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The Impact of Tax Pressure on Normal Tax Revenues in Algeria: An Autoregressive Distributed Lag (Ardl) Analysis (1999-2022).

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Abstract:

This study examines the impact of tax pressure on ordinary tax revenues in Algeria. The rates of tax pressure in Algeria are analyzed and are compared with the optimal rate, in addition, the causal relationship between tax collection and the most important possible determinants (tax evasion, tax pressure, tax concessions) determined using the ARDL model between 1999 and 2022. The results revealed that every increase in the volume of tax evasion results is offset by a decrease in the volume of tax collection, indicating a contrary relationship. The findings also revealed the results also confirmed the existence of an inverse relationship in the short-term (-0.196776) and long-term (-0.280923) between the rate of tax pressure and tax collection, despite its low rates outside of fuel, when compared to the optimal rate of 25%. This is due to excessive tax concessions that have eroded the tax base. Relying on petroleum collections to cover the state's public.

Keywords: Tax Pressure; Tax Concessions; Tax Evasion; Tax Collection.

1. INTRODUCTION

Similar to all economic systems of nations, Algeria's economic system aims to generate the highest rate of public revenue, with taxes and fees being among the most significant sources from which it is formed. This is accomplished through designing an effective tax system that responds to the economic and social goals of the state and works to achieve them. However, every tax system faces several obstacles that limit its effectiveness, and perhaps the most important of these obstacles is tax pressure if it exceeds the optimal rate, which burdens the taxpayers and pushes them to evade it. Therefore, tax pressure rates must be studied within an effective tax policy to avoid this phenomenon.

What is the impact of tax pressure rates on the normal tax collection proceeds in Algeria from 1999-2022?

This key question is divided into several sub-questions to answer the study's problem:

- Is there a statistically significant relationship between the size of tax concessions and the volume of tax collection in Algeria?
- Is there a statistically significant linkage between the rate of tax pressure and the volume of tax collection in Algeria?
- Is there a statistically significant nexus between the volume of tax evasion and the volume of tax collection in Algeria?

Hypotheses:

- There is an inverse relationship between the size of tax concessions and the volume of tax collection in the short run and a direct relationship in the long run.

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- There is a direct correlation between the rate of tax pressure and the volume of tax collection.
- There is an inverse relationship between the volume of tax evasion and the volume of tax collection.

2. Background

2.1. Tax pressure:

Tax pressure is that proportion which is deducted from the income of the taxable individual or the income that the state obtains in the form of taxes and fees, which is employed in financing its expenditures. Tax pressure can be calculated mathematically as follows (Ben daas)2019 ،:

Total tax pressure = Tax revenue/Gross domestic product.

The rate of tax pressure can be measured as follows (Chebah & Baghded, 2019):

Tax pressure rate = total tax deductions to GDP/general tax pressure.

The total tax deductions include taxes and deductions related to social security contributions. This is consistent with the broad concept of tax pressure, whereas the narrow concept of tax pressure limits tax deductions to tax revenue only (kaddi, 2003).

Another criterion for assessing tax pressure is based on the ratio of tax deductions to all public deductions, however, this measure is complicated in the measurement of non-tax deductions and the divergence in the significance of many government resources in different nations**.**

2.2. Tax Pressure in Algeria

Tax pressure is one of the most important indicators used to assess the effectiveness of a tax system. The tax pressure rate is determined by the sum of the tax revenue divided by GDP (outside of fuel) multiplied by 100. The Australian research " Kon Clark " set the typical tax pressure rate at 25% (Bouzida, 2006).

2.2.1. Evolution of Tax Pressure in Algeria

The evolution of fiscal pressure rates in Algeria during the period 1999-2022 is demonstrated in Table 1 below:

Table 1. Evolution of tax pressure in Algeria (1999-2022)

Years	Total regular revenue collection	Gross Domestic Product outside of fuels	The tax pressure rate for normal collection
1999	348,75	3 240,00	10,76%
2000	373,157	2 507,20	14,88%
2001	444,499	2 783,19	15,97%
2002	493,091	3 045,74	16,19%
2003	562,879	3 383,43	16,64%
2004	603,771	3 829,29	15,77%
2005	664,79	4209,1	15,79%
2006	745,56	4 619,40	16,14%
2007	786,748	5 263,60	14,95%
2008	983,63	6 046,10	16,27%
2009	1172,45	6 858,90	17,09%
2010	1309,37	7 811,20	16,76%

2011	1548,52	9 346,50	16,57%
2012	1944,58	10 673,20	18,22%
2013	2072,09	11 679,90	17,74%
2014	2126,33	12 570,80	16,91%
2015	2557,3	13 578,40	18,83%
2016	2564,61	14 499,50	17,69%
2017	2630	15 176,50	17,32%
2018	2711,8	15 844,70	17,11%
2019	2843,5	16 509,20	17,22%
2020	2625,2	15 901,80	16,50%
2021	2762,7	17 167,20	16,09%
2022	2943,2	19071,4	15,43%

Source: Prepared by researchers based on statistics of the Ministry of Finance.

