responded positively. Self-completion questionnaires were used as a research instrument. The questionnaires were sent to the respondents in the period of March 2021. The main limitation is that the response rate is low at only 64%. However, through the collected data, we develop the shadow economy index, which includes several components: the percentage of underreported income by enterprises (subjective perceptions of business representatives about their sector), the percentage of underreported employees and the percentage of underreported employee wages. It should be noted that these types of surveys with the owners or higher-level management are difficult to be realized. In this course, Baruch (1999) states that most academic studies involving owners and representatives of highest level of management, it is reasonable to have a return rate of 35%.

The questionnaire is mainly designed according to the questionnaire used by Putnins and Sauka (2015) for the Baltic States with little change and contains four main parts: (i) characteristics of business entities; (ii) governance factors; (iii) government policy and size of informal economic activities; and (iv) managers' or entrepreneurs' attitudes about tax evasion. To increase the response rate and truthfulness of responses, the questionnaire begins with non-sensitive questions about satisfaction with government and tax policy, before addressing more sensitive questions about hidden economic activities. Putnins and

Sauka (2015) explain that this "gradual" approach is recommended by several methodological studies on survey design in the context of tax evasion and the shadow economy, such as Gërxhani (2007) and Kazemier and Van Eck (1992).

The first part of the questionnaire contains general questions regarding the characteristics of business entities such as year of establishment, number of employees, region, operating profit, change in net profit, sales turnover, and total employment.

The second part of the questionnaire consists of questions related to governance factors where respondents are asked to express their satisfaction with public revenue administration, tax policy, business legislation and government support for entrepreneurs. The questions use a five-point Likert scale, from "1" ("very dissatisfied") to "5" ("very satisfied").

The third part contains questions about the size of informal economic activities where managers or entrepreneurs are asked to estimate the degree of underreporting of business income (net profit), underreporting of the number of employees, underreporting of wages paid to employees and the percentage from the revenues that companies pay as bribes.

Questions are asked indirectly to entrepreneurs by asking them about firms in their industry rather than their firm. This approach is discussed and justified by Gërxhani (2007) as a method to obtain more true answers and has been used by many authors to estimate the shadow economy through the direct approach such as (Sauka, 2008; Reinvest, 2013; Putnins and Sauka, 2015; Krstic, 2015; Reilly and Krstic, 2017).

In addition to questions related to informal economic activities, a question related to unregistered firms is also included, meaning owners/managers of registered firms are asked about their knowledge regarding the percentage of total production by unregistered enterprises in their industry. Putnins and Sauka (2015) assume that they are experts in their industry and probably know approximately how many unregistered firms operate in their industry. So registered companies are in competition with unregistered companies and therefore they should be aware of such companies.

Results and Discussion

This section initially provides a general overview of the surveyed business entities, to provide a descriptive profile of the firms that are subject of our study. We note that to obtain reliable survey results, only owners or executive managers were surveyed. This allowed us to obtain relevant information about the current state of the firms and the industries in which they operate.

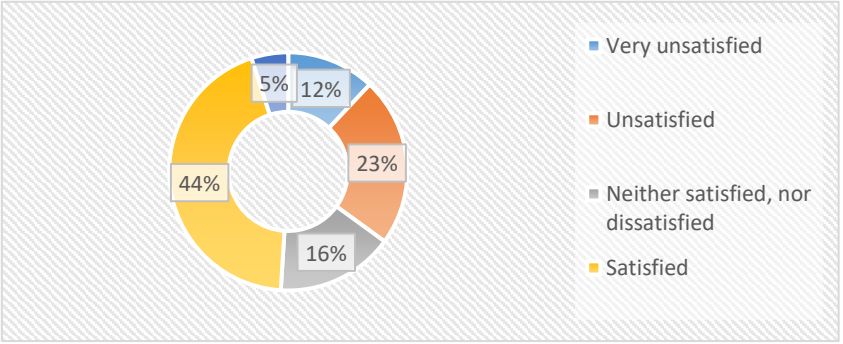
Most of the surveyed business entities were founded after the independence of the state (in the early 1990s, the Republic of North Macedonia was established as a sovereign

and independent state), so about 18% were founded in the first decade of the transition, 60% of the companies were founded in the period 2000-2019, while 22% of the surveyed companies were founded before 1990.

Given the nature of the sample selection, most surveyed firms for the purposes of this study were from the manufacturing sector at around 30% and the service sector at 27%, while retail 14%, wholesale 8%, agriculture 5%, construction 6% and the rest are other activities. According to a Eurostat survey (2011), the manufacturing sector has the largest share in the shadow economy, followed by retail and wholesale trade, construction, and transport.

Inefficient tax administration is considered by many authors and experts to be the most responsible for increasing tax evasion and the shadow economy. For this reason, a question was asked to the respondents about the satisfaction with the work of the public revenue administration. According to the obtained results, only 5% of the respondents are very satisfied and 44% are satisfied, while 12% of the owners/managers are very dissatisfied, and 23% of them are dissatisfied, this means that about 35% of the respondents are dissatisfied (Figure 1). From this it follows that the simplification of the tax regime - laws and administration are of special importance for the country. In this direction, the World Bank (2015) suggests segmenting taxpayers and adapting the administration to serve each specific segment. In addition to providing multiple, convenient ways for taxpayers to file and pay taxes. At the same time, it is emphasized that it is very important for the tax authority to develop cooperative relations with institutions from the private sector and to help develop an understanding that working in hidden economic activities has a negative impact on the economy and on the quality and delivery of public services.

Figure 1. The work of the public revenue administration

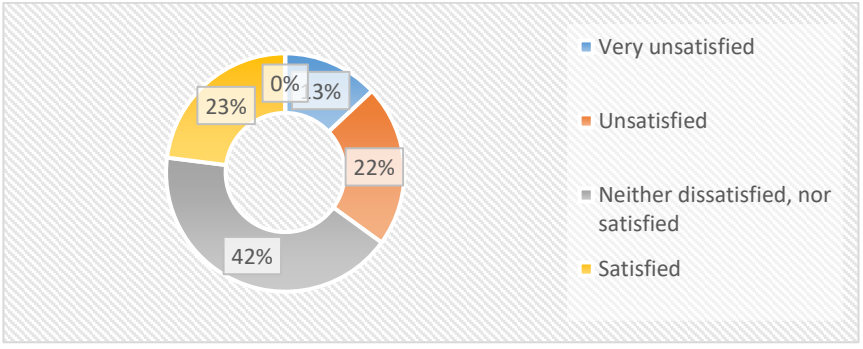


Source: Authors' calculations based on survey results

As for the question of satisfaction with the government's tax policy, only 1% of respondents are very satisfied and 30% are satisfied; 36% are neutral, i.e., neither dissatisfied nor satisfied, while 14% are very dissatisfied and 19% are dissatisfied (Figure 2). This means that about 33% are not satisfied with the tax policy. In this context, the high tax burden on labour, especially with low earnings, is the key reason for the shadow economy, mainly due to high social security contributions. As a result of high taxes, companies and workers often face the problem of "trade off" between compliance and survival, and the same is more present in less developed and poorer countries.

In most empirical research, the increase in the tax burden and social contributions are considered the main causes of the shadow economy (Friedman et al. 2000; Schneider, 2000; Schneider et al., 2010; Schneider, 2015; Schneider and Enste, 2000). The tax burden of North Macedonia was significant during progressive taxation, namely 23%, 27% and 35% until 2000, and 15%, 18% and 24% until 2006. High tax rates were the main driver of tax evasion. The introduction of the proportional tax of 12% in 2007 and 10% in 2008 was one step towards a more neutral tax system. This reduced the tax burden on employers for hiring the factors of production, i.e., the workforce. Also, this method of taxation is easy to apply and leads to relatively smaller distortions of economic activities.

Figure 2. Tax Policy



Source: Authors' calculations based on survey results

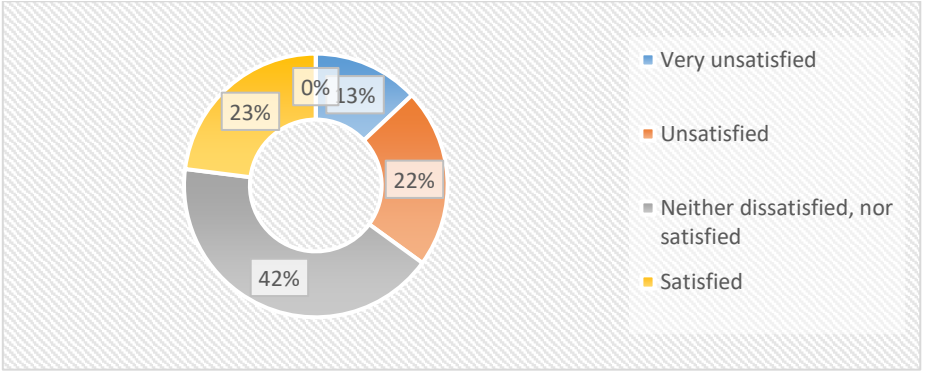
After the introduction of the proportional tax, the following years saw lower tax revenues compared to the previous period, so in 2019 the progressive taxation of personal income (previously the personal tax) was introduced again. Although the reform contributed to an increase in public revenues, it is stated that the additional revenues achieved could have been higher by a certain percentage, if there had been no changes in the behaviour of taxpayers due to the introduction of progressive taxation. The analysis indicated the possibility of avoiding tax obligations and increasing tax evasion. Based on

the assessment, starting from January 1, 2020, the Government of the Republic of North Macedonia decided to put this tax reform on hold for a period of 36 months, during which time the application of the flat tax of 10% for all types of income, except for the income obtained from games of chance, where the tax rate remains 15% (Strategy for the reform of the tax system, 2021-2025). Eilat and Zines (2000) argue that it is very difficult, even impossible, to eliminate the shadow economy, but certain reforms can contribute to its reduction. However, despite the low tax burden, the high cost of labour (social security contributions) is considered among the main causes of the tax evasion in the country that directly affects the magnitude of shadow economy. At the other side, Tanchev and Yakova (2018) empirically have evidenced that countries with higher taxes and higher redistributive share as a percentage of GDP have more efficient public expenditure and resource allocation.

In addition to this, the respondents provided an opinion on whether tax avoidance is a common behaviour in the Republic of North Macedonia. A large percentage of respondents of about 47% agree with this statement, while 30% disagree and 23% percent of respondents are neutral.

The questionnaire contains a question about the quality of business legislation and the business environment, and according to the results, none of the respondents are very satisfied, while only 23% are satisfied, and the majority of respondents have a neutral opinion, i.e. 42%, while 22% are dissatisfied, and 13% are very dissatisfied (Figure 3).

Figure 3. The quality of business legislation



Source: Authors' calculations based on survey results

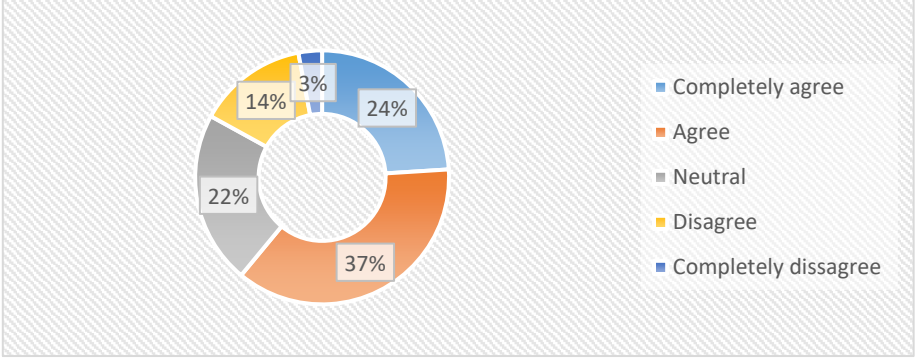
In addition to the tax burden, the intensity of regulations has a key impact on the size of the shadow economy, even some authors claim that regulations are more influential than taxes, such as the study by Johnson et al. (1997).

Regulatory obstacles for starting and running a business are minimized and are the lowest in the region, which should therefore influence the reduction of the shadow economy. However, according to the studies of Mojsoska-Blaževski (2012) and Stankovic and Stankovic (2012), the reforms to improve the business climate did not contribute significantly to the reduction of the shadow economy. Dzekova et al. (2014) claim that in R. North Macedonia considerable efforts have been made to improve some aspects of the business environment, but other aspects have been neglected, such as contracting, resolving insolvency, reducing export barriers and others, so yes, it is necessary for the authorities to address the efforts in other areas of business life and not only in isolated aspects.

In addition to this, the survey provides the opinion of the respondents about bribery and corruption, namely 37% of the respondents agree that bribery is a common behaviour in the Republic of North Macedonia and 24% completely agree, while only 3% completely disagree, 14% disagree, and 22% are neutral (Figure 4). It follows from this that bribery is at a high level in the country, as about 61% of respondents answered affirmatively.

Schneider (2007) argues that bribery and corruption are treated as a special type of taxation and regulation that lead many entrepreneurs to move partially into the shadow economy. The research also concludes that the relationship between the shadow economy and corruption differs between low-income and high-income countries. In doing so, Çule (2004) empirically shows how corrupt tax inspectors affect the incentives of companies to cheat on taxes, and how the shadow economy in turn creates opportunities to sustain corrupt practices. The report of the Macedonian Center for International Cooperation (MCMS, 2014) emphasizes that the shadow economy creates bribery (to prevent the payment of fines from inspections), but also provides cash for another type of bribery (contracts for public procurement, shaping laws, etc.). Which means that these two destructive phenomena are closely related to each other.

Figure 4. Bribery and Corruption



Source: Authors' calculations based on survey results

North Macedonia belongs to the countries with a relatively high level of bribery and corruption. This phenomenon is constantly counted among the key problems of the country by the public, and is also among the most prominent remarks, by the relevant international institutions and the European Commission. According to Transparency International (2020), in 2020, the corruption perception index for North Macedonia was 35 points (points range between 100 very clean, and 0 very corrupt).

In the conducted survey we also obtained the opinion of the respondents about the percentage of the income (turnover), which is paid by the companies in unofficial payments to "get things done". From the obtained results, we find that on average about 14% of the income, companies pay to complete certain works.

In the following, the indicators of the shadow economy are analysed, i.e. under-reported income by enterprises (subjective perceptions of business representatives about their sector), under-reported employees and under-reported salaries of employees. Through which the index of the shadow economy is then calculated.

Table no.1 - The perceptions of the respondents regarding the participation of companies from their industry in the shadow economy

Subjective attitudes of respondents about participation of companies from the same sector in the shadow economy

	2019	**2020**
% of workers without formal contracts	15.45	18.40
% of workers with formal contracts but without full reported salaries	19.18	20.82
% of underreported income	19.30	24.8
Shadow economy magnitude	19.98	21.34

Source: Authors' calculations based on survey results

According to the obtained results, the participation of workers without formal contracts in the total number of workers is 15.45% in 2019, while 18.40% in 2020, which means that it has seen an increase of about 3%, which is most likely attributed to the health crisis COVID-19. As for the percentage of workers with formal contracts but without fully reported salaries, it is 19.18% in 2019, while 20.82% in 2020. In addition to this, the share of insufficient reported income was also estimated, amounting to 19.30% in 2019, and 24.8% in 2020. Also, these indicators see an increase in 2020, especially the increase is significant in underreported income (Table 1). The shadow economy index is obtained as an average of the above sub-indices and is about 20% in 2019 and 21.34% in 2020. Krstić and Radulović (2015) obtain somewhat larger estimates for Serbia using the same

approach, i.e. the subjective views of entrepreneurs/managers on the participation of firms from the same industry in the shadow economy.

(Table 2) shows the correlations between the above indicators that show a pronounced correlation between the different types of informal economic activities as stated by the surveyed business entities: in other words, the results show that when the business entity is involved in informal cash transactions, i.e. undeclared income, there are also undeclared workers as well as undeclared salary payments. Pearson's correlation coefficients reveal a pronounced association between the indicators and statistically significant.

Table no. 2 - Correlation between different types of informal economic activities

	% of workers without formal contracts	*% of workers with formal contracts but without full reported salaries*	*% of underreported income*
% of workers without formal contracts	1	-	-
% of workers with formal contracts but without full reported salaries	0.775	1	-
% of underreported income	0.594	0.589	1

Source: Authors' calculations based on survey results

In addition to registered companies, there are also unregistered companies, which do not report any of their activity to the authorities. According to the knowledge of the respondents, on average, about 14.5% of the total production/sale of goods/services are carried out by unregistered enterprises.

Respondents were also asked to give a general perception of the intensity of tax controls (inspections). The results reveal that the approximate probability of being detected if they underreport their income, i.e., evade taxes, is only 45%, while the remaining 55% of the probability is that entrepreneurs/managers believe that they can easily get away with it if they decide to evade taxes. As for the probability of a firm being detected if it underreports the number of employees, it is only 41%. These alarming levels of perception towards audits provide a general picture of the mechanisms implemented to detect and punish firms that underreport their income. The low level of "fear of being found out" is an

important determinant of the general behaviour towards paying taxes and social contributions for undeclared employees in the Republic of North Macedonia.

Regarding the question if a firm in the same industry was found to have deliberately misreported revenue, employees, or wages, which was usually the consequence for that firm, most respondents at around 48% believed that only a small fine was paid, and 19 % believe that nothing serious was taken, while about 33% think that a serious fine was implemented. However, according to the tax literature, the more severe the penalties, the greater the risk of negligent behaviour. A high level of fine may backfire if businesses feel that the penalty is not appropriate, therefore it may influence the growth of corruption.

Concerning the question of what the main causes of the shadow economy are in North Macedonia, about half of the respondents 48.4% think that corruption is the main reason, 20.3% think that the low quality of public services is the main reason, about 11% believe that it is about survival, 11% think that the high tax burden affects, 4.7% think that it is the culture and 4.7% think that the reason is the bureaucracy.

Previous studies also identify causes that are also related to economic factors such as, for example, insufficient growth in employment and jobs, insufficient economic growth, and continued poverty. Especially youth unemployment is at a high level that spurs their involvement in shadow economic activities. Even though youth unemployment is becoming increasingly pressing issue at European and regional level (Vutsova and Arabadzhieva, 2021). In addition to economic factors, institutional factors, such as, politicized state and public administration, politicized judiciary, insufficient respect of rules and laws, politically privileged companies have a great influence on shadow economy (see Bexheti et al. 2022; Nenovski, 2012; CEA, 2008). For some institutional aspects, North Macedonia has low marks from the international annual reports, and quite a few remarks in the reports of the European Commission. This is reflected in the fact that the politicized state and public administration, as well as the judiciary, have a direct influence in the "amnesty" of certain economic agents that do not respect the rules and laws, and this negatively affects other companies and individuals in losing confidence in the institutions.

Regression Results

In this section are presented the regression results on the causes of the shadow economy. Three regressions were performed where, as dependent variables are the percentage of underreported income, non-reported workers, and underreported salaries, respectively. Independent variables are considered tax policy, business legislation, corruption and bribery, probability that the company will be found out if it underreports the number of employees, percentage (%) of revenue (turnover) do companies pay in informal payments to "get things done". Besides these variables were also considered some other

variables related to shadow economic activities but they resulted statistically insignificant and were omitted from the models. Tax policy, business legislation and corruption and bribery are qualitative variables with ordinal measurement, whereas probability of discovery and informal payments are quantitative variables with ratio scale of measurement.

Table no. 3 - Regression analysis of causes of shadow economy

Independent Variables	**Dependent Variable**		
	Percentage of underreported income	**Percentage of non-reported workers**	**Percentage of underreported salaries**
	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
Tax policy	-0.1024** (0.025)	-0.2462** (0.048)	-0.0731** (0.042)
Business Legislations	0.0922** (0.040)	0.4224* (0.075)	0.1632* (0.064)
Corruption and Bribery	0.3965*** (0.003)	0.4416*** (0.001)	0.6721 (0.142)
Probability of discovery	0.1873* (0.057)	0.1508** (0.023)	0.1838*** (0.001)
Informal payments to “get things done”	0.6914* (0.061)	-0.0871* (0.055)	0.5391 (0.273)
Constant	-3.2721 (0.359)	-0.9222 (0.940)	1.5741 (0.293)
F-Statistic	5.122	7.153	4.17
R-Squared	0.44	0.67	0.52

*; **; and *** represent the rejection of null hypothesis in the level of significance of 10%; 5%; and 1%, respectively

Source: Authors' calculations

The regression results are displayed in Table 3 above, which indicate that tax policy, business legislations, corruption and bribery are significant determinants of shadow economy of North Macedonia, as their coefficients are statistically significant. Despite dearth responses, these findings are of great importance, as this is among the few studies that empirically inspects the causes of shadow economy in North Macedonia. Thus,

identifying the root causes of shadow economy is essential for creating effective mechanisms for its suppression.

Conclussion

The main goal of this research was to collect primary data on shadow economic activities and to assess the magnitude of shadow economy based on perceptions of owners/managers of companies. An attempt is also made to identify its nature and its main causes. The direct approach gives an estimate of the shadow economy index for 2019 and 2020, which is 20% and 21.34%, respectively. The disadvantage of direct methods is that they underestimate the share of the shadow economy because they do not cover all its aspects and dimensions. However, through survey research, we obtained relevant information based on the opinions of entrepreneurs and managers about the most significant factors affecting the growth of the shadow economy, considering that they are the most familiar with the hidden economic activities in their industry.

The Government of the Republic of North Macedonia promotes serious mechanisms to formalize and suppress the shadow economy. However, our research recommends that efforts would fail if the root causes of the shadow economy are not addressed, such as cracking down on of bribery and corruption, substantially improving the quality of public services, strengthening mechanisms to prevent tax evasion as well as developing sound policies to support small and medium businesses to not face with survival problems.

Although most of the results reflect reality, the estimates are subject to relevant limitations. It is extremely difficult to obtain reliable estimates of the shadow economy due to its nature and the serious shortcomings of the direct method. Calculations on the shadow economy, and especially those based on the direct method, have been subject to serious criticism for several previously stated reasons, thus the results should be taken with some caution.

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COMPETITION DYNAMICS AND NEW MANAGEMENT PARADIGMS IN THE PUBLIC SECTOR

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Abstract

The paper provides a comprehensive exploration of the role of competition in the public sector, defining its multifaceted dynamics. It highlights the intensified competition between producers of public and private goods, as well as competition among entities producing different categories of public goods in various industries and diverse sectors, such as education, healthcare, and legal services. Transitioning to the new management paradigm within the public sector, the text underscores the profound transformations triggered by the shift to a market economy. Benchmarking, public-private partnership and outsourcing are considered, underlining the need for a well-defined methodology and the commitment to international standards. This approach is essential for providing high-quality public goods and services in a globally competitive environment.

Keywords: *competition; public sector; new management; public-private partnership benchmarking; outsorcing*
JEL Codes: *H44, H00, D40, O16, G30*

Introduction

The penetration of market-oriented dynamics and the incorporation of market-oriented principles within the public sector is a consequence of budgetary and institutional provisions. This integration is facilitated through the application of competitive models aimed at enhancing the effectiveness and efficiency of public resource utilization.

The development and implementation of robust economic and market institutions, such as competition, demand, and supply, entail several key considerations:

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• Division of Regulatory and Production Functions: This involves an allocation of the state's roles concerning the provision of public goods, specifically separating regulatory functions from production responsibilities.

• Segregation of Institutional Consumers and Producers: A clear demarcation is established between institutional consumers of public goods and the entities responsible for their production.

• Determination of Financing and Production Parameters: The volume and structure of financing and production of public goods are determined based on an optimal balance between economization and humanism, and the economic efficiency and social justice considerations. This involves establishing an equilibrium that maximizes resource utilization while upholding ethical and societal principles.

The paper aims to reveal the major “conduits” creating the implementation of market principles within the public sphere, suitably denominated as "new management." These “conduits” encompass public-private partnerships, outsourcing, benchmarking, and clustering within the public sector. Numerous Bulgarian authors, including Hr. Hristov, P. Lulanski, D. Brusarski, E. Delcheva, St. Stavrev, P. Mitev, have made noteworthy contributions to the exploration and development of these relevant issues.

The Role of Institutions in Shaping Public Sector Dynamics

Competition represents a foundational institution in societies characterized by market-regulated economic exchanges, serving as an imperative for the optimal functioning of the market and the fulfillment of its inherent roles. It manifests as a form of rivalry, emerging when multiple economic entities endeavor to secure property rights over resources with the aim of maximizing their respective benefits. According to M. Porter in order to achieve a competitive success the companies must possess a competitive advantage in the form of lower costs or differentiated products imposing higher prices. (Porter, 2004) However, the size of a company's competitive advantage is the difference between the economic value that the company makes and that of its rivals. (Barney and Hesterly, 2006,)

The genesis of competition lies in economic coercion within modern societies, where each market participant, including the state as a producer of public goods, endeavors to offer to the desires and necessities of consumers. According to R. Dimitrova (Dimitrova, 2013), a factor of major importance is the analysis and evaluation of the competitive potential of the enterprise as a prerequisite for discovering possibilities towards increasing its competitiveness and future development. The competitive potential of the enterprise is seen as its integrated potential. Competitive advantage can be obtained only if a business system creates superior value for buyers. A company must be able to provide a more suitable product or service for customers than those produced by rival companies. The

activities that bring value, such as manufacturing, logistics, marketing and sales are generically called chain of values (De Wit and Meyer, 2004).

In this context, the market institution transforms individual actions of economic agents into economically oriented activities—specifically, the production and provision of public goods aligned with both personal and communal needs. Within the notion of competitive dynamics, the determination of the "rules of the game" holds dominant significance, and unequivocally, it is the state that assumes this responsibility.

