

THE INFLUENCE OF VAT VARIATION ON THE DAMAGES RESULTING FROM FRAUD IN THE ROMANIAN ECONOMY

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Abstract: The purpose of this article is to determine the influence of the VAT rates variation, on different fields of activity of national economy, on the damage caused to the state's consolidated budget, from the point of view of the damage caused and damage recovered the damage that is caused by economical-financial offenses. Between 2011 and 2019, the VAT rate registered a continuous decrease from 24% to 19%, which significantly reduces the amount of damage caused and recovered. Our study intends to point out the fact that in Romania, the various VAT rate had a major income on the damage caused as well as the damage recovered, thus leading to a decrease in several fields of activity. On the opposite side, there were fields of activity where a major increase of damage was registered, considering that the VAT rate decreased all along the period of time analyzed, such is the case of recycled materials. In some cases, the VAT decrease determined significant diminution of the damage caused and not of the damage recovered and in other cases, it had an effect only on the damage recovered or had no effect at all.

Keywords: economic-financial crime, fraud, VAT, damage

JEL Codes: H21, H26, K14, K41

1. Introduction

Frauds are singular and included in the metaphor "sown flakes" meaning that they are not similar and each case must be dealt with as a singular case (Singleton & Singleton, 2010). We consider that great consideration must be given as it may

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cause important damage to public and private property. According to Regulations on the organization and operation of the Romanian Court of Account the definition of damage is "the loss caused to the state public or private property, caused to one of its administrative-territorial unit or to one of theirs public entities".

The concept of damage is provided also by art. 9 paragraph 2 and 3 Law no 241/2005 regarding the prevention and countering tax evasion, where the legislator established two aggravations of tax evasion crime, their sanction treatment being justified by surpassing the value level of 100.000 € (as established by paragraph 2) and of 500.000 € (as established by paragraph 3) both amounts represent the damage caused to the state budget. At the same time frauds are defined also by "general deviant behavior or antisocial attitudes". According to this study (Morales, et al., 2014), the collection of budget revenues can be affected by a series of external shocks felt by national authorities with a direct impact on contributors consequently on fiscal efficiency.

Tax fraud is considered the main obstacle in collecting tax revenues. In this new context, theoretical and empirical studies show that the losses of fiscal revenues and by which the state loses financial resources come from two ways, one external through the externalization of revenues, profits mostly due to offshore companies with headquarters in tax heaves, and the other one internal – tax evasion, fiscal fraud in the context of the growth of the underground economy (Tørsløv, et al, 2018).

The chosen topic, the influence of various VAT rates on a certain period of time longer or shorter, on the damage caused and recovered to the state budget as a result of financial crime is in accordance with the new trends as the aim is to assess the evolution and the ratio of damage, the impact and the significance of the various VAT rate on the main fields of activity vulnerable to frauds.

Financial crimes committed in society are difficult to counter. The ways in which they are committed are numerous and include all the fields of activity of the Romanian economy. We classified them starting from the most serious and perilous frauds. Special attention was given to the fields of financial activity they are encountered.

Is easier to identify the domains and the way financial crimes manifest themselves, from a theoretical point of view. In practice, on the other hand, they are intertwined in an intricate manner, for example in the trade domain area: traffic and smuggling associated with tax evasion in the import/export of cigarettes, alcohol, coffee, electronic devices, energy raw materials, and primary products processed out of petrol, metal, etc. Another special category of operations regards the transportation of raw materials and strategic products or of products that have a special procedure for fiscal and customs control, exports established at an international level, intra-community acquisitions/deliveries or acquisitions/deliveries to/from non-EU states,

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the capture of markets and imposing abnormal prices, forestry behind which corruption is dissimulated.

The financial-banking sector regards illegal loans without securities, misappropriations, illicit and inefficient capital investment, laundering money of obscure origin, usage of counterfeited means of payment, illegally taking out of the country currency in cash ready or not coming back of the currency obtained from export deals. In the economical-social field regards drug traffic, gambling, prostitution, illicit trafficking and trade of art goods, illegal migration and illegal use of labor force etc. All these crimes have a destructive role in the economic and sustainable development of states and highly characterize low-income countries. (Hoinaru et al, 2020).

In these circumstances, criminal organizations in Romania extended their operations and area of action, improved their methods meanwhile expanding the territories, causing significant damage to the state budget.

A study analyzing these fields of activity (Kenessey, 1987) emphasizes that "economy comprises of four major activities and sectors" as followed main activities that obtain products directly from raw materials found in nature, such as agriculture, forestry and fishing, secondary activities that transform raw materials in finished products or semi-finished products, such as industry, constructions, mining, third activities is the services sector because it does not produce goods but it provides services such as transport, gas, electricity and healthcare suppliants, wholesales trade, retail trade and the forth activities produces high intellectual quality services, such as research, development, innovation, financing, insurances and real estate, services, public administration.