Table 1 above provides the following facts. The rate of tax pressure in Algeria during the period studied did not reach the optimum rate estimated at 25%. The tax pressure rate ranges from 14% to 18% as the highest rate, so these rates should be addressed with a certain amount of caution given that this figure does not reveal information about its structure. The reason for this is the volume of tax spending represented in tax exemptions and reductions, especially after the creation of support agencies entrepreneurship that grants tax exemptions and concessions for the benefit of activities and areas to be upgraded, such as the agricultural sector and desert areas (Salhi, 2021). Accordingly, the structured economy subject to tax bears a real tax pressure rate much higher than the average pressure borne by all components of the national economy, in addition to a limited number of taxpayers, and the existence of a tax contribution base that does not reflect the real tax potential of the country. The amount of tax evasion (Touhami M. R., 2022), which still registers at high levels, makes the problem worse.

Table 2. Evolution of EU Tax Pressure for the period 1999-2022

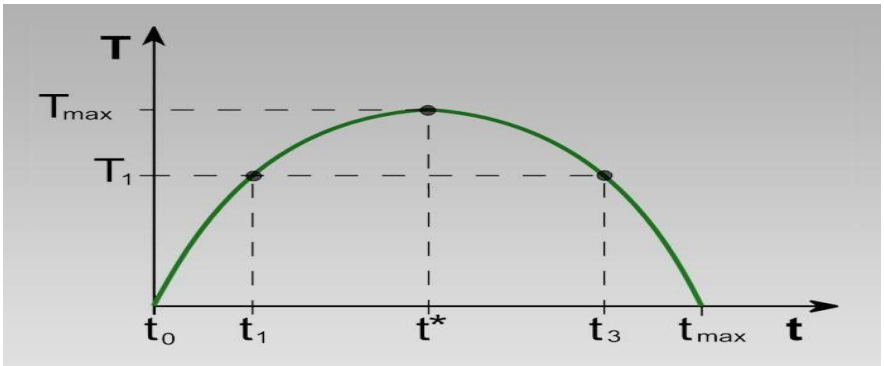
Years	**1999**	**2004**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Tax pressure	41.8%	39.4%	39.1%	39.4%	40.5%	41%	41%	40.9%	41%
Years	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**			
Tax pressure	41%	41.1%	41%	41.1%	41.5%	41.2%			

Source:1- Harak Mesbah, Economics of Public Finance, New University Publication, 2020, p. 209.
2-https://ar.eureporter.co/economy/taxation/2023/11/02/eu-tax-and-social-contribution-revenue-up-in-2022/

The data in Tables 1 and 2 above show that the rates of tax pressure in Algeria are low compared to developed countries with diverse economies (More than 41 per cent in the European Union). Particularly, Algeria recorded rates ranging between 16 and 18%, which may explain the poor performance of the Algerian tax system's revenues. This made the State disregard ordinary taxes and focus its attention on petroleum collection due to its high prices; This is what caused Algeria to enter into a financial crisis after the collapse of oil prices in 2014, which resulted in the adoption of a general austerity policy by the government. As well as seeking ways to replace regular taxation with petroleum taxation, by searching for the optimal rate of tax pressure. According to the researcher " Arthur Laver" who developed a curve in 1979 that "measures the extent to which government revenues are affected by changes in tax burdens so that it can measure the relationship between tax burden and tax revenues (Magne, 2022). His curve points out that the tax rate of 0% does not yield tax revenues, and the imposition of a tax rate of 100% is not expected to yield tax revenues, however, increasing revenues can be generated when the state raises tax rates to the extent where tax revenues reach their maximum levels (Hamouche & Touhami, 2022). Tax revenue will then begin to decline with any new increase in the tax rate. At this point, the rates of tax evasion increase (Talha, 2021)." Figure 1 below shows the Laver curve that explains

the relationship between tax burden and tax revenue:

Figure 1. The relationship between tax burden and tax revenue



Source :https://actufinance.fr/actu/courbe-de-laffer-6966349.html

3. Variables Definitions and Data Sources.

3.1. Variables Definition

The study model is specified in Table3 below. Section 3.3. Discusses the data sources of all variables.