A distinctive feature of competitive relationships within the public sector is the constant involvement of a public institution—either at the state or municipal level. The integrity of contracts, particularly those associated with public-private partnerships and outsourcing arrangements, as well as the protection of property rights for involved parties, necessitates cautious oversight and safeguarding by the state. Functioning as a custodian, the state ensures the preservation of the competitive order through the establishment of pertinent institutions, organizational frameworks, and the imposition of sanctions in instances of rule non-compliance.

The competitive environment is the next immanent characteristic of the public sector. Constituting a complex system of transactions, it intricately involves market agents such as producers, intermediaries, and consumers in the exchange of public goods. Innovation is one of the most important sources of competitive advantage and for most organizations it is a process of continous improvement. They offer the same service, but with the help of creative reengineering supported through investments, they add to the product or service certain value generating elements. (Popa & Dobrin 2011)

The state actively engages in shaping the competitive environment, assuming a direct role across the phases of goods production, distribution, and consumption. Simultaneously, it is the state entities to establish and cultivate the institutional framework supporting this competitive landscape.The main objective guiding the operationalization and evolution of the competitive environment is the growth of the general level of national economic competitiveness. This pursuit is clarified by diverse metrics, as exemplified in the Global Competitiveness Index. This comprehensive index serves as a barometer, directly mirroring both quantitative and qualitative sides of public sector development. Parameters encompassing education, qualifications, institutional maturation, and the health status are among the indicators analyzed within the context of this index, thereby providing empirical insights into the multifaceted dimensions of the public sector's developmental trajectory.

In the domain of the public sector, a suitable characterization emerges as a 'quasi-competitive' environment. Within this paradigm, 'quasi-markets' manifest as complicated systems of interactions among economic entities competing to provide public goods, the production of which is subsidized by governmental entities. While real-world

manifestations of 'quasi-markets' may exhibit differences owing to institutional and industry-specific characteristics, such as those observed in education, healthcare, and the judicial system. They collectively embody a framework where producers engage in competitive dynamics under public financing. According to Rinkova (Rinkova, 2013), the development of the "quasimarkets" structures in the public sector is an opportunity for the penetration of market relations and the formation of competitive behavior of the economic agents. These processes are conditions to improve the efficiency and the quality of the public goods.

An inherent feature of quasi-market public goods lies in the prevalence of information asymmetry, designating some as 'trust assets.' Consequently, the State formulates and implements monitoring and control mechanisms, along with accreditation or licensing protocols for organizations engaged in the production of these public goods. This strategic intervention of the State aims to restrict the potential for opportunistic behavior among entities contributing to public goods.

The establishment of quasi-market structures necessitates consideration of the institutional details distinctive to the various branches of the public sector. This highlights the importance of modifying the formation of these quasi-market structures in alignment with the unique features characterizing each sector, thereby contributing to the efficacy and integrity of the overall quasi-competitive environment within the public sphere.

Competitive Dynamics and Resource Allocation in the Public Sector

Public sector entities and governmental departments are established with the primary purpose of fulfilling government responsibilities, and they are anticipated to collaborate in both policy formulation and service delivery. Within Western societies, public agencies are created in order to rectify market failures, aiming to persist in their operations to enhance the collective welfare. In the context of public sector their function additionally encompasses contributing to industrial development and the establishment of markets. (Matthews & Shulman, 2005) A fundamental tenet of agency theory suggests that individuals in positions of resource control tend to prioritize their own interests over the interests of the resource owners (Stewart, 1999). Conversely, public sector organizations are established with the overarching objective of formulating and delivering services for the betterment of the general populace.

When applying the reproductive approach to examine the trajectory of products within the public sector, distinct levels of competitive relationships with various actors and subject determinations could be distinguished.

Firstly, there exists a competition dynamic between producers of public and private goods, which revolves around the optimal allocation of resources between these two

sectors. The methodological apparatus employed for this analysis leverages the concept of the production possibilities frontier. Within any given timeframe, society challenges an alternative decision, necessitating the allocation of limited public resources across public and private sectors. In the production of private goods, requisite resources are acquired by firms through transactions in factor markets, where prevailing market prices serve as the determinants of resource acquisition.

As far as the production of public goods is concerned, the primary source of financial resources is taxes. Serving as a mechanism for the redistribution of primary income, taxes empower public administration to make crucial decisions relating to the allocation of resources for public goods production, concerning the quantity, methodology, and beneficiaries of public goods. The public choice on whether to channel more resources into private goods production or enlarge the tax burden for increased public goods production lacks a definitive answer and is contingent upon the prevailing political circumstances in the state.

Secondly, competition emerges among producers engaged in the creation of distinct categories of public goods, competing for allocated resources. Diverse forms of material, labor, and financial resources are employed in the production of various public goods, encompassing sectors such as education, health, social and legal services, and others. This competition extends beyond inter-institutional dynamics, encapsulating contests within each sector of the public domain. For instance, competition exists to secure more resources within specific branches of the public sector, such as the rivalry between different educational levels—secondary and higher education—or the contest for resources between pre-hospital and hospital healthcare services. The state as an institutional authority, assumes responsibility for producing public goods crucial to national security, notably categorized as pure public goods.

The contemporary landscape is marked by intensified competition among providers of both public and private goods across diverse industries. Alternative market structures, such as private enterprises, municipal entities, and state-operated educational institutions, actively engage in the education sector from the supply side, rivaling for consumers of their respective services. This competitive dynamic is mirrored in the healthcare sector, where various entities operate within a comparable framework. Analogously, within the legal services domain, competition exists among private and state-appointed bailiffs, as well as private and state-affiliated notaries, illustrating the persistent nature of this competitive paradigm

The rivalry among consumers of public goods across distinct territorial entities is prominently evident, notably in higher education. Various universities engage in robust competition, particularly in metropolitan areas where multiple institutions contest for

individuals seeking their educational services. This competitive dynamic is similarly manifested in clinical and hospital structures, where entities strive to attract users. However, the uneven distribution of these public goods across different regions poses challenges, impeding equitable access for all citizens and thereby intruding their constitutional rights. To correct these inequalities, the state may intervene through appropriate market and administrative regulations, thereby addressing these perceived "market defects" and "state defects" and ensuring more balanced and accessible provision of public goods.

New Management in the evolving Public Sector landscape

The transition to a market economy has activated profound transformations in both the economic foundations and institutional framework of the public sector. These changes are conspicuously evident in the reconfiguration of property relations, accompanied by alterations in the organizational and managerial structures within the public sector. A paradigm shift is observed through the adoption of "new management" principles, signifying the invasion of market-oriented relations at both micro and macro levels.

As explained by J. Brown, "new management" constitutes a system of market-oriented approaches to the administration of institutions and allocation of resources within the public sector (Brown, 1998). This necessitates a radical change from traditional bureaucratic management practices, calling for adaptation and competition. Consequently, the "new management" is suitably characterized as a "quasi-market" management approach, reflecting its distinctive blend of market-oriented strategies applied within the public sector context.

Public-private partnership (PPP) represents a transformative approach to ownership relations and stands as a promising tool of collaboration between the public and private sectors (Law on Public-Private-Partnership, 2023). According to Professor Hr. Hristov (Hristov, 2005), PPP requires an interaction between state and municipal institutions on one side and private sector enterprises on the other, strategically designed to improve the management of public infrastructure, municipal facilities, and the delivery of relevant public services.

The reasons for establishing these partnerships varies, but generally they include considerations such as financing, design, construction, operation, and maintenance of public assets, as well as the provision of public services. The institutional foundation of PPP has been firmly established with the enactment of the Law on PPP since 2013. This partnership is rooted in the recognition that both the public and private sectors possess distinctive attributes, affording them advantages in specific aspects of the production and provision of public goods.

PPP manifests in various forms, each tailored to the specificities of different industries and types of goods. Examples include the exploitation and servicing of publicly owned objects, the design and construction of objects, and comprehensive involvement in the design, construction, and operation of objects, among other configurations. The complex nature of PPP reflects its adaptability to diverse sectors and underscores its potential as a dynamic mechanism for addressing complex challenges in the sphere of public infrastructure and services.

The basic economic argument in favor of outsourcing is that it introduces competition and utilizes the strengths of the private sector. There is a concern, however, that outsourcing could lower service quality. The reason is that private for-profit providers have strong incentives to reduce costs but possess limited motivations to enhance aspects of quality that are challenging to specify or codify within contractual agreements (Hart & Shleifer, 1997). Outsourcing, as expressed by Professor M. Hariznova (Hariznova, 2001), exemplifies a contemporary business practice wherein an organization delegates internal activities and processes to external consultants or service providers. This entails the transfer of business functions and related assets to an external specialist for a specified duration at a mutually agreed competitive price.

The primary impetus for entering into outsourcing contracts lies in the reciprocal benefits accrued by both parties—the public organization and the service provider. The objectives of the company outsourcing include reducing staff maintenance costs, lowering service prices, and improving the quality of the core service. Brian J. Heywood (Heywood, 2001) clarifies how outsourcing, if handled correctly, has the potential to produce real tangible saving for all types of organisations, not just large ones. He also explains how outsourcing arrangements can be unsuccessful and what customers and service providers should do to limit their risks of failure.

The engagement of public organizations in commercially-oriented outsourcing, facilitated by external contractors through contractual agreements, involves both benefits and risks. Public organizations, when engaging in commercial outsourcing, often contract external entities for services such as hygienic maintenance of offices, upkeep of information and copying equipment, security services, printing, street lighting, and others. In the educational sector, outsourcing extends to non-core activities and functions, including security, hygiene, computer services, legal and notary services, practical training, repairs, construction activities, and beyond.

Positioned as a strategic business management approach and an anti-crisis measure, outsourcing emerges as an alternative for the efficient development and utilization of limited resources while ensuring the provision of quality public goods. In specific cases, outsourcing relationships between specialized organizations serve as essential devices of

interaction within cluster organizations, thus representing a qualitatively new paradigm of business organization during the era of the information society and knowledge economy.

A fundamental determinant for entities within the public sector relates to their competitive standing. For numerous organizations, competition goes beyond national boundaries and extends to supranational; European, and global domains—examples include universities and healthcare facilities. The primary objective for such entities is to attain international standards in the provision of public goods. Rigorous and constant assessment and comparison of distinct business processes or sets of activities with benchmark organizations, both nationally and internationally, form the foundational framework for improving and optimizing the operational efficacy of the entity (municipality, school, hospital).

The utilization of a benchmarking system, wherein an entity measures its performance against industry leaders, serves not only as a technological tool for competitive analysis but also embodies a conceptual framework that signifies an aspiration and motivation for perpetual development and improvement. This competitive approach follows a methodological trajectory characterized by distinct stages— planning, the identification of leading practices and benchmarks, continuous monitoring, analysis, and eventual adaptation. All these stages are interrelated, they require preliminary preparation and highly professional qualities to effectively incorporate the practices of benchmark organizations into the the public structure.

Conclusion

The competitive relationships within the public sector are characterized by the constant involvement of public institutions, necessitating careful oversight to ensure the integrity of contracts, property rights, and competitive order. The quasi-competitive environment, particularly in the context of quasi-markets, underscores the complex interactions among economic entities striving to provide public goods subsidized by governmental entities. The competitive dynamics within the public sector triggers the competition between producers of public and private goods, as well as the intra-sectoral competition among entities producing different categories of public goods.

The adoption of "new management" principles, characterized by market-oriented approaches, signifies a departure from traditional bureaucratic practices, fostering adaptation and competition. Public-private partnerships and outsourcing emerge as transformative tools, fostering collaboration between the public and private sectors for improved infrastructure management and the delivery of public services. Benchmarking is a strategic approach for entities within the public sector to enhance their competitive standing. The process of benchmarking involves planning, identifying leading practices,

continuous monitoring, analysis, and eventual adaptation. This systematic and continual improvement process is depicted as not only a technological tool for competitive analysis but also as a conceptual framework embodying an aspiration for perpetual development and improvement within the public sector.

Altering the economic paradigm of public sector management is rooted in the doctrines of institutional economic theory. This transformation is facilitated through the application of management tools and practices derived from the private sector, emphasizing a commitment to strict financial discipline and the judicious utilization of public resources.

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OPEN INNOVATION PROJECTS WITHIN REGIONAL CLUSTERS: RECONSIDERING THE HUMAN DIMENSION THROUGH DYNAMIC CAPABILITIES THEORY

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Abstract

This paper focuses on the human dimension of open innovation, by mobilising the dynamic capabilities view and by focusing on regional clusters as an empirical field. Our main issue is what dynamic capabilities should be developed to overcome the human difficulties of open innovation projects within regional clusters? 22 semi-structured interviews with four open innovation project actors (business leaders, university professors, engineering research labs executives, and cluster managers) within three Moroccan clusters were conducted. The thematic analysis of data collected was realised via Nvivo 10 software. To overcome the main human difficulties of open innovation, it seems necessary for an organisation to develop four dynamic capabilities, namely team sensemaking capability, absorptive capacity, capacity to renew its competences and capacity to transform its organisational culture. The results could be useful for managers of organisations participating in open innovation projects within regional clusters during the development and implementation of HRM practices.

Keywords: *open innovation; collaborative project; regional cluster; dynamic capabilities; human resources; team sensemaking capability; absorptive capacity; competence; organisational culture*

JEL Codes: *O32, O36, M20*

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Introduction

In the context of a knowledge-based economy, the concept of open innovation, which is based on collaborative practices, poses new challenges for organisations. Since it was introduced in 2003 by Henry Chesbrough, over the past 20 years numerous researchers have analysed the phenomenon from different perspectives. Nevertheless, the scientific community underlines that the human dimension of open innovation is still under-studied, and this field of research is highlighted as a promising area (Hossain & Anees-ur-Rehman, 2016; Randhawa et al., 2016; Lopes & de Carvalho, 2018).

On the other hand, regional clusters are the ideal terrain to study open innovation since they foster collaboration between external partners, mainly due to geographical proximity. Thus, several authors advocate the need to explore the concept of open innovation at the inter-organisational level in the context of regional networks of innovation systems (BodasFreitas et al., 2013; Michelfelder & Kratzer, 2013).

Additionally, the theoretical framework mobilised so far by open innovation researchers is mostly around knowledge-based theories (KBV) and resource-based view (RBV). Other promising theoretical fields have been applied to a minor extent. At the same time, many authors highlight that the theory of dynamic capabilities provides an interesting perspective on open innovation (Randhawa et al., 2016).

To respond to these three scientific gaps, we focus on the « human side » of open innovation at the inter-organisational level and in the context of regional innovation networks, namely the Moroccan innovation clusters, by mobilising the dynamic capabilities framework. In this context, our research problem is as follows: What dynamic capabilities has to be developed to overcome the human difficulties of open innovation projects within regional clusters?

This paper is structured as follows. First, a brief literature review on the concept of open innovation in relation to regional clusters will be developed. Then, the methodology and design of our research will be described. Thirdly, the findings of our empirical study will be presented and discussed. It will be concluded with an emphasis on the theoretical and practical implications of our study, as well as research limitations and perspectives.

Open Innovation Within the Regional Cluster from The Perspective of Dynamic Capabilities Framework.

Theories of open innovation suggest that innovations are not always inspired and developed entirely within a single company and that the production of innovative results is facilitated by greater openness to external sources of knowledge (Elmquist et al., 2009). In this paper, the most recent definition of Henry Chesbrough has been adopted: “Open

innovation is a distributed innovation process that relies on purposively managed knowledge flows across organisational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organisation's business model to guide and motivate knowledge sharing". (Chesbrough, 2017, p. 35).

While cluster can be defined as "" process of firms and other actors co-locating within a concentrated geographical area, cooperating around a certain functional niche, and establishing close linkages and working alliances to improve their collective competitiveness". (Andersson et al., 2004, p. 7).

The examination of the literature at the intersection of open innovation and regional clusters revealed some similarities and complementarities between the two. These similarities include collaboration between companies and other institutions (and, thus, the presence of inter-organisational network effects), knowledge flows across organisational boundaries and their externalities, as well as a positive impact of geographic proximity (Cooke, 2005; Simard & West, 2006; Vanhaverbeke, 2006; Huang & Rice, 2013).

Thus, Vanhaverbeke (2006) noted that regional clusters are more likely to use open innovation strategies, while Simard and West (2006) recognised that regional clusters are an ideal framework for open innovation analysis. Furthermore, several research studies have been conducted previously to analyse how and to what extent cluster initiatives foster and promote open innovation practices: Omta and Fortuin (2013), Santos and Mendonça (2017), Yström and Aspenberg (2017), Nestle et al. (2019), Vlaisavljevic et al. (2020).

The theoretical framework of dynamic capabilities was proposed by Teece, Pisano and Shuen in 1997 and provides some comprehension of how an organisation can achieve new forms of competitive advantage by reconfiguring its internal and external resources to adapt to the changes of the environment (Teece, 2007). Since open innovation is a relatively new phenomenon, the shift from the closed innovation paradigm to open innovation causes many changes in the organisation's environment. In this sense, dynamic capabilities theory can provide the required perspective for open innovation (Teece, 2014). Indeed, open innovation may seem easy in theory, but in reality, it is quite difficult to implement (Teece, 2019). Only organisations with strong dynamic capabilities will be able to take full advantage of open innovation practices (Bogers et al., 2019).

Teece (2020) makes a distinction between ordinary dynamic capabilities and high-level dynamic capabilities, while high-level dynamic capabilities can be divided into three categories: sensing, seizing and transformating capabilities. All these three dynamic capabilities reinforce open innovation (Bogers et al., 2019). These three high-level

capabilities will be further developed when discussing the results in the third part of this paper.

Methodological Choices and Research Design.

This research positions in the *epistemological interpretative paradigm*. Therefore, it is considered that social reality is subjective and that it is constructed through the mix of the actors' intentions who build the meaning of this reality through the sharing and confrontation of their interpretations. Thus, the *qualitative approach* is adopted. This approach is well adapted to the needs of our research because it is consistent with the study of invisible, not directly observable objects, such as the actors' feelings, thoughts, intentions, motivations and fears, and which allows approaching the personal mental perceptions of the actors interviewed.

Based on the interview guide developed following the literature review, *22 semi-directive interviews* with the representatives of four categories of actors in open innovation projects (university professors, business leaders, engineering research labs executives and cluster managers) within the three Moroccan clusters were conducted. Each interview lasted from 45 to 90 minutes.

The *interview guide* consisted of two axes. First, the interviewees were asked about their experience of participation in the open innovation projects within the clusters. Then they were asked about the difficulties they went through while participating in these projects. Thereafter, each difficulty detected was the subject of in-depth questioning. All interviews were recorded and then transcribed.

The study is based on the *strategy of multi-site study*, which is considered by many authors to have the advantage of deepening and strengthening understanding, as well as increasing the generalisability of the results, by confirming that the findings observed in such context are not purely idiosyncratic. The cases were selected using the explicit sampling method guided by our research question and theoretical framework. The examination of a series of similar cases at the first site (first regional cluster) allowed us to understand in-depth the findings obtained. Then, we tried to intensify our results and increase the validity and stability of our findings. Thus, the *successive replication strategy* advocated by Yin (1991) was followed, which states that if the finding is true in a context and is also true in a comparable context, then the finding is more robust. Thus, three clusters that all present a similar context and operate in interconnected sectors were selected, namely the Electronics, Microelectronics and Mechatronics Cluster of Morocco (CE3M), the Solar Cluster of Morocco and the Cluster of Moroccan Technical Textiles (C2TM).

Concerning the selection of people to be interviewed within each case study, the *snowball or chain effect sampling method* proposed by Miles and Huberman (2003) was adopted. This method involves identifying good cases through people who know other people who know cases rich in information. Therefore, the iterative approach based on the progressive constitution of the sample by successive iterations was applied. *Theoretical saturation* was achieved to ensure the robustness of our data collection. Theoretical saturation is the point where the redundancy with previously obtained data appears (Glaser & Strauss, 1967). Following Yin (2016), we continued our semi-structured interviews until the data collected no longer provided new information (or incremental learning was minimal), and the marginal information did not challenge our built frameworks. The empirical data was translated into theoretical concepts through the *abstraction method* using *open coding* (Strauss & Corbin, 1990; Thiétart, 2014). Then the data was encoded using the *method of thematic analysis* with *Nvivo 10 software* and the unit of analysis was a paragraph.

Table no. 1 - Justification of methodological choices

Methodological choice	Justification
Abductive approach/Hybrid Exploration	The concepts we have mobilized are sufficiently studied in literature
Qualitative approach	Consistent with the study of objects not directly observable (feelings, thoughts, motivations, attitudes of the actors)
Semi-Directive Individual Interview as a data collection mode	Develops a deep understanding of the phenomenon in its context and the meaning that individuals attribute to it
Multiple case study	Increases the generalizability of the results and deepens the understanding and explanation of the phenomenon
Successive replication strategy as a case sampling method (Yin, 1991)	Verification of results in similar contexts increases the robustness of these results
«Snowball or chain effect» as an intra-site sampling method (Miles and Huberman 2003)	Increases the contextual nature of the knowledge produced
Thematic analysis method (coding unit = paragraph) via Nvivo 10	This facilitates the identification of relationships between nodes
Mixed analysis strategy (case-oriented + variable-oriented; intra-site + inter-site)	Allows analysis of components that do not obscure the study of all sites

Source: Developed by authors

Research findings of empirical study

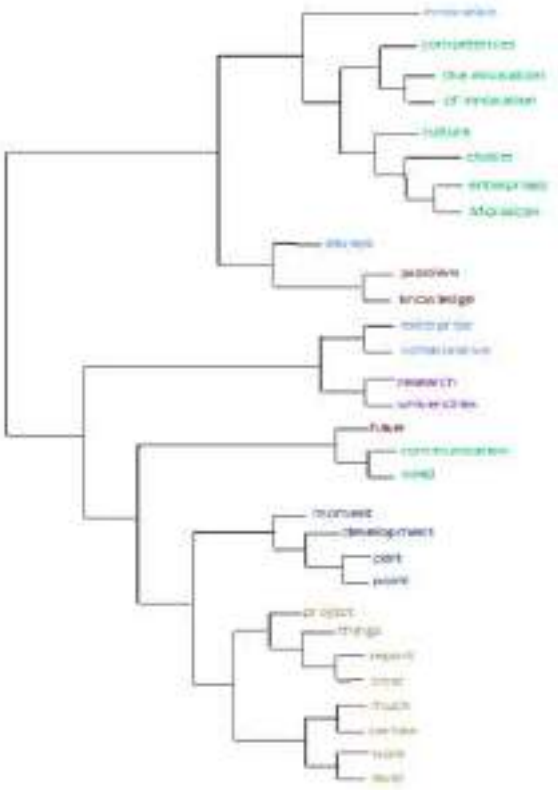
The results of the lexical analysis revealed the 30 most frequently used words (see Figure 1). As can be noticed, the words the most frequently used by our interviewees are "cluster", „project", „research", „companies" and „problem". Then some other words emerged such as „innovation", „development", „work", „time", „skills", „knowledge", „party", „communication" and „collaborative".

Figure no. 1 „Cloud" of the most frequently used words

Source: output of Nvivo 10 software

In addition, a « word tree » were extracted from the discourse of our interviewees. As it is demonstrated in Figure 2, the words « innovation » and « competences » were used by our interviewees in association within the same sentence. The words „enterprise" and „Moroccan" were preceded by the word „cluster" which, in turn, the word „culture" was the pioneer. The word „knowledge" was very often applied in combination with the word „problem", which was preceded by the word „always". The word „enterprise" was frequently used in combination with the word „collaborative". The word „university" was employed in combination with the word „research". The word „communication" was used in combination with the word „need". The word „time" was applied together with the word „report" which was preceded by the word „project".

Figure no. 2 „Word tree“ of interviewees' discourse

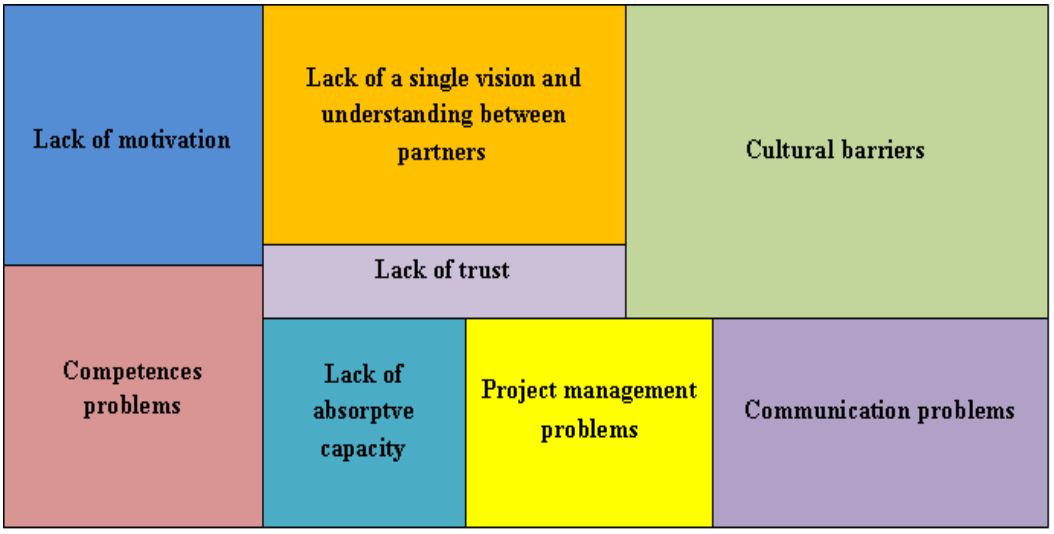


Source: output of Nvivo 10 software

1.1 Human difficulties of open innovation projects within regional clusters

After completing the lexical analysis, the different nodes and sub-nodes were encoded according to the method of thematic analysis with the paragraph as the unit of analysis. The results of this encoding allowed us to construct the rectangular hierarchical diagram of the themes. Thus, Figure 3 demonstrates the human difficulties of open innovation projects discussed by our interviewees. The size of the space given to the theme in the graph corresponds to its importance (the percentage of the discourse given by the interviewee to each difficulty). Thus, the main human difficulties of open innovation projects within Moroccan regional clusters are lack of motivation, lack of a single vision and understanding between partners, cultural barriers, lack of trust, competences problems, lack of absorptive capacity, project management problems and communication issues.