Taking into consideration the facts mentioned above and that VAT is the major source of the state is revenue and the fact that in the present economic context the VAT represents a milestone in order to have a prosperous European economy, therefore, in the first chapter we wrote about the 17 domains regarding the economy sectors, the main, secondary, the third and the fourth, that are vulnerable to frauds and also to assess the damage caused from financial crimes.

The outline of the paper is presented as follows. In the second section, after going through the literature in the domain and after presenting a short history concerning the various VAT rates applicable in Romania we settle the research hypnotizes. In the third section, we present the work methodology. The fourth section centralizes the results and provides the discussion. The paper ends with the main conclusions, presenting the policy implications, limitations, and avenues for future research.

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2. Literature review

2.1. Risk of Fraud, efficiency in collecting taxes and VAT

Many researchers wrote studies concerning frauds so they focused on the risk of fraud that took into consideration the main parameter of financial fraud because various VAT rates can influence the consumption through price adjustment with direct influence on future taxable base in order to discover financial frauds.

According to his study (Badawi, 2008), financial situations must mirror in an arbitrary way the performance and the financial state of companies. However, this study (Kaminski et al, 2004) has empirical proves concerning a reduced capacity of financial rates to detect and/or to foresee financial fraud.

Studies and reports concerning the amplitude of frauds and establishing methods to assess them (Miri-Lavassani et al., 2009) and (Wang, et al., 2009) write about static approaches to identify financial frauds, and Krambia-Kapardis study (Krambia-Kapardis, 2002) analysis the necessity of using approaches to detect frauds, meanwhile observing that the increase of VAT rates may encourage the growth of VAT fraud phenomena and may also influence the decrease to a minimum of sales that may lead to a reduction of VAT collection. Bierstaker's study (Bierstaker et al., 2006) shows that the auditors' perception of quantitative methods of fraud risk evaluation is oriented also towards the classification of frauds based on analyzing the main components (Brockett et al, 2002) and also based on analyzing and assessing fraud risk (Carpenter, 2007).

The most frequent actors that lead to a high fraud risk are identified by (Cohen et al., 2010), suggesting that the personality traits may be a major fraud risk and so the auditors must assess the ethics of management. An unprofessional behavior from the managers, lack of responsibility from their parts heightens fraud risk and this thing can be regarded as a lack of moral behavior. A study of (Lubua, 2014) considers that compliance with fiscal liability with the small and medium-sized businesses by using transparent online methods has positive effects on the taxpayers. The starting point for an organization in order to commit fraud is the intentional manipulation of fiscal declaration for example incorrect report of revenues or of other commercial operations; any type of misappropriation of tangible and untangle goods (for example illicit expense reimbursement); Corruption (for example bribery, manipulating the procedures of ask and demand, not declaring the conflict of interests, misappropriations), (Institutul-Auditorilor et al, 2008). Corruption and shadow economy are generally highly related. For instance, the study of Borlea et al. (2017) investigate the relationships between corruption and shadow economy among the European Union countries, over the period 2005-2014 and confirms a high and positive relationship between these two

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phenomena, therefore a higher level of corruption involves a higher level of the shadow economy.

The VAT rates structure (in order to avoid possible frauds related problems), should not be neglected, besides the right application of different VAT rates might stimulate the economy. It is broadly known that the EU present VAT system is not „properly equipped for today's society” (European-Commission, 2011). The efficiency in collecting VAT is being affected by the economy and an unstable policy would reduce the efficiency of tax collection and the collection is influenced structural factors that have a direct effect on tax evasion (revenues from VAT collection in reference to aggregate consumption divided by VAT standard rate), shows that one single standard deviation increases the sustainability of the political regime and the fluidity of political attendance, so VAT collection efficiency increase with of 3.1 % and with 3.6 %.

One singular standard deviation increases urbanization, trade opening and agriculture weight. The results from the point of view of quality are applied for the ratio between the revenues from VAT collections and the gross domestic product divided to standard VAT (Aizenman & Jinjark, 2008).

The optimization of revenues collecting to the state budget is related to taxation reforms that increase the autonomy of fiscal administrations regarding the applying of fiscal policies (Miri-Lavassani et al., 2009). Such a reform implies the transition from direct taxation, income tax, which creates tension between fiscal authorities and taxpayers to indirect taxation, for example using VAT (Matthews, 2003).

Besides studies regarding fraud risks, the efficiency in collecting and classifying frauds, other studies have as subject the difference of what VAT was collected and what should have been collected, more precisely the degree of VAT collection and in what way the taxpayers defer the request of this tax, what is the impact of various VAT rates.

The significance of VAT is justified and points out why fiscal authorities appreciate this tax on one hand and on the other hand, it shows the trying of taxpayers to limit, as much as possible, the pressure of this tax.