Table 3. Determination of study variables

Variables Symbol	Variables Name
Dependent variable	
RF	Tax collection
Independent variables	
AF	Amount of Tax concessions
PE	The tax pressure rate for normal collection
EF	Tax Control

Source: Prepared by the researchers

3.2. Variables Description.

We express the variable that is dependent on the volume of the tax proceeds of ordinary taxes estimated at one billion Algerian dinars, which represents the total of the actual deductions that were transferred to the state treasury following the imposition of a set of taxes and fees on tax personnel as a contribution to public expenditure. The amount of the contribution of each person charged with the tax is determined by the Algerian tax system, which aims at achieving the greatest possible tax revenues and thus achieving efficiency. The independent variables include all that can affect the volume of tax collection, either directly or indirectly. The most important of these variables can be mentioned in:

Tax privileges and their relation to tax collection: Tax privileges consist of the shortage in tax revenues resulting from the reduction of the tax burden granted to some tax officials to encourage them to invest and push

economic growth in the medium and long term, thereby reducing part of the tax revenues that were supposed to be collected. In this respect, the opposite relationship between the tax proceeds and the volume of tax concessions is evident, as the greater the concessions, the lower the tax revenues in the short term, while the relationship is perverse in the long term (Dakhmoush & Jaghlouf, 2004).

Tax pressure rate and its relation to tax proceeds: Tax pressure expresses the tax deductions rate applied to the tax base. "Generally, the higher the tax pressure is, it is expected to have adverse effects on tax revenues (Nicholas, 1959), which American economist Laver put on the idea of (more tax kills tax). He explained that this phrase is achieved when the state exceeds a certain threshold of taxation, where the tax takes away a large part of the income, which makes the tax-payer evade paying **(**Ben daas**)2019** ، ." Accordingly, the higher the rate of pre-emptive pressure than the optimal rate of 25% according to the economist "Colin Clark" is the negative effect of the revenue (Mourad, 2009).

Tax evasion and its relationship to Tax yields: The taxpayer reduces its tax burden through the practice of tax evasion, which is a negative phenomenon in the national economy; It prevents the collection by the State treasury of the due financial resources; This makes the opposite relationship between tax evasion and the volume of tax collection (Touhami m. r., 2018).

3.3. Data Sources

The variables' data are extracted from the Ministry of Finance, the General Directorate of Taxation, the General Directorate of Tax Control, and the National Bureau of Statistics for the period 1999-2022. Due to the unavailability of data for some variables until 2022, the data utilized in the regression starts from 1999 until 2020.

4. Results and Discussion

4.1. Stability Testing

The unit root selection is intended to examine the time series in question and determine their degree of integration, the time series of each variable sleeps as a prerequisite for analysis to achieve correct and logical results and to avoid what is known as false or permissions Perio User Regressions. We use two tests in this study, including, the Augmrnte dicKey-Fuller (1981), and Peron-Philips (1988) test as the most widely used choice in standard economic studies.

- **Dickey-Fuller Exam ADF:**

Table 4. ADF stability test

UNIT ROOT TEST TABLE (ADF)

	At Level				
		RF	EF	AF	PE
With Constant	t-Statistic	-1.4472	-1.4871	-4.8225	-3.1741
	Prob.	***0.5430***	***0.5235***	***0.0008***	***0.0338***
		n0	n0	***	**
With Constant & Trend	t-Statistic	-0.1564	-3.5151	-4.7855	-2.4892
	Prob.	***0.9904***	***0.0649***	***0.0040***	***0.3300***
		n0	*	***	n0
Without Constant & Trend	t-Statistic	6.1918	-0.2380	0.7798	-2.0935
	Prob.	***1.0000***	***0.5904***	***0.8751***	***0.0372***
		n0	n0	n0	**
	At First Difference				
		d(RF)	d(EF)	d(AF)	d(PE)
With Constant	t-Statistic	-3.6525	-4.4288	-7.9613	-5.2100
	Prob.	***0.0121***	***0.0020***	***0.0000***	***0.0003***
		**	***	***	***
With Constant & Trend	t-Statistic	-3.7649	-4.5221	-9.2172	-5.7426
	Prob.	***0.0370***	***0.0076***	***0.0000***	***0.0005***
		**	***	***	***
Without Constant & Trend	t-Statistic	-3.9432	-4.5282	-7.6079	-4.8818
	Prob.	***0.0174***	***0.0001***	***0.0000***	***0.0000***
		**	***	***	***

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant
*MacKinnon (1996) one-sided p-values.