Figure no. 3 Rectangular diagram of human difficulties in open innovation projects



Source: output of Nvivo 10 software

Each theme from the above diagram was explored in depth to better understand the origins and causes of each difficulty. This allowed us to detect which dynamic capabilities should be developed to overcome these difficulties.

1.2 Dynamic capabilities to overcome human difficulties of open innovation projects within regional clusters

The empirical data was translated into theoretical concepts through the *abstraction method* using *open coding.* Also, the abductive approach was applied which is about the iterative back and forth between theory and practice. Thus, by reviewing the literature at the intersection of the human dimension of open innovation and the theory of dynamic capabilities, four theoretical concepts were identified and linked to the dynamic capabilities framework. Therefore, it is proposed that, to overcome human difficulties, and to adapt to the new environment induced by the shift from a closed to open innovation paradigm, four dynamic capabilities should be developed by the organisation, namely team sensemaking capability, absorptive capacity, capacity to renew its competences and capacity to transform its organizational culture. These ideas will be further developed in the following subsections.

1.2.1 Team sensemaking capability

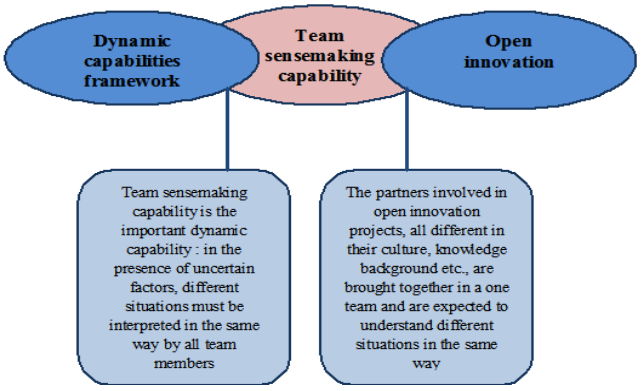
As it has been mentioned above, Teece (2020) makes a distinction between ordinary dynamic capabilities and high-level dynamic capabilities, while high-level dynamic capabilities can be divided into three categories: sensing, seizing and

transformating capabilities. *Sensing capabilities* are abilities to identify and evaluate new business and technology opportunities and relate to activities such as analysing and monitoring changes in the organisation's environments, assessing customer preferences, capturing ideas internally from employees and identifying new business opportunities. According to the findings of our research, sensing capabilities first consist of developing the team sensemaking capability.

The concept of team sensemaking capability comes from Weick's sensemaking theory and focuses on the cognitive processes, using them people develop together mental models and attribute appropriate meaning to new experiences to meet the requirements of the changing environment (Weick et al., 2005). According to the dynamic capabilities theory, sustainable competitive advantage is attributed to companies that can react quickly to the turbulent changing in the environment. Thus, companies with strong team sensemaking capabilities have a competitive advantage, as they are able to develop shared interpretations of changes in the environment (Teece, 2020).

Many authors have mentioned the importance of team sensemaking in open innovation projects: Alasoini (2011), Amaya et al. (2019), Mahdad et al. (2020), Mesgari & Okoli (2019). Sheng (2017) and Teece (2020) also recognise that one of the important dynamic capabilities, especially in the early stages of open innovation, is the sensemaking capability because, in the presence of uncertain factors, it is necessary to be able to assign the same meaning and interpreting the different situations in the same way by all the team members.

Figure no. 4 Theoretical links between team sensemaking capability, dynamic capabilities framework and open innovation



Source: Developed by authors (based on a literature review)

Indeed, the partners involved in open innovation projects are all different in their culture, knowledge background, mode of operation and objectives. Notably, a part of the companies belonging to the clusters is subsidiaries of foreign multinational companies, which implies the difference in objectives between these subsidiaries and the Moroccan national companies belonging to the same cluster. Some verbatims of our interviewees illustrate this point:

> *... the difference between the local Moroccan companies and the subsidiary companies ... there was some friction because we do not have the same objectives ... the Moroccan company wants to go further in its development, and the subsidiary company, for it, must do just the production and not go further. (Company manager)*

On the other hand, it is about the difference in objectives between the company and the university. The company wishes to do practical and applicative research, while the university favors fundamental research :

> *... often we see studies or projects at the level of Universities ... we remain attached to fundamental research in the field of science. And sometimes, we will find subjects that we know that ... even if we find results, they will be useless ... (Cluster Leader)*
>
> *Morocco ... needs to do applied research concerning the different products ... that are consumed by the local market, and to be able to do ... reverse intelligent engineering ... and that will be much more quickly ... valued than staying in fundamental research ... (Company manager)*
>
> *I have the impression that our institutions in Morocco remain disconnected... I tend to believe that the two worlds do not understand each other... The company, concerning the University, is ready to hear what the University says, but without expecting much. (Cluster Leader)*

Despite these differences, the members of open innovation are united in one team to collaborate on a project and are therefore expected to create common sense to understand different situations in the same way:

> *... it's this vision of things that is not always the same from one interlocutor to another... the challenges we encounter about the human factor are often about how to share, already build a vision and be able to share it with the other stakeholders, and allow them the same understanding of this vision. And I think that this is the key to the success of all collaborative projects ... (Cluster Leader)*

Akgün et al. (2012) argue that team sensemaking capability is a second-order construct consisting of five elements, namely internal and external communication (Weick et al., 2005), information gathering (Neill et al., 2007), information classification

(Akgün et al., 2006), the building of shared mental model (Neill et al., 2007), and experimental action (Weick et al., 2005). In this sense, the speeches of our interviewees confirm this. In particular, concerning communication :

> *... every day we had physical meetings, so a physical presence. And that doesn't prevent us from using WhatsApp at the time ... when one of us was abroad, we used Skype to discuss, but ... it was mainly physical meetings. Daily and physical. (University Professor)*
>
> *Constructive criticism via brainstorming sessions helps to create a common sense, ... it will be useless to develop something that won't be sold later... That's brainstorming ... focused and directed brainstorming. I am criticising the idea, because ... when you direct a maximum of criticism to an idea, and really you are able to ... argue, to find ... founded answers ... (University Professor)*

Communication is primarily a matter of common language. However, university professors and business leaders of our sample have difficulties understanding each other because they don't use the same language :

> *We don't speak the same language... and there is a feeling that the communication between the two... does not pass ... (Cluster Leader)*
>
> *We always have this difference in language between the university and the entrepreneur. So, it is this difference in language that makes the two entities more and more distant. (University Professor)*

To be able to make sense in common, there is a need to teach the other our language, but also to make the effort to understand the language of the other partner:

> *... we also integrate them through what we call knowledge-sharing meetings ... try to interweave them so that they can learn our language. And then we also communicate so that they can learn each other's language. That's how it works (Research Foundation Manager).*
>
> *At this point, the language, the jargon, I have it, the scientific background, I have it ... That's why I can still speak the same language as an engineer or ... a technician. (University Professor)*
>
> *... we also try to search for information to be able to speak the same language as our partner ... (Head of the Research Foundation)*

Also, communication is the way to understand the exact meaning of the information shared in the transfer of knowledge:

> *... sometimes we ask directly for the exact information... you send me a draft proposal or something, if I don't understand something, one, I look it up on the internet first of course, two, I contact the partner directly, so that I can, one, understand exactly what they mean by such and such information, and two, so*

that I can point out the research that I'm going to do to understand the given information more deeply. (Head of the Research Foundation)

Thus, as it was mentioned above, among the human difficulties in open innovation projects within Moroccan clusters is the lack of a single vision and understanding between partners. To overcome this difficulty, it is proposed that all open innovation project members should make an effort to develop team sensemaking capability.

1.2.2 Absorptive capacity

Still regarding sensing capabilities, the second dynamic capability to develop is the absorptive capacity (according to our empirical findings). The concept of *absorptive capacity* was introduced by Cohen and Levinthal (1990), who defined it as the ability to recognise the value of new information, assimilate it and apply it for business purposes. Zahra and George (2002) redefined the concept by highlighting its multidimensional nature. In particular, the authors distinguish between *potential absorptive capacity*, which includes the capacities to acquire and assimilate, but that does not always lead to the exploitation of knowledge; and *realised absorptive capacity*, which appeals to the capacity to transform and exploit new knowledge.

As it was mentioned above, among human issues of open innovation projects within Morrocan clusters is the lack of absorptive capacity. That is the partners the actors involved in the projects have difficulty understanding the new knowledge coming from the external partners. Some verbatims of our interviewees illustrate this :

Very often, a lot of time has been wasted ... discussing trivia... « And how do you do that? » « Well, no, that's how it goes. » (University Professor)

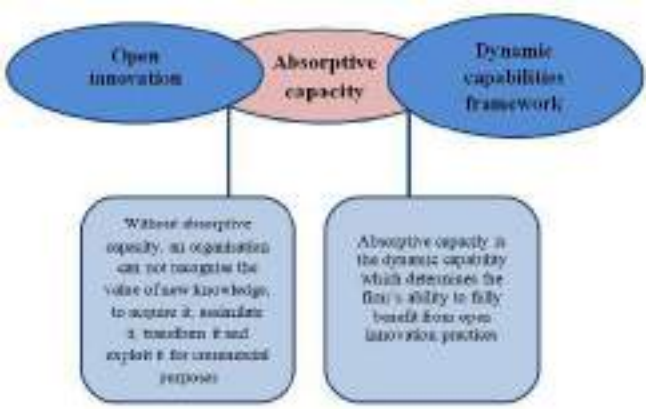
... He doesn't understand, his capacities are limited, he has no absorptive capacity to understand, and his absorptive capacity is very low ... They can't understand my proposals. (Company manager) ...

... if someone comes to them with a new project, sometimes they are not able to understand it. (University Professor)

And since they can't understand, it follows that they are not able to respond properly, and communication between external partners of the project becomes distorted.

I send out deliverables; I don't get any feedback ... because they don't understand ... I send you a deliverable, and you answer me ... with another report. You tell me yes, this part is good, it fits with the specifications, and this part is not ... And this is a problem ... And this is a handicap, the fact of not having a team, a team that is capable of answering you based on a deliverable of a report as to whether you have respected or not, this is a problem. (University Professor)

Figure no. 5 Theoretical links between absorptive capacity, open innovation and dynamic capabilities framework



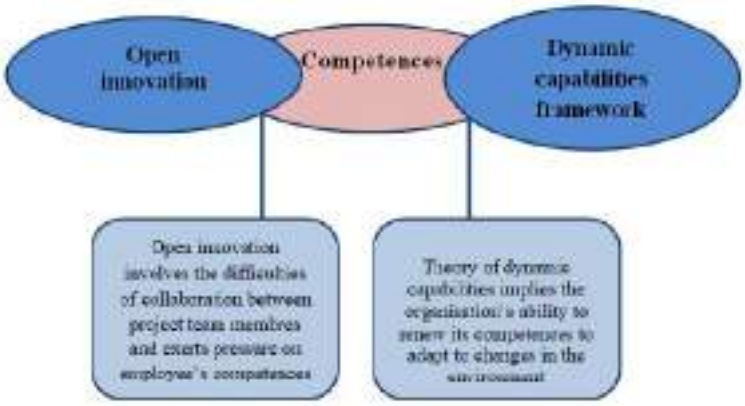
Source: Developed by authors (based on a literature review)

Thus, the second dynamic capability to be developed to adapt to the changing environment of the new open innovation paradigm and to overcome human difficulties is the absorptive capacity. In the context of sensing capabilities, it is about developing the potential absorptive capacity, to be able to identify and recognise the value of new knowledge that may be useful, so as to detect new business and technology opportunity. Once this opportunity is recognised, it is supposed to be exploited and transformed into a new product on the market, which requires seizing capabilities. *Seizing capabilities* refer to the ability to invest in complementary technology and assets and to be able to exploit new opportunities as they arise. Thus, in the case of our research, it is proposed to connect seizing capabilities with realised absorptive capacity.

1.2.3 Capacity to renew individual competences

Concerning seizing capabilities, apart from the realised absorptive capacity that was already mentioned, in order to be able to exploit the newly acquired knowledge, an organisation should be able to adapt its competences to the changing context of the open innovation paradigm. Indeed, the paradigm of open innovation involves the difficulties of collaboration and puts pressure on employees' competences (see Figure 6). In this context, dynamic capabilities focus on the organisation's ability to renew its competences to adapt to changes in turbulent environments (Sheng, 2017).

Figure no. 6 Theoretical links between competencies, open innovation and dynamic capabilities theory



Source: Developed by authors (based on a literature review)

Numerous research studies have investigated what individual competences are important for open innovation projects: Behnam et al. (2018), Bello-Pintado and Bianchi (2019), Hong and Kim (2020), McPhillips and Licznerska (2021). Regarding the results of our study, the important competences for open innovation projects are first of all hard scientific skills, each in their field of specialisation:

> *Now, in this type of work, you need experts, experts by trade who master different technologies. When we think of developing a new product, we need experts in plastics, mechanics, hydraulics and others, electronics and software, so that these experts collaborate together to make projects ... So, we need experts by trade ... (Company manager)*

More importantly, these are the soft skills that are needed as a result of the new open innovation paradigm. In particular, according to the analysis of our interviewees' speech, these are managerial skills, such as project management skills, team management skills, but also communication, leadership capacity, the ability to resolve conflicts, a spirit of sharing, the ability to listen, adaptability and sense of initiative. Some verbatims could illustrate these findings :

> *We need people who have a sense of the organisation because to manage projects involving different organisations, we need to keep track of deadlines, ensure that deliverables are handed in on time and that the deliverables are compliant and validated by all stakeholders. (Cluster Leader)*
>
> *It's very important ... are able to manage the project as a group, you don't find them. (Cluster Leader)*

... first of all, it is the sense of listening. First of all, you have to know how to listen to the company in order to know how to identify its problems... the associative work... it's really... knowing how to listen ... (Cluster manager)

Soft skills are very important in collaborative projects because you have to communicate, you have to understand each other (University Professor)

Communication skills, you have to be able to communicate, to know who to communicate with, you have to be able to look for the right partners, you have to have a minimum of communication tools ... (Cluster manager)

... first of all, it is the sense of listening. First of all, you have to know how to listen to the company in order to know how to identify its problems... the associative work... it's really... knowing how to listen... (Cluster manager)

What we lack is the soft skills ... knowing ... how to guide (orientate) people ... how to really try to federate the members of each team ... (Head of the Research Foundation)

... I think that in the context of open innovation ... it's also everything that is a collaborative project ... there has to be a coordinator or a coordinating committee because effectively to frame the communication ... the management of the group ... (Head of the Research Foundation)

Indeed, our findings are consistent with the results of Petroni et al. (2012), who demonstrated that open innovation reduces the role of senior scientists with only scientific and technical skills, and that with the adoption of open innovation, new professional profiles appear, such as "integration experts" or "T-men", i.e. people with scientific expertise and at the same time a strong capacity for integration and coordination, able of managing complex organisational structures :

We need moderators, facilitators, people who can resolve conflicts easily, give importance to both visions and are capable of finding compromises because often we will be confronted with conflicts, with concerns about understanding ... (Cluster Leader)

When there is a conflict or misunderstanding, it is the leaders and the coordinator who resolve the problem. Every Workpackage... there are the Leaders. So, if there is ever a problem, it's the leader who will resolve it. If the leader can't...or...involved in the problem, it's the project coordinator who manages... (Research Foundation Manager)

... we need people ... who are able to adapt easily to both cultures, who can communicate easily with both, who speak both languages. (Cluster Leader)

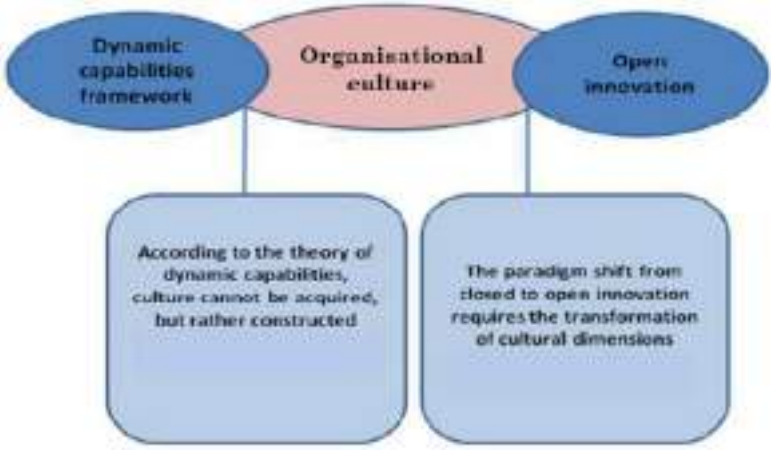
Thus, the findings of our study confirm that in order to fully exploit new opportunities once they have been identified, the organisation should be able to adapt its competencies. And this is the third dynamic capability to be developed.

1.2.4 Capacity to transform its organisational culture

Finally, *transformating capabilities* are about the ability of an organisation to reconfigure itself to adapt to highly dynamic environments. And the first factor that should be reconfigured is organisational culture. The definition of organisational culture mostly accepted by the scientific community is as follows: « a set of values, beliefs, assumptions and symbols that is shared by all members and that directs their decisions and organizational behaviors» (Schein, 1985). Indeed, organisational culture can promote or delay the open innovation process it depends on whether an organisation's culture is favorable or unfavorable to such a process (Naqshbandi et al., 2015). In open innovation literature, organisational culture is often flagged as a key inhibiting force and one of the greatest challenges when companies are moving toward open innovation principles (Van de Vrande et al., 2009; Lichtenthaler, 2011; Cui et al., 2018).

According to the theory of dynamic capabilities, culture cannot be acquired, rather it must be constructed. Thus, to successfully transition from closed to open innovation, companies need dynamic capabilities to adapt their intangible resource « organisational culture » to their innovation strategy (Teece et al., 1997).

Figure no. 7. Theoretical links between organisational culture, open innovation and dynamic capabilities



Source: Developed by us (based on a literature review)

The analysis of our data demonstrates that the place of culture is crucial in the context of inter-organisational projects, which involve different partners:

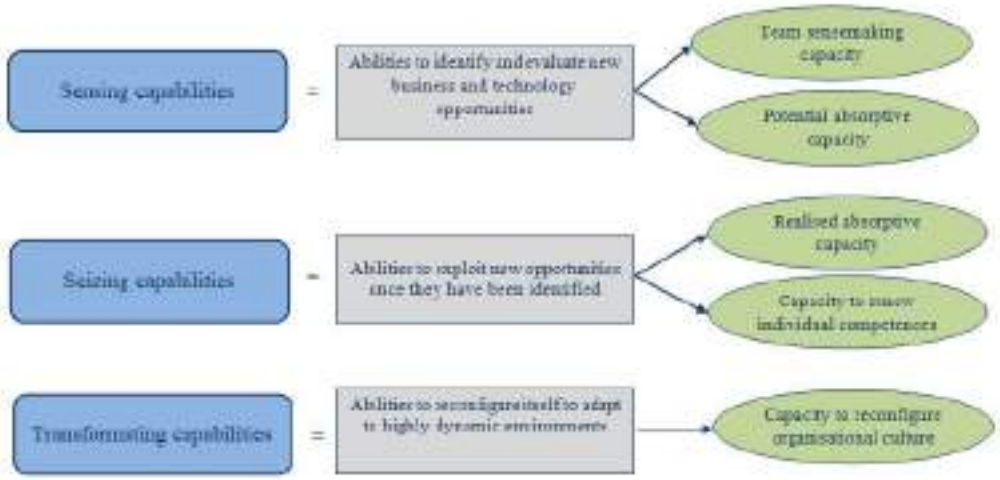
> *It is the cultural shocks, and cultural clashes that make sometimes the advancement of the project hindered by cultural biases. (High-level manager at the Engineering Research Lab)*
>
> *We contrast with intra-company projects where we need to have a minimum of communication because people share already a common culture ... When we bring together people from different cultures ... (Head of the Cluster)*
>
> *Culture is the first factor of success... When we talk about « mindset » ... to be in the same problem ... to really make a good collaborative project succeed, all the actors must have the same culture of sharing, the same sense of challenge, the same sense of success, and especially the concern of information... (Cluster manager)*

The cultural obstacles we have detected through the analysis of our interviewees' speech fall under the two sub-dimensions of organisational culture. The first sub-dimension, which is innovation culture, consists of a lack of ambidexterity, fear of change, lack of patience, no encouragement of the initiative, fear of failure, a culture of ease « turnkey », mimetic behaviors (based on the analysis of our results). For the second sub-dimension, which is open innovation culture, our analysis revealed resistance to collaboration and sharing knowledge, a culture of self-interest and opportunism.

In this sense, our findings reveal that open innovation is a relatively new concept in the Moroccan context, it is always a question of successfully transitioning from the closed approach of innovation to the open innovation paradigm. Therefore, there is a need to transform the organisational culture to develop strong innovation culture, to move from the « turnkey » culture of ease and imitation towards the innovation culture based on risk-taking and controlled fear of failure, to develop a sense of ambidexterity, of patience, encouraging talent and the reason for the initiative, but most of all to promote open innovation culture based on collaboration and knowledge sharing.

Thus, the fourth dynamic capability that should be developed to overcome the human difficulties of open innovation projects is the capacity to transform its organisational culture. The ideas presented here above are summarised in the relational scheme (see Figure 8), which links the four theoretical concepts we identified with the three high-level dynamic capabilities.

Figure no. 8. Relational scheme of high-level dynamic capabilities



Source: Developed by authors (based on literature review and empirical findings)

Conclusion

This paper focus on the human dimension of open innovation from dynamic capabilities view. Based on a semi-structured guide, 22 interviews were conducted with four categories of open innovation project actors (company managers, university professors, research foundation executives and cluster managers) within three Moroccan clusters: CE3M (Electronics, Microelectronics and Mechatronics Cluster of Morocco), Solar Cluster and C2TM (Moroccan Technical Textiles Cluster).

The *findings* of our study reveal that the main human difficulties of open innovation projects within Moroccan regional clusters are lack of motivation, lack of a single vision and understanding between partners, cultural barriers, lack of trust, competences problems, lack of absorptive capacity, project management problems and communication issues. To overcome these difficulties, and to adapt to the new environment induced by the shift from a closed to open innovation paradigm, four dynamic capabilities should be developed by the organisation, namely team sensemaking capability, absorptive capacity, capacity to renew its competences and capacity to transform its organisational culture.

As *managerial implications*, the results of our research could be useful for managers of organisations participating in open innovation projects within regional clusters in the development and implementation of human resource management practices.

As each research study has its *limitations*, ours is no exception. First, the theoretical concepts studied are not static but evolve. Thus, it could be more interesting to conduct longitudinal research. Also, our analysis was based only on the speech of people during the interviews. An immersion on the site to carry out a deep observation of the actors has not been realised.

Future research perspectives are directly derived from the above-mentioned limitations. Furthermore, the results of our study, which were obtained by mobilising the qualitative approach and the abductive one, could in the future be the subject of a quantitative study through the testing of the various hypotheses to find out whether our results are confirmed or refuted on a representative sample of actors. Additionally, it would be worth conducting another research to see which HRM practices are best adapted to meet the human challenges identified in our research. Finally, it would be interesting to explore inter-organisational HRM practices, aligned at the level of all the partners in the collaborative innovation project.

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A COMPARATIVE ANALYSIS OF THE STARTUPS ECOSYSTEM IN THE UAE AND KSA WITH REFERENCE TO ALGERIA

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Abstract

The study aimed to compare the startup ecosystems in the UAE and KSA to determine their location on the global map of these systems, in addition to shedding light on the Algerian experience as a recent model in this field. The study reached the difference between the startup ecosystems in these countries: while the UAE is considered one of the most successful experiences with very advanced ranks in the world and the first in the Arab world, Saudi Arabia succeeded during 2022 in achieving good results that strengthened its global position in that. As for Algeria, it is still laying the groundwork for its startups ecosystem. Although, as a country, it has not yet entered the global ranking of the 100 best startups ecosystems, the city of Algiers has entered the ranking of the 1000 best cities, achieving a huge qualitative leap compared to the preceding year in the startups ecosystem, opening the way for it to compete for more advanced ranks.

Keywords: *Entrepreneurship; Startup; Ecosystem; UAE; KSA; Algeria*.
JEL Codes: *L26, O57.*

Introduction

Start-ups are today one of the most important topics that receive great attention from academics and economists, as they have become among the essential ways and tributaries that contribute to achieving economic development and keeping pace with technological developments at the same time. This importance has increased with the rising role of creativity and innovation in promoting development and economic growth, which is directly linked to start-ups (Ziakis, Vlachopoulou, & Petridis, 2022, p. 01). Also, start-ups

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can play a pivotal role in economic growth and dynamism through their contribution to creating more jobs and employment opportunities while increasing innovation and enhancing competition (Kartini & Callista, 2021, p. 931). This has made startups a "tendency" that both developed and developing countries are heading towards, through the support and stimulation of their establishment and launch by entrepreneurs. Through this, countries pay great attention to preparing and providing an integrated institutional framework that allows support for the establishment of start-ups and works on their success. This by covering various aspects, including the legal, legislative, and regulatory aspects; the financing aspect; a stimulating investment environment; exchange with the education community, such as universities, research centers, and specialized institutes; availability; and then interaction with other similar and complementary bodies within the "startup ecosystem"(Ziakis, Vlachopoulou, & Petridis, 2022, p. 01). In this area, various studies and reports have highlighted a clear difference between countries that have achieved great success and an international reputation in the establishment and success of start-ups and those that have encountered difficulties in setting the appropriate climate for them.

