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ITERATED TIKHONOV FOR ILL POSED PROBLEMS WITH SVD AND PARAMETER EVALUATION

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ABSTRACT:

In this paper we will show some numerical examples for Iterated Tikhonov with Singular value decomposition to solve linear systems of equations $Ax = b$. The general idea is to use Tikhonov method and to iterate in order to improve the approximate solution. The matrix A is severely ill conditioned and b is (might be) contaminated by errors. We would like to be able to find a good approximation of the regularization parameter without any previous knowledge of any other parameter. The discrepancy principle is what we use for the parameter evaluation.The implementation is done in Matlab.

KEYWORDS:

Iterated- Tikhonov, SVD (Singular Value Decomposition), subspace, Discrepancy principle, matlab, ill-posed problems.

INTRODUCTION

In this paper we consider the minimization problem that arise in applications in physics and engineering

$$\min_{x\in R^n} \| \mathrm{Ax}-\mathrm{b} \| \qquad (1)$$

where $A \in R^{mxn}, b \in R^n, x \in R^m,$ where the vector b represents the measured data contaminated by some unknown errors e in R^n of bounded norm $\delta > 0.$ The matrix A might be of ill-determined rank where the singular values gradually decay to zero with no significant gap. Problems which include matrices with above properties are called discrete ill-posed problems. Those kind of problems arise for example from discretization of Fredholm Integral operator of first kind. Let b_{true} denote the error free, unknown vector such that

$$b = b_{true} + e \qquad (2)$$

We will refer to the error e in b as "noise". It is assumed not to be known. We assume that b_{true} is in the range of A and that an estimate of the error norm $\delta = \| \mathrm{e} \|$ is available. Through this paper we will refer to $\| \cdot \|$ as the Euclidean vector norm or the associated induced matrix norm. Due to errors on the measured data and the clustering of the singular values of A at the origin the solution $x^{\dagger} = A^{\dagger} b$ where $A^{\dagger}$ is the Moore-Penrose pseudoinverse, is not meaningful. One approach that can be used to solve problem (1) is Tikhonov regularization, one of the most popular and simplest methods. The main idea is to consider the penalized least squares problem:

$$\min_{x\in R^n} \left\{ \| \mathrm{Ax}-\mathrm{b} \|^2 + \mu \| \mathrm{x} \|^2 \right\} \qquad (3)$$

The parameter $\mu > 0$ is the regularization parameter that determines the sensitivity of the solution of equation (3) to the error e in b and how close is the solution to the desired vector $x^{\dagger}$.

It is often possible to improve the quality of the approximation determined by Tikhonov regularization by replacing the Tikhonov minimization problem (3) by the following problem:

$$\min_{x\in R^n} \left\{ \| \mathrm{Ax}-\mathrm{b} \|^2 + \mu \| \mathrm{Lx} \|^2 \right\} \qquad (4)$$

The matrix $L \in R^{sxn}$ is a regularization operator. Common choices of L include the identity martix or approximations of differential operators, usually chosen to be the discretization of a differential operator such that

$$\mathrm{N}(A) \cap \mathrm{N}(L) = 0 \qquad (5)$$

where $\mathrm{N}(L)$ and $R(L)$ denote the nullspace and the range of $L,$ respectively. Then we assure that (5) has a unique solution x_{μ} for any parameter $\mu > 0.$ The minimization problem (5) is referred to as Tikhonov regularization in general form, which in its simplest form replaces the least squares problem (1) by the penalized minimization problem (3). We will discuss a combination of Singular Value Decomposition of the matrix A and the discrepancy principle to stop the iterations. Let $\mathrm{A} = U \Sigma Y^T$ and $L = V \Lambda Y^T$ be the Singular Value Decomposition of the pair of matrices $(\mathrm{A}, L),$ where the matrices U and V are with orthonormal columns, the matrix Y is nonsingular and the matrices $\sum$ and Λ are diagonal matrices with elements $\sigma_i,$ $i = 1, 2, \ldots m.$ Let consider first the minimization problem $(3),$ which we express as

$$\min_{h\in R^n} \left\{ \| \mathrm{Ah}-r_0 \|^2 + \mu \| h \|^2 \right\} \qquad (6)$$

where $r_0 = b - Ax_0,$ $h = x - x_0.$ Thus, h provides an approximation of the error $x^{\dagger} - x_0.$ An improved approximation of $x^{\dagger}$ is given by $x_1 = x_0 + h.$