Source: prepared by the researcher based on the outputs of the program**.**

- **Phelps Peron stability test PP:**

Table 5. Phelps Peron stability test PP

UNIT ROOT TEST TABLE (PP)

	At Level				
		RF	EF	AF	PE
With Constant	t-Statistic	-1.3397	-1.4871	-8.0132	-5.4135
	Prob.	***0.5947***	***0.5235***	***0.0000***	***0.0002***
		n0	n0	***	***
With Constant & Trend	t-Statistic	-0.5429	-1.9694	-6.0547	-2.5186
	Prob.	***0.9739***	***0.5890***	***0.0002***	***0.3171***
		n0	n0	***	n0
Without Constant & Trend	t-Statistic	5.2906	-0.2348	0.2941	-2.2582
	Prob.	***1.0000***	***0.5915***	***0.7630***	***0.0258***
		n0	n0	n0	**
	At First Difference				
		d(RF)	d(EF)	d(AF)	d(PE)
With Constant	t-Statistic	-3.6458	-4.4103	-7.5554	-5.2218
	Prob.	***0.0123***	***0.0021***	***0.0000***	***0.0003***
		**	***	***	***
With Constant & Trend	t-Statistic	-3.7680	-4.5143	-8.9784	-5.9798
	Prob.	***0.0367***	***0.0077***	***0.0000***	***0.0003***
		**	***	***	***
Without Constant & Trend	t-Statistic	-2.0158	-4.5154	-7.2337	-4.8818
	Prob.	***0.0440***	***0.0001***	***0.0000***	***0.0000***
		**	***	***	***

Source: Prepared by the researcher based on the outputs of the program

We note from the table above that all variables (RF, EF, AF, PE, AFF) are unstable in levels, but they are stable at the first difference, which indicates their integration in the first degree I (1) at the both the 10 and the 5 per cent levels of after taking the first difference I (1). We applied Applying the ADF and PP tests to test the stability of the time series, by comparing the tabular t with the t calculated at the 5% and 10% level of significance. The results of the two tests indicated the instability of all variables at both levels, however, they are stable after taking the first difference I (1). In addition, at the level of significance 5% and the 10% levels, no stable variable was found at the second difference I (2), therefore, the co-integration test can be performed using the ARDL- Error Correction Model (ECM) approach.

4.2. Cointegration Test for Study Variables:

Before revealing the presence of cointegration relations using the boundary testing methodology of All and Pesaran 2001, the optimal lag period must be determined.

4.2.1. Select the Optimal Delay Interval:

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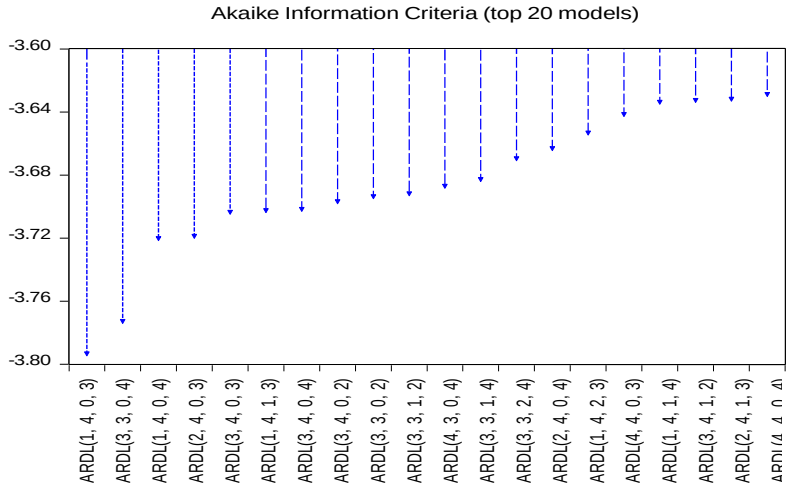
The optimum delay period of the study variables is determined using the AKAIKE standard.