The passing of VAT offers a series of advantages regarding the collection of VAT, thus allowing fiscal authorities to have control over the reported sales based on the declarations made by taxpayers. A study concerning the intra-community trade showed that there is a systemic correlation between the commercial disparity and VAT rate that is interpreted as proof of tax evasion in the VAT area (Gradeva, 2014).

Another study (Barrell & Weale, 2009) analyzed the effects of VAT various on internal consumptions as well as on production, the result points out the effect on economic activities, as it is presented by the gross internal product. Consequently, VAT decrease influence the growth of consumption thus there will be an increase

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in personal incomes. So when the consumption does not increase as a direct result of VAT various than the personal finances will increase.

The measurement of fraud concerning VAT can be made by using the disparity of VAT that is the difference of VAT collected and the theoretical sum estimated to be an exigible VAT. The VAT fraud caused by the carousel type fraud led to this thing that is an important loss of revenues form VAT collection in the EU (Gebauer et al., 2007).

A study confirms that the efficiency of the VAT system decreases as the VAT rate increases. The decrease of efficiency is based on a mixture of the reduction of VAT base and tax evasion by avoiding the paying of VAT (Hayes et al., 2005).

The indicator of VAT deficit is used to assess the efficiency of applying, according to a VAT GAP survey made in the EU-28 Member States; the VAT deficit offers an estimation of revenues loss registered by fiscal authorities, thanks to implementing tax reductions and tax exemptions for some goods and services. According to this survey, this deficit comprises of rate deficit and tax exemption deficit that point loss of reputed revenues (Research-Center for Social et al., 2018). Moreover, according to a study published by Commission-European (2019) "European states lost revenues from VAT collection in the amount of 137 milliards euro in 2017. The so-called deficit of VAT - or the general difference between reputed revenues from VAT and the actual amount collected narrowed has somehow reduced in comparison to previous years, but still, it remains very high.

This substantial difference in VAT underlines once again the necessity of reform of EU legal provisions regarding VAT, as to how it was advanced by the Commission in 2017 and the necessity of enhanced cooperation between the members of the state in order to cut out VAT fraud and to make in such a way that legal provisions work for legit businesses and traders.

The deficit of VAT collected is a measure for the efficiency of VAT application and find the legal provisions way are abided in every state member because it offers an estimation of revenues loss caused by fraud and tax evasion, by bankruptcy, by insolvency as well as by wrong calculations".

According to a study (Soukopova et al., 2014) regarding the stimulation of fiscal revenues by applying a standard VAT rate or reduced VAT rate it was estimated that a higher rate tax means a higher economic efficiency but at the same time, it might determine even greater deficit thus obtaining the opposite. Most definitely it would not recommend a way for increasing VAT rates in order to stimulate fiscal revenues. There are major risks that the outcome to be the opposite of what was intentioned. For most of the EU states, the VAT rate should be an instrument of assistance and the accent should be placed on the tax base.

Likewise study of (Raczkowski, 2015), states that economic growth does not necessarily suggest an increase of budget revenues the reasons that stay at the base

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of this situation era due to general fiscal disparity, that appears when the state does not oppose to illegal fiscal activities deployed by entities that commit crimes without being punished or identified. As a starting point for identifying budgetary loss, it was taken into consideration the fiscal disparity because it indicates that this is the level of tax evasion committed by the taxpayer, and that leads to a significant decrease of the tax base and to a decrease of sums that should be paid to the state budget. Therefore it can be said the main element in the fiscal deficit is tax evasion along with fiscal debt.

The results mentioned above should be correlated with Laffer curb that states that an increase of fiscal pressure, fiscal revenues register an increase up to a maximum point (M) after which fiscal revenues start to decrease to a null value (Laffer, 2004). Similar results are obtained by Achim and Borlea (2019) that show that "in case of a decrease of fiscal pressure the level of the underground economy will rise". This result is surprising because it is not according to our expectations. Naturally, the outcome of an increase in fiscal pressure should have been a rise in the underground economy. Nevertheless, the same results are shown in studies such as (Kawano & Slemrod, 2016), (Achim et al., 2018). The results of these studies do not point out a negative influence of fiscal pressure on the underground economy, either they show no connection or they point out a positive one.

2.2. The History of VAT rates in Romania

Along the years in Romania is was applied single tax – before 1989 cumulated tax – between 1989-1993 tax on the movement of goods and VAT – after 1993, there were numerous VAT rate changes.

From the introduction of VAT in Romania (the 1st of July 1993) up to present, (see table no. 1), were registered the following VAT rates: 0%; 5%; 9%; 11%; 18%; 19%; 20%; 22% and 24%. The VAT rate of 24%, was applied in Romania in the period the 1st of July 2010 – the 31st of December 2015, and was one of the highest standard VAT rates in EU, after Hungary VAT rate of 27%, Denmark and Sweden VAT rate of 25%, taking into consideration that medium standard VAT rates in EU states vary from 18% to 21%.