The iterated Tikhonov method is defined by repeated application of the above process. Given the initial approximation x_0 consider the following steps: for $k = 0, 1, \ldots$ do

1. Compute $r_k = b - Ax_k$

2. Solve $\min_{h\in R^n} \left\{ \| \mathrm{Ah}-r_0 \|^2 + \mu \| h \|^2 \right\}$ to obtain h_k

3. Update $x_{k+1} = x_k + h_k$

where $\mu_0, \mu_1, \ldots$ denotes a sequence of positive regularization parameters. The iterations for the iterated Tikhonov method can be expressed in the form

$$x_{k+1} = x_k + (\mathrm{A}^{\mathrm{T}}\mathrm{A} + \mu_k I)^{-1} \mathrm{A}^{\mathrm{T}} (\mathrm{b} - \mathrm{A}\, x_k) \qquad \mathrm{k} = 0, 1, \ldots \qquad (7)$$

where the subscript ^{T} stands for transposition and I denotes the identity matrix. The iterations will be terminated by the *discrepancy principle*, which requires k to be increased until

$$\| \mathrm{r}_{k+1} \| \leq \tau\delta \qquad (8)$$

holds. The constant $\tau > 1$ is a user-supplied constant independent of $\delta.$ In general, the more accurate the estimate δ of the norm of the error $e,$ closer to the unity we choose $\tau.$

2. ITERATED TIKHONOV REGULARIZATION WITH SVD

Assume that the matrices A and L are square matrices and consider the singular value decomposition (SVD) of the matrix A.

$$\mathrm{A} = U\Sigma Y^T \qquad (9)$$

where $U \in R^{mxm}; V \in R^{sxs}$ are orthogonal matrices, $\Sigma = diag\left[\sigma_1,...,\sigma_n\right] \in R^{mxn}$ is diagonal matrix. The vectors u_i, v_i are the ordinary singular vectors of A and σ_i are the ordinary singular values of A. If the condition under (5) hold then minimization problem

$$\min_{x \in R^n} \left\{ \| \mathrm{Ax} - \mathrm{b} \|^2 + \mu \| \mathrm{Lx} \|^2 \right\}$$

has the unique solution given by: $x_\mu = (\mathrm{A}^T\mathrm{A} + \mu L^T L)^{-1}\mathrm{A}^T b.$

Note: The usage of the matrix L different from the identity yields better results in practice and there is a well developed theory that supports the numerical tests. In this paper we will not consider the matrix L, since the SVD can not connect the matrices A and L together. By default the matrix L is considered to be the identity matrix.

2.1. The iterated Tikhonov with SVD base.

Using the iterated Tikhonov schema given by (7) or we obtain the equivalent formula writing the normal equations given by:

$$(A^T A + \mu_k I^T I)x_{k+1} = A^T b + \mu_k I^T I x_k \qquad (10)$$

or

$$x_{k+1} = (A^T A + \mu_k I^T I)^{-1}(A^T b + \mu_k I^T I x_k) \qquad (11)$$

Substituting the factorization (9) into (10), we get:

$$(\Sigma^T\Sigma + \mu_k I)x_{k+1} = \Sigma^T U^T b + \mu_k I x_k \qquad (12)$$

$$(\Sigma^T\Sigma + \mu I)x_{k+1} = \Sigma^T U^T b + \mu_k I x_k \qquad (13)$$

, i.e.

$$x_{k+1} = (\Sigma^T\Sigma + \mu\Lambda^T\Lambda)^{-1}\left(\Sigma^T U^T b + \mu_k \Lambda^T \Lambda x\right)_k \qquad (14)$$