Many international bodies and organizations have taken an interest in studying and evaluating the "startup ecosystem" at the countries level, in view of the importance and role of these systems in supporting and developing the fabric of start-ups. That comes in order to identify the strengths and weaknesses of each of those ecosystems while benefiting from successful experiences in that area, including Arab Gulf Countries and Algeria.

Problematic and hypotheses of the study:

Arab countries are working to keep pace with the international market at various levels while improving their ranking in many global indicators. Some of them have experienced tremendous growth in their start-ups ecosystems and have placed them in good ranks at the global level to become a model for the start-ups ecosystem, led by Arab Gulf countries like the United Arab Emirates (UAE) and the Kingdom of Saudi Arabia (KSA). On the other side, Algeria is still new and recent in this field, where its approach to the issue of start-ups does not exceed 3 years, while the ecosystem in its practical sense is still under construction through serious initiatives and important steps in the legal, financial, and even academic aspects. Therefore, **the reality of the startups ecosystem in each of the UAE, KSA, and Algeria** is the main issue of this study.

To answer the problematic of this study, we propose the following general hypothesis: The ecosystem of start-ups knows a clear discrepancy between the UAE, the KSA, and Algeria, where they agree on the potential and growth rate witnessed by the ecosystem, while they differ in the development recorded in each of them.

While the proposed partial hypotheses are:

- In 2022, the UAE will still maintain its reputation as one of the most important ecosystems for start-ups in terms of attraction and facilities.
- The KSA managed to impose itself on the global map of start-up ecosystems through an advanced ranking during the year 2022.
- Despite the efforts made in Algeria to strengthen the ecosystem of start-ups, it is still far from the world level in this field.

Objectives and importance of the study:

The importance of the study appears in the basic and effective role that the ecosystem plays in the success of the start-ups, as the presence of these enterprises means the availability of all the factors and elements that help them to do so. Therefore, knowing the practical reality of these systems is important to benefit from successful experiences, especially those that converge in some characteristics, such as the Arab countries. This study aimed to determine the status of each of the UAE, the KSA, and Algeria on the global map of start-up ecosystem, in order to determine the weight of these systems and the extent of their effectiveness in the establishment of start-ups in each of them. As well as a comparison of these ecosystems to identify their similarities and differences.

THEORETICAL BACKGROUND

1. Literature review:

Entrepreneurship is among the domains that countries are working to develop in order to contribute to supporting the economy; therefore, many researchers have been interested in studying and evaluating the ecosystems of entrepreneurship, sometimes in comparison, in order to extract successful models to project on other experiences. Since start-ups are considered one of the most discussed topics recently, their ecosystem is usually included within the entrepreneurial ecosystem of countries.

The study of (Ali-Aljarwan & al., 2019) aimed to evaluate the ecosystem of entrepreneurship and start-ups in the UAE. The researchers analyzed the results of an applied study of practical interviews with actors in the ecosystem of start-ups, and surveys, in order to understand the extent of the presence and availability of these elements in the ecosystem and the extent of their impact on it, especially through the relationship between the government - academia – industry. So that the study concluded with building a practical framework for entrepreneurship that is ideal for the Emirates according to the specificities that the country possesses.

In the same context, the study of (Rahatullah-Khan, 2016) had as an objective to conduct a critical review of the entrepreneurship ecosystem, including startups, in the KSA, based on evaluating entrepreneurship initiatives to understand their growth and mapping the national entrepreneurship ecosystem, through interviews with a group of general managers and CEOs. The study concluded that the ecosystem in Saudi Arabia is in the stage of construction and launch with rapid expansion rates, which prompts it to adopt a continuous development strategy to enhance its ecosystem for startups.

While the study of (Balawi, 2021) tries to make a comparison between the entrepreneurship ecosystems of the UAE, the KSA, and Qatar, it focuses on the UAE case according to the Global Entrepreneurship Index. The study found that although there are similarities between these countries as a part of the Gulf Countries, the UAE reached very advanced ranks in many sub-indices, while the KSA has other characteristics but is still far from the UAE in general with serious and broad prospects for growth, which preaches the reduction of the difference between them.

As for Algeria, the study of (Sadkaoui, 2019) focused on the evaluation of the entrepreneurship ecosystem, including start-ups, through a survey study among a group of Algerian entrepreneurs in order to try to understand the components of the ecosystem and the interaction between them in terms of financing, cooperation, environment, innovation, and others, within a proposed framework in this field. The study concluded that the ecosystem of entrepreneurship and start-ups in Algeria needs gradual environmental and technological changes in order to adapt to the requirements of this type of enterprise, with the need to enrich and develop related efforts. Similarly, the study of (Baaziz, 2018) tried to provide contexts and paths for thinking about startups by studying the relationship between ecosystems of entrepreneurship and start-ups and some of the actors in this system. The study concluded the necessity of matching and adapting the entrepreneurship and start-up ecosystems with the local requirements of the countries in the framework of the existing conditions and the problems that can be faced.

2. Theoretical framework:

2.1. Definition of "Start-up":

Despite the interest of many studies and research in the start-up, no agreement has been reached on a single and unified definition of it, due to different points of view and the angle from which it is viewed, as start-up is considered a part or an image of entrepreneurship. Although it was previously viewed as a stage of the enterprise life cycle, it has today become a form of enterprise that can move to another in case of its success; otherwise, it fails and exits the business market (Ziakis, Vlachopoulou, & Petridis, 2022,

p. 01). It is indicated that the start-up is « an enterprise at an early stage, which, through the development of its competitive and technological capabilities, can move to another form of enterprise whether a company, partnership or temporary organization » (Kartini & Callista, 2021, p. 931). This can be considered acceptable despite the special characteristics of the start-up that distinguish it from other types of enterprises. It is often the first stage in which the project begins and is launched, in order to have the opportunity to transform into another model of enterprise in the event of achieving the required success in light of the high risk, which means significant growth, or the inability to conform to these conditions and directly exit the market.

Therefor, it can be said that a start-up is « a group of people seeking to propose and provide a new product or service, under conditions of complete uncertainty » (Ziakis, Vlachopoulou, & Petridis, 2022, p. 01). This uncertainty often results from the element of creativity that accompanies the start-up, whether in its product, operations, market, or business model. Which requires it to be innovative and uncommon judging from the fact that the start-up is « an organization in its early stage and early phase of its life and operation, it may aim to enter an existing market, create, or open a new market, this through an innovative product or service » (Nurcahyo, Akbar, & Gabriel, 2018, p. 44). Consequently, a start-up is an enterprise characterized by its youth, smallness, independence, creativity, innovation, and carrying out research and development activities, all with the aim of providing current and futuristic solutions to real problems through an attractive business model and a talented team.

Thus, start-ups differ from other types of enterprises in many characteristics. The most important of which is the high degree of innovation that distinguishes start-ups, whether in technology, product or service, business model, operations, etc.. As well as in their great ability to exploit the internet to penetrate markets at the global level and their accessibility to various and new financing sources that give them the opportunity to grow faster than other enterprises (Sevilla-Bernardo, Sanchez-Robles, & C. Herrador-Alcaide, 2022, p. 01).

2.2. Presentation of the startups ecosystem:

The emergence and growth of startups is not only related to the owners of ideas and talents, and it is not enough either. This must be accompanied by the availability of an environment based on various private and governmental entities, which have a contribution to support and care for these enterprises. That which facilitates and clarifies the work of the entrepreneur in launching and following up his startup, especially if the ecosystem has previous experience, which means the availability of previous projects with clear financing mechanisms, an advanced innovation system, and a stimulating and conducive climate to

do so (Agnihotri, March 2018, p. 02). Which has been confirmed by some studies related to the success factors of start-ups. Those studies concluded that some of the important aspects of the launch and success of start-ups are based on: the sustainability of the approved business model, the high capabilities of employees, theoretical and educational support, benefiting from and participating in programs related to start-ups like business incubators and accelerators, the attitude and turnout of investors to risk, as well as the availability of angel investors (Sevilla-Bernardo, Sanchez-Robles, & C. Herrador-Alcaide, 2022, p. 04). That is, the cognitive and innovative aspect that characterizes start-ups is not sufficient alone for their success and continuity, but rather requires the availability of a complete system of institutions, bodies, and individuals who support this approach from constituent, organizational, financing, and many other axes required by these enterprises.

According to that, any start-up ecosystem aims to develop and expand a network that includes a diverse mix of talents and resources that solve problems facing society, locally or globally. The start-up ecosystem is "a community or fabric that includes many parties and elements that are linked to each other in the framework of cooperation, integration, and collaboration in order to enhance the special value of this ecosystem and raise its impact and effectiveness". It includes idea owners, skilled people, founders of innovative projects, early-stage young companies, business incubators and accelerators, venture capitalists, angels, media, and others. In addition to integration with other parties represented in the educational and research community such as universities, research centers and laboratories, government, the private sector, banks, workers' representatives, family businesses, entrepreneurs' associations, etc. (ALEISA, 2012-2013, pp. 06, 07). So, the startup ecosystem can play the role of a bridge between many parties who are in and exist within this system. Which means mutual benefit between the various stakeholders, bodies, and institutions and startups. For example, the ecosystem allows start-ups to provide information related to new consumer needs and advanced technologies, whether in operations or delivery, in addition to the size and type of capabilities and machines available, the suppliers, the services, the marketing, etc.. Therefore, the ecosystem of start-ups will try to link and combine ideas, resources, and people (Mason & Brown, 7th November 2013, p. 10) .

Thus, the ecosystem of startups includes each of the capital represented in the money in itself and in the available infrastructure that stimulates and facilitates the launch and growth of emerging enterprises; the knowledge including creative ideas, innovation owners, entrepreneurs, designers, engineers, and others. It also requires the rebellion and the risk that must characterize the entrepreneur to continuously create innovations in the product, process, or others (Agnihotri, March 2018, p. 02).

It should be noted that although the internet and technology allow access and communication between organizations and projects on an international level, local structure and interaction are still considered vital and pivotal to start-ups, especially in their early stages (Bachtiar, Sawiji, & Vandenberg, November 2022, p. 02). This has doubled interest in the start-up ecosystems at local and national levels, to compare them between countries and to identify points of shortcomings that can be overcome or strengthened, and points of strength that must be benefited from and exploited. This appears in the endeavor of many countries to develop their start-up ecosystems in accordance with the specifics of the local society and market on the one hand, and with the requirements of the global market on the other hand. Which is also what prompted international bodies interested in the issues of entrepreneurship to design and propose many indicators for measuring and evaluating these ecosystems.

Methodology

In line with the nature of the subject and the intended objective of the study, the analytical-descriptive approach was relied upon by examining a set of articles and reports related to the startup ecosystem, with analyzing and interpreting the data contained in the Global Startup Ecosystem Index 2022. The comparative approach was also adopted in the comparison between the countries under study. In order to achieve this, the positions of the UAE and KSA in the index will be discussed as countries, then their positions will be analyzed according to their classified cities, and then reference will be made to the case of Algeria.

The Global Startup Ecosystem Index (GSEI) is an annual report issued by StartupBlink, which represents a research center that specializes in studying and evaluating the startup ecosystems at the global level. It is considered the most comprehensive in this field. It works to provide stakeholders and those interested in the subject such as researchers, developers and innovators, businessmen and investors, the public sector, the private sector, and other parties, with the necessary tools for a comprehensive assessment of the startups ecosystems in the countries or cities of which they are interested; in order to make the appropriate decision for investment, research, or personal purposes. As well as providing the ecosystem owners with sufficient accurate information in order to develop this system in addition to promotion, generation of potential customers, analysis, consulting, and others (StartupBlink, 2017a).

In this regard, the Center annually issues a special report based on the classification of startup ecosystems at the level of 100 countries and 1000 cities in the world. So that, this index is not only concerned with the startups themselves, but also highlights all the actors

in the ecosystem, such as co-working spaces, business accelerators, investors, entrepreneurs, and others (StartupBlink, The Global Startup Ecosystem Index, 2017b).

This index is updated annually according to the changing data for each year regarding startups since 2017. In this index, the start-up ecosystem gets a certain score, which represents a total of 03 sub-points (Startup-Blink-Report, 2022, pp. 14-16):

- **Quantity score:** As the start-up ecosystem does not only include start-ups, it must be supported by many bodies and institutions that help provide and obtain resources, networks, and capital. Therefore, building an ecosystem for start-ups and its quantitative development require the participation of many stakeholders. This sub-indicator measures the "quantitative part" that is available at the level of the country or city being assessed, by which it means the number of start-ups, co-working spaces, accelerators, and meetups related to start-ups.

- **Quality score:** This sub-indicator is concerned with evaluating the quality of the start-up ecosystem at the country or city level. It includes existence of strategic branches and research and development centers for international companies in technolog, availability of branches for multinational companies, total private sector investment in the start-up ecosystem, number of employees in start-ups, the number and size of global events related to start-ups, in addition to the presence of global events related to them, number of start-ups supported by accelerators, especially international ones, presence of Unicorns, Exits, Pantheon companies, and Global Start-up Influencers.

- **Business Environment Score:** It relates to the general environment that has a direct or indirect impact on the establishment, development, and success of start-ups, such as infrastructure, business environment, size and weight of the ecosystem, and the extent of freedom and ability to establish this type of enterprise in the country. Among the elements that are measured and evaluated in this sub-indicator are: Diversity index; Internet speed and Internet freedom; R&D investment, Number of patents per capita; Availability of technological services (payment portals, ride-sharing apps..); Level of English proficiency; Top universities per location.

Results and discussion

1. Startups ecosystem in the UAE and KSA according to GSEI 2022

According to the evaluation and points granted to the UAE and KSA, concerning their startup ecosystems based on the criteria for measuring and evaluating the GSEI, their ranking for the year 2022 is shown in the following table:

Table no. 1 – The startups ecosystem assessment in UAE and KSA for 2022

	Quantity score	Quality score	Business score	Total score	Rank 2022	Ranked cities
UAE	2.19	4.30	2.92	9.412	27	03
KSA	0.28	0.16	0.51	0.948	72	04

Source: (Startup-Blink-Report, 2022, pp. 30, 32, 49)

The UAE and KSA are distinguished by many similar characteristics, resulting from their presence within the same geographical scope with great convergence in economic, social, and other aspects. Despite this, each of them still maintains local characteristics that result in clear differences in the level of performance, ranking and evaluation of each country at the level of the ecosystem for start-ups

The UAE relies on a rich and diverse startup ecosystem based on many motivating elements to attract investments and talents. It has a regulatory framework that is characterized by openness and transparency, with a constant endeavor to strengthen and develop its governance system in line with international standards. That means providing a safe and reliable business environment, including for entrepreneurs and SMEs, for which the UAE has worked for a long time to facilitate their establishment, to reach in 2020, for example, to contribute to more than 50% of the non-oil GDP in the Emirates (Expo-2020, october 2021, p. 05). This has led to the UAE occupying a very advanced rank at the global level in the start-up ecosystem, such as 27th in the world, 2nd in the Middle East, and 1st in the Arab world, with a total score of 9.412 (Table 01). Which means a very competitive system that has greater prospects for development over the past few years, with the possibility of entering among the top 10 in the world.

This result is the sum of the points recorded in the sub-indicators of the GSEI 2022, as Table 01 shows that the UAE achieved 2.19 points in the Quantity Score. It takes into account the quantitative aspect of the ecosystem, as the UAE recorded approximately 340 start-ups, 4 accelerators, 3 co-working spaces, 21 organizations, 0 leaders, and other entities and organizations not evaluated by the index. As for Quality Score, the UAE achieved 4.30 points. It indicates the qualitative results achieved by the start-up ecosystem that is highlighted by attracting some private bodies such as Unicorns, Exits, and Pantheons; the UAE has many entities of that. While for Business Score, the UAE was awarded 2.92 points, given that this sub-index measures economic and commercial indicators on the national level (StartupBlink, Best Countries for Startups, 2022a) & (StartupBlink, United Arab Emirates Startup Ecosystem Overview, 2022b).

This is thanks to the many reforms adopted by the UAE several years ago, which allowed the establishment and building of a strong legal and financial infrastructure. This includes legislation and laws that stimulate entrepreneurs, developing the banking and

financing system, especially for projects that are based on innovation, in addition to the bankruptcy law, the flexible visa system, licensing startups, and other procedures that had a positive impact and reflection on the business environment and attracted investments, capital, talents, and entrepreneurs. Which made the UAE a suitable place and an important center for launching projects and businesses, especially with the marketing of the UAE and their cities as ecosystems for start-ups, which thus attracted global attention (Startup-Blink-Report, 2022, p. 140). This corresponds to the study of (Ali-Aljarwan & al., 2019), which indicated that the UAE had adopted a special long-term vision based mainly on economic diversification, starting in 2006, through which it aimed to make the UAE a leader in innovation and creativity within the framework of sustainable development. It has focused on encouraging entrepreneurship and the growth of the role and contribution of SME's in the economy, while enhancing the competitiveness of the UAE by constantly moving towards everything new at the international level in industry, products, and services. In order to support start-ups, many initiatives, programs, and bodies launched by governmental or private entities, appear in various regions of the Emirates. Among them, we found business incubators, accelerators, and financing funds, where start-ups benefit from accompaniment and training, in order to prepare them to face local and international challenges. So that it is allowed to startups to conduct experiments within these entities, in order to expand them outside the UAE in the event of their success, by providing workspaces and activities at nominal costs, in addition to the reliability or credibility that these entities grant to start-ups when presenting their works, resulting from the reputation of the supportive body. These initiatives have led to the allocation of a part of the activities of large private and governmental enterprises and companies to dealing with start-ups, giving them priority in many sectors, accepting their business models and products through evaluation only, without going through tender. These companies should also provide the start-ups, when necessary, with educational programs related to innovation and technology, and financing local high-tech research and technologies through charitable funds (Ali-Aljarwan & al., 2019, pp. 08, 09). Especially since the growth of technology and the development of artificial intelligence provided great opportunities for start-ups and SMEs to determine the requirements and nature of the market. Which allowed them to build business models and environmental systems that help meet the needs of this market, while creating added value for consumers. This can subsequently contribute tremendously to enhancing the growth of these start-ups and SMEs, as it provides them with opportunities to expand their internal markets and move towards external markets, especially for those who prefer digital transformation (Atanasova, 2022, p. 08). Given that entrepreneurship in the field of technology seeks mainly to enhance the level of performance of enterprises by gaining them a competitive advantage (Dimitrakaki, 2018, p. 139).

It should be noted that, within the framework of linking the relationship between government-university-industry, which was the focus of (Ali-Aljarwan & al., 2019), the UAE tends to try to mandate the government for both the university and the academic community, as well as the industry, to contribute to supporting and accompanying the start-ups, each according to its specialization and specificities. So that the government funds and motivates universities and research centers to teach and include entrepreneurship, and what is related to it, within the curricula therein. In order to build an entrepreneurial culture in the Emirates, as well as to contribute to building distinguished human capital with advanced skills that are in line with the requirements of the economy in the current era of innovation and technology. Which in turn will contribute, in the future, to the creation of new entrepreneurs and start-ups, with the new jobs that this entails. As for industry, the government mandates the industrial sector in the UAE to link and strengthen the relationship with the academic community through research and development. Which allows the university's outputs to be presented according to the data provided by the industry about the practical reality, whether in the form of business models, products, services, or human capital that practically matche the requirements and needs of the industry. On the other hand, the government also mandates the industrial sector to support and cooperate with start-ups, which helps the industrial sector contribute to the development and diversification of the economy. So that UAE believes that this mandating is necessary at the beginning in order to build and strengthen the ecosystem of startups in it, and that once this system grows sufficiently, this mandating will be gradually reduced, because the relationship between stakeholders and actors within this ecosystem will become automatic, sequential, and interdependent (Ali-Aljarwan & al., 2019, pp. 12-15).

That is confirmed by the results obtained in this field, where it was noted that the UAE attracted headquarters for more than 35% of the value of an investment exceeding one billion dollars in start-ups in the Middle East in 2020, including approximately 33 of Forbes' recent 50 most-funded start-ups. This is done by providing a remarkable and clear roadmap and strategy to provide the most appropriate ecosystem for start-ups and entrepreneurs, such as the Entrepreneurial Nation project, which aims to provide all types of assistance available to innovators in order to launch and develop their startups. The UAE seeks to attract 20 startups over a period of 10 years, each with a value of more than one billion dollars, as well as the UAE's Operation 300 billion industrial plan and the 13500 planned industrial companies in sectors based on innovation, which allow the establishment of an important number of start-ups (SEED, 2021, pp. 05, 06).

On the other side, for nearly 20 years, the business environment in Saudi Arabia did not encourage the establishment of start-ups or focus on them, which was reflected in the ecosystem of start-ups, which was neither motivating nor integrated and polarizing

entrepreneurship and was characterized by many shortcomings. But, Saudi Arabia's intention, with a strong political will supported by the Kingdom's summit, to get out of dependence on oil, prompted it to underline a strategy of economic diversification and prosperity, led by a real revolution in the field of entrepreneurship. This initiative and effort were in order to prepare the right way and climate to launch investment and entrepreneurial projects, including start-ups. It is done through multiple medium- and long-term programs, which allowed organizations, universities, research centers, chambers of commerce entities, private enterprises, and others, to integrate into building the entrepreneurial ecosystem and interact with it, which later created a generation of entrepreneurs. Saudi Arabia also targeted researching and attracting everything related to innovation and intellectual capital, backed by a physical and technological structure that helped in that (Khan, Al-Akkad, & Al-Khursani, 2017, p. 19).

Considering that reliance on entrepreneurship within the strategic plans of Saudi Arabia is considered somewhat recent, as it was included in the Saudi Vision 2030 launched in 2016, the ecosystem for start-ups is still witnessing successive developments with significant improvements and changes that serve this goal. Among these changes are many regulatory reforms including the acceleration of the pace of legislation related to this field, the availability of capital, the gathering of young talents, and the establishment of a strong infrastructure. Along with the harmonization of the several ministries, agencies, and various authorities that are necessary within the ecosystem to facilitate the procedures for doing business and launching projects.

Also, as a part of its vision, KSA has established extensive initiatives in order to promote a culture of entrepreneurship among its citizens and residents through strong interaction and movement among entrepreneurs, the private sector, and various Saudi organizations and bodies (OC&C-Startegy-Consultants, 2018, pp. 30, 31). It is the same as the findings of (Rahatullah-Khan, 2016) with regard to the gradual preparation of the ecosystem for entrepreneurship and start-ups, which was launched even before 2016 to draw the features of development that it is today. Saudi Arabia has taken many measures and initiatives in order to strengthen its ecosystem and make it more open, attractive, and effective. This includes the cooperation and integration that take place between: the strategic level in the KSA (represented by the Summit, the ministries and authorities concerned with that); the institutional level (represented by the contribution of Saudi companies and enterprises, especially large ones, in all programs and plans that work to provide means that support the establishment of SMEs' and start-ups). The support covers the establishment of funds and appropriate financing formulas that reduce the financial burdens of the entrepreneur in order to launch the project. Also, since 2015, new organizations have been launched, specializing only in the field of SMEs and then start-

ups, in order to follow up on their establishment and growth and work on coordination between stakeholders. They work too, to diagnose problems and challenges and try to find solutions in the form of new policies, laws, and facilities. In addition to increasing the number and quality of services provided by various ministries and organizations related to this issue, such as the Ministry of Interior, the Ministry of Labor, the General Authority for Investment, King Abdulaziz City for Technical Sciences, the Human Resources Development Fund, and others. So that these bodies worked, each according to its competence, to provide the sound and correct frameworks to build an appropriate and competitive entrepreneurship and start-up ecosystem (Rahatullah-Khan, 2016, pp. 79-86).

As a result of all this, in 2022, Saudi Arabia reached the 72nd rank in the world in terms of its start-up ecosystem, thus being among the best 100 ecosystems in the world in which start-ups can be established and succeed in various sectors, with a total point of 0.948 according to the index (Table 01). In detail on this point obtained, we find that KSA has achieved 0.28 points in Quantity Score as it recorded approximately 104 start-ups, 0 accelerators, 2 co-working spaces, 2 organizations, and 01 leader, in addition to many governmental and private business incubators and many co-working spaces that are not included in the index. As for the Quality Score, Saudi Arabia achieved 0.16 points; it is noted that entities like Unicorns, Exits, and Pantheons, are absent so far, which led to a low point for KSA in this regard. While for the Business Score, Saudi Arabia was awarded 0.51 points (StartupBlink, Saudi Arabia Startup Ecosystem Overview, 2022c); in this sub-score, it can be said that KSA is working hard to provide a better business environment for investors and entrepreneurs. This is as a part of the KSA strategy to shift towards a more diversified economy, through developing the private sector and increasing its contribution to the economy, with a special focus on innovation, where the Kingdom encourages all initiatives that support innovation. For example, Saudi Arabia offers, through private institutions and bodies, the possibility of financing innovative projects in the form of startups in the technology sector, with approximately 90% of the financing value (Startup-Blink-Report, 2022, pp. 241, 242). As for the most popular sectors of activity for start-ups in KSA, we find Transportation, Hardware & loT, Ecommerce & Retail.