Just like in all the countries that apply VAT, in Romania VAT rates were and will be modified from one period of time to another. These modifications are due to the fiscal policies of each country and for the EU states also by the European fiscal policies that want to harmonize this tax (standard rates, reduce rates, tax exemptions, facilities, taxable matter etc.).

In table no 1 there is the history of standard/reduction rates for VAT that applicable in Romania.

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Table 1 The history of standard/reduction rates for the VAT applicable in Romania

Period	Legislation	Variation	Standard/reduce rates
01.07.1993	31.12.1994 O.G. 3/1992 art. 5, 17	→	18 % 0%,
01.01.1995	31.01.1998 O.G. 3/1992. Pct. 6 din O.G. nr. 33/1994	→	18%, 9%, 0%
01.02.1998	31.12.1999 O.G. 3/1992.	↑	22%; 11%.
01.01.2000	14.03.2000 O.G. 3/1992. Pct. 2 din O.U.G. nr. 215/1999:	↓	19%, 0%
15.03.2000	31.05.2000 O.U.G. 17/2000	→	(1) VAT-exempt operations.
01.06.2000	31.12.2003 L. 345/2002	→	(1) „ <i>exempt operations with the right of deduction</i> ”, for which the name “ <i>zero quota was previously used</i> ” (2) „ <i>operations without the right of deduction</i> ”.
01.01.2003	30.06.2010 L.571/2003	→	9% -cultural events; textbooks, books, newspapers and magazines, except for advertising purposes, prostheses of any kind and their accessories, except dentures; orthopedic goods; medicines for human and veterinary use; hotel services
15.12.2008-	30.06.2010 L. 571/2003	→	5% applies to the tax base for the delivery of housing as part of social policy, including the land on which they are built.
01.07.2010-	31.12.2015 L571/2003; O.U.G. 58/2010	↑	24%, 9%, 5%, 0 %
01.01.2016-	31.12.2016 L 227/2015	↓	20%, 9%, 5%, 0%
Started to	01.01.2017 L 227/2015	↓	19%, 9%, 5%, 0% 9%, - food, non-alcoholic beverages, medicines, prostheses, drinking water, irrigation, fertilizers, pesticides, seeds, agricultural food and water services 5%, hotel services, catering, cultural events, textbooks and non-advertising publications, sports facilities, homes under 120m.p / 450,000 lei. eco or traditional products.,

Source: Legislation – VAT Regulations, according to the law

Pin some periods there was the null rate for VAT, that is another may for exemption operations from VAT, but in some legal provisions the following expression was used „operations with null VAT”.

Based on the previous aforementioned the following research hypothesis is stated:
Research hypothesis: *Did the VAT changes, from 2011-2019, significantly influence the damage caused and recovered in the sense of a decrease? If so, what are the significant areas where the value of the damage has decreased?*

3. Research methodology and sample

The 17 fields of activity, selected for analysis, are relatively small, compacted, depending on the type of economic and financial fraud, illegal activities and operations carried out by criminal organizations, chosen based on statistical data provided by the County Directorate of Operational Records and Criminal Records Bucharest Judiciary. Also, the same typology was approached from the point of view of the value of damages determined both in the caused version and in the recovered version, under the law, at the end of the criminal investigation as a phase of the criminal process, performed by the criminal investigation body.

We mention the fact that this paper includes, the damages reported, by fields, by the County Police Inspectorates and Bucharest, Economic Crime Investigation Services, excluding the damages found and recovered related to other police structures or institutions with control attributions in the economic-financial field.

Another important tool used to conduct this study, considered as an independent variable, is the VAT rate for the period 2011-2019. In order to know the impact of VAT variation on damages, the first step was the descriptive evaluation of the variables, both numerically and graphically. Thus, the main descriptive statistics were calculated - average, standard deviation, minimum and maximum (Table 2 and Table 3).

Table 2 Variables used

Variables	Description	Mean	Standard deviation	Min.	Max.
Damage Caused	Value of damage caused	72035,8	82430,5	495,1	372703
Damage recovered	Value of damage recovered	20807,3	34227,8	135,3	264129,8
VAT_TOTAL	Variable dummy that gives the VAT modifications that were during the period of time analyzed.	-	-	-	-

Source: author's calculations in STATA 13

Being panel data, the graphs are clustered timelines on the analyzed domains. Due to the high variation observed for both types of damage, both as a whole and by domains, the transformation of these variables by logarithm was resorted to. Logarithm reduces the variation without affecting the properties of the variables and, moreover, allows interpretations in relative terms - of elasticity/growth rates.