2.2. Discrepancy principle as stopping criteria

The choice of the regularization parameter is important and many methods have been proposed in the literature. If $u_k = u$ for each step, then the iterative method is said to be stationary, otherwise it is called non-stationary; see [1] for more details. In many applications non-stationary iterated Tikhonov regularization has been found to give more accurate approximations of $x^\dagger$ and sometimes it might give faster convergence than stationary iterated Tikhonov regularization. A common choice of the regularization parameter is the geometric sequence

$$\mu_k = \mu_0 q^k, \ u_0 > 0, \ 0 < q < 1, \ k = 0,1,... \qquad (15)$$

The choice is studied on [2], [3]. The case when the matrix L is different from the identity is not very analyzed. Computed results reported in [10,11] show that iteratively minimizing (1) gives better approximations of $x^\dagger$ choosing the matrix I different from the identity. The paper [1] gives an analysis of the case when the matrix I is different from the identity, but the choice of the regularization parameter that they find is dependent in the choice of the matrix L. It is the aim of this paper to propose a way how to choose the regularization parameter in such a way that it is not dependent on any other parameter or matrix. Our schema is non-stationary iterated Tikhonov. We start the iterations by letting the parameter in the beginning to be zero. The singular value decomposition of the pair of matrices A, L is computed once. At each iteration we calculate a parameter with a zerofinder by stopping the iterations when the discrepancy principle is satisfied, i.e,

$$\| Ax_k - b \|^2 = (\eta\delta)^2 \qquad (16)$$

Plugging in equation (11) into (16) we get

$$\| A(A^T A + \mu_k L^T L)^{-1} A^T (b - Ax_k + x_k) \|^2 = (\eta\delta)^2 \qquad (17)$$

Using the decomposition (9) that connects the pair of matrices A,L we get

$$\| U\Sigma Y^T (\mathrm{Y}\,\Sigma^T\Sigma Y^T + \mu_k Y\Lambda^T\Lambda Y^T)^{-1} Y\Sigma^T U^T (b - U\Sigma Y^T x_k + x_k) \|^2 = (\eta\delta)^2 \qquad (18)$$

In this paper we will talk about the regularization parameter $\mu = \frac{1}{\beta}$ and we will comment on the use of β instead of μ below.

3. THE ZERO FINDER USED TO SOLVE THE DISCREPANCY PRINCIPLE

As discussed above, a better regularization parameter will give us a better approximation of $x^\dagger$. Since the way we propose to find the regularization parameter is independent of any other parameter, then it is reasonable to look in details and study methods to find a good regularization parameter. We are looking to determine the regularization parameter by the *discrepancy principle*, i.e, we are looking for a positive value of the parameter $\beta = \beta(\delta)$ so that the associated solution x_β of (4) satisfies (16). When the regularization parameter β is much larger than the positive zero of $\Phi(\beta)$, then the associated Iterated Tikhonov solution x_β might be severely contaminated by propagated error due to the error e in b. In fact, it is very difficult to compute x_β since the linear system of equations may be very ill-conditioned. The use of a very large value of the parameter β is called *underregularization*. Let denote

$$\Phi(\beta) = \| \mathrm{b} - \mathrm{Ax}_\beta \|^2 - (\eta\delta)^2 \qquad (19)$$

Using the factorization (9) we get

$$\Phi(\beta) = \| \mathrm{b} - \Sigma(\Sigma^T\Sigma + \tfrac{1}{\beta}^{-1}\Sigma^T(\mathrm{b} - \Sigma x_k) + \Sigma x_k + \Sigma x_k - b) \|^2 - (\eta\delta)^2 \quad (20)$$

Writing the function $\Phi(\beta)$ as a sum gives

$$\Phi(\beta) = \sum_{j=1}^{m} \left(\frac{\hat{b}_j \lambda_j^2 - \sigma_j(\hat{\mathrm{x}}_k)_j \lambda_j^2}{\beta\sigma_j^2 + 1} \right)^2 - (\eta\delta)^2 \quad (21)$$

We compute $\Phi(\beta)$ for any positive value of β by first solving the last squares problem. The first and second derivatives of $\Phi(\beta)$ at β are evaluated in the same way as following

$$\Phi'(\beta) = \sum_{j=1}^{m} \frac{-2\sigma_j^2 \left(\hat{b}_j \lambda_j^2 - \sigma_j(\hat{\mathrm{x}}_k)_j \lambda_j^2 \right)^2}{(\beta\sigma_j^2 + 1)^3}, \quad \Phi''(\beta) = \sum_{j=1}^{m} \frac{6\sigma_j^4 \left(\hat{b}_j \lambda_j^2 - \sigma_j(\hat{\mathrm{x}}_k)_j \lambda_j^2 \right)^2}{(\beta\sigma_j^2 + 1)^4}$$