In support of the foregoing, it appears that both the UAE and KSA are characterized by some similar characteristics that allowed them to achieve positive and stimulating results at the global level in the field of the ecosystem of startups, with their being among the top 100 startup ecosystems in the world, including their presence in the MENA region. Some studies confirm that it is a region that is witnessing significant growth, whether in the number of startups that have been established or in the volume of funding for these enterprises. Those start-ups work to adapt the business models that they offer with the regional requirements and the local requirements in each country in the region, before

moving to business models more presentable or expanding outside the local market. Therefore, the innovation, creativity, and boldness adopted by entrepreneurs in the region, while adopting best practices in investment and entrepreneurship, helps to provide greater value to investors and projects, as well as to the ecosystem of start-ups in the region (Alkasmi & al., 2018, pp. 06, 07, 09).

Some indicators highlight that in the year 2020, for example, only three countries obtained a total of approximately 88% of the invested capital, namely the UAE, KSA, and Egypt, with the UAE acquiring more than 50% of this capital. The increasing concentration of investments and start-ups in the UAE and KSA can be explained by the availability of a strong capital base advantage and the established strategies in these countries to attract strong, distinguished talents and unify resources. They work, also, to introduce many reforms related to the business field, such as registration processes, including electronic registration, and reducing fees for launching projects and enterprises, with the possibility of full foreign ownership in many sectors, except for sensitive and strategic sectors. In addition to launching sovereign funds that finance start-ups in both the UAE and KSA, with the aim of encouraging investment in them and reducing dependence on oil revenues in exchange for building a diversified economy based on innovation, knowledge, and digitization (The-Lauder-Institute, 2022 , pp. 58, 59).

Despite these similarities between the UAE and KSA, Table 01 clearly shows a difference in the ranking and scores of each of them in the index, through the superiority of the UAE with a clear and significant difference from KSA. It is the result of some local and national particularities, where the UAE is classified as an innovation-driven economy, while KSA is classified as an efficiency-driven economy. This can be explained by the dissimilarity in the timing and implementation of the strategies outlined to achieve economic diversification in each of them, which was relatively discussed in the results of (Balawi, 2021). In 2020, for example, the UAE was able to rank first in the Arab world, including the Gulf countries, in the field of business performance. It is characterized by many facilities that have been formulated and adopted, such as business and real estate registration, building permits, ease of paying taxes, etc., which make it one of the most successful markets in which business is conducted. In addition to strengthening the position of entrepreneurship in the UAE and making it a major axis in achieving the desired economic development and diversification, where SMEs today represent more than 94% of the total business in the UAE. It is also being sought for the continuous development of the system and environment of entrepreneurship in the UAE by providing a business environment suitable for entrepreneurs who present innovative ideas, new products, and processes, with opportunities to link with international markets and the possibilities of financing with risk capital, which are all necessary for the establishment of start-ups.

On the other hand, the KSA still relies on oil significantly in its economy and has not moved towards relying as a priority on including entrepreneurship, SME's, and start-ups within its plan to achieve economic diversification and get out of oil dependence except through the Saudi Vision 2030, which was launched in 2016. This means continuing to build the ecosystem so far, and it is still marred by some problems and obstacles that KSA is working to find the necessary solutions for in order to improve its global ranking in this and reduce the difference from the UAE as the leader in the region in this field (Balawi, 2021, pp. 59, 60, 62).

2. Startups ecosystem at the cities level in UAE and KSA

The country usually works to create and build an ecosystem for startups that is integrated and comprehensive enough to reach the various regions. But the real application of this on the ground shows clear differences between countries and between cities in the same country, either in the availability of the components of this system or the extent of success in laying its foundations. Which prompted the index to assess the start-up ecosystem in cities as well. The results for the UAE and KSA are shown in the table:

Table no. 2 – Evaluation of start-ups ecosystems in UAE and KSA by ranked cities

	Number of ranked cities	The ranked cities	National rank	Global rank 2022	Change rank (2021)	Total score
UAE	03	Dubai	01	61	+ 6	10.328
		Abu Dhabi	02	171	- 2	4.716
		Sharijah	03	898	- 176	0.199
KSA	04	Riadh	01	254	- 62	2.916
		Jeddah	02	385	- 91	1.281
		Demmam	03	563	/	0.566
		Mecca	04	977	- 282	0.168

Source: (Startup-Blink-Report, 2022, pp. 139, 241)

As for the classification of start-up ecosystems in cities, Table 02 shows that the UAE has 3 classified cities in the top 1000 start-up ecosystems for cities in the world, with considerable advanced ecosystem, especially for Dubai, which reached a total score of 10.328. This made it earn six ranks compared to 2021 and led it as one of the best 100 cities start-up ecosystems all over the world. According to (StartupBlink, The Ecosystem of Dubai Startups, 2022d), Dubai registers 302 start-ups, 4 accelerators, 2 coworking spaces, 4 organizations, and no leaders: these start-ups are spread principally over Foodtech, Transportation, Fintech and other sectors. Although the seven emirates operate under a unified national policy, each emirate strives and works to build and develop its own ecosystem according to its own characteristics.

Dubai is considered one of the most important commercial centers around the world, as it is gaining a wide reputation for being among the best places to invest, launch projects, implement and develop innovations. This rank was obtained thanks to a supportive and encouraging entrepreneurial environment that provides all facilities and privileges that contribute to attracting capital, entrepreneurs, innovators and talents, supported by excellent infrastructure, stimulating tax policies, and leadership that supports innovation, and technology. Which means providing an opportunity for innovators, entrepreneurs, and owners of creative ideas to launch their startups through a large number of free zones or specialized cities in Dubai, such as Dubai Media City, Dubai Knowledge Park, Dubai Multi Commodities Centre, Dubai International Financial Center, Dubai Silicon Oasis, Dubai Airport Free Zone, Jebel Ali Free Zone, and many other places. In addition to that, the start-up ecosystem in Dubai includes a significant number of bodies and organizations that work to accompany entrepreneurs, owners of start-ups, and even foreign investors, from the advisory, financial, or practical side. Among these bodies are Dubai Foreign Direct Investment, The Mohammed bin Rashid Fund, Dubai Future Accelerators, a large network of business incubators and co-working spaces, enabling platforms, The Nasdaq Dubai Growth Market, The Dubai Angel Investors...etc (Expo-2020, october 2021, pp. 45, 46).

Abu Dhabi is also known as one of the most attractive regions for projects, investments, and talents in the world due to its business system and start-up ecosystem that facilitate the establishment of businesses in various aspects. Thus, Abu Dhabi obtained 4,715 as a total score, ranking 171 among the best 1000 start-up ecosystems of cities in the world. It also counted, according to the index map: 27 start-ups primarily in sectors of Education, Fintech, Marketing and Sales, and other sectors, and 01 coworking space, with no accelerator, no organization, and no leaders (StartupBlink, The Ecosystem of Abu Dhabi Startups, 2022e).

Abu Dhabi has been able to achieve an important position in the businesses environment, as it has become a preferred investment destination for many companies in the world, thanks to the great growth witnessed by the various industries in which start-ups are active, especially those related to technology, as mentioned previously. This is due to the impact of the measures taken to encourage the establishment of business within the five free zones in Abu Dhabi, which include 100% foreign ownership, a low-cost operating environment, full repatriation of capital and profits, and exemption from many taxes. In addition, the Abu Dhabi start-up ecosystem contains the headquarters of 2 of the largest banks in the region namely First Abu Dhabi Bank and Abu Dhabi Commercial Bank, and 24 foreign banks, with many cooperation and financing programs and agreements signed between Abu Dhabi banks and the bodies competent in developing entrepreneurship. All

of that in order to support, finance, stimulate, and enable the start-ups (Expo-2020, october 2021, pp. 42, 43).

This made Abu Dhabi a high-quality ecosystem, especially with regard to innovation, knowledge, and technology. Thanks to the strengths of this ecosystem of entrepreneurship and start-ups in several respects including: advanced physical infrastructure, wide and easy business networks, the wide demand of consumers for new and innovative products and the desire to try them, and work to simplify and accelerate the administrative procedures for the establishment and management of start-ups, innovative projects, and others.

As for what is taken on the ecosystem of entrepreneurship and start-ups in Abu Dhabi, the obstruction of the flow of new knowledge among entrepreneurs. It appears that the new knowledge produced by local universities, research centers, and large companies is not taken as an important and priority source of ideas. In addition to financing, although the amount of financing available in Abu Dhabi is sufficient for start-ups and entrepreneurs there, its sources are not sufficiently diversified, as most of them are concentrated in the government, with a lack of diversification of financing sources such as loans, angel investors, and the like (GEM, 2019/2020, pp. 10, 11).

On other side, Sharjah remains one of the top 1000 start-up ecosystems for cities despite its decline by 176 rank compared to 2021. It achieved a total score of 0.199 points, the lowest achieved point among the cities classified in the UAE; the index map was evaluated in Sharjah, 05 startups, 01 organization, no co-working spaces, no accelerators, and no leaders (StartupBlink, The Ecosystem of Sharjah Startups, 2022f). Sharjah has gradually developed into a center for culture and arts in the Emirates, beside building a base and infrastructure that have made it a leading industrial center. It is also being distinguished by a significant number of developed free zones. These latter open the way wide for investors, entrepreneurs, and innovators in various biomes, scientific and media fields, and various research centers. Which helped it to be a good background for launching start-ups and building the ecosystem that suits them by many facilities provided by Sharjah. As well as the bodies and institutions that its start-up ecosystem contains such as the Sharjah FDI Office, the Sharjah Investors Services Centre. This Center is considered a distinguished body in accompanying investors and entrepreneurs to launch their projects and start-ups, by providing an integrated set of government solutions to investors. Without neglecting the role of the Sharjah Chamber of Commerce and Industry in regulating the economy and industry in the emirate (Expo-2020, october 2021, p. 47).

Sharjah's position has supported its presence within a country that is classified among the most developed and attractive economies for investors, in addition to its geographical location close to promising markets, an attractive business environment, and

a support system for start-ups. At the local level, Sharjah is characterized by an integrated and distinguished group of bodies and entities that form its ecosystem for entrepreneurship and start-ups. It is based on: highly rated universities, the technology park that is the fastest growing in the region represented by Sharjah Research Innovation and Technology Park, the Sharjah Entrepreneurship Center (Sheraa) specialized in building the ecosystem for entrepreneurship with international standards, and the Sharjah Entrepreneurship Festival to promote entrepreneurial culture. In addition to a significant number of bodies supporting, following up on, and financing investment and startups (Startup-Genome, 2021, p. 150).

GSEI 2022 also shows 4 Saudi cities classified within the ranking of the best 1000 start-up ecosystems for cities in the world. Although Table 02 shows the decline of each of Riyadh, Jeddah, and Makkah in the ranking by significant places compared to 2021, with the city of Dammam entering the ranking for this year, Saudi Arabia still maintains its position in the Middle East in terms of the number of cities classified in the index (rank 02). As shown in Table 02, the points awarded to each city differ from the other, based on its local characteristics and its local ecosystem. It appears that Riyadh records the highest point in the KSA as 2.916, with 16 start-ups in Transportation, 15 in Fintech, and 12 in Marketing and Sales, as the most prevalent sectors in Riyadh, in addition to nearly 19 other startups in other sectors. Riyadh registered 2 workspaces, 1 organizations, and no accelerators or leaders (StartupBlink, The Ecosystem of Riyadh Startups, 2022g).

The second start-up ecosystem city in KSA is Jeddah with a total score of 1.281. The GSEI 2022 sees that Jeddah is the ideal place for setting up startups in Fintech, Hardware & IoT and Ecommerce & Retail, as the most popular industries in this city, which counts according to the index evaluation and startup blink map, 15 startups and no accelerators, coworking spaces, organizations, and leaders (StartupBlink, The Ecosystem of Jeddah Startups, 2022h).

In the same context, it appears that the start-up ecosystem in the city of Dammam is very suitable for Software and Data sector, with a census according to the map of only 3 start-ups and the absence of the rest of the bodies and institutions in this ecosystem (StartupBlink, The Ecosystem of Dammam Startups, 2022i). This is the same as registered in Makkah with only 4 startups and the absence of those other bodies and organizations. Makkah is distinguished by being a suitable system for start-ups active in Hardware & IoT, Ecommerce & Retail and Health (StartupBlink, The Ecosystem of Mecca Startups, 2022j).

3. Algeria in the start-ups ecosystem global map

According to GSEI 2022, Algeria has obtained the most important scores mentioned in the following table:

Table no. 3 – The startups ecosystem of Algeria according to GSEI 2022

	Quantity score	Quality score	Business score	Total score	Rank 2022	Ranked cities
Algeria	-	-	-	-	n.c	01
Algiers	0.04	0.13	0.13	0.299	771	-

Source: (Startup-Blink-Report, 2022, p. 299) & (startup-blink, 2022)

According to the index, Algeria has not yet entered the classification of the best 100 ecosystems in the world covered by this index. This is due to a set of challenges that start-ups face within the Algerian environment in order to enhance their position and role in the economy. It includes the novelty of the idea of startups, the lack of awareness of the importance of these enterprises in achieving the required economic diversification, and the lack of creative ideas and entrepreneurial background in Algerian society. This is what led to a shortage of qualified human resources in line with global developments, especially with the lack of compatibility and integration between universities and their trainings and courses with the requirements of local and national reality. In addition to a lack of funding and investment capital, complex bureaucratic procedures, and a technical backwardness at the level of dealing with global developments, such as the delay in adopting and spreading e-payment, e-commerce, and others (Fetni & Barhoum, 2022, p. 30).

This is the same as indicated in the studies of (Sadkaoui, 2019) and (Baaziz, 2018) who attempted to diagnose and analyze the ecosystem of entrepreneurship in Algeria, whether for SME's or startups. They found that corruption and administrative procedures have an important negative impact on the entrepreneurial activities, especially with regard to some formal and bureaucratic procedures that take a long time and delay the launch of the startup. As well as the concentration of various accompaniment and support bodies and institutions such as incubators, accelerators, financial institutions and others, in Algiers in particular without the rest of the cities and regions, which is considered a negative point in the development of an ecosystem that encourages the trend towards start-ups throughout Algeria. They also noted that the technological environment is not suitable for the infrastructure and ICT services currently available. They confirmed too, the obstacles related to human resources, where they showed their dissatisfaction with the educational and training programs offered by universities, which are often not in line with what the labor market requires and their practical application in reality. In terms of culture, despite the availability of some factors that open up positive prospects to enhance the trend towards entrepreneurship in the future, Algerian society still needs to be pushed, motivated, and some attitudes and prejudices regarding this field changed. While financing is also considered one of the most important obstacles facing the ecosystem of start-ups in Algeria which is represented in the absence and lack of financing opportunities. In the form of bank

loans, that require large guarantees that the owner of a new start-up may not be able to meet. The venture capital that is considered little in Algeria. Even for angel investors, who are also limited (Sadkaoui, 2019, pp. 484- 489) & (Baaziz, 2018, pp. 73- 75). This is despite the importance of angel investors, as an example, in playing a great role in financing start-ups, where they rank second, in some countries, as the largest source of financing, after family and friends. Funding for angel investors may be in the form of minority investment ranging between 10-30%, in the capital of new projects and ventures at the pre-seed, seed, early stage, and startup phases. The Angels can use various rounds of financing and frequent co-investment with other equity and co-investment funds, in the case that more growth financing is needed (Stankovska, Stamevska, & Dimitrieska, 2018, p. 109).

Accordingly, Algeria is trying with intense efforts to solve these problems by underlining a strategy aimed to supporting and assisting the establishment and success of start-ups. Where the government is seriously moving towards supporting and motivating Algerian youth to invest more in the field of entrepreneurship, through policies that support their orientation towards this sector, especially towards start-ups, with the aim of making entrepreneurs value makers and real and effective contributors to the development of the economy (Belgoum & Benessalah, 2023, p. 22). Especially since youth entrepreneurship is considered one of the important aspects of modern entrepreneurship, along with social entrepreneurship, green entrepreneurship, technological entrepreneurship, and others. In addition to being a main focus in modern employment policies, where young people work within their framework to achieve self-employment, which will also have a reflection on the level of creativity, innovation, and development in the country 139 (Dimitrakaki, 2018, p. 139). As many indicators have proven and confirmed the existence of a relationship between the degree of availability and practices of entrepreneurial activities in a country and the level of national economic growth in it. Entrepreneurs have an important impact on creating job opportunities and promoting creativity and economic growth, as they provide the opportunity for other individuals to achieve financial independence. Thus, they work alongside the government in reducing unemployment rates and providing opportunities for generating appropriate income for various groups of society to achieve prosperity (Raguž, 2017, p. 106).

From these points, a Ministry of Knowledge Economy and Startups was established in 2019 that works to strengthen the ecosystem of these enterprises through many activities and operations. Also, in this context, enterprises that have obtained the label "start-up" benefit from a set of tax and quasi-tax benefits to facilitate their establishment and launch, such as exemption from commercial activity tax, corporate income tax, and value-added tax on purchases for investment purposes. As for the year 2020, the Algerian Start-ups Fund (ASF) was established, which is managed by six public banks and targets start-ups in the

early stages represented in the thinking and pre-establishment stages. In March 2022, the fund provided nearly 3.2 million euros to more than 390 startups that applied to it for funding. The startup ecosystem also includes a government-supported business accelerator represented in Algeria-Venture; in May 2022, the accelerator signed an agreement with the Algerian Investment Fund amounting to $10 million for diversified funding for startups outside the ASF, in order to provide growth and financing for the next stage. In addition, the National Agency for Support and Development of Entrepreneurship (ANADE) is now providing services related to financing startups. For Angel Investors, Algeria has only one private network, (Kasbah Business Angel) which was launched in 2013 and invests in startups. In addition, an application called "MY STARTUP" has been launched that enables entrepreneurs to access and communicate directly with the Ministry of Knowledge Economy and startups in order to answer their questions, support them regarding the legal, administrative, and financing aspects, and build a brand. Algeria has also changed the approved legal form for the establishment of a startup to a more simplified form to give it greater flexibility than other types of enterprises, which is required by its specificities. It is also noted that there has been a recent trend in increasing the number of business incubators and accelerators, while trying to ensure their deployment in all regions of Algeria during the coming period. As for the aspect of spreading the culture of entrepreneurship, it has established many youth associations that are interested in the field of entrepreneurship and are working to spread this culture among young people, with the launch of private offices or business incubators at the universities to promote that. With reference to the establishment of an event under the name Disrupt as an annual conference aimed at highlighting and introducing the ecosystem of startups in Algeria, at the national and regional levels (Sarangé & al., August 2022, pp. 16, 17).

As for startup ecosystem classification in cities, Algiers entered the 2021 classification for the first time as one of the best 1000 ecosystems at the level of cities in the world, making a huge leap in the following year, jumping from 984th place to 771st place in 2022 with a total score of 0.299.(Startup-Blink-Report, 2022, pp. 299, 300), by 0.04 for quantity score, 0.13 for quality score, and 0.13 for business score (StartupBlink, Top Cities for Startups in Algeria Ranked by StartupBlink, 2022k). This is thanks to the availability of many elements and factors in Algiers that help the establishment and development of start-ups when compared to the rest of Algeria. Among them the business incubators and accelerators, the speed of Internet flow, the availability of the infrastructure and superstructure necessary for the work of these enterprises, the availability of banking institutions, and various national economic and investment institutions and bodies in abundance in Algiers, and other factors (Fetni & Barhoum, 2022, p. 23). A performance that deserves praise as it has achieved the largest annual improvement among all the cities

included in the classification of the index. If this trend continues, there are promising prospects for Algeria to enter as a strong competitor among the 100 best startups ecosystems in the near future. Especially since Algeria is ranked at 117th globally and 4th in Northern Africa in the start-up ecosystems classified by the Global Startup Ecosystem Index 2022 (StartupBlink, Algeria Startup Ecosystem Overview, 2022l).

Conclusion

This study came in order to compare the ecosystem of start-ups in UAE and KSA, shedding light on the case of Algeria. It was found that the UAE and KSA have succeeded in entering among the top 100 start-up ecosystems in the world by establishing an integrated system. It includes various bodies and elements that contribute to attracting entrepreneurs and owners of creative ideas, from inside or outside of the country, to be classified among the best countries for investment and doing business in the world, which reflected positively on their start-up ecosystems. The UAE has been at the forefront of the Arab countries and the Gulf States in this field for years, especially with its success in diversifying its economy. Which confirms the validity of the first partial hypothesis indicating that the UAE is still among the best ecosystems for start-ups in the world for attraction and facilities that promote its reputation in that.

In other side, the KSA continues to develop the frameworks and context of its business and investment environment to raise the effectiveness and efficiency of the start-up ecosystem and improve its global ranking in that area while achieving successful results in that area. Which was approved by the presence of KSA among the top 100 ecosystems for start-ups around the world, with distinction. This is due to the prosperous construction of these systems at the local level, where 4 Saudi cities were ranked among the top 1000 cities in relation to the ecosystem of start-ups according to the index when the UAE counted 3 classified cities. Which confirms the validity of the second partial hypothesis, indicating that the KSA has already imposed itself on the global start-up ecosystem map.

As for Algeria, it is trying, through serious and intensive efforts, to activate positively and quickly its ecosystem of start-ups. It contains trying to put in place the legislative, financial, institutional, research, cultural, and other frameworks necessary to encourage the establishment of this type of enterprise and accompany it in order to ensure its success. Despite the fact that the issue of start-ups in Algeria is very recent, those efforts succeeded in including Algiers among the best 1000 ecosystems at the level of cities in the world, achieving an important quantum leap in the ranking compared to 2021. This prompted GSEI 2022 to place Algiers among the start-up ecosystems with great prospects for success in the future. In addition to a high probability of Algeria joining the list of the top 100 start-up ecosystems soon, if the efforts made by the various actors and stakeholders

with interest in the start-ups continue to develop the ecosystem of these enterprises at an advanced and positive pace. Which denies the third partial hypothesis that considered the efforts exerted within the framework of establishing and building an effective ecosystem for start-ups in Algeria, are still far from international standards, competition, and the global map in this area.

That calls for recommending the need to promote the entrepreneurial culture and stimulate creativity and innovation in Algerian society. It can be achieved through educational programs starting at a young age and encouraging entrepreneurs and owners of start-ups to participate in university business incubators or in lectures and scientific forums with universities, to bring their experience closer to students. As well as the marketing of the idea of start-ups to the Algerian business environment, in a way that encourages Algerian businessmen, as individuals or enterprises, to finance risk in the framework of venture capital or angel investors.

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ORGANIZATIONAL POLITICS ON EMPLOYEE COMMITMENT IN THE FLOUR MILL PLC

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Abstract

The study looks into how organizational politics affect employee loyalty at Flour Mill Plc. The primary source of data for this study's descriptive survey research design was its primary data source. The sample size for this research study consisted of a total of 288 questionnaires that were completely filled out and returned. Descriptive statistics, multiple regression, and correlation coefficients were used to test and analyze the data, and the results show that the overall regression model is fit. Results shows that workplace diversity had significant positive effect on employee commitment and also organizational design had significant positive effect on employee commitment. The study reached the conclusion that while enhancing organizational design would increase employee commitment, it would also decrease employee commitment. The study thus suggests, among other things, that the organization make sure that departmentalization, centralization, span of control, and unity of command are implemented.

Keywords: *Organizational Politics; Workplace Diversity; Organizational Design; Employee Commitment; Social Exchange Theory*
JEL Codes: *P00, J54, H00*

Introduction

The most valuable resource in every organization is its workforce. This is due to the fact that they enhance an organization's productivity, performance, and quality. They are most important to an organization's success because they are in charge of running the machines and carrying out other operational tasks. As a result, the organization's performance, which is influenced by employee commitment, determines its outcomes. Without a doubt, organizations need dedicated employees to function and accomplish their goals (Yaseen, 2020).

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The degree of a worker's attachment to his or her place of employment is referred to as employee commitment. The majority of committed employees have affection for their company, a strong sense of loyalty, and a better comprehension of the objectives and aspirations of their company (Jeong & Kim, 2022). Additionally, it describes a circumstance that employees associate with their organizations and their participation in those organizations. Evidently, the majority of loyal employees are generally pleased with their organization. Since they are appropriately motivated, these workers typically experience less stress at work. These help them perform better, and they typically behave well around an organization's processes. Employee turnover is less likely, absenteeism is rare, and punctuality in the workplace is a trait of committed workers. They also help their organizations' high levels of customer satisfaction and profitability (Cho & Yang, 2018).

Organizational politics, as per the study conducted by Lau, Tong, Lien, Hsu, and Chong (2017), it pertains to the covert strategies employed by employees, encompassing the multitude of actions they undertake within the workplace to gain influence, utilize it, and effectively manage resources in their pursuit of achieving their organizational objectives. Every organization has some level of power struggles and workplace politics. It is the way that employees act in relation to authority and power at work. It alludes to a method by which businesses evaluate the various perspectives and operational skills of employees at their places of employment. It has to do with how employees leverage their position of authority and social capital within their organizations to effect desired changes that are advantageous to their fellow employees. It is also considered to be self-serving behavior used by employees to increase their chances of succeeding at work (Salem, 2015).

Organizational politics, a form of power play, is significant in organizations (Zhao, Liang, Yao, & Han, 2022). Some employees may participate in organizational politics for private gain at the expense of other employees and the organizations as a whole. These employees typically participate in office politics to gain access to both material and immaterial resources owned by the companies for which they work. They engage in power struggles at work to gain access to status and phony authority, which they use to influence the behavior of other employees. It has been demonstrated that how employees perceive organizational politics affects their attitudes, behaviors, and organizational commitment as well as their performance (Jeong & Kim, 2022).