Figure 2. Choosing appropriate slowing periods for the model



Source: Prepared by the researcher based on the outputs of the program

From the above figure and according to the AIC standard, the ARDL model (1,4,0,3) is shown to be the optimal model for this study among the top 20 models. Thus, the study model can be formulated in the following equation:

$$\Delta RF_t = C + \sum_{i=1}^{1} \beta_{1i}\Delta RF_{t-i} + \sum_{i=1}^{4} \beta_{2i}\Delta AF_{t-i} + \sum_{i=1}^{0} \beta_{3i}\Delta PE_{t-i} + \sum_{i=1}^{3} \beta_{4i}\Delta EF_{t-i} + \alpha_1 RF_{t-1} + \alpha_2 AF_{t-1} + \alpha_3 PE_{t-1} + \alpha_4 EF_{t-1} + \varepsilon_t$$

Where:

Δ .First-order differences

$\mathbf{C}$ .Hard limit

T .Time direction

$\boldsymbol{\varepsilon}$ .Random error limit

$\boldsymbol{\beta}$.Short-term relationship coefficients

$\boldsymbol{\alpha}$.Coefficients of the long-term relationship

4.2.2. Bounds-Test for Cointegration:

Based on the above equation, we will run the Pesaran bound Test (2001) to verify the value of the parameters. This test aims to detect the existence of a long-term balanced relationship between the study variables. Thus, to perform this test, the following hypotheses have been formulated:

Null hypothesis: There is no long-term statistically balanced relationship between the study variables.

$$\boldsymbol{\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0}$$

Alternative hypothesis: There is a long-term statistically balanced relationship exists between the study variables.

$$\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$$

Table 6. BOUND TEST

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	18.10184	10%	2.72	3.77
k	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
Actual Sample Size	22		Finite Sample: n=35	
		10%	2.958	4.1
		5%	3.615	4.913
		1%	5.198	6.845
			Finite Sample: n=30	
		10%	3.008	4.15
		5%	3.71	5.018
		1%	5.333	7.063

Source: prepared by the researcher based on the outputs of the program

From the above table, Fisher F's statistical value is 18,10184, which is greater than the high tabular value 7,0363 and the low value of 5,333 at the nominal 1 % level, indicating a long-term balanced relationship between the independent and dependent variables, and therefore an alternative hypothesis that indicates a long-term balanced relationship between the variables is accepted. Therefore, the error correction the **error correction model** (**ECM**) can be applied to the ARDL self-regression model for long-term and short-term relationships.

4.3. Autoregressive distributed (ARDL) time lags estimation

According to the model chosen in this study ARDL (1,4,0,3), table 4 shows the results of the estimation of the model (1,4,0,3), while table 5 below shows the estimated parameters of the model over the long and short term.

Table 7. ARDL (1,4,0,3)

Date: 07/20/22 Time: 00:03
Sample (adjusted): 1999 2020
Included observations: 22 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): AF PE EF
Fixed regressors: C
Number of models evalulated: 500
Selected Model: ARDL(1, 4, 0, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RF(-1)	0.299538	0.115748	2.587845	0.0270
AF	-0.142387	0.053657	-2.653636	0.0242
AF(-1)	0.073481	0.036129	2.033830	0.0694
AF(-2)	0.085668	0.037601	2.278362	0.0459
AF(-3)	0.146195	0.037874	3.860057	0.0032
AF(-4)	0.085029	0.033959	2.503869	0.0312
PE	-0.196776	0.300303	-0.655258	0.5271
EF	-0.123621	0.032563	-3.796379	0.0035
EF(-1)	0.072852	0.031227	2.333015	0.0418
EF(-2)	0.077711	0.024220	3.208547	0.0094
EF(-3)	0.054812	0.027666	1.981225	0.0757
C	1.494616	0.820642	1.821275	0.0986

R-squared	0.809149	Mean dependent var	7.063345
Adjusted R-squared	0.808213	S.D. dependent var	0.738503
S.E. of regression	0.031217	Akaike info criterion	-3.793244
Sum squared resid	0.009745	Schwarz criterion	-3.198130
Log likelihood	53.72569	Hannan-Quinn criter.	-3.653053
F-statistic	1067.515	Durbin-Watson stat	3.051447
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Source: prepared by the researcher based on the outputs of the program.