(22)

We provide expressions for the function $\Phi(\beta)$ and its derivatives at $\beta = 0$. Those expressions are obtained by diferentiating (21) and letting $\beta \to 0$. This yields the formulas:

$$\Phi(0) = \sum_{j=1,\lambda_j \neq 0}^{m} \left(\hat{b}_j - \sigma_j(\hat{\mathrm{x}}_k)_j \right)^2 - (\eta\delta)^2, \quad \Phi'(0) = \sum_{j=1,\lambda_j \neq 0}^{m} -2\sigma_j^2 \left(\hat{b}_j - \sigma_j(\hat{\mathrm{x}}_k)_j \right)^2$$

(23)

$$\Phi''(0) = \sum_{j=1,\lambda_j \neq 0}^{m} 6\sigma_j^4 \left(\hat{b}_j - \sigma_j(\mathrm{x}_k)_j \right)^2 \quad (24)$$

Algorithm 1 Iterated Tikhonov with SVD (ITSVD)

1: **procedure** ITSVD(A;b)
2: $A = U\Sigma Y^T$ ▷ *Calculate the SVD of A*
3: $\mu = \frac{1}{\beta}, \ \beta = 0, \ x_0 = 0$
▷ *Initalize the parameter and the approximation of* $x^\dagger$
4: $Z_k = X_k$ and $b = U^T b$
5: **for** $k = 1, 2, ..$ until stopping criteria **do** 6: **while** $\| \mathrm{r}_k \| > \tau\delta$ **do**
7: Calculate $\mu_k = min \| \Phi(\beta) \|$
8: **end while**
9: $Z_{k+1} = \left(\Sigma^T\Sigma + \frac{1}{\beta} I \right)^{-1} \left(\Sigma^T \hat{b} + \frac{1}{\beta} I Z_k \right)$ 10: $X_{k+1} = Z_{k+1}$
11: **end for**
12: **return** $x_k \approx x^\dagger$
13: **end procedure**

In this paper we have implemented and tested numerically some zero finders as Bisection method, Newton method applied to the function $\Phi(\mu) = (\eta\delta)^2$. In order to avoid *underregularization* during the computation of the desired zero, we would like the zero-finder to produce a sequence of $\beta -$ values that converge to the desired zero from the left.

3.1. Bisection Method

One of the easiest zero-finders to implement is the bisection method. Consider a transcendental equation $\Phi(\beta) = 0$ and suppose that it has a zero in the interval [a, b], then the Bisection method will converge to the zero linearly. If the chosen interval is large enough such that it contains the zero of the function, then we are sure that will find the solution, but the convergence will be very slow. Bisection is one of the methods we have implemented and we will compute some numerical results later to show the slow convergence.

3.2. Newton Method applied to $\Phi(\mu) = (\eta\delta)^2$

If we would like to speed up the convergence then we have to consider any other method which yields faster convergence. It is well known that Newton Method yields quadratic convergence.

4. NUMERICAL EXAMPLES

In this section we will represent some computed examples where we illustrate the performance of Iterated Tikhonov with SVD and different root-finding applied to find the regularization parameter. We use $\eta = 1.01$ and will test for different values of σ such that $0.00001 \leq \sigma \leq 0.01$.