Table 3 Damage – Descriptive Statistics for the Domains Analysed

Domain	DAMAGE CAUSED				DAMAGE RECOVERED				
	Value	Standard Deviation	Min	Max	Value	Standard Deviation	Min	Max	Weight
Public Admin	49488,4	31480,7	16064,2	97975,2	12166,9	6122,3	2610,5	22765,3	24.58%
Agriculture and land fund	102897	71925,43	41195,23	264183,7	20763,06	12600,81	4916,63	42055,07	20.17%
Alcohol	15510,44	11874,2	2400,15	32462,25	4166,28	2291,112	1809,88	8400,9	26.86%
Constructions	201740,2	64438,97	119960,5	285914	59179,82	29986,88	19699,72	119254,6	29.34%
Financial Crimes	218631,9	57667,13	110610,1	285187,8	69574,92	37019,8	17711,21	138195,3	31.82%
Customs fraud	89296,58	96945,22	8285,46	267500	7959,822	6655,002	1397,78	22079,69	8.91%
Food industry	168188,3	121640,3	41141,45	372703	62584,19	78532,48	19840,99	264129,8	37.21%
Gambling	8117,35	2922,917	3181,59	11414,45	1250,122	8782,085	398,69	2608,5	15.40%
Recycled materials	87414,35	48403,52	12387,21	163951,6	11788,42	7476,523	1278,1	23944,74	13.48%
Energy and excisable products	51705,06	20685,18	31432,84	95795,68	13938,99	8975,386	1513,25	27578,21	26.95%
Labour force protection	45175,6	35348,02	5648,81	100866	16270,64	17293,72	1343,83	47656,32	36.01%
Healthcare protection	8502,452	9860,74	495,1	32033,96	1,969,483	3563,534	145	11376,49	23.16%
Healthcare and public acquisitions	17372,36	18853,03	1055,11	59579,15	9475,338	12100,09	135,27	36152,51	54.54%
Forestry	17040,46	7951,161	7296,15	34241,35	7114,597	9475,118	2489,63	32154,66	41.75%
Transport and Road Infrastructure	64777,76	25269,46	19802,22	101659,1	13537,85	5705,161	6459,55	22375,39	20.89%
Tourism	37648,13	46819,37	4342,11	144829,7	13733,92	16986,43	1800,43	50580,55	36.47%
Tobacco	41102,66	68996,39	7241,11	224184,2	28248,9	64519,13	2570,82	200069,9	68.72%

Source: author's calculations in STATA 13

The next step was to evaluate the chronological properties of the dependent variables, more precisely stationary and autocorrelation (serial correlation). The stationarity was assessed using unit root tests developed for panel data. In this case, the Levin-Lin-Chu test was chosen. The results reveal that both Damage-Cause and Damage -Recovered are stationary on the level.

The second chronological property – the correlogram highlighted the presence of autocorrelation in variables. Moreover, the residual evaluation of static regression models revealed the persistence of the serial correlation in residues, confirming the previous results. For this, we used his test (Wooldridge, 2002) specified for panel data and implemented in STATA see, for example (Drukker, 2003). This test starts, as the classical tests, from the null hypothesis, that there is no rank 1 autocorrelation in the data panel. Again, values of the probability of accepting the null hypothesis, p-value, were obtained, well below the standard critical threshold of 5%.

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The regression models were specified as a dynamic panel, to take into account the chronological interdependencies existing in the data. An advantage of dynamic models is that they allow the evaluation of the relationship both long-term and short-term. Moreover, one can test their statistical significance to see if, indeed, in the long run, there is a relationship of dependence between factors and dependence. This procedure is based on testing nonlinear coefficients by the Wald method, which uses a Hi-square distribution see, for example, (Dragoş et al., 2019).

In order to analyze the relationship between injury and VAT changes over time, on each field was used sorting by fields and analysis using chronological analysis methods - regression by time series, similar to the panel data, so we used the calculation and evaluation the short-term and long-term relationship between the VAT changes and the amount of damage caused and recovered.

Table 4 The dynamic Regression – Damage-Caused

Number of instruments = 10 Wald chi2(2) = 38,19 Prob > chi2 = 0,000				Number of observations = 136 Number of groups = 17		
Damage-Caused	Coef.	Robust Std. Err.	Z	P>z	[95% CI]	
L. Damage-Caused	0,532	0,096	5,54	0,000	0,344	0,72
VAT_TOTAL	-0,264	0,117	-2,25	0,024	-0,493	-0,034
Const.	4,892	0,979	5,00	0,000	2,973	6,811
Arellano-Bond test for AR(1) in first differences: z = -3,19 Pr > z = 0,001						
Arellano-Bond test for AR(2) in first differences: z = 0,36 Pr > z = 0,719						
Sargan test of overid. restrictions: chi2(7) = 11,38 Prob > chi2 = 0,123 (Not robust, but not weakened by many instruments.)						
Hansen test of overid. restrictions: chi2(7) = 8,76 Prob > chi2 = 0,271 (Robust, but weakened by many instruments.)						
Hansen test excluding group: chi2(6) = 8,70 Prob > chi2 = 0,191						
Difference (null H = exogenous): chi2(1) = 0,06 Prob > chi2 = 0,810 iv(TVA_TOTAL)						
Hansen test excluding group: chi2(6) = 8,61 Prob > chi2 = 0,197						
Difference (null H = exogenous): chi2(1) = 0,15 Prob > chi2 = 0,702						

Source: author's calculations in STATA 13

In the case of the damage caused, it is observed that, in the short term, the VAT changes have a significant influence on its value (p-value = 0.024 < 0.05 - table 3). Thus, a change in VAT leads to an average decrease of 26.4% of the damage caused. But the VAT changes registered in the analyzed period represent only

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decreases. By default, we can conclude that the decrease in VAT leads to a decrease in the value of the damage caused (Table 4). The same type of relationship was obtained, in the short term, in the case of recovered damage, but the impact of the VAT decrease is higher - 32.4% (Table 5).

