

**The scope for entrepreneurship in tindouf's area during the period 2007-2020 - Analytical study (the evIEWS-9 with arima model).**

**واقع المقاوالتية في ولاية تندوف خلال الفترة 2007-2020 دراسة قياسية (نماذج الأريما باستخدام برنامج إيفوز 9)**

**Benfareh aicha<sup>1</sup>**

<sup>1</sup> Phd student, university center ali kafi of tindouf, the laboratry for sustainable local development and entrepreneurship, benfarehaicha@gmail.com,

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**Abstract:** The EvIEWS software is a software package specifically designed to process time series data. Autoregressive Integrated Moving Average (ARIMA) model, a time series forecast method, the forecast procedure with ARIMA model is illustrated in this work. As an example An estimated 14-years' time series has been taken from 2007 to 2020 as a sample study to accurately identify the reality in the area of entrepreneurship and enterprise creation in Tindouf's area based on the evIEWS9 data analysis and forecast procedure for 2021-2022 The data from the study were taken from CNRC, the National Commercial Registry Centre for the State of Tindouf, based on the number of legal entities recorded during this period. There was a qualitative jump in the overall compounded annual growth rate (CAGR) over this four-year period, with an unprecedented 18.92% rise for moral entities, that about the future of entrepreneurship in Tindouf (2021-2022).

**Keys words:** arimamodel, forecasting, theentrepreneurship,cagr.

**JEL classification codes:** B23.C22, C53, M21.

**ملخص**

برنامج evIEWS هو مجموعة برامج مصممة خصيصا لمعالجة بيانات السلاسل الزمنية، ويتجلى هذا العمل في نموذج المتوسط المتحرك المتكامل التلقائي (ARIMA) اريما، وهو أسلوب للتنبؤ بالسلاسل الزمنية وكمثال على ذلك تم اخذ سلسلة زمنية مقدرة ب 14 سنة من 2007 الى غاية سنة 2020 كعينة دراسة لمعرفة بشكل دقيق الواقع الحاصل في مجال المقاولة وانشاء المؤسسات في ولاية تندوف باعتماد على برنامج 9 evIEWS لتحليل بيانات العينة الزمنية وإجراء التوقع لسنة 2021-2022 تم اخذ مؤسسات التي لها سجل تجاري معنوي في الولاية تندوف كعينة دراسة في شكل بيانات فصلية من سنة 2007 الى غاية 2020 من (CNRC) المركز الوطني لسجل التجاري لولاية تندوف حيث سجلت قفزة نوعية في معدل النمو السنوي الاجمالي (CAGR) خلال هذه 4 سنوات بارتفاع لم يسبق له نظير بنسبة 18.92% بالنسبة للمؤسسات ذات سجل التجاري المعنوي هذا ما يعكس صورة المقاوالتية في الولاية مستقبلا في الفترة 2021-2022.

**الكلمات المفتاحية:** اريما، توقعات، المقاوالتية، (CAGR) معدل النمو السنوي المركب..

**تصنيف JEL:** B23. M21, C53, C22.

**Corresponding author:** Benfarehaicha, e-mail: benfarehaicha@gmail.com

## **1-Introduction**

EViews provides the object/option “Forecast,” which can directly be used to conduct the forecasting (Agung, Advanced Time Series Data Analysis, 2019)it is an interactive computer programme for statistical and econometric analysis (Tatahi, 2018), EViews provides Fixed/Random Effects Testing, namely the Redundant Fixed Effects likelihood Ratioand the Correlated Random Effects – Hausman Tests in addition to the Coefficient Tests and Residual Tests. (Agung, Panel Data Analysis Using EViews, 2014). A *time series* is a sequence of observations taken sequentiallyin time. Many sets of dataappear as time series: a monthly sequence of the quantity of goods shipped from a factory, aweekly series of the number of road accidents, daily rainfall amounts, and hourlyobservationsmade on the yield of a chemical process (LJUNG, 2016)we will learn more about this model through this study.

## **2-RESEARCH HYPOTHESES:**

**H0:** there is no statistically significance in the entrepreneurship intention to establish companies on Tindouf’s area.

**H1:** there is a statistically significance in the entrepreneurship intention to establish companies on Tindouf’s area.

## **3-Value of the study:**

The main objective of this study to shine some light on the enhancing companies on Tindouf’s area during the period 2007-2020 with arima model.

*Procedure of ARIMA modeling*the procedure flow chart of ARIMA modeling and forecasting is given in this step (Lihua Ma Chao Hu, 2017).