Example 4.1. Let consider the Fredholm integral equation of the first kind,

$$\int_0^{\frac{\pi}{2}} K(\sigma,\tau)\,\mathrm{x}(\tau)d\sigma = b(\tau), \qquad 0 \leq \tau \leq \pi, \quad (25)$$

where $K(\sigma,\tau) = \exp(\sigma cos(\tau))$ and $b(\tau) = 2sinh(\tau)$. This problem has been discussed by Baart [7].
The solution of Baart problem is $x(\tau) = sin(\tau)$. Using the code *baart* from MATLAB package [8] we discretize 25 with 400 orthonormal box functions. This generates the matrix $A \in R^{400\times400}$ and the right-hand side vector $b \in R^{400}$. The matrix generated is severely ill-conditioned with a condition number $K(A) = 1.9\times10^{20}$. The error vectors $e \in R^{400}$ is modeled by white Gaussian noise and we refer to the ratio

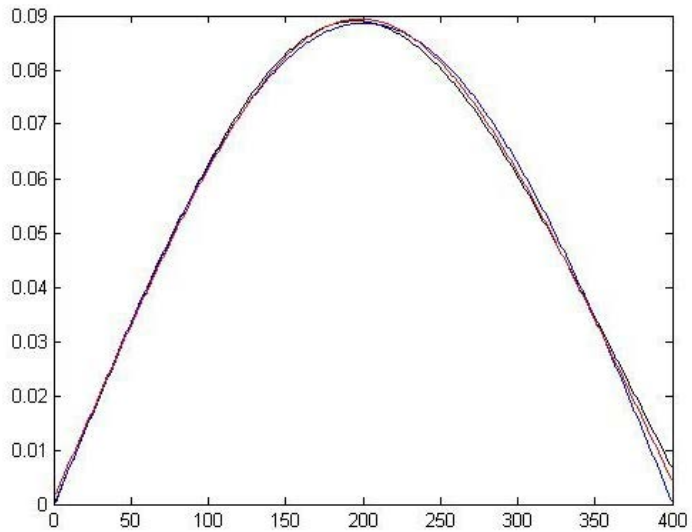
$$\sigma = \frac{\| \mathrm{e} \|}{\| b_{true} \|}$$

The relative reconstruction error of the computed solution x_{β_k} is measured by

$$RRE(x_{\beta_k}) = \frac{\| x_{\beta_k} - x^\dagger \|}{\| x^\dagger \|}$$

and the contaminated right-hand side b is obtained by (2). The iterated Tikhonov method with Singular value decomposition will be applied with different zero-finders to evaluate the regularization parameter and then find an approximate solution of the least squares problem.

Table 1: Example 4.1: Baart test problems using different zero-finders to estimate the regularization parameter. The table shows the number of iterations i for the Iterated Tikhonov, the value of the regularization parameter β_i, the value of the function $\phi(\beta_i)$ defined by (21) at β_i and the relative error of the computed approximate solution x_{β_i} with $\sigma = 10^{-2}$.



Zero-finder	i	β_i	$\phi(\beta_i)$	$RRE(x_{\beta_i})$	Time (s)
Bisection		0.5635 x10-4	-0.162x10⁻5	0.13	2.96
302		0.2300 x10-4	-0.334x10⁻5	0.024	0.5
Newton to $1/\Phi$	3				

Figure 1: Example 4.1: Baart test problem: True solution (blue curve), Iterated Tikhonov solution Newton zero-finder (black curve) and Bisection zero-finder solution (magenta curve)

Example 4.2. Let consider the Fredholm integral equation of the first kind,

$$\int_0^{\frac{\pi}{2}} K(\sigma,\tau)\,x(\tau)d\sigma = b(\tau), \qquad 0 \le \tau \le \pi, \tag{26}$$

where

$K(\sigma,\tau) = \left(\cos(\sigma)+\cos(\tau)\right)^2 \left(\frac{\sin(\xi)}{\xi}\right)^2$, $\xi = \pi\left(\sin(\sigma)+\sin(\tau)\right)$ and $b(\tau) = 2\sinh(\tau)$.

The above integral equation is discussed by Shaw [9]. The MATLAB command shaw from [8] is used to discretize (26) by a quadrature rule with 400 nodes and

obtain the matrix $A \in R^{400\times400}$ severely ill-conditioned with condition number $K(A) = 1.92\times10^{19}$.

Zero-finder	i	β_i	$RRE(x_{\beta_i})$	Time (s)
Bisection	381	0.007181915862	0.0565993	2.872103
Newton to Φ	2	0.004247052065	0.011122377368	0.163326
Newton to $1/\Phi$	3	0.004247534545	0.008659238096	0.178161

Table 2: Example 4.3: Philips test problem using different zero-finders to estimate the regularization parameter. The table shows the number of iterations i for the Iterated Tikhonov, the value of the regularization parameter β_i, and the relative error of the computed approximate solution x_{β_i} with $\sigma = 10^{-2}$.