Table 5 The dynamic Regression – Damage-Recovered

Number of de instruments = 10 Wald chi2(2) = 15,76 Prob > chi2 = 0,000				Number of observations = 136 Number of groups = 17		
Damage-Recovered	Coef.	Robust Std. Err.	Z	P>z	[95% CI]	
L. Damage_ Recovered	0,446	0,151	2,96	0,003	0,151	0,741
VAT_TOTAL	-0,324	0,136	-2,37	0,018	-0,591	-0,056
Const.	5,094	1,393	3,66	0,000	2,364	7,824
Arellano-Bond test for AR(1) in first differences: z = -2,83 Pr > z = 0,005						
Arellano-Bond test for AR(2) in first differences: z = 1,06 Pr > z = 0,287						
Sargan test of overid. restrictions: chi2(7) = 15,15 Prob > chi2 = 0.034 (Not robust, but not weakened by many instruments.)						
Hansen test of overid. restrictions: chi2(7) = 10,1 Prob > chi2 = 0,183 (Robust, but weakened by many instruments.)						
Hansen test excluding group: chi2(6) = 9,66 Prob > chi2 = 0,140						
Difference (null H = exogenous): chi2(1) = 0,43 Prob > chi2 = 0,510 iv(TVA_TOTAL)						
Hansen test excluding group: chi2(6) = 9,88 Prob > chi2 = 0,130						
Difference (null H = exogenous): chi2(1) = 0,21 Prob > chi2 = 0,645						

Source: author's calculations in STATA 13.

Following the analysis, we used to calculate and evaluate the long-term relationship between the VAT changes and the value of the injury. The results are shown in Table 6. Thus, it can be seen that both coefficients are statistically significant and have the same sign as the short-term coefficients. Thus, we can conclude that a decrease in VAT will have, in the long run, a decreasing effect, both of the damage caused and of the one recovered.

Table 6 Long-term coefficients for the Damage - VAT relationship

Dependency	Coefficient	Wald Hi-square	p-value
Damage-Caused	-0,564	4,48	0,034
Damage-Recovered	-0,584	4,32	0,038

Source: author's calculations in STATA 13

4. Results and discussions

Following this study, several conclusions can be drawn. First of all, the results of the comparisons made, in terms of the share of damages and the evolution of damages, for the different areas of activity studied were systematized.

We appreciate that we can focus on identifying areas of activity that generate damage to the state budget, influenced by VAT changes in the sense of decreasing them, identifying fraud mechanisms, reflected in the financial-accounting records of taxpayers, institutions. Thus, the highest percentage of the share of damage found vis-à-vis recovered, was identified in the sphere of activities carried out with tobacco 68.72%, followed by public health procurement 54.54% and in forestry with a percentage of 41, 75%. According to the study developed by Novel Research (Transylvania Business Magazine, 2019) "in November 2018, the level of illicit trade in cigarettes in Romania represented 15.4% of the total cigarette market". Also, according to the analyzed data, the fact that the share of recovering these damages in the field of tobacco, forestry and public health procurement is the most significant.

In terms of forestry, the wood is no longer stolen from the forest with the cart or cart pulled by oxen, the theft is done with the hectare, through fraudulent work, generally have behind them crimes of corruption, tax evasion and money laundering, to close eyes on flagrant illegalities in the field of forestry in Romania. The phenomenon of corruption is mentioned in the National Strategy for National Defence for the period 2015-2019 as it "makes the state vulnerable, generates economic damage and affects the country's development potential, good governance, the decision for the benefit of citizens and communities, and trust in justice and in state institutions" (Presidential Administration, 2015).

Compared to the evolution of the damage caused to the recovered in the field of tobacco, agriculture and health - public procurement, for the entire period 2011-2019, it can be seen that there are no large discrepancies between the recovered and caused damage, which we conclude that in these areas the assets relevant for the judicial body to take precautionary measures as early as possible in the criminal investigation phase have been identified, which is a guarantee that they will not be alienated or destroyed, that the injured state or institutions will be able to recover their damages in case of final sentencing decisions and that convicted persons will be deprived of illegally acquired property.