However, there is a lack of dedication among manufacturing workers, particularly in the food and beverage industries. A few of the reasons for this include poor pay, Within the realm of detrimental work conditions, diminished motivation, inadequate incentives, and the presence of organizational politics are noteworthy factors. Among these influences, organizational politics stands out as the most prevalent. As a result, this study delves into

the impact of organizational politics on employee commitment within Nigerian food and beverage manufacturing companies.

This study's primary goal is to analyzing the Influence of Organizational Politics on Employee Commitment at Flour Mill Plc. First and foremost, the specific goals are to look into how workplace diversity affects employees' commitment at Flour Mills Plc; secondly, they are to determine how organizational design affects employees' commitment at Flour Mills Plc. As a result, the following research questions form the foundation of this investigation: First off, does workplace diversity affect the commitment of employees at Flour Mills Plc? (ii) How does organizational design impact the loyalty of the workforce at Flour Mills Plc?

According to policymakers, the study will be important for all institutions, but particularly the manufacturing industry, as it has come out at the ideal time to support national policies, particularly the policy to make the manufacturing industry the engine of economic growth. It will undoubtedly contribute to knowledge advancement and lay a strong foundation for upcoming research projects in areas related to organizational politics and employee commitment. Finally, future researchers interested in organizational politics and employee commitment will likely find this study to be a gold mine of information.

2. Literature Review

2.1 Organizational Politics

The significance of politics in businesses is substantial as it shapes the decision-making processes of leaders. Depending on its usage, politics can either exert a detrimental or beneficial influence on workplace interactions among colleagues (Cho & Kim, 2018). In essence, the dynamics of an organization's political climate can be deduced from the manner in which its employees engage with one another. As defined by Amponsoh-Tawiah and Annor (2017), organizational politics pertains to the pursuit of personal ambitions within an organization, irrespective of whether these aspirations align with the organization's objectives.

According to Jeong and Kim (2022), organizational politics can be described as deliberately orchestrated actions aimed at optimizing either immediate or future self-interest. This concept aids in comprehending the inherent balance of competition and collaboration within organizations, serving as a fundamental conceptual framework. In the pursuit of favorable results in business endeavors, employees engage in actions that serve their personal interests. This may entail leveraging power and utilizing social dynamics within the workplace to instigate changes that benefit either the company or the employees themselves (Naseer, Raja, Syed, Donia, & Darr, 2016).

Workers participate in self-interested organizational political activities in order to increase their opportunities of success in their companies, claim Lau, Tong, Lieu, and Hsu (2017). People might use their power without taking into account how it might affect the company as a whole. Only a few examples of personal advantages include having the privilege of accessing tangible assets or intangible advantages, such as status or pseudo-authority, that exert an influence on how other people behave (Takeuchi, Yu, & Lin, 2022). According to some definitions, organizational politics is a complex fusion of influence, behavior, power, and knowledge of the processes involved in leadership. In general, it is also connected to things like power struggles, the capacity to shape roles and sources of power, and self-serving behavior within an organization (Shrestha, 2021).

Abun et al., (2022) defined organizational politics as the measures necessary to convince individuals or groups within an organization are referred to as influencing actions. According to Malik, Shahzad, Raziq, Khan and Khan (2018), when exploring the link between organizational politics and employee attitudes, two aspects of organizational politics should be considered. The sequence begins with organizational politics, followed by reality. Secondly, an employee's exposure to organizational politics can have both advantageous and detrimental consequences. Therefore, it is essential to consider both organizational politics and policies.

Gaji, Madaki, Bello and Hussaini (2021) define organizational politics as the actions and conduct exhibited by individuals within an organization to improve their performance and advance their professional careers. People's behaviors align with their perception of reality, so politics matter to the employees of a company (Fiaz & Qureshi, 2021). Despite the fact that reality may differ, people can still react to situations based on their perceptions. Some people think that organizational politics should be used to address internal issues, making an employee's stance on politics a requirement for employment. The pursuit of a person's rights in society through negotiation and consultation, it is widely believed, is the original definition of politics (Amponsoh-Tawiah & Annor, 2017).

2.2 Dimensions of Organizational Politics

2.2.1 Workplace Diversity

Workplace diversity, as defined by Zhao, Liang, Yao, and Han (2022), involves an organization's recruitment of individuals from a broad spectrum of backgrounds. It is important to note that diversity encompasses a wide array of characteristics, such as age, gender, race, ethnicity, sexual orientation, language, educational history, and numerous others, contrary to common misconceptions. The staff mix of a company is influenced by factors such as age, gender, race, ethnicity, sexual orientation, religion, social class,

education, national origin, language, skills, and occupations (Saleem, 2015). Most academics and researchers have categorised diversity into groups, frequently into four main categories: personality, internal characteristics of diversity, external workplace factors, and organizational aspects of workplace diversity. Gender, race, ethnicity, intelligence, and sexual orientation are a few examples of the internal characteristics of diversity. The external aspects of workplace diversity focus on age, marital status, culture, and nationality. Position, department, and union are discussed in the organizational characteristics of workplace diversity (Naseer et al., 2016). Dimensions of personality that can be captured include traits, abilities, and skills.

According to Handayani (2017), the dimension of workplace diversity and its associated sub-variables are anticipated to facilitate the cultivation of a diverse work environment, elevate professionalism and productivity, and ultimately improve organizational performance. When an organization's diverse skills and competencies harmonize with one another, it is more inclined to nurture a cooperative workplace atmosphere, heighten productivity, and achieve outstanding business outcomes. Workplace diversity can serve as a catalyst for the company's creativity and innovation, affording it a competitive edge and driving profitability by offering customers enhanced value. The majority of organizations and institutions have benefited from supporting the company's development (Lau et al., 2017). The complexity of workplace diversity is one of the difficult issues of essential business management, though. The knowledge, problem-solving abilities, and professional skills of employees all improve as a result of diversity, claim by Gaji, Madaki, Bello and Hussaini (2021).

Additionally, it increases organizational productivity and attractiveness and helps the company draw in key personnel. Employees' experiences of organizational rudeness and discrimination put a cap on diversity (Abun et al., 2022). Giving workers this sort of treatment can undermine workplace appeal, teamwork, profit growth, and morale (John-Eke & Gabriel, 2019). The organization must deal with these problems in order to benefit from or exploit workplace diversity. The company should encourage good communication, fostering team cohesion, and nurturing a sense of community within the workplace, all aimed at bolstering acceptance, productivity, and the potential for profit growth. (Fitriastuti, Larasatie & Vanderstraeten, 2021).

2.2.2 Organizational Design

Organizational design refers to the vertical and horizontal arrangement of departments, lines of authority, and tasks within an organization, as defined by Okeke and Mbah (2019). This arrangement empowers managers to allocate and delegate the tasks necessary to accomplish the primary objective. According to Olusegun (2019),

organizational design is the general process for decomposing jobs into smaller tasks and coordinating those smaller tasks within the organization. The overall organizational structure, which has a pyramidal shape, governs every hierarchical relationship between managers and workers inside of a company (Ganesh, 2021).

In the word of Shrestha (2021), organizational design is the establishment of a framework that establishes a system for delegating authority and responsibilities within an organization. It involves the formal distribution and coordination of job responsibilities and duties to achieve overarching corporate goals and objectives. Much like the grouping, division, and coordination of job tasks outside an organization, organizational design delineates the formal procedures employed within the organization. Samaila, Uzochukwu and Ishaq (2018) define organizational design as a structured framework of task assignments and reporting relationships that govern how employees utilize organizational resources to achieve broad goals and objectives.

Organizations use organizational design as a control strategy and a mechanism to affect employee productivity. Organizational structure, according to Gaji et al., (2021), focuses on how power is allocated, responsibilities are assigned, and rules and regulations are upheld by all level managers within the organization. Determine how the various components of the organization should relate to one another using the organizational structure. This relationship networks the employees' roles and positions within the company in order to manage their behaviors and perceptions of the nature of the workplace (Fiaz & Qureshi, 2021).

2.3 Employee Commitment

Organizational commitment is a concept that has drawn significant attention from academics in a variety of fields, including management, business administration, industrial psychology, and public administration (Ogunkoya, Elumah & Shobayo, 2013). Employee commitment has emerged as a substantial key concept in organizational research as a result of its connections to work-related constructs like absenteeism, turnover, job satisfaction, job-involvement, and leader-subordinate relationships (Huhtala & Felt, 2016). Employee commitment is the level of a person's involvement and identification with the organization. The concept is among the most frequently examined work attitudes by practitioners and researchers. Committed employees are more inclined to remain with the organization and contribute to its goals and objectives. Three distinct psychological states, namely affective commitment, continuance commitment, and normative commitment, are believed to impact an employee's decision to remain with or depart from the company. Affective commitment pertains to an employee's emotional connection and sense of belonging to the organization. Greater feelings of loyalty, belonging, and stability are among the benefits for the staff.

Affective commitment is connected to individual characteristics, organizational structures, and professional experiences, claim Dan-Jumbo and Waribugo (2018).

A continuation (economic/calculative) commitment is what an employee would have to give up if they had to leave the company. Because they believe they will receive material benefits, employees who have a continuous commitment to the organisation as their principal bond continue to work there (Laurie, 2014).Therefore, if employees believe that staying with their current employer is their only viable option, they will be highly motivated to do so. Any decision that increases perceived costs, like direct or indirect investments in the organization, should be connected to a dedication to consistency. According to Kooskora and Magi (2010), normative commitment develops as a result of socialization experiences that emphasize how acceptable it is to stick with one's employer or as a result of receiving benefits like tuition reimbursement and skill development that make the employee feel obligated to pay it forward.

According to Ma'amor et al., (2012), Employee commitment is the extent to which a worker aims to align themselves with a company, its objectives, and its aspirations, with the intention of joining and staying with it. The relationship between the employee and the business is psychological. The connection includes identification, compliance, and internalization. Employee commitment is a measure of a person's level of involvement with a company. Commitment is characterized as an individual's readiness to invest their time and energy in a cause they support, a pledge they've undertaken, or a formal choice to initiate action. To devote oneself to a cause is to show commitment. Employee commitment, as described by Khuong and Dung (2015), represents the psychological connection each employee forges with the organization. The dedication of a worker can be gained or acquired. An organization will have an employee's loyalty if they are happy with the company's actions and feel an emotional connection to it (Ouma, 2017).

2.4 Organizational Politics and Employee Commitment

Political strategies are typically used by all organizations (Olusegun, 2019). Political tactics have a small influence on employee commitment. Employees' interpretation of organizational politics serves as a reliable gauge of their perception of the workplace as politically driven, prioritizing personal interests over fairness from an individual standpoint (Gaji et al., 2021). Because of their strong political views, employees also have strong feelings about unfair, dishonest, and manipulative business practices.

Perceived organizational politics is viewed as detrimental to individuals because it can impact employees' commitment to the organization, engagement in organizational citizenship behaviors, job satisfaction, experience of job stress, and overall job performance. According to Ganesh (2021), perceived corporate politics will significantly

affect a range of employment outcomes, including employee loyalty. Political impressions have an effect on how employees feel about their company, their co-workers, and their mentors. People who consider organizational politics to be unhealthy may begin to have issues with their habits (Khan et al., 2020).

Views of organizational politics have an impact on how employees think about their employer, managers, and mentors, which has an impact on workplace satisfaction (Olusegun, 2019). In the end, they affect how well employees perform at work. Similar research has shown that organizational politics have a detrimental effect on employee performance. According to all of them (Okeke & Mbah, 2019), one of the many negative effects of employees' perceptions of corporate politics is lower employee performance. Furthermore, according to Ganesh (2021), there is a bad correlation between commitment on the part of employees and how they view organizational politics. Jabid et al., (2021) found that employees who engage in organizational politics exhibited increased levels of job commitment. A study conducted by Opoku and Arthur (2018) discovered that individuals working in the telecommunications sector, who perceived a higher prevalence of general political behavior, were more likely to report reduced levels of job dedication.

2.5 Theoretical Review

2.5.1 Social Exchange Theory

The Social Exchange Theory (SET), originally proposed by Blau in 1964, posits that human interactions are shaped by the exchange process (Blau, 1964). In this framework, social behaviors and interactions are considered outcomes of exchanges. When favors are granted, leading to unspecified future obligations and outcomes beyond the giver's control, it relates to ambiguous commitments. These resources can be either socio-emotional (such as loyalty, compassion, and respect) or interpersonal (like financial exchanges). Essentially, this concept aligns with the reciprocity norm introduced by Gouldner in 1960, where one party initiates an exchange by offering a benefit to another. If the recipient reciprocates, a sense of reciprocal duty is established, leading to a series of beneficial exchanges.

The Social Exchange Theory demonstrates the significance of communication and interaction in human relationships, explaining why some relationships thrive while others falter and why individuals initiate and maintain particular relationships (Olusegun, 2019). This theory enhances our understanding of interpersonal relationships, asserting that people make decisions based on logic aimed at maximizing their gains. Many people value attributes like acceptance, loyalty, financial security, love, and companionship, making it

satisfying to be in a relationship with someone who enhances their social status (Opoku & Arthur, 2018).

A crucial conceptual framework used to describe workplace behavior is the Social Exchange Theory (SET). According to SET, social interactions, including organizational politics, comprise a web of interconnected transactions in which one party's actions, such as their level of engagement, can be influenced by another's behavior, such as their involvement in political activities. Hence, accepting a benefit implies an obligation to reciprocate. The interpretation of offers or benefits may vary among different employees and organizational power players, making involvement highly unpredictable. The structured and competitive nature of political activities, coupled with their significant relevance to personnel, makes it challenging to gauge employee engagement in a political work context. Understanding how to respond to organizational politics, in particular, involves recognizing that perceptions of political activity and rewards are intertwined with subjectivity in a work environment, resulting from psychological constructs. Both the employee engagement and social exchange perspectives acknowledge this complexity.

2.5.2 Theory of Justice

According to Rawls (1971), the equity theory provides a theoretical foundation for understanding the connection between organizational politics and employee commitment. This theory represents an evolution of the concept of justice attributed to thinkers from the 17th and 18th centuries, including Locke, Rousseau, and Kant. Rawls (1971) constructed his theory on two distinct principles: the first calls for fairness in the distribution of basic rights and obligations, while the second asserts that social and economic disparities, such as differences in wealth and power, are only justifiable if they result in benefits for everyone, particularly the most disadvantaged members of society (Shrestha, 2021). Rawls' (1971) theory of justice is based on the belief that ethical discourse has an objective, rational, and cognitive foundation, aiming to: (a) identify and explain the shared moral principles underpinning well-considered ethical judgments in society, (b) determine whether these shared principles would be accepted under conditions of objective thinking and reflection, and (c) demonstrate that workable "fair" principles are acceptable. The central question is whether individuals in a just society would support and be supported by those whose individual life plans were organized within "rational life plans" (Ugwu et al., 2018).

Wijewantha, Jusoh and Azam (2020) summit that legal research formed the basis of the initial work on justice. While much of this research focused on how citizens perceived legal systems and dispute resolution, it was later expanded to cover other contexts, including citizens' interactions with the police, assessments of politicians and educators,

dispute resolution, and performance evaluations (Samaila et al., 2018). The findings of these subsequent studies confirmed the primary conclusions that distributive and procedural justice are two components of organizational justice that impact employee commitment. Inference can be drawn that if a political action accounts for both distributive and procedural justice, it will be perceived as fair and will enhance employee engagement. While procedural justice assesses whether the method used to grant incentives is fair, distributive justice ensures that outcomes are equitably distributed within the organization, encompassing matters related to salaries and promotions (Olusegun, 2019). Therefore, employees are more likely to be productive and trust their supervisors even in times of conflict because they view them as fair and dedicated to managing the organization's affairs (Opoku & Arthur, 2018). This holds true whenever employees in an organization perceive both distributive and procedural justice.

3. Methodology

The workforce of Flour Mill Nigeria Plc served as the study's population. As of March 31st, 2023, Flour Mill Nigeria Plc employed 14,813 people across its various departments, according to the human resource manager of the company. Therefore, 4,813 employees of Flour Mill Nigeria Plc were included in the study's population. Using the formula developed by Taro Yamane in 1967 for calculating sample size at 10% standard error, 288 employees were sampled. The descriptive survey research design, which also used primary data, was used in this study. The information was gathered by administering a carefully constructed questionnaire to study participants.

The research tool used to gather the data was a questionnaire. In order to guide the investigation, the researcher created the questionnaire's items in accordance with the questions asked. The instrument contained closed-ended questions. The items in the research instruments were validated using the content validity method. The split-half reliability approach was used to validate the study instrument as well. During a specific phase, the researcher administered the instrument to ten employees of De-United Foods Limited in Lagos who were not part of the main study. The responses of these ten workers were divided into two groups of five each. The relationship between these two groups was assessed using Cronbach's Alpha. The result revealed the instrument's reliability, supported by a Cronbach's Alpha coefficient of 0.7211 (72.1%) obtained from the responses of the two groups.

4. Results and Discussion

The data would be analyzed using frequency count and simple percentage for each justification advanced by respondents after being collected and sorted from properly completed questionnaires. The data's descriptive statistics are displayed:

Table no. 1 - Descriptive Statistics of the Data

Details	Percentage (%)
Department:	
Administration	2.0
Production	26.3
Procurement	2.7
Sales and Finance	25.6
Marketing	38.3
Research and Development	1.3
Technical	3.8
Gender:	
Male	58.3
Female	41.7
Age (In years):	
Below 20	19.4
21-30	33.4
31-40	27.8
41-50	19.4
Above 50	0.0
Marital Status:	
Single	16.7
Married	83.3
Separated	0.0
Divorced	0.0
Highest Educational Level:	
O'Level	9.0
Ordinary National Diploma (OND)	20.1
Higher National Diploma (HND)	36.1
First Degree (Bachelor's Degree)	22.2
Second Degree (Master's Degree)	6.9
PhD. (Doctorate)	5.6
Others	0.0
Management Cader:	
Junior Staff	76.0
Senior Staff	24.0

Source: Researcher's Fieldwork (2023)

4.1 Hypotheses Testing

4.1.1 Hypothesis One

H_{01}: The findings suggest that workplace diversity does not have a statistically significant impact on employee commitment in Flour Mills Plc.

Table no. 2 - Regression Results on the Influence of Workplace Diversity on Employee Commitment

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.726	.351		7.762	.000
	Workplace Diversity	.289	.097	.414	2.984	.005

a. Dependent Variable: Employee Commitment

Source: Researcher's Fieldwork (2023)

The result in table no. 2 showed that workplace diversity had significant positive effect on employee commitment ($t = 2.984$; $\beta = .414$; $p = .005$; $p < 0.05$). The coefficient of .289 suggested that workplace diversity has positive relationship with employee commitment. The beta factor showed that 0.414% increase/decrease in workplace diversity would lead to 1% increase/decrease in employee commitment. The t-value of 2.984 suggested that there was higher evidence against the null hypothesis one stated for this study. This suggested that the null hypothesis was rejected leading the acceptance of the alternative hypothesis one. On this note, the study found that workplace diversity had significant impact on employee commitment.

4.1.2 Hypothesis Two

H_{02}: There is no significant impact of organizational design on the commitment of employees in Flour Mills Plc.

Table no.3 - Regression Result on the effect of organizational design on employee commitments

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.857	.381		2.249	.030
	Organizational Design	.786	.103	.760	7.665	.000

a. Dependent Variable: Employee Commitment

Source: Researcher's Fieldwork (2023)

Table no. 3 The study's results demonstrated a significant, positive impact of organizational design on employee commitment ($t = 7.665$; $\beta = .760$; $p = .000$; $p < 0.05$). The coefficient of 0.760 indicates a positive relationship between organizational design and employee commitment. Specifically, it suggests that a 1% increase in employee commitment corresponds to a 0.76% increase in organizational design. Moreover, the higher value of the t-statistics provides strong evidence against the null hypothesis, leading to its rejection in favour of the alternative hypothesis. Consequently, the findings suggest that organizational design plays a role in enhancing the commitment of employees at Flour Mill Nigeria Plc.

4.2 Discussion of Findings

The objective of this study was to assess the influence of organizational politics on the commitment of employees at Flour Mill Nigeria Plc. Two factors, namely workplace diversity and organizational design, were utilized as indicators of organizational politics. Employing linear regression, we analyzed primary data gathered through a questionnaire. The results revealed a robust positive relationship between employee commitment and workplace diversity. These findings align with the conclusions drawn by Abbas and Awan (2017) and Ahmed (2018, who identified a significant positive effect on employee commitment. Conversely, the results contradicted the assertions made by Chukwuma et al. (2019) and Cletus, Mahmood, Umar, and Ibrahim (2018), who contended that workplace diversity had no substantial impact on employee performance.

Additionally, the study found that organizational structures characterized by features such as formalization, centralization, span of control, rules, and procedures had a notable impact on employee engagement. These findings provide support for the claims made by Ugwu, Okafor, Onyishi, Casimir, and Chinedu (2018) and Khan, Siddiqui, Zhiqiang, Weijun, and Mingxing (2021), who asserted that operational processes, formalization, and decentralization significantly affected employee engagement. Contrary to the position taken by Asad, Muhammad, Rasheed, Chethiyar, and Ali (2020), who posited a weak correlation between organizational design and employee engagement, our results refute such claims.

Conclusion

The primary aim of this study was to investigate the influence of organizational politics on employee loyalty, assessed through workplace diversity and organizational structure. Cross-sectional primary data were collected for analysis, with data evaluation conducted through linear regression analysis. The results revealed a significant impact of workplace diversity on employee commitment. Specifically, higher workplace diversity at

Flour Mill Nigeria Plc correlated with increased employee commitment. Furthermore, the study identified a positive relationship between organizational design and employee commitment, indicating that as organizational design improved, both employee commitment and loyalty to the organization would increase.

In light of these findings, several policy recommendations have been proposed to enhance employee commitment through organizational politics. Firstly, Flour Mill Nigeria Plc should leverage the benefits of workplace diversity by promoting gender sensitivity and equitable distribution of responsibilities, actions that have the potential to boost employee loyalty. To ensure alignment with organizational goals and, consequently, heightened employee commitment, the organization should also work on improving formalization, departmentalization, centralization, span of control, and unity of command as elements of organizational design.

It's worth noting that this study has some limitations. It used workplace diversity and organizational structure as proxies for organizational politics, omitting considerations of organizational democracy and culture. Future research should address these gaps. Additionally, the study relied on cross-sectional quantitative primary data. A study of this magnitude could benefit from incorporating longitudinal data and employing a triangular method that combines quantitative and qualitative approaches. Furthermore, since the study was conducted at Flour Mill Nigeria Plc, its findings may not be universally applicable, emphasizing the need for future research to encompass a broader range of commercial organizations.

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SPECIFICS OF DIGITAL TRANSFORMATION IN BUSINESS

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Abstract

Global business is digitizing, leading to new challenges. There is a need to introduce up-to-date innovative approaches, models and strategies for digital business transformation. As a key factor for business competitiveness and growth, digital transformation becomes an important tool of sustainable development, providing opportunities for fundamental innovative changes in the organization and management of companies. ***The main goal of the article*** *is to clarify the main characteristics of digital transformation and its role in the development of modern business.* ***The main research methods*** *involved in the development are content analysis, method of analysis and synthesis, method of observation, intuitive and systematic approach.*

Keywords: *digital transformation; digitization; innovations; business; sustainable development*

JEL Codes: *M10, M21, M31, M33*

Introduction

The dynamics of modern business development, related to the search for ways for future growth and innovation opportunities, improvement of the economic condition of enterprises and their competitiveness, determines the need for its digital transformation. Some of the main characteristics of the external environment of enterprises are its strong instability and high dynamism, the continuous strengthening of competition in the sectoral and/or regional markets, the extremely rapid development of information technologies, leading to major changes in the conditions of the competitive struggle (Dimitrova, 2014, p.

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5). In the conditions of such a multifaceted and complex competitive environment, distinguished by a high degree of dynamism and instability, at the current stage, enterprises are faced with a number of current problems affecting all areas of their economic activity (Dimitrova, 2023, p. 190).

The new conditions of global competition and changes in relationships with customers and partners lead to a drive for digital change, which in turn is related to the creation of new models of organization and management in companies. The rapid change and growing importance of digitization processes affects business functions, communications and interactions, forcing a rethinking of companies' processes, policies and strategies and leading to the emergence of a new digital culture.

At the same time, digital transformation affects not only business and economic life, but also affects social processes. It maximizes the benefit of implementing innovations that promote environmental and social benefits (Ilcheva, 2020, p. 241).

Problem statement

Digitization has both its positive and negative sides, but in today's world it affects all areas of our lives. The sharp changes in the external business environment and the internationalization of business are invariably linked to the innovation opportunities provided by the introduction of digital technologies. The COVID-19 pandemic has led to an acceleration of the integration of digital innovations due to the resulting changes in consumer behavior, consumer attitudes and business processes (Genov & Hadjitchoneva, 2021, p. 478).

Defined as an important driver of value, digital technologies change modern business by allowing easy access to information, automation of production, integration of processes, optimization of used resources, reduce costs and increase financial income (Næss-Schmidt et al., 2020, p. 13). At the same time, they stimulate businesses to look for new ways to create and maintain competitive advantage and sustainable growth. The use of digital technologies in the context of modern strategic management creates prerequisites for the improvement of interaction with stakeholders, the creation of new jobs and the increase of the efficiency of the workforce through the implementation of new models of work and organization. In addition, digitization leads to the acceleration of business activities and processes, introducing new requirements for management knowledge. The new conditions for business development impose requirements for increasing digital marketing skills as an effective way to reach the market (Kyurova, Yaneva, & Zlateva, 2019, p. 61-72).