- 1/ Time series.
- 2/ Stationarity test.
- 3/Calculate correlation coefficient.
- 4/Pattern recognition.
- 5/Parameter estimation.
- 6/Model test.
- 7/Model optimisation.
- 8/Forecasting.

## **4-NOTION OF ENTREPRENEURSHIP:**

1/Entrepreneurship: provides numerous opportunities for self-expression and realization of one’s passion for doing something new and different (SAHAI, 2008)

2/having understood the meanings of entrepreneur and intrapreneur, now the two can easily be distinguished from each other on the following basset: (MBA))

**Table 1.difference between an entrepreneur and anintrapreneur.**

<b>difference</b>	<b>entrepreneur</b>	<b>intrapreneur</b>
dependency	Is Independent in his operations	Is dependent on the entrepreneur i.e the intrapreneur does not raise the owner funds.
Raising of funds	An entrepreneur himself raises funds required for enterprise.	Funds are not raised by the intrapreneur
Risk	Entrepreneur bears the risk involved in the business.	An intrapreneur does not fully bear the risk involved in the enterprise.
Operation	An entrepreneur operates from outside.	On the contrary ,an intrapreneur operates from within the organization itself

**source:MBA. Entrepreneurshipdevelopment.Nitropdfprofessional. (2020).**

**5-We make modeling and prediction of the SME data in the following table:**

Reg: it is mean the registration or the first procedure of inscription to trade register (REGISTER(NCTR), MAY 2017).

M.REG: main registrations.

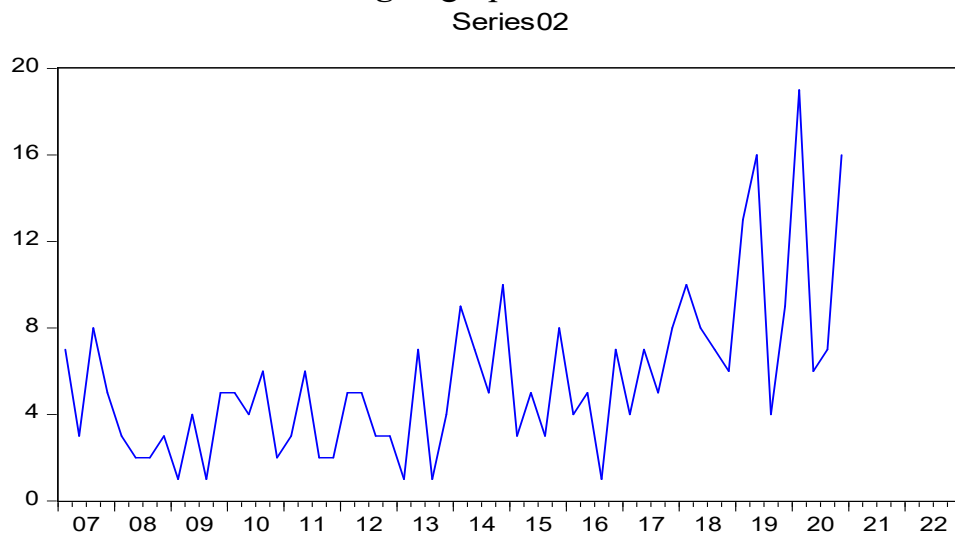
S.REG: secondary registrations.

**Table2.thesme (Tindouf's area) data during the period 2007Q1-2020Q4**

years	1-quarterly			2-quarterly			3-quarterly			4-quarterly		
	M.REG	S.REG	Total	M.REG	S.REG	Total	M.REG	S.REG	Total	M.REG	S.REG	Total
2007	2	5	7	3	0	3	6	2	8	3	2	5
2008	1	2	3	1	1	2	2	0	2	1	2	3
2009	1	0	1	3	1	4	0	1	1	2	3	5
2010	3	2	5	3	1	4	4	2	6	1	1	2
2011	2	1	3	4	2	6	1	1	2	2	0	2
2012	4	1	5	4	1	5	1	2	3	2	1	3
2013	1	0	1	4	3	7	1	0	1	4	0	4
2014	5	4	9	4	3	7	3	2	5	6	4	10
2015	1	2	3	2	3	5	1	2	3	2	6	8
2016	2	2	4	4	1	5	1	0	1	5	2	7
2017	2	2	4	4	3	7	4	1	5	2	6	8
2018	3	7	10	5	3	8	4	3	7	4	2	6
2019	11	2	13	11	5	16	3	1	4	2	7	9
2020	12	7	19	3	3	6	4	3	7	5	11	16