At the opposite pole are customs frauds with only a percentage of 8.91%, recyclable materials 13.48% and the field of gambling in the proportion of 15.4%.

As the evolution of the damage in the field of gambling, it can be seen that there is a discrepancy between the damage found as a result of fraudulent operations carried out in practice and the damage recovered. Frequent operations leading to

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the fraud of tax obligations are manifested by mechanical or electronic modification of the index/meter of electronic gambling devices, or by non-withholding and payment of tax on prizes won by various individuals, all of which aim to reduce the amounts declared and of the revenues realized and registered in the accounting records of the companies. The existing discrepancy is due to the fact that no movable or immovable assets belonging to entities or persons of law or de facto, carrying out such operations, such as the establishment of the insurance seizure or the measure of seizure of money from their bank accounts, do not cover the damage caused. Similar behavior can be noticed in the evolution of damages in the field of recyclable materials and customs fraud, there are many situations in which those who commit criminal acts do not own goods in their name or have not been identified goods that may be subject to special or extended confiscation or which may serve to guarantee recovery of the damage caused by the offense.

Between the values of 20-30% are found the activities in the field of agriculture - 20.1%, transports - 20.98%, environmental protection - 23.16%, public administration and budgetary institutions, education, sports culture with a percentage of 24.58%, alcohol - 26.86%, energy and excisable products - 26.95% and construction - 29.34%.

Also, between the values of 30%-40%, are included the activities carried out in the field of "financial crime" respectively credit institutions, financial leasing, insurance and reinsurance - 31.82%, labor-force protection - 36.01%, tourism - 36.47% and food industry - 37.21%

In conclusion, the working hypothesis is supported, which is proven, the relationship between VAT changes and injury significantly influenced the damage, both caused and recovered, and led to a decrease in the following areas: Tourism, Public administration, Customs fraud, Labour-force protection, Health - public procurement. In the field of tourism, by introducing the VAT rate from 2015 - from the value of 24% to 9%, currently, 5% was aimed at reducing tax evasion consisting in under-declaring revenues by operators. Services have become more accessible to the entire population, have led to increased productivity and thus, increased economic efficiency and improved cash flow. Following this analysis, we conclude that the influence of the variation of VAT rates in this area has influenced the decrease in the number of damages caused and recovered, the measure to reduce the VAT rate has generated significant positive effects on the business environment, by reducing tax evasion, including damages in this area which leads to a stimulation of tourism in Romania and an increase in domestic consumption. More and more people can afford access to hotel or restaurant services, which are no longer considered luxury services. It should be noted that VAT-exempt operations must also be taken into account for certain activities of general interest such as health, hospitalization and medical care, educational activities, meditations,

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healthcare, radio television, postal services. We thus appreciate that the positive effects of the exemption of operations, especially in the field of health, of education, influenced the decrease of the value of the damage both to the one caused and to the one recovered in the field of health, of the public administrations. The abolition of customs barriers between the Member States has led to the abolition of customs control, and new terminology has been created, as part of intra-Community trade, intra-Community acquisition and delivery, which replaces the name of import and export. Among the operations that create damage in this field, we mention the road, naval and air imports of goods at undervalued prices, MTIC type fraud, which today has become a concept, the presentation to the Romanian customs authority of false certificates of origin, using the cap method, in the purpose of benefiting from a preferential customs tariff (exemption or reduction of customs duties, avoidance of anti-dumping duty).

This analysis also determined a decrease in the damage caused and recovered in the field of labor. Despite the substantial repressive efforts of the tax authorities, undeclared work still remains deeply rooted in our economy. Although quasi-formal employment has become an integral part of European labor markets, employers undertake various strategies to ensure collaboration with workers and in a timely manner by ingenious methods find systems through which they extract money for the part unreported from salary. This practice exists independently of undeclared work and in certain circumstances; it may even be based on cash flows that are fully visible. As is well known many quasi-officials are actually satisfied with their jobs because of the misconception that they earn more money this way.

Another relevant influence is the fact that the VAT decreases led to significant increases in damages, both in the caused and in the recovered version, in the case of Recyclable materials. This field of recyclable materials is a problematic area for both the Member States of the European Union and Romania, in terms of hazardous waste, but other types of waste are not to be neglected. Although, in the analyzed period 2011-2019, the VAT changes decreased, the damage found and recovered as a result of the illegal economic operations carried out, increased. In this field, reverse charge is used for certain operations, currently, if the supplier and the beneficiary are persons registered for VAT purposes, then the seller of the waste will invoice without VAT, and the beneficiary will perform reverse charge. This rule applies according to the tax code for certain specified wastes. In the case of the other categories of waste as well as in the sales to natural persons, the normal taxation regime will be applied. In addition to the reverse charge, we appreciate the fact that, in this field, commercial operations were carried out, which aim to obtain bonuses from the profile institutions for increasing productivity or the associated reduction of production costs. In order to evade the payment of tax obligations and obtain these bonuses, taxpayers record in the accounting

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documents operations that may be real, regarding the purchase of material needed to be recycled, implicitly increase their productivity. Large disposal facilities are encouraged to reduce the generation of hazardous waste by providing low disposal costs, while those that apply inexpensive disposal methods do not benefit from this incentive. Consequently, there is a tendency to record in the accounting of these companies, fictitious operations in order to conceal the real expense, in order to obtain bonuses and evade the payment of tax obligations.