These new business opportunities require a rethinking of traditional economic theory in the context of one of the leading topics in the last decade - the digital transformation of modern business.

According to some authors, digital transformation is the most significant term that defines the impact of digital technologies on society (Larsson & Teigland, 2019). It is more than the introduction of innovative devices and new software (Yuleva-Chuchulayna, 2021a, p. 57). It represents a process of replacing traditional existing business processes with innovative ones (Yuleva-Chuchulayna, 2021b, p. 220), using advanced technologies, causing a fundamental change in the economy, organizations and society (Yordanova & Stefanova, 2019, p.7). Digital transformation offers an opportunity for businesses to redesign their business processes by the introduction of digital technology and a digital mindset (Kyurova, 2022b, p. 21). It is caused by the constant progress of digital technologies, which forces companies to adapt their strategies, business models and investments by aligning them with future markets (Yuleva-Chuchulayna, 2021c, p .144) Genov and Hadjitchoneva (2021) even define digital transformation as a factor for survival in the changed context through the introduction of digital high-tech solutions in organizations, dictated by the need for timely and rapid adaptability and flexibility (p. 468). Galyarski (2020) enriches the above opinions, defining the transformation in a digital environment as "a tool for ensuring an optimal transition to an innovative corporate culture, optimization of processes, business models, products and services" (p.175).

It is becoming clear that digital transformation is aimed at affecting all aspects of business from the organizational structure of companies, through research and development, production and productivity analysis, to the way they generate revenue (Lazarov, 2020, p. 259). In their developments, a number of authors advocate the thesis that the transformation of the business model through digital modification of the business is a new digital business and digital globalization. These processes take place by adding digital content to existing products and services and introducing new digital solutions. Digitization of services accelerates globalization. Multinational companies use it to reduce the cost of managing human resources, finance, production and design through global outsourcing. In emerging high-tech companies, digital technologies enable globalization already in the first years of their emergence (Westerman et al., 2011, p. 5-34).

From the above, it is clear that the opinions of Bulgarian and foreign authors are united around the importance of digitization and digital transformation for modern business. Based on them, we will give a generalized definition of the concept by outlining its role and specific features.

Technology has changed people's lives. Today's consumers have technological knowledge. They demand and constantly look for new offers and innovative solutions. (Stavrova, Zlateva, Pinelova, 2021a, p. 129). Overall, technological changes are immensely changing the way of doing business (Kyurova, 2022a, p. 14). In search of ways to adapt to

the highly dynamic external environment, digital transformation becomes a key priority for every company. As a result of the digital revolution, internationalization of business and global competition, it is becoming a driver of fundamental innovation changes in business models, approaches and processes in organizations. It represents a process of transformation of traditional functions, procedures, communications and organizational capabilities into a new digital way of thinking and behaving.

Digital transformation aims not only at digitization of technologies and automation of processes, but at increasing productivity, competitiveness of offered goods and services, innovation, research and development, interaction with partners, service and more complete satisfaction of consumer needs. As for the innovation activity, it is necessary to take into account that there is a continuous aspiration of the business to use innovative technologies and materials, create innovative products, develop strategies for innovative development, which in turn is a prerequisite for ensuring competitive advantages (Kyurova, 2015, p. 196). This change in the way the business operates, in turn, creates new efficient organizational and management forms, enhances the corporate image and company climate, increasing profitability and leading to growth and stabilization of market positions.

At the same time, it is also important for dealing with a number of socially significant problems such as social exclusion. The creation of new social relationships and partnerships, the improvement of working conditions and the quality of life of the employed, the stimulation of the active inclusion of disadvantaged people and the application of social innovations in the field of social services are just some of the advantages that digital transformation offers. It is necessary to rethink strategic approaches and direct business towards ecologically oriented thinking and socially responsible behavior (Stavrova, Zlateva, Vladov, 2017, p. 31). Furthermore, the future belongs to investing in the development and implementation of effective solutions regarding the transformation of sustainable development through digital innovation (Kirilov, 2018) and green digital transformation.

Specifics of the process of digital transformation

After the literature review, it is established that for the study of digital transformation, special attention should be paid to the factors, tools and stages of the process. The lack of a clear market definition of platform businesses creates a need for a more holistic perspective on how markets create, deliver and add value through their business model configurations. Therefore, to meet this need, it is necessary to study the distinctive types of business models in the market through a systematic study of their elements (Stavrova, Zlateva, Pinelova, 2021b, p. 88). A key role in clarifying its essence

and specific characteristics is the identification of models and strategies for business reorientation in a digital direction.

Of importance for the purposes of the study is the view of Vertoef et al. (2021, p. 890-891), who present a flow model to describe the drivers, phases or levels, and imperatives of digital transformation. They identify three major external factors driving the need for digital transformation. Due to the increasing number of new digital technologies, competition is changing drastically, changing consumer behavior in turn.

Figure no. 1. Flow Model for Discussion on Digital Transformation

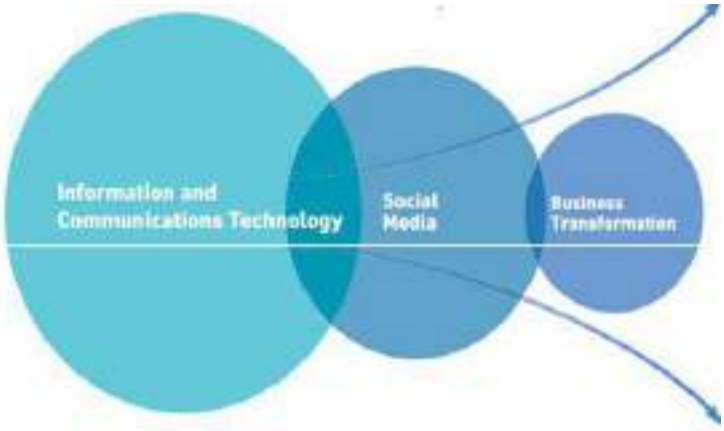
Source: Vertoef, P. et al. (2021). Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research, Elsevier, 122 (4), p. 890.

Digitalization has a strong impact on business innovation (Yuleva-Chuchulayna, 2021b; Kalaydzhieva, 2014; Kalaydzhieva, 2016a, Zlateva, 2019) and competitiveness (Logodashki, 2019; Yuleva, 2019; Kalaydzhieva, 2016b). Its influence on marketing and, more specifically, on the purchase decision, consumer tastes, habits, satisfaction, etc., is unchanging. Building profitable business models is a consequence of the constructive and creative thinking of modern marketers (Zlateva, Vladov, 2017, p. 31). In this regard, Yordanova and Stefanova (2019) consider five groups of business factors as drivers of business transformation:

- providing a consistent and personalized product range to customers across all possible channels;
- developing a competitive advantage by creating unique opportunities to improve customer satisfaction;
- gaining a deep understanding of customer behavior in order to increase loyalty;
- conducting effective and targeted marketing campaigns, the result of data analyzes from multiple sources;
- reducing costs by optimizing inventory and supply chain management (p.7-8).

The digital revolution is invariably linked to social impacts primarily through social media. Therefore, Næss-Schmidt et al. (2020) pay attention to tools supporting business transformation, presenting the progression from information and communications technology (ICT) to social media (p.44).

Figure no. 2. Tools supporting business transformation

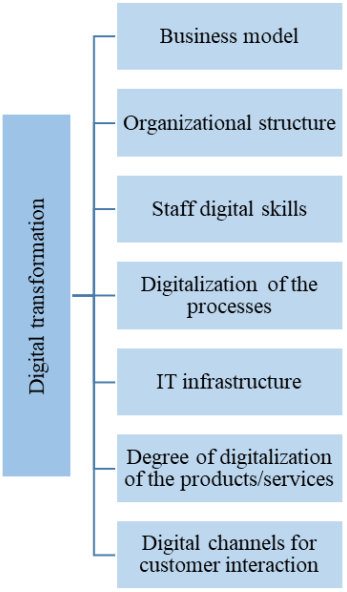


Source: Næss-Schmidt, S. et al. (2020). Digital transformation in business – the facebook company, Copenhagen economics, p. 44.

Examining the opportunities that digital transformation provides for business is also related to the stages of the process itself. According to Vertoef et al. (2021) the process begins with digitization - the encoding of analog information into a digital format such that computers can store process and transmit the information. In the transition to digitalization, IT or digital technologies are used to change existing business processes. Digital transformation represents the overall change of the company that leads to the development of new business models (p. 891).

A more detailed study of digital transformation is done by Slavova (2016), who examines seven mandatory elements of the process presented in Figure 3 (p.145).

Figure no. 3. Elements of the digital transformation process



Source: Slavova, M. (2016). Digital transformation of business. Economic alternatives. [Online] 4. pp. 142-149. Available at: https://www.unwe.bg/alternativi/bg/journalissues/article/10132

Of interest is the opinion of Strømmen-Bakhtiar, who considers a model for dealing with DT containing five stages: insights, impact, scenarios, business cases and trend watching. The first stage is related to the understanding of the coming changes by everyone involved in the process. In impact analysis, the stakeholders must understand the change in the relationship between the company and the external environment through the so-called drivers of transformation: transparency, accountability, proximity, responsiveness, bi-directional, humanization and authenticity. Scenarios consider at least four possible versions that could happen in the future. At the fifth stage, specific projects are developed to be launched. In the final phase, innovations and changes in technology must be permanently monitored (Strømmen-Bakhtiar, 2020, p. 96-97).

Similar is the perception of Bosse & Zink (2019), who consider the process of digital business transformation through the prism of the phases of inspiration (familiarity with existing innovative technologies and solutions and good practices); orientation (the

determination of the company's position); planning (defining initial projects, forming teams, setting goals and presenting them to stakeholders); implementation (performance and commitment by staff); evaluation and adjustment (gaining insight into subsequent projects and process improvement) (p. 20) .

At the same time, some authors (Galyarski, 2020) consider digital transformation as a long process that "often encompasses more processes or a collection of smaller projects". This interdisciplinary process goes through the following steps:

- choosing a process to optimize by introducing a new system;
- leveraging digital innovations through the creation of a more efficient business model;
- partial synchronization of two or more digitized processes;
- overall synchronization – validation of the digital platform and the new business model;
- making digitization an invariable part of the company culture and optimization process (p.170 - 171).

As it became clear, shaping the digital transformation requires new strategic and behavioral approaches. Stankova and Kaleichev (2023) researching the tourism industry, assume that the ever-widening use of digital tools gives individual companies a new field of expression. According to Lazarov (2020), the business needs the transformation strategy as a key role in the process plays the use of the opportunities of digital technologies and its main directions should include:

- assessment of the possibilities of digital technologies for their transformation into a digital transformation strategy unified with strategic corporate goals;
- driving innovation and digital transformation by applying the best available technologies;
- cross-functional management and leadership;
- integration of digital technologies for transformation of business processes;
- development and implementation of new digital business models;
- assessment of the effect of applying digital technologies;
- talent management and creation of the necessary competencies to apply digital technologies for business optimization;
- assessment and management of operational risks in the transition to a digital environment for managing business processes.

The author outlines eight stages of an effective digital transformation strategy:

- establishing a baseline;

- informing and involving staff;
- determination of priority directions for digital transformation;
- team selection and improvement of the organizational structure;
- preparation and implementation of road maps for key projects in the priority directions;
- regulation and goal setting;
- implementation and implementation of the projects;
- optimization and improvement using the implemented digital technologies (Lazarov 2020. p. 264-267).

Rogers describes the landscape of DT for today's business by presenting five key domains of strategy reshaped by digital forces: customers, competition, data, innovation and value (Rogers 2016, p.6). Westerman, Bonnet and McAfee (2014) distinguish two critical capabilities that constitute the digital new age: digital capabilities and leadership capabilities. On the one hand, company management should look at technology as "a way to change the way they do business" and "tools to get closer to customers, empower their employees and transform their internal business processes". On the other hand - leadership capabilities are related to the way of leading change (Westerman, Bonnet and McAfee, 2014, p.6).

Based on the above, we must make the important clarification that the digital transformation strategy should be relevant to the emerging challenges from the external environment and adaptable to the internal business environment. Priority attention should be given to building long-term and sustainable competitive advantages through innovation. It is a fact that innovations contribute to the construction of a competitive advantage and increase in competitiveness, as well as to the advancement of scientific and technical progress (Kyurova &Koyundzhyska - Davidkova, 2020, p. 200). An important condition is for the management team to build an understanding of the digital transformation of the business as an important tool for the introduction of innovative changes in management approaches, organizational strategies and company culture. It needs to build transparency, continuity and management support. The connection between business and education plays a decisive role here. Realizing the potential of digitization for corporate development and stability, efforts should be directed towards improving the qualification and digital knowledge, skills and competences of the citizens through "lifelong learning", the application of alternative forms of education, etc.

Conclusion

From the above, we can conclude that digital transformation has a serious impact on business development. This process displaces the traditional models, approaches and strategies for the organization and management of companies by imposing the need for the application of innovative strategic thinking and behavior. It has a key role in increasing competitiveness, company growth and prosperity, therefore a long-term orientation towards sustainable digital transformation is needed through in-depth research and optimization of innovation opportunities; updating management concepts and approaches; optimization of marketing planning, organization, implementation and control in line with the changed requirements, behavior and relationships with partners and customers in a digital environment.

The topicality of the considered issue arouses the scientific interest of the authors, as it will be developed in subsequent scientific works. Future directions of research will focus on the problems and prospects of digital transformation in SMEs.

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THE INTEGRATION OF ARTIFICIAL INTELLIGENCE AND FINTECH IN GREEK BANKS, FOR THE BENEFITS OF SMALL AND MEDIUM-SIZED COMPANIES

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Abstract:

Artificial intelligence as a technological development has been around for decades, but it has been increasingly applied in the financial sector as part of the digital transformation only recently. The emerging trend tends to replace banking services with those of technology companies that are more modern, innovative and consumer-friendly. The objective of the present research is to investigate whether the financial institutions consider that the development of technologies will help not only the large organizations but also the small and medium-sized enterprises. In order to achieve this aim a quantitative, primary and descriptive research was employed to gather and analyze data and draw conclusions. In particular, a questionnaire survey was operated. The results showed that all parts of the financial system can benefit from the appropriate application of the artificial intelligence. Customers and especially SMEs, can enjoy better and more personalized services and access personalized financial products, reduce their operating costs while improving the efficiency of their internal processes.

Keywords: *Artificial intelligence; FinTech; Greek Banks; small and medium sized companies.*
JEL Codes: G21, M15, O33

Introduction

Artificial intelligence as a technological development has been around for decades. But why has this sector grown so rapidly in recent years? The answer to this question was given by the engineer and entrepreneur Gordon Moore, one of the founders of Intel, who, in 1965, created Moore's Law, which states that while the processing power of computers doubles every 18 months, the cost of production is decreasing. In other words, the cost of producing a computer chip of a given power, which cost 20,000 euros in 1970, costs less

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than 0.002 euros today. This increases the computing and storage power of computers, while at the same time reducing their cost, enabling rapid technological advances, including artificial intelligence (Theis & Wong, 2017). There is no doubt that the financial system will be affected as rapid technological developments affect the way it operates and interacts with customers (de la Mano & Padilla, 2018).

In recent years, artificial intelligence has been increasingly applied to the financial sector as part of digital transformation. The increasing adoption of artificial intelligence and machine learning technologies in the financial sector is driven by the rapid technological developments and the wealth of big data available to financial institutions, and by the pressure to increase efficiency resulting from intense competition and strict regulatory framework. At the same time, financial institutions will inevitably have to evolve to meet the needs of their customers who want to make their lives easier through technology (Xie, 2019).

The concept of Fintech includes any technological means used by financial services. The use of PayPal or credit card for online purchases, online store transactions with consumers and banks, the ability to monitor the bank account electronically are considered Fintech categories. The Fintech category includes companies that develop solutions in electronic payments, electronic banking, money transfers, transaction clearing and alternative currencies (BitCoin). The concept of Fintech broadly describes the field, entry, development and impact of technology in the field of finance.

The emerging trend tends to replace banking services with those of technology companies that are more modern, innovative and consumer-friendly. Fintech is nothing new, but it has been growing steadily in recent years. It is increasingly evolving to reshape financial services, commerce, payments, money transfers, asset management, insurance and ultimately money, as we know it today. More and more businesses, start-ups and organizations are offering technology to their user-customers in order to optimize service by offering speed, convenience, immediacy and many other advantages (Basdekis et al., 2022).

Artificial intelligence (AI) is a branch of computer science that deals with the design of intelligent computing systems, i.e. systems that exhibit characteristics that mimic intelligence in human behavior. Artificial intelligence is a classic application of behavior design, machine learning, information systems, etc. In addition to classic applications, such as machine learning and information systems, smart devices find application in the semantic web, online banking and other more modern applications (Tzanis et al., 2006).

The rapid development of the financial sector and the great involvement of technology have already transformed the banking, but also the financial sector in general, in Greece. Studies and research have confirmed the operational advantages of digital

transformation and the evolution of financial technologies (Stournaras, 2020). In addition to improving customer service, the use of artificial intelligence technologies also concerns the optimization of existing processes in financial institutions, but also in organizations active in areas such as fraud detection, investment management tasks, risk management and market analysis.

Still in Greece, there is not enough data about the use of the AI and FinTech for the growth and the development of small and medium sized enterprises (Grigoriadou, 2020). On the one hand, the financial crisis of 2008 slowed down the digital transformation of financial institutions, while the COVID-19 pandemic boosted the use of FinTech services by SMEs (OECD, 2022).

The scope of this research is to investigate whether financial institutions consider that the development of technologies will also help the development of small and medium-sized enterprises, and not only large organizations.

The Research Questions are:

1. Does employee adaptation to AI and SME-related FinTech depend on age, gender and education level?

2. Are Greek banks adapting and transforming to serve SMEs through AI and FinTech services?

3. Do Banks/organizations collaborate with staff to develop means of increasing SME efficiency through the use of AI and FinTech services?

Literature Review

Braggion et al. (2017) investigated whether the expansion of FinTech will threaten the financial stability in the future. It is true that banks are already accepting deposits and conducting transactions digitally. However, digital transactions enhance a number of issues such as flexibility, security and competition in payments, the way financial services are provided as well as the way and security of cross-border transfers and the issue of private and official currency. Analysts, such as Vives (2019), have argued that the main purpose of FinTech is to keep traditional banks out of the market. In this way, FinTech companies have been able to overcome the challenges of growing their customer base by achieving greater economies of scale.

According to Vives (2019), the use of new technologies has had a significant impact on the financial sector, due to lower transaction costs and the provision of new, higher quality products. Therefore, it can be argued that big data and appropriate statistical models can screen potential borrowers more effectively, which is vital to address the problem of information asymmetry. The use of sophisticated rate models also enables targeted pricing policies. New technologies can enable more efficient implementation of business plans and

the provision of services to new and small businesses. Furthermore, according to Kruse, Wunderlich and Beck (2019), AI has a wide range of applications, particularly in data quality, financial policy and risk analysis, as well as fraud monitoring and detection. At the level of national banks, AI is integrated into functions that support the monitoring of micro- and macroeconomic indicators (Kruse et al., 2017), supervision, information management, and the prediction and detection of malicious activities (Fernandez, 2019).

Another event that facilitated the digitization of the banking sector was the Covid-19 virus pandemic, visible to both consumers and banks with SMEs in their customer base. The measures taken during the pandemic have transformed many banking operations and will lead to new developments in the future. What is certain, however, is that the need to confine oneself to the home led to the rapid adoption of digital technologies. This increased use of digital technologies has also meant less reliance on brick-and-mortar banking, accelerating the transformation of banking (Adarkar et al., 2020).

Specifically in the case of Greece, the implementation of capital controls in 2015 led to the first rapid transformation of banking transactions, with plastic money replacing paper money. The Covid-19 pandemic has further accelerated this transformation with the use of digital technology. Now that the crisis has subsided, there is clearer evidence of its impact on customer and business behavior and expectations (Adarkar et al., 2020).

Among the emerging trends there will undoubtedly be a greater openness to digital channels. In the wake of the financial crisis, workers may be more willing to adopt new remote work models. Banks, on the other hand, will face a long period of low interest rates and reduced profits due to tighter balance sheets and higher operating costs caused by the new security measures and will need to act quickly on the right decisions to survive. Banks must learn from the two crises that occurred in 2008 and 2019 respectively and immediately start their own digital transformation while creating greater operational and financial flexibility (Buehler et al., 2020). In the last global crisis, banks were seen as the biggest problem. However, banks are now considered to be at the center of solving the problem (Bensley et al., 2020).

A recent survey in Greece (Basdekis et al., 2022) reported that while there are several factors that influence the decision to use FinTech services, security factors are the most important to users. In terms of trust, the majority of respondents said they trust traditional banks more than other non-financial institutions. Regarding the adoption of new technologies by banks, Greek banks seem to recognize that they have given weight and invested significantly in digital transformation. Digital transformation is a one-way street and will continue to light the way to a technological revolution. The survey results also show that banks invest significantly in training, offering their employees the opportunity to acquire the skills they need to meet modern needs and further growth.

Methodology

Research objective

This study aimed to investigate the integration of Artificial Intelligence (AI) and Financial Technology (FinTech) in Greek Banks. A quantitative, primary and descriptive research design was employed to gather and analyze data. This approach allowed for the collection of numerical data to quantify relationships and differences among variables.

Participants

The study included employees of a banking institution. A purposive sampling technique was employed to ensure representation from various departments. A total of 102 participants were selected for the study.

Data analysis

The data analysis was performed using the statistical software IBM SPSS 26. Demographic characteristics were presented using frequencies. Likert scale variables were presented with M (mean) and SD (standard deviation).The factors created from corresponding questions, with high reliability ($\alpha \geq 0.857$), were assessed for their normality using the Shapiro-Wilk test. Due to the lack of normality, for comparing medians of three or more independent samples, the non-parametric Kruskal-Wallis test was employed. However, to compare differences in quantitative variables with respect to gender, the parametric independent samples t-test was used since the sample sizes were large ($n \geq 30$).

Results

Descriptive statistics

Demographic data - Table 1 presents the demographic data of the sample, which consists of 102 people.

Table no. 1 - Demographic data

Feature	Category	N	f%
Gender	Male	62	60.78%
	Female	40	39.22%
Age	≤30	28	27.45%
	31-40	39	38.24%
	41-50	8	7.84%
	51-60	14	13.73%
	>60	13	12.75%
Educational level	Bachelor's degree	55	53.92%
	Master's degree	38	37.25%
	PHD	9	8.82%

Employee Tenure (years)	0-5	29	28.43%
	6-10	36	35.29%
	11-15	12	11.76%
	16-20	10	9.80%
	21-25	4	3.92%
	26-30	7	6.86%
	31-35	1	0.98%
	>35	3	2.94%
Employee Status	Trainee	12	11.76%
	Customer Service	18	17.65%
	Freelancer	10	9.80%
	Administrator	16	15.69%
	Bank clerk	21	20.59%
	Employee of a subsidiary company of a banking institution	11	10.78%
	Head of Department	5	4.90%
	Bank branch manager	2	1.96%
	Member of the Board of Directors	1	0.98%
	Other	6	5.88%
What kind of department do you work in?	Accounting	11	10.78%
	Administrative	7	6.86%
	Sales	25	24.51%
	Marketing	14	13.73%
	HR	7	6.86%
	Operations	10	9.80%
	Finance-corporate banking	11	10.78%
	Product	6	5.88%
	Research and Development	8	7.84%
	PR	3	2.94%

Commend: As to gender, 60.78% (N=62) of the respondents are male and 39.22% (N=40) are female
Source: Author

Regarding the age, 38.24% (N=39) of the participants are 30 years old or younger, 27.45% (N=28) from 31 to 40, 13.73% (N=14) from 51 to 60,12.75% (N=13) older than 60 years old and 7.84% (N=8) from 41 to 50.

Regarding the educational level, 53.92% (N=55) of the participants have a Bachelor's degree, 37.25% (N=38) a Master's degree and 8.82% (N=9) a PHD.

As to the employees' tenure, 35.29% (N=36) of the participants stated that they have been working between 6 and 10 years, 28.43% (N=29) up to 5, 11.76% (N=12) between 11 and 15, 9.80% (N=10) between 16 and 20, 6.86% (N=7) between 26 and 30, 3.92% (N=4) between 21 and 25, 2.94 (N=3) more than 35 and 0.98% (N=1) between 31 and 35.

Regarding the employees' status, 20.59% (N=21) stated that they are bank clerks, 17.65% (N=18) are working in the customer service, 15.69% (N=16) are administrators, 11.76 (N=12) trainees, 10.78% (N=11) employees of a subsidiary company of the banking institution, 9.80% (N=10) freelancers, 5.88% (N=6) are working in other positions, 4.90% (N=5) head of departments, 1.96% (N=2) bank branch managers and 0.98% (N=1) member of the board of the directors.

Referring to the department that they are currently working at, 24.51% (N=25) of the respondents are working on Sales, 13.73% (N=14) on Marketing,10.78% (N=11) was the percentage of those working on Accounting and on Finance and Corporate banking each, 9.80% (N=10) on Operations and 7.84% (N=8) on Research and Development. Also, 6.86% (N=7) was the percentage of those working on HR and Administrative each, 5.88% (N=6) are working on Product and 2.94% (N=3) on PR.