**source; national center of the trade register of TINDOUF (NCTR)**

**Fig.1. graph of sme**



**source:**output of evIEWS-9.

**Compound annual growth rate (CAGR)**

CAGR : is a specific term for the geometric progression ratio that provides a constant growth rate over the time period , CAGR dampens the effect of volatility of periodic changes that can render arithmetic means irrelevant it is particularly useful to compare growth rates from different data sets such as consumption growth of commodity (SHARMA, 2015)

$$CAGR = \{(CF/CI) ^ ( 1 / (n-1))\}$$

Where:

CF = consumption of final year

CI=consumption of base year

n = current year – base year

**CAGR;** compounded annual growth rate for registration of legal entities

**Table3.**The CAGR of SME’S Tindouf.

years	q1	q2	q3	q4	PERIOD	CAGR	%/YEAR
2007	7	3	8	5	1	/	/
2008	3	2	2	3	2	/	/
2009	1	4	1	5	3	/	/
2010	5	4	6	2	4	/	/
2011	3	6	2	2	5YEARS	-10,78%	/
2012	5	5	3	3	1	/	/
2013	1	7	1	4	2	/	/
2014	9	7	5	10	3	/	/
2015	3	5	3	8	4	/	/
2016	4	5	1	7	5YEARS	1,22%	/
2017	4	7	5	8	1	/	/
2018	10	8	7	6	2	/	/
2019	13	16	4	9	3	/	35,48%
2020	19	6	7	16	4YEARS	18,92%	14,29%

**source** output of evIEWS-9.

**6-Stationarity test:**

The SME data series during 2007Q1-2020Q4 is plotted Figure. 2. The result of the stationarity test (ADF test) on the data is given in Table 4.

**Table4 .Augmented Dickey-Fuller unit root test on SME**

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.286465	0.9196
Test critical values: 1% level	-3.562669	
5% level	-2.918778	
10% level	-2.597285	

**Source:** output of eviews-9.

It can be seen that  $ADF=-0.286465$  is greater than the critical value of the significance level of 0.01, 0.05 and 0.1 in the level, that is to say, the original sme sequence is non-stationary.

We make test ADF in the first-order difference a DSME it shows that  $ADF= -8.993038$  is less than the three critical values of the test level. That is tosay, the DSME sequence after the first-order difference is a stationary series.

**Table5. The results of the ADF test for the DSME sequence**

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.993038	0.0000
Test critical values: 1% level	-4.144584	
5% level	-3.498692	
10% level	-3.178578	

**Source:** output of eviews-9.

**7-Model Identification**

With the eviews software, the autocorrelation and partial autocorrelation function graphs of the DSME series are plotted in Figure 3:

**Fig.2.** Autocorrelation and partial autocorrelation function graphs of the DSME series.

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
*** .	*** .	1	-0.433	-0.433	10.899	0.001
** .	*** .	2	-0.264	-0.557	15.034	0.001
. **	** .	3	0.248	-0.305	18.753	0.000
. *.	. .	4	0.146	0.044	20.069	0.000
** .	. .	5	-0.241	0.020	23.701	0.000
. .	. *.	6	0.073	0.130	24.040	0.001
. *.	** .	7	-0.081	-0.224	24.464	0.001
. *.	. .	8	0.185	0.016	26.743	0.001
. *.	. .	9	-0.099	-0.004	27.414	0.001
. .	. *.	10	-0.023	0.124	27.451	0.002
. .	. .	11	0.006	0.054	27.453	0.004
. .	. *.	12	0.021	-0.120	27.485	0.007
. .	. *.	13	-0.041	-0.138	27.609	0.010
. *.	. .	14	0.110	0.045	28.538	0.012
. *.	. *.	15	-0.104	0.135	29.385	0.014
. .	. *.	16	0.050	0.180	29.583	0.020
. .	. .	17	0.006	0.039	29.586	0.029
. .	. .	18	0.032	0.015	29.672	0.041
. *.	. .	19	-0.069	-0.012	30.091	0.051
. .	. .	20	-0.004	-0.032	30.092	0.068
. *.	. **	21	0.134	0.249	31.747	0.062
. *.	. .	22	-0.146	-0.050	33.781	0.052
. .	. *.	23	-0.018	-0.113	33.815	0.068
. *.	. .	24	0.166	-0.059	36.601	0.048

**Source:** output of eviews-9.

Table 5: lists the test results of ARMA (p, q) for different parameters. Adjusted R-squared, AIC value, SC value and S.E. of regression are all important criteria.

for selecting models. The lowest AIC criterion and the lowest volatility (SIGMA<sup>2</sup>), the highest Adjusted R-squared, and the more significant. And we select the optimal model in this study the best ARIMA model is MA (1).