Zero-finder	i	β_i	$RRE(x_{\beta_i})$	Time (s)
Bisection	145	0.0013038516045	0.022019162953821	1.027642
Newton to Φ	6	0.0000474986787	0.015001257763887	0.198463
Newton to $1/\Phi$	4	0.0213515426964	0.009369945382983	0.203115
New zero-finder	3	0.0213328928322	0.038710862654777	0.161413

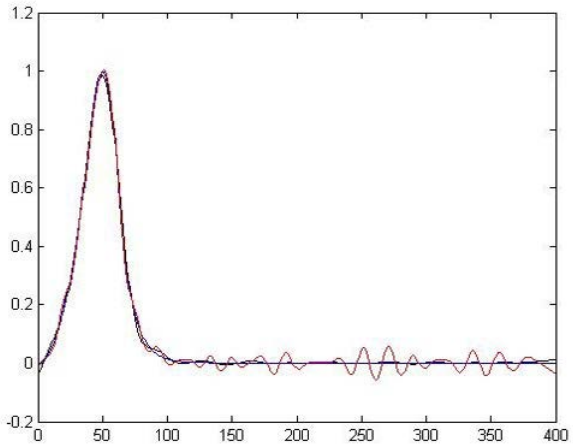


Table 3: Example 4.4: Deriv2 test problems using different zero-finders to estimate the regularization parameter. The table shows the number of iterations i for the Iterated Tikhonov, the value of the regularization parameter β_i, and the relative error of the computed approximate solution x_{β_i} with $\sigma = 10^{-2}$.

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Figure 2: Heat test problem: True solution (blue curve), Iterated Tikhonov solution Newton zero-finder (black curve) and Bisection zero-finder solution (magenta curve).

Test problem	i	$RRE(x_{\beta})0$	Time(s)
shaw(400)	401	0829	2.683273
deriv2(400,2)	145	0.0220	1.028533
baart(400)	5	0.0277	0.191452
philips(400)	401	0.0905	2.727137

Test problem	i	$RRE(x_{\beta})0.$	Time(s)
shaw(400)	21	1898	0.781244
deriv2(400,2)	17	0.0695	0.645818
baart(400)	5	0.0262	0.279662
philips(400)	78	0.0175	0.363704

Table 4: Tests comparing different algorithms. Left are tests calculated with ITSVD with Bisection method as zero-finder and right are tests created with IT.

Test problem	i	$RRE(x_{\beta})0$	Time(s)
shaw(400)	2	.1208	0.265
deriv2(400,2)	9	0.0046	0.306
baart(400)	3	0.0277	0.5178
philips(400)	2	0.0126	0.167191

Test problem	i	$RRE(x_{\beta})0.$	Time(s)
shaw(400)	29	1275	1.038077
deriv2(400,2)	32	0.0047	1.064888
baart(400)	8	0.0300	0.417362
philips(400)	28	0.0117	0.935753

Table 5: Tests comparing different algorithms. Left are tests calculated with ITSVD with Newton method as zero-finder and right are tests created with IT.

The work on [1] motivated us to research and find a better method for regularization term estimation. We are showing on table 4 some numerical tests comparing the number of iterations needed, the and Time(seconds) needed to calculate the solution. We are using test problems shaw(400), deriv2(400,2), baart(400), and philips(400) from regularization tool in Matlab [8] with The zero finder used is Bisection method.

We are showing on table 5 some numerical tests comparing the number of iterations needed, the and Time(seconds) needed to calculate the solution. We are using test prob-lems shaw(400), deriv2(400,2), baart(400), and philips(400) from regularization tool in Matlab with using IT with parameters and The zero-finder used is Newton method.

As shown in the numerical tests in table 4, there are cases when IT gives better but on those cases ITSVD do not need any previous knowledge of any other parameter. For IT we need a good approximation of and good choice of which depend on the matrix

Further, if we study the results closer we see that the computational time is small in ITSVD compared