Table 8. Testing a short- and long-term relationship

ARDL Long Run Form and Bounds Test
Dependent Variable: D(RF)
Selected Model: ARDL(1, 4, 0, 3)
Case 3: Unrestricted Constant and No Trend
Date: 07/20/22 Time: 14:43
Sample: 1995 2020
Included observations: 22

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AF(-1)	-0.532759	0.115788	-4.601174	0.0010
PE**	-0.196776	0.916300	-4.655258	0.0027
EF(-1)	-0.328996	0.065338	-5.035316	0.0005
D(AF)	-0.142387	0.053657	-2.653636	0.0242
D(AF(-1))	-0.316892	0.075455	-4.199759	0.0018
D(AF(-2))	-0.231224	0.059939	-3.857671	0.0032
D(AF(-3))	-0.085029	0.033959	-2.503869	0.0312
D(EF)	-0.123621	0.032563	3.796379	0.0035
D(EF(-1))	-0.132523	0.037654	-3.519503	0.0055
D(EF(-2))	-0.054812	0.160977	-2.981225	0.0057
CointEq(-1)*	-0.700462	0.115748	-6.051615	0.0001

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AF	-0.760583	0.121071	-6.282115	0.0001
PE	-0.280923	2.139237	-7.642560	0.0001
EF	-0.469684	0.021929	-21.41806	0.0000

EC = RF - (-0.7606*AF - 0.2809*PE - 0.4697*EF)

Source: prepared by the researcher based on the outputs of the software

4.4. Testing the quality of the model

The purpose of this phase remains to ensure that the form is free of the following standard issues:

- Contrast instability problem
- The problem of autocorrelation
- Multiple autocorrelation problem
- The problem of non-normal distribution of the residuals

4.4.1. Heteroskedasticity Test

Table 9. ARCH Test Results

Heteroskedasticity Test: ARCH

F-statistic	2.911280	Prob. F(1,19)	0.1043
Obs*R-squared	2.790201	Prob. Chi-Square(1)	0.0948

Source: prepared by the researcher based on the outputs of the software

From the table above, we notice that the value of Prob. Chi-square (0,0948) is completely greater than the 5

percent level of morale and therefore accept the no-correlation hypothesis of the condom.

4.4.2. Breush-Pagan-Godfrey Test

Table 10. BREUSH-PAGAN-GODFREY Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.033257	Prob. F(11,10)	0.4833
Obs*R-squared	11.70319	Prob. Chi-Square(11)	0.3864
Scaled explained SS	1.598170	Prob. Chi-Square(11)	0.9995

source: prepared by the researcher based on the outputs of the program

From the table above, we notice that the value of Prob. Chi-square(0,0948) is completely greater than the 5 % level of significance, thus, the Null hypothesis that claims the non-correlation between the residuals is accepted. As can be observed from the previous two tests, the total value of all tests is greater than 5 %, thus, Thus, we conclude that the model does not suffer from the variance problem, which is a desirable characteristic of the model.

4.4.3. Lagrange Multiplier (LM) test for Errors Autocorrelation

Table 11. BREUSH-GODFREY Test Results

Breusch-Godfrey Serial Correlation LM Test:

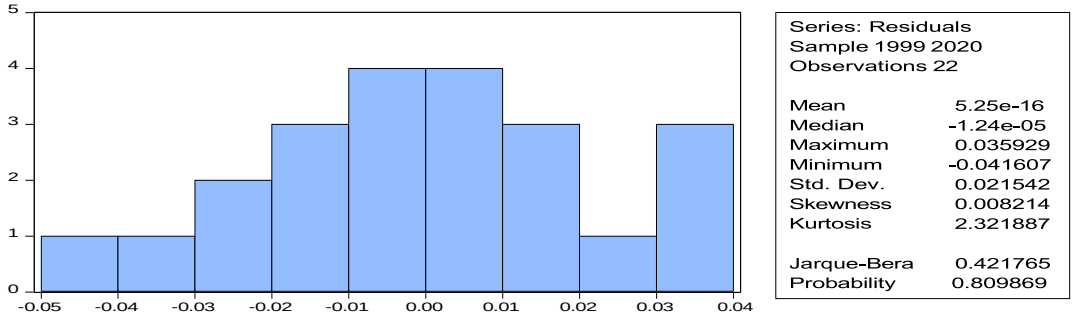
F-statistic	8.195720	Prob. F(1,9)	0.1095
Obs*R-squared	5.685201	Prob. Chi-Square(1)	0.6300

source: prepared by the researcher based on the outputs of the program

From the above table, the probability value of the LM Test is 0.6300, which is greater than 5 % indicating that there is no autocorrelation between model errors at 5 % level of significance.