**Table 6:** Test results of ARMA (p,q).

ARIMAMODEL	SIG COEFF	SIGMAADJSR	-SQUARAIC	
MA(1)	2	10.208	0.452	5.295
ARIMA (1.1.1)	2	10.011	0.452	5.312
ARIMA (1.1.2)	3	10.199	0.442	5.331
ARIMA (3.1.1)	1	8.375	0.542	5.173
ARIMA (1.1.3)	3	12.494	0.317	5.526

**Source:** output of eviews-9.

Model establishment and inspection the estimated results with the ARIMA model are as follows:

**Table 7: Estimation results of the ARIMA model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.129459	0.076313	1.696414	0.0958
MA(1)	-0.865505	0.078894	-10.97051	0.0000
SIGMASQ	10.20884	2.065455	4.942658	0.0000

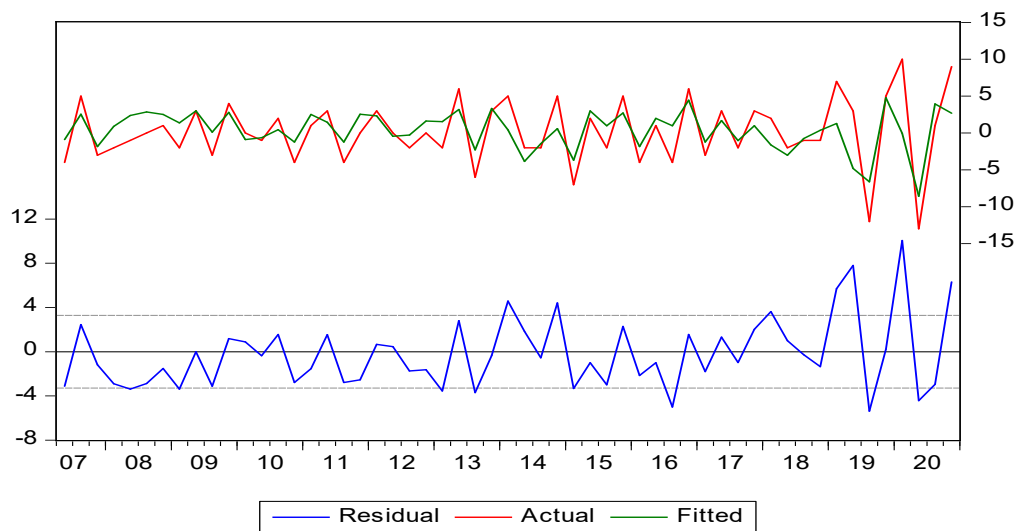
  

R-squared	0.473044	Meandependent var	0.163636
Adjusted R-squared	0.452776	S.D. dependent var	4.442070
S.E. of regression	3.286002	Akaike info criterion	5.295362
Sumsquaredresid	561.4860	Schwarz criterion	5.404853
Log likelihood	-142.6224	Hannan-Quinn criter.	5.337703
F-statistic	23.33998	Durbin-Watson stat	2.135208
Prob(F-statistic)	0.000000		

Inverted MA Roots .87

**Source:** output of eviews-9.

**Fig .3.**Actual series, fitted series and residual series of the DSME sequence.



**Source:** output of eviews-9.

Fig.4. the autocorrelation and partial correlation.

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
.*)	*)	1	-0.118	-0.118	0.8036	
.*)	.*)	2	-0.184	-0.200	2.8030	0.094
.**	.**	3	0.347	0.314	10.060	0.007
.*)	.**	4	0.190	0.264	12.283	0.006
.*)	.)	5	-0.166	-0.004	14.012	0.007
.)	.)	6	0.060	-0.016	14.244	0.014
.)	**)	7	-0.015	-0.229	14.258	0.027
.*)	.*)	8	0.121	0.135	15.238	0.033
.*)	.)	9	-0.070	-0.032	15.574	0.049
.)	.)	10	-0.052	0.036	15.760	0.072
.)	.*)	11	-0.006	-0.098	15.762	0.107
.)	.*)	12	0.005	-0.086	15.765	0.150
.)	.*)	13	-0.008	0.077	15.769	0.202
.*)	.*)	14	0.102	0.178	16.557	0.220
.)	.*)	15	-0.042	0.092	16.698	0.273
.)	.)	16	0.069	0.040	17.081	0.314
.)	.*)	17	0.031	-0.100	17.160	0.375
.)	.)	18	0.062	0.034	17.485	0.422
.)	.)	19	-0.024	-0.009	17.537	0.487
.)	.)	20	0.043	0.059	17.705	0.542
.)	.)	21	0.072	0.066	18.190	0.575
.*)	**)	22	-0.131	-0.266	19.826	0.532
.)	.*)	23	-0.036	-0.077	19.956	0.586
.*)	.)	24	0.117	0.022	21.330	0.561