At the same time, the influence of VAT determined significant decreases of the caused damage, but not of the recovered one, for Agriculture and land fund, Alcohol, Food industry, Energy and excisable products. In the last 10 years, APIA has managed the applications submitted by over 1 million beneficiaries, for which it has directed funds of over 15 billion euros (Agricultural Payments and Interventions Agency, 2019). The influence of the variation of the VAT quotas applied in the field of the food industry of the food trade was felt; it is not a novelty that more and more traders in this sector started to issue tax receipts for the products sold. Companies in this field began to "whiten" their businesses, trying to get rid of the "undercover" trade. The measure also led to positive effects due to the fact that more serious controls were undertaken at these companies, followed in many cases by the temporary suspension of activity and in the case of agriculture the granting of subsidies.

At the same time, there is a decrease in the damage found as a result of illegal activities in the field of production, bottling and illegal sale of alcohol, alcoholic beverages and wines, by producing and holding excisable products outside the authorized tax warehouse and marketing in the territory. Romania of excisable products subject to marking, without being marked, improperly marked, or with false markings above the limit provided by the legislation in force. Regarding energy products, a well-known mode of operation is that fuel oil purchased for use for heating changes its destination and arrives as fuel in retail stations. Energy products whose provenance cannot be proven and for which taxes due to the state budget have not been paid may still exist in retail outlets or are mentioned in the accounting documents as lower products in terms of excise duty (inaccessible or with reduced excise duty). However, the recovery of damages in these areas did not have the same trend, the efficiency of the competent control bodies, they are present once the products enter the market, in order to discover the illegality of transactions and determine the real content of the goods compared to that of the procurement documents, necessary for the retailer or the final consumer. Also, the energy products are checked on the trading chain, in order to be able to detect companies that have certificates without storage.

Moreover, it is also the VAT changes, applied in the field of constructions, of the reduced rate of 5% when selling homes under 120 m.p. / or below the value of

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450,000 lei, aimed at stimulating this sector of activity, the construction market being aimed at building and selling homes. As can be seen, these changes did not impact the rate of increase of the damage caused but led to increases in the damage recovered. The same trend was observed in financial crime compared to the financial crimes of banking, credit institutions, financial leasing, and insurance. It should also be taken into account, the tax exemption of operations involving the provision of financial services, the negotiation of credit guarantees, transactions in deposit accounts, payments, transfers, receivables, etc., the administration of special investment funds.

In these cases, the efficiency of the control bodies and the measures applied in order to recover the damages by the state control bodies involved in the fight against the economic-financial crime can be appreciated. At the same time, they must respect the fundamental democratic doctrines regarding the right to a fair trial, as well as other civil rights, and recover damages by applying precautionary measures.

An increase in the damage caused to Transport, road infrastructure can also be concluded, but no effect on the one recovered, as a result of the VAT changes.

Transport is an important sector of the economy, it ensures the mobility of citizens by ensuring the free movement of people and goods around the world, criminal groups specialized in this field directly or through intermediaries control several companies with activities in the field of transport, especially intra-Community trade in motor vehicles -hand. Through these companies, used cars are purchased from partners in the European Union, mainly from Belgium, the Netherlands, Germany, Italy, France and Spain, and resold on the domestic market in Romania, without recording the income in the accounting records; without declaring the operations carried out, thus evading the payment of tax obligations due to the consolidated state budget. The analysis considers that the changes in the value of the VAT rate had as an impact an increase in the damage caused and no effect on the recovered. In this transactional chain, second-hand car dealers carry out their activity through companies on which debts are accumulated to the state, legally represented by persons with a precarious financial situation. It was also found that there is no link between VAT and any of the types of damage to Gambling, Environmental Protection, Forestry and Tobacco.

5. Conclusions

The main contribution of this analysis is to find the influence of the variation of VAT on the damages caused to the national budget, in the long or short term, as a result of committing some crimes of an economic nature.

Second, our model provides information and clarifies how the damages in different areas of activity have changed. The conclusions are important for policymakers so

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that they can include measures to prevent and combat crime. At the same time, it brings to light the areas of activity, where there have been significant increases in damages, given that the VAT rate has decreased. It can predict in which direction, additional clarifications should be adjusted in the accounting system. Our research has also some limitations. One of these is the small size of the sample, due to the lack of certain data on the damages caused and recovered. In this case, only the value of the damages registered at the end of the criminal investigation as a phase of the criminal process carried out by the criminal investigation body was taken into study.

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