4.4.4. Test for normal distribution of residuals

Figure 3. JARQUE-BERRA Test Results



source: prepared by the researcher based on the outputs of the program

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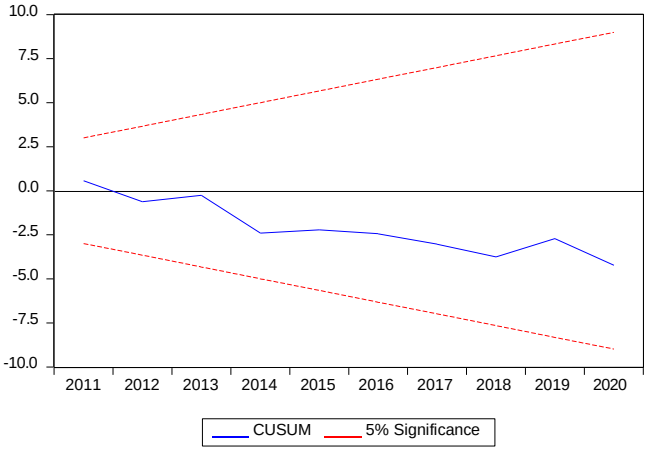
From the above figure, we note that the probability value of the Jarque-Berra Statistics is 0.809869, which is greater than 5 per cent so the residuals follow a normal distribution at the 5 % significance level.

4.4.5. Testing the structural stability of the model:

The purpose of this test is to verify that the data used in the study is free from any structural changes over time, in doing so,, the following tests are used: **Cumulative sum of the swinging shield (CUSUM):**

Figure 3. Cumulative sum test of the swing shield Cusum

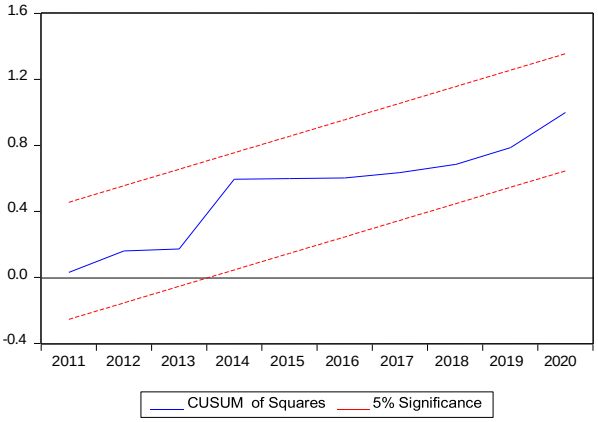


source: prepared by the researcher based on the outputs of the program.

From the above figure, the cumulative total curve of the swinging condom is within the 95 % confidence interval, confirming the stability of the parameters in the long term at the 5 % significance.

- **Cumulative Sum of Squares (CUSUMSQ)**

Figure 4. Cumulative Sum of Squares (CUSUMSQ) Test



source: prepared by the researcher based on the outputs of the program

The above figure shows that the graph of the cumulative sum of the squares of the preponderant residuals lies within the 95 % confidence interval., which confirms long-term stability of transactions at 5 % level of significance.

5. Discussion of Empirical Results

Based on the previous estimation tables, we will analyze the results of the ARDL (1,4,0,3) model for both the short and the long terms, but before doing so, we will test the quality of the model reconciliation.

5.1. Quality of Model Fit

It can be observed from the ARDL (1,4,0,3) estimation table that the coefficient of determination is 0.809149, which is very acceptable. This means that 80 per cent of the changes in RF tax collection are explained by the explanatory variables (AF,PE,EF), whereas, 20% of these changes can be attributed to other economic variables that are not included in the model, indicating that the model has strong explanatory power. Moreover, Fisher's probability value is 0.0000, which means that the model is significant at the 5 % level, thus, it can be claimed that the independent variables can explain changes in the dependent variable.

5.2. Results of the ECM estimate

After establishing a long-term balance relationship through the bound test, we analyze the results of the short- and long-term impact assessment as follows:

5.2.1. Short- and long-term relationship

The short-term estimation results indicate that the value of the adaptation speed, which represents the estimated parameter of the error correction limit that reveals the speed or slowness of the variables returning to the equilibrium state, must be significant and negative to reveal the presence of co-integration between the variables, is -0.70, with a strong statistical significance of 0,0000. This result confirms the long-term validity of the balance relationship. We can also notice from the error correction model that most of the independent variables are significant at the 5 % level, which means that the independent variables explain the dependent variable RF in the short and long term. Particularly, the sign of the tax evasion volume (EF) coefficient, is found to be negative (-0.123621), which indicates an inverse relationship between the volume of tax evasion and tax collection in the short term. However, the long-run sign of the tax evasion parameter EF is negative and significant at the 5% level (-0.469684), which indicates an inverse relationship between tax evasion and tax collection in the long run. This is in line with economic theory, which claims that tax evasion causes both short-term and long-term leaks in tax revenues.