Source: output of eviews-9.

**8- Data forecasting:**

**8-1 Projected from within the sample (2007q1-2020q4) :**

Fig.5.: the graph of actual, fitted, residual

obs	Actual	Fitted	Residual	Residual Plot
2007Q2	-4.00000	-0.87762	-3.12238	*)   .
2007Q3	5.00000	2.54004	2.45996	.   *)
2007Q4	-3.00000	-1.82551	-1.17449	. *)   .
2008Q1	-2.00000	0.90173	-2.90173	*)   .
2008Q2	-1.00000	2.37912	-3.37912	*   .
2008Q3	0.00000	2.87075	-2.87075	*)   .
2008Q4	1.00000	2.52096	-1.52096	.*)   .
2009Q1	-2.00000	1.37508	-3.37508	*   .
2009Q2	3.00000	3.01098	-0.01098	. * .
2009Q3	-3.00000	0.11592	-3.11592	*)   .
2009Q4	4.00000	2.81305	1.18695	.  *) .
2010Q1	0.00000	-0.88871	0.88871	.  *) .



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2010Q2	-1.00000	-0.63772	-0.36228	.	*	.
2010Q3	2.00000	0.44555	1.55445	.		*
2010Q4	-4.00000	-1.21756	-2.78244	.	*	
2011Q1	1.00000	2.53176	-1.53176	.	*	
2011Q2	3.00000	1.45499	1.54501	.		*
2011Q3	-4.00000	-1.20845	-2.79155	.	*	
2011Q4	0.00000	2.54256	-2.54256	.	*	
2012Q1	3.00000	2.32917	0.67083	.		*
2012Q2	0.00000	-0.45079	0.45079	.	*	.
2012Q3	-2.00000	-0.26097	-1.73903	.	*	
2012Q4	0.00000	1.63401	-1.63401	.	*	
2013Q1	-2.00000	1.54304	-3.54304	*		.
2013Q2	6.00000	3.19586	2.80414	.		*
2013Q3	-6.00000	-2.29757	-3.70243	*		.
2013Q4	3.00000	3.33369	-0.33369	.	*	.
2014Q1	5.00000	0.41843	4.58157	.		*
2014Q2	-2.00000	-3.83571	1.83571	.		*
2014Q3	-2.00000	-1.45932	-0.54068	.	*	
2014Q4	5.00000	0.59748	4.40252	.		*
2015Q1	-7.00000	-3.68092	-3.31908	*		.
2015Q2	2.00000	3.00210	-1.00210	.	*	
2015Q3	-2.00000	0.99675	-2.99675	.	*	
2015Q4	5.00000	2.72316	2.27684	.		*
2016Q1	-4.00000	-1.84116	-2.15884	.	*	
2016Q2	1.00000	1.99794	-0.99794	.	*	
2016Q3	-4.00000	0.99317	-4.99317	*		.
2016Q4	6.00000	4.45107	1.54893	.		*
2017Q1	-3.00000	-1.21115	-1.78885	.	*	
2017Q2	3.00000	1.67772	1.32228	.		*
2017Q3	-2.00000	-1.01498	-0.98502	.	*	
2017Q4	3.00000	0.98200	2.01800	.		*
2018Q1	2.00000	-1.61713	3.61713	.		*
2018Q2	-2.00000	-3.00119	1.00119	.		*
2018Q3	-1.00000	-0.73707	-0.26293	.	*	.
2018Q4	-1.00000	0.35702	-1.35702	.	*	
2019Q1	7.00000	1.30397	5.69603	.		*
2019Q2	3.00000	-4.80048	7.80048	.		*
2019Q3	-12.0000	-6.62190	-5.37810	*		.
2019Q4	5.00000	4.78423	0.21577	.	*	.
2020Q1	10.0000	-0.05729	10.0573	.		*
	-					
2020Q2	13.0000	-8.57518	-4.42482	*		.
2020Q3	1.00000	3.95917	-2.95917	.	*	
	9.00000	2.69063	6.30937	.		*