Definition of FinTech

Regarding the respondents' opinions on the definition of FinTech, the participants agree that those are services that improve the efficiency of the financial system (M=3.19, SD=0.79), new technologies that facilitate access to financial services (M=3.11, SD=0.79), anything related to cryptocurrencies and virtual money (M=3.08, SD=0.89), the applications used by all the bank's customers (M=3.05, SD=0.84) and any ICT used to enhance financial services (M=2.97, SD=0.74). Additionally, they neither agree nor disagree that these technologies are used only by a bank and large organizations (M=2.07, SD=0.87).

Evolution of the use of AI and FinTech to serve SMEs

The statements that refer to the evolution of the use of AI and FinTech to serve SMEs show that the participants agree that the COVID-19 pandemic has made a decisive contribution to the evolution of financial services (M=3.07, SD=0.91), that in the future, technological developments will greatly differentiate the service of SMEs (M=3.04, SD=0.77), that banking institutions in Greece make extensive use of financial technologies to serve SMEs (M=2.98, SD=0.91) and that technological developments in recent years have improved the service of banking activities related to SMEs (M=2.97, SD=0.84).

Meaning of technological advancements and AI development for SMEs

Regarding the statements that refer to the meaning of technological advancements and AI development for SMEs, the participants agree that they mean faster service of requests (M=3.10, SD=0.88), simplification and reduction of procedures (M=3.09, SD=0.81), increase in customer volume (M=2.98, SD=0.74), more effective crisis management (M=2.94, SD=0.83), greater satisfaction for companies of all sizes (M=2.92, SD=0.91) and freeing up working time for employees (M=2.91, SD=0.86).

Approach of the Financial Institution

The statements that refer to the approach of the Financial Institution show that the participants agree that the bank or the organization invest resources in developing AI technologies (M=2.93, SD=0.85), that employees (M=2.92, SD=0.83) and the bank or the organization (M=2.91, SD=0.87) are constantly adapting to the use of financial technologies related to the development of SMEs, that they provide adequate training to employees in the use of financial technologies relevant to SME development (M=2.84, SD=0.79) and make extensive use of technological advancements to serve SMEs (M=2.83, SD=0.70).

Inductive statistics

Reliability analysis

The reliability of the questionnaire factors was tested using the Cronbach Alpha coefficient. Specifically, it emerges that the factor «Definition of FinTech» has reliability a=0.857 (high), «Evolution of the use of AI and FinTech to serve SMEs»a=0.899 (high), «Meaning of technological advancements and AI development for SMEs»a=0,947 (optimal), and «Approach of the Financial Institution» a=0.926 (optimal). The results of the factor normality test show that all the factors follow a non-normal distribution ($p<0,001$).

Effect of demographic profile

Gender

The results of the independent samples of t-test of the factors in terms of gender of the respondents show that there are statistically significant mean differences in the factor«Definition of FinTech» ($t(102)= 8.65$, $p<0.001$), «Evolution of the use of AI and FinTech to serve SMEs» ($t(102)= 8.426$, $p<0.001$)«Meaning of technological advancements and AI development for SMEs» ($t(102)= 9.577$, $p<0.001$) and «Approach of the Financial Institution» ($t(102)= 9.976$, $p<0.001$).

Age

The results of the Kruskal-Wallis tests of the factors with respect to the age of the respondents show that there are statistically significant mean ranks in the factor «Definition of FinTech» ($H(4)=57.043$, $p<0.001$), «Evolution of the use of AI and FinTech to serve SMEs» ($H(4)=62.852$, $p<0.001$)«Meaning of technological advancements and AI development for SMEs» ($H(4)=63.118$, $p<0.001$) and «Approach of the Financial Institution» ($H(4)=58.67$, $p<0.001$).

Educational level

The results of the Kruskal-Wallis tests of the factors in terms of the educational level of the respondents show that there are statistically significant mean ranks in the factor«Definition of FinTech» ($H(2)=41.241$, $p<0.001$), «Evolution of the use of AI and FinTech to serve SMEs» ($H(2)=33.012$, $p<0.001$) «Meaning of technological advancements and AI development for SMEs» ($H(2)=44.910$, $p<0.001$) and «Approach of the Financial Institution» ($H(2)=39.990$, $p<0.001$).

Discussion

The present research included 102 people, mostly men, up to 40 years old, working up to 15 years as bank clerks, administrators, trainees, in customer service or in a subsidiary company of a banking institution. Regarding the educational level, half the respondents have a Bachelor's degree and as to the department they are currently working at, most are in Sales, Marketing, Accounting, Finance Corporate banking and Operations.

In the 1st research question the employees' adaptation to AI and SME-related FinTech was studied. The results showed that men, up to 40 years old with a Master's degree or a PHD were more positive to the definition, the evolution of the use of AI and FinTech to serve SMEs, the meaning of technological advancements and AI development for SMEs and the approach of the Financial Institution. Similarly, Chavan (2008), and later Diouf and Pépin (2017), reported that this tension is also observed in countries other than Greece. However, a reversal of this trend is observed lately, since more and more women are receiving senior positions in the financial sector. In addition, there are studies in which the age of employees is disconnected from the digital transformation of financial institutions (Liu, 2021).

In the 2nd research question, the adaptation and transformation of the Greek banks to serve SMEs through AI and FinTech services was studied. The participants agreed that the COVID-19 pandemic made a decisive contribution to the evolution of financial services, that in the future, technological developments will greatly differentiate the service of SMEs, that banking institutions in Greece make extensive use of financial technologies to

serve SMEs and that technological developments in recent years have improved the service of banking activities related to SMEs.

OECD research (2022) points out that the pandemic simply accelerated the natural course of financial services growth to the benefit of SMEs. This contrasts with a 2021 survey (Meramveliotakis and Manioudis, 2021), where the disparity in the use of financial opportunities between SMEs and large organizations in Greece is highlighted. It is a fact that the pandemic changed corporate thinking, forcing SMEs to adapt to a new climate in the social sphere, technology, policies, cultural convergence, and relationships. Financial services should also adapt to the new climate (Bogdanova, 2022).

In the 3rd research question the collaboration of the banks or organizations with the staff to develop means of increasing SME efficiency through the use of AI and FinTech services was studied. More specifically, the respondents agreed that the bank or the organization invest resources in developing AI technologies, that they are constantly adapting in coordination with the employees to the use of financial technologies related to the development of SMEs, that they provide an adequate training to employees in the use of financial technologies relevant to SME development and make an extensive use of technological advancements to serve SMEs.

Regarding the benefits of adopting new financial technologies, Broby et al. (2018) mention as a key benefit the increase in productivity and therefore profitability. Regarding education, Morgan, Huang and Trinh (2019) state that both consumers and employees (not exclusively of financial institutions) need to be more educated in new financial technologies. Also, Yoshino, Morgan and Long (2020) observed in Japan that people with higher education better accept and use new financial technologies more often. Loukis, Arvanitis and Myrtidis (2020) observed that in the midst of the financial crisis, educational and technological resources were not adequately used by financial institutions to train employees, as the main purpose was to reduce operating costs. Nevertheless, they link training in new technologies and services to the economic environment of the country, which in recent years (2019) supports the change in behavior of financial institutions (OECD, 2022). It is a fact that banks are constantly developing innovative payment methods, including new organizations such as non-banking institutions, which introduce new operating models and change the way currencies are used for transactions, for example "digital currencies", as a part of their digital transformation (Koldovskyi, 2023).

Conclusion

Our research shows that all parts of the financial system can benefit from the correct application of artificial intelligence. Customers and especially SMEs can enjoy better and more personalized services and access personalized financial products, reduce their

operating costs while improving the efficiency of their internal processes. Financial institutions can improve the effectiveness of supervision and achieve productivity and reduction of operating costs. Finally, the country can benefit from the formation and development of the economic environment.

Limitation of the Study

The main limitation of the study was that our data was collected from a single financial institution (bank) and employees from Athens. Another limitation was the inclusion of all sectoral contexts (e.g., in less 'information-intensive' sectors, like business loans). Therefore, similar research is required also from the prospect of customers (e.g., smaller size firms, having less experience in ICT use) and other national contexts (employees and firms in rural areas).

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PACKAGING AS THE 5TH P OF MARKETING

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Abstract

Packaging is important for the product to have safe journey from the producer to the consumer. It ensures the protection of the product during its storage, handling, transportation, and prolonging its life cycle. The packaging depends on the nature of the product. From a marketing point of view, packaging is a promotional tool and represents the first contact with the consumer. Today, consumers are becoming more sophisticated and demanding, and in addition to high quality, they are looking for good packaging. Increasingly intense and fierce competition is pushing companies to think about using well designed and sustainable packaging that protects the health of both consumers and environment. Due to its prominent importance, packaging has been considered as the 5P of marketing.

This paper aims to show the importance of packaging, its advantages and disadvantages, historical development that started with its minor significance and ends with complex managerial decision-making, future packaging trends, by using primary and secondary data.

Keywords: *packaging, sustainable packaging, consumers, marketing*
JEL Codes: *M31, M37, M38*

Introduction

Packaging is an activity of designing and producing the container or wrapper for a product (Kotler and Armstrong, 2016, p.264). It is a science, art and technology of protecting goods during transportation, distribution, storage, sales and use (Shikha, 2023). Packaging is very important for the successful and safe journey of products from producers to consumers. It helps in identifying, describing and promoting the products.

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With the passage of time, packaging experiences lots of transformations influenced by human needs, changes in their lifestyle, discoveries and innovations, fierce market competition, wars, industrialization, digitalization, etc. The first beginnings of packaging can be traced back to the beginning of mankind when the first people used leaves, hollowed logs, woven grass and animal skins and organs to store their food. In Ancient times, especially in Egypt (1500 B.C), the use of glass to store food and water was industrialized (Hook et al, 2017). Ancient China is considered the inventor of paper in which food was packaged, and later was used for preserving medicine and tea parcels. In the Middle Ages, the most famous way of packaging were wooden barrels and wooden chests in which products such as rum, dried fruit, and fresh water were stored that were transported across the oceans (Crawford Packaging, 2023).

During the Industrial Revolution (1760-1840) tremendous technological changes in production took place and the need for packaging increased. (food packaging, bags, storage and transportation bins, primary packaging materials, in-store packaging options) (Loeser, 2015). In 1810, Peter Durand, an English merchant is widely credited with receiving the first patent for the idea of preserving food using tin cans. In 1817, the first industrialization of cardboard boxes took place in England, and in 1844, the first commercialization of paper bags took place in Bristol, England. In 1908, the Swiss chemist Brandenberger invented cellophane, which would be the basis for the appearance of plastic in the following years. During the Great Depression, "self-service" culture developed and people more often shopped in grocery stores. So, again there was a need of packaging change. Packaging becomes a sales tool and gets the epithet "silent salesman" (Loeser, 2015). After World War II, new materials appeared, such as plastic and aluminum foil, which pushed paper and the related products out of use. Plastic, although cheap, easy to use, will become a real problem in the coming years. In 1957, Alfred Fielding and his business partner Marc Chavannes discovered the bubble wrap that would later be used as a packaging material for computers made by the IBM. In 1973, chemist Nathaniel Wyeth first patented plastic bottles (PET-Polyethylene Terephthalate) that began to be used for carbonated drinks and also as a cheap substitute for glass.

Today, companies are taking actions to explore new ways of packaging that will be less harmful to the health of both humans and the planet. Efforts are being made to replace the linear economy (take-make-dispose) with a circular economy (make-use-recycle). Nowadays, the terms "eco-friendly", "biodegradable", "compostable", "green", "sustainable" packaging are increasingly used that aim to be easy to recycle, safe for people, safe for the environment and made from recycled materials (Dellis, 2016).

So, in the beginning, packaging was considered an insignificant element of the marketing mix (product, price, promotion, place). The packaging only had the function of

protecting the product from external influences. In the marketing literature it was included under the P-product along with other product attributes, branding, labeling and after-sales services (Kotler and Armstrong, 2016). Today, packaging is a powerful sales tool that is becoming a significant area of management decisions. Some marketing experts suggest the change of the original 4P elements of marketing mix (coined by E. Jerome McCarthy, 1960) by adding the new 5th element, P-packaging. This attitude is supported by the important functions that packaging plays today, such as: (Farooq, 2023)

- Providing physical protection of products on their way from the producers to consumers from various external influences, contaminations and damages, theft, etc.,
- Product identification that is ensured by the usage of distinctive colors, shapes, graphics, texts, size, material, design, etc.,
- Information about the product, i.e. display of the price, value, content of the product,
- Communication with consumers through labeling, such as usage instructions, warnings, expiration date, nutrition's value, etc.
- Marketing role, i.e. the attractiveness of packaging, impressive colors, creative designs that grab the attention of consumers,
- Protection of the environment, that is, "green" packaging made by biodegradable, eco-friendly, recycled materials,
- Enhancing companies profit because consumers are willing to pay higher price for well-designed and eco-packaging, etc.

From a marketing point of view, packaging is the first thing people notice about a product and can either attract or repel their attention. It really has to make the right impression (Ribble, 2023). Although the importance of the packaging should not be overstated, it still plays a crucial role when it comes to brand identity, recognition and customer loyalty.

Literature Review

Packaging today is considered a significant part of successful business practices. Due to consumer pressure, fierce competition and societal concern for the environment, companies are increasingly placing emphasis on packaging.

Consumers demand well-designed, quality and environmentally friendly packaging. They are interested in the product information that is usually found on the package labels regarding quality, value, features, instructions for use, etc. For them, the primary concern is that the product is well preserved with the packaging. Consumers are increasingly conscious about the environmental impacts and they evaluate the carbon footprint of the packaging before buying a product (Tiuttu, 2020). Young people from Generation Z (1997-

2012) who are the “spenders of tomorrow” are especially interested in the environmental aspects of packaging (Dimitrieska & Efremova, 2022). It is also very important for companies to use packaging for easy distribution, storage and promotion of the product. Today they work in a highly dynamic and uncertain environment (Zlateva, 2020). They face the challenges of the new age. Namely, they use the following layers of packaging: (Iverson, 2021)

- Primary packaging: packaging with which the product is directly protected during the production process and remains together with the product for the entire lifetime (jars, bottles, tubes, cans, bags, boxes, etc.),
- Secondary packaging: packaging that additionally protects the product and is removed before using the product. It influences the consumer's decision to buy the product with its attractiveness (thick paper, large corrugated boxes, bins, mailing bags, etc.) and
- Tertiary (shipping) packaging – it protects the product during storage and transportation (shipping containers, wooden pallets, etc.)

The new packaging trends are for them to be unique, by which the products will be differentiated from the competition, with creative designs, impressive colors, simple to handle and use, with easy-to-read texts, understandable graphics that will reflect the brand image and, most importantly, to be ecological, that is, to take care of the health of both people and the planet. Experts are increasingly talking about sustainable packaging. It is packaging that has less and less harmful effects on the environment over time (Forbes, 2023).

Sustainable packaging can be recyclable, recycled and compostable (Vivo packing, 2023). Recyclable refers to the use of materials that can be sorted, processed and transformed into new products (cardboards, paper, certain types of plastics). Recycled packaging refers to materials that are made from post-consumer and post-industrial recycled content. In this way, the demand for virgin materials is reduced and the extraction of natural resources is minimized. Compostable packaging refers to materials designed to break down naturally and return to the earth without leaving harmful residues behind (Pathak, 2014). This includes biodegradable materials such as plant-based plastics, natural fibers that are susceptible to microbiological decomposition in an industrial composting environment. Consumers need to be educated and involved in the recycling process. Companies must provide instructions for proper waste disposal and recycling practices. Only in this way, with a joint effort, we can save the planet, our only home.

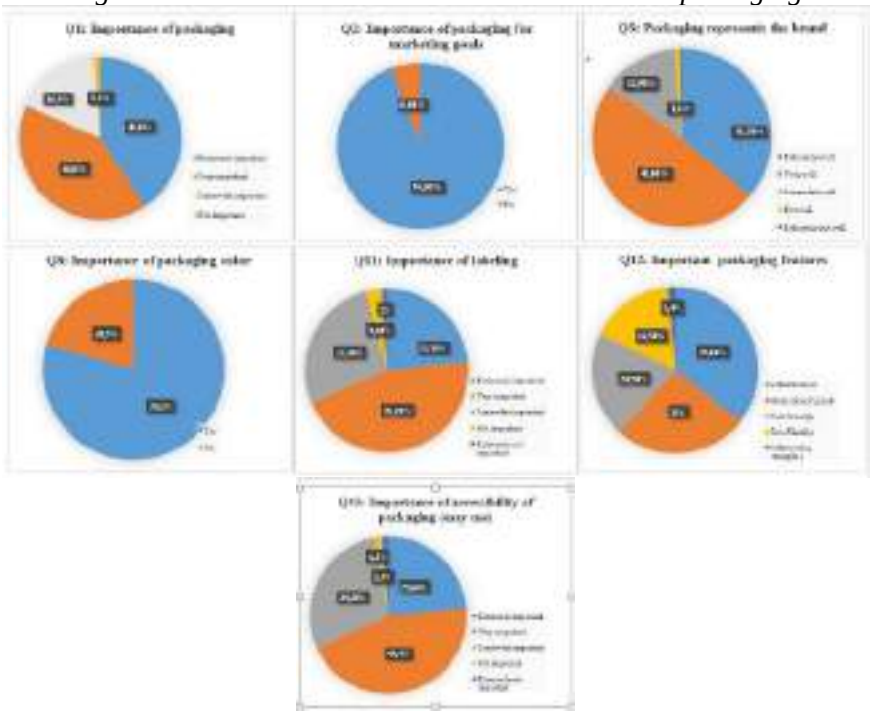
Methodology

This paper elaborates two surveys in detail, targeting individuals (primary data) and companies (secondary data). The primary research was done in the period March-June 2023 with an anonymous questionnaire containing 13 research questions. 73 respondents were surveyed electronically. The secondary research was taken from the blog Respublika (Prlja, 2019) and refers to the recycling of packaging carried out by Macedonian companies. The paper also uses other secondary data, such as books, publications, journals, reviews, mostly published on the Internet.

Analysis and discussion

The first research was conducted in the period March-June 2023 targeted individuals. In total 73 responses were received. The survey was conducted with an electronic anonymous questionnaire that required answers to 13 questions. The answers to the questions are shown in figures below, namely Figure 1: "Positive consumer comments about the packaging" and Figure 2: "Not so positive consumer comments about the packaging".

Figure no.1 Positive consumer comments about the packaging



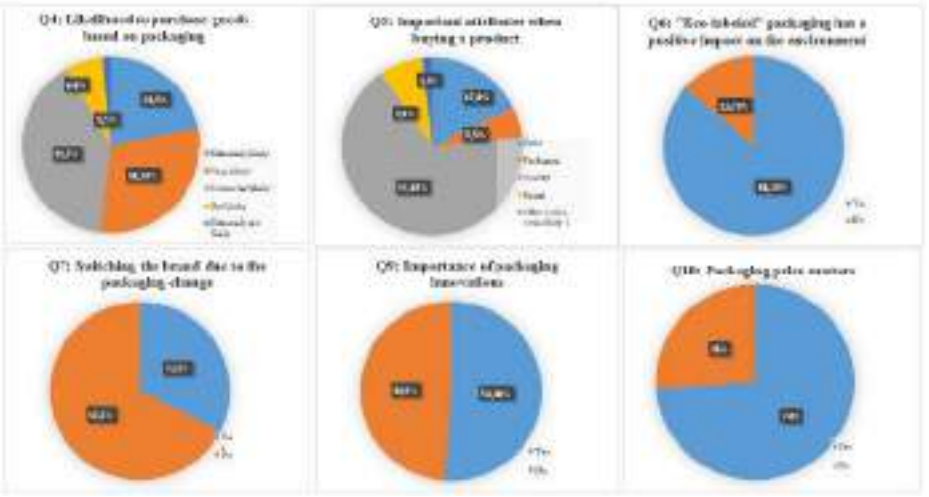
Source: Own research

The first Figure shows the respondents' positive answers about the packaging. This includes the answers to questions numbered 1, 2, 3, 8, 11, 12 and 13. Thus, to the first question about the importance of packaging, almost 82% of respondents answered that packaging is important to them. Only 1.5% of respondents do not care and are not interested in product packaging. 94.50% of respondents believe that companies achieve their marketing goals with packaging. A large percentage of respondents 98.60% (i.e. 48.60% persons responded with extremely good, 36.10% with very good and 13.90% with neither good nor bad) answered that the packaging represents the brand image well. Also, quite a high percentage of respondents 79.50% believe that the color of the packaging is important when buying products. Regarding labeling, 95.90% of the respondents consider it an important element of the packaging. When it comes to the features of packaging, respondents value attractiveness the most (35.60%), followed by product protection (26%), functionality (21%), and environmental protection (17%).

According to these answers, consumers think that packaging is important, that it serves to fulfill the marketing goals of the companies, and that it good represents the brand image. The color of the packaging is also important, but of all the characteristics, the most important is the attractiveness of the packaging together with its functionality, the protection of the products and the concern for the environment.

However, the answers to questions numbered 4,5,6,7,9 and 10 (Figure 2) show some confusion among consumers.

Figure no. 2 Not so positive consumer comments about the packaging



Source: Own research

Thus, the fourth question refers to the probability that the respondents will purchase products based on the packaging. Although respondents previously said that packaging is important, only 48% of them would buy products based on packaging alone. When asked what are the important attributes when buying a certain product, the answers were as expected, as the highest percentage 67% of the respondents replied that it is the quality, followed by the price with 18%. However, what is a bit surprising is that the packaging is almost at the last place with 5.5% of respondents who consider it to be an important attribute. It is even striking that for more respondents product to be a brand (8%) is more important than that it is well packaged. Another surprising answer is that almost 15% of the respondents do not believe that the eco-friendly packaging label is real and truly has a positive impact on the environment! Also a large percentage 68% of the respondents would not change the brand if the packaging of another similar or substitute product was changed. Even more surprising is that 51% of respondents do not consider packaging innovations to be important when making a purchase decision. However, Macedonian consumers are price sensitive, as shown by the data that 74% of them consider the price of the packaging to be important when purchasing products.

For the second research, the answers from the Respublika blog (2019) were used. Even though 15 Macedonian companies were asked about recycling plastic, paper, glass, metal and electronics, only three of them responded. The main purpose of this research was to find out exactly what is recycled in Macedonia according to the practice and experience of the companies. Below are the results by recycled materials:

1) Plastic: In companies, a large number of materials are not recycled due to small amounts of waste, expensive processing installations, as well as lack of support from the state in the form of subsidies (Prlja, 2019). In Macedonia, plastic from hygiene products, plastic packaging from yogurts and sour milk, cream is not recycled because it is a very expensive and uneconomical process. Practically, only transparent PET plastic is recycled, i.e. that of water bottles.

2) Paper: Macedonian companies do not recycle composite paper because there are no such facilities.

3) Glass: In the world, all glasses that do not have other impurities inside, such as wire in reinforced glass, glass with foils, etc., are recycled, but our companies do not have such facilities. Light bulbs that contain harmful chemicals, glass cups and glass containers, glass from windows and shop windows or mirrors are also not recycled worldwide because they are not made of the same glass. In addition, glass recycling centers do not accept broken glass anywhere! Our glass recycling containers are such that when you drop a bottle it will inevitably break. Additionally, the patch on the container clearly shows broken glass.

4) Metal: It is known that cans can be infinitely recycled, however in most world centers sprays, aluminum foil, metal hangers, needles, cutlery and the like are not accepted. In addition, an unwashed can cannot be recycled. Again a new confusion for consumers!

5) Electronics and machinery: Companies from this area have given a comprehensive explanation of their operations according to the Law on the Management of Electrical and Electronic Equipment. They explained that "collection companies, public utility companies, municipalities, recyclers, manufacturers/importers and citizens" are responsible for successful recycling and "In principle all electrical and electronic devices are recyclable or at least part of the device is recyclable while it has parts. Plastics from computers that contain fire suppressants, which are hazardous substances, are not recycled.

All these responses of the Macedonian companies show that in the field of recycling there is a lot of confusion and a lot of ambiguity. It is not known exactly what is really recycled and what is not. Therefore, companies must more clearly inform the public about what can be recycled (exact raw materials), how it is recycled (independently, through contractors...), where the recycling locations are (map of locations) and how waste is selected (flattened, well washed or cleaned).

On the other hand, the state should be more actively involved in the recycling process. It should ban, limit or tax non-recyclable materials. So they will not be used and will not end up in landfills. On the other hand, it can help companies with subsidies to be able to recycle or facilitate transport to countries that can recycle.

Conclusion

This paper illustrates the importance of packaging for consumers, companies and the environment, which leads to it being considered the 5th element of the marketing mix. From an insignificant part of management decisions and as a small segment of the “Product” element in the marketing mix, packaging is receiving increasing attention today. This is due to the vital functions that packaging has today, such as protecting the product, informing about the product, recognition of brands, promoting the product. Promotion is carried out through the distinctive packaging elements, such as shape, design, colors, text, graphics, etc. Packaging is the product's first contact with the consumer. Today, attention is also paid to ecological packaging, which should do less harm to human health and the planet. The world is increasingly talking about the application of so-called sustainable packaging based on recycled materials, biodegradable natural materials that are less harmful to the environment.

According to research done with Macedonian consumers and companies, it can be noted that the awareness of the new recycling trend is still at a low level. Consumers would not pay for higher environmental packaging, nor would they switch brands if a similar or

substitute product with environmental packaging appeared on the market. Companies, on the other hand, do not recycle due to a small amount of waste or lack of recycling facilities that are too expensive. They expect help from the state in the form of subsidies to engage themselves more seriously in recycling.

This paper gives a picture of the recycling situation in Macedonia which is not good and certain steps must be taken as soon as possible for the health of people and the health of the planet which is our only home for now.

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