The sign of the coefficient of tax concessions AF, turned to be negative (-0.142387), in the short term, which indicates the existence of an inverse relationship between tax concessions and tax collection in the short term. Similarly, this sign also turned out to be negative in the long run (-0.760583), with a 5% level of significance. This result also suggests an inverse linkage between tax concessions and tax collection in the long term. The negative sign of tax concession in the short term is consistent with economic theory because it represents money lost or lost by the state budget or lost tax revenue, which explains the weakness of the impact of changes in the level of tax concessions on tax revenue. However, the inverse relationship, in the long run, is inconsistent with the economic theory because it explains the abuse of these exemptions and thus results in lower tax revenues in the long-run.
The sign of the tax pressure coefficient (PE), is negative (-0.196776). This indicates an inverse relationship between tax pressure and tax collection in the short term. In the long term, this relationship also turned to be negative (-0.280923) at the 5% significant level. These findings are also consistent with the economic literature which believes an increase in the tax pressure can lead to an impediment to economic growth by reducing tax revenues, especially if the increase exceeds the tax burden of the citizens since a low tax can refresh the economy by raising its rates to achieve an appropriate profitability but exceeding a certain threshold of tax pressure would negatively affect the financial resources of the state and the economy as a whole, and this what motivates tax evasion. This was explained by the American economist Arthur Laffer through the "Laffer" curve, which indicates that excessive taxation kills the tax, that is, exceeding tax pressure to certain rates can contribute to reducing the financial resources of the state by increasing rates of tax evasion.

Concerning the optimal tax rate through which the tax revenue can be increased, it cannot be applicable in Algeria due to the presence of some imbalances, the most important of which is the problem of determining the gross domestic product**.** Despite this, the size of the tax pressure in Algeria was estimated which shows the low tax pressure rates in general**.** However, the relationship between tax pressure and tax collection turned out to be negative due to the erosion of the tax base. According to what the economist Vito Tanzi stated in his work "The Indicators for measuring the Effectiveness of the Fiscal System", the erosion index, refers to the erosion of the tax base. "It is related to whether the actual tax bases are close to the possible tax bases, because the expansion of the tax base makes it possible to increase revenues despite the adoption of relatively low rates, and if the actual tax bases are far from the possible due to the excessive granting of exemptions to activities and sectors, this leads to the erosion of the base. Tax, and this is what prompts raising rates to compensate for the shortfall in revenues, and such a measure would stimulate tax evasion."." Based on the empirical results, It can be concluded that the erosion of the tax base occurs due to the excessive granting of exemptions to activities and sectors, and this is what makes taxpayers who do not benefit from tax concessions bear the responsibility of financing the state treasury and thus the high tax pressure on this category makes them tend to tax evasion, which explains the inverse relationship Between tax pressure and tax collection, despite the low rates of tax pressure in Algeria, which does not reflect the reality.

6. CONCLUSION

This paper examined the impact of tax pressure on ordinary tax revenues, as well as the causal link between tax collection and its most significant driving elements including (tax evasion, tax pressure, and tax concessions) in Algeria over the 1999-2022 period using the ARDL model. The empirical analysis indicates that Algeria is experiencing low tax pressure rates outside the hydrocarbons sector when compared to the optimal rate of 25%, this is due to the excessive granting of tax concessions, and the reliance on oil taxation to cover its public expenditures. Besides, there exists an inverse short and long-term linkage between the volume of tax evasion and Fiscal collection, as well as between the size of the tax concessions and the tax collection due to their misuse by the beneficiaries. The findings further indicate the inverse relationship in the short and long term between the rate of tax pressure and tax collection, despite its low rates outside of fuel, when compared to the optimal rate of 25%. This is due to the excessive granting of tax concessions that caused the erosion of the tax base, and the reliance on oil taxation to cover the state's public expenditures. Based on the empirical findings, this study suggests several policy implications including the reevaluation of the tax concessions awarding policy and its connection to the growth rate, as well as identifying appropriate methods to lessen or limit the phenomenon of tax evasion.

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