**Source:** output of eviews-9.

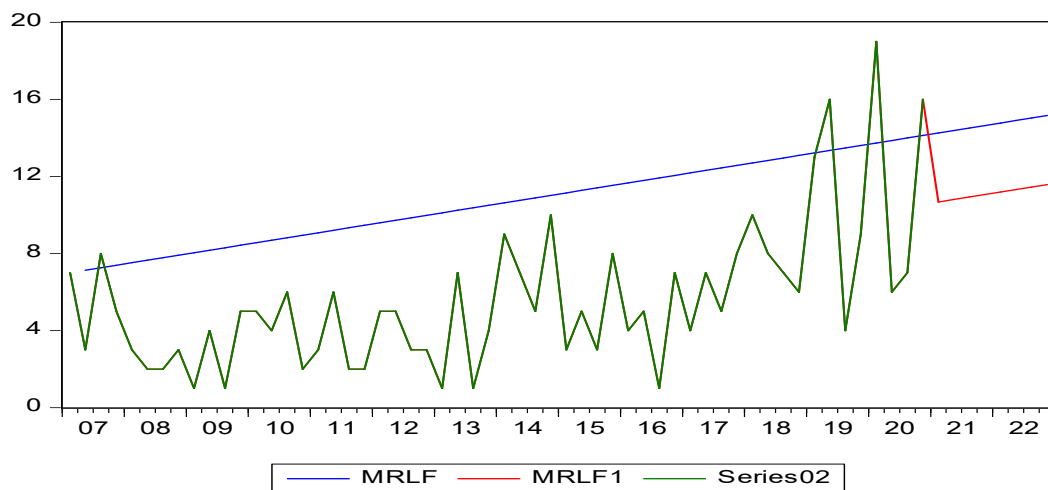
**8- 2 Projected from outside the sample (2021q1-2022q4) :**

**Table 8.TINDOUF SME forecast from 2021Q1 to 2022Q4.**

QUARTLERLY FORECASTING	PRECENT (%) CHANGE
2021Q1/	3.77%
2021Q2/	3.74%
2021Q3/	3.70%
2021Q4/	3.67%
2022Q1/	3.63%
2022Q2/	3.60%
2022Q3/	3.57%
2022Q4/	3.54%

**Source:** output of eviws-9.

**Fig.5.** graph ofTINDOUF SME forecast from 2021Q1 to 2022Q4



**Source:** output of eviws-9.

**Hence,** we have excepted H1 which meansthere is a statistically significance in the entrepreneurship intention to establish companies on Tindouf’s area while H0 (there is no statistically significance in the entrepreneurship intention to establish companies on Tindouf’s area.) hasrejected.

## **9. Conclusion and Future Directions ;**

The ARIMA model is suitable for short- term prediction in a period not exceeding 18 months, through this study we came to predictions for the next two years:

### Evolution of legal entities registration:

1/from 2007 to 2011 there was a decline in the overall compounded annual growth rate (CAGR) moral entities ratio (10.78%) in five years and this is due to economic and other factors.

2/from 2012 to 2016 there was a 5-year rise in the overall compounded annual growth rate (CAGR) rate of 1.22% for moral entities.

3/from 2017 to 2020, there was a qualitative jump in the overall compounded annual growth rate (CAGR) during this four-year period, an unprecedented 18.92% rise for moral entities. In particular, following the announcement of the opening of the Algerian-Mauritanian land border crossing post-2018, the martyr Mustafa Ben Boulaide of Tindouf 's area.

4/during 2019, the rate of annual growth compared to 2018 (35.48%) for moral entities is indicative of the recovery of entrepreneurship and the establishment of industries and companies in Tindouf's area.

5/ during 2020, the annual growth rate compared to 2019 increased by 14.29% for moral entities.

6/projections of growth rates of enterprises with a moral business record on Tindouf's area from Triple I for 2021 to Triple IV for 2022:

1-First trimester of 2021/2022= 3.77%/3.63%

2-Second trimester for 2021/2022=3.74%/3.57

3-Third trimester of 2021/2022=3.70%/ 3.60%

4-Fourth trimester of 2021/2022=3.67%/3.54%

**10-Citations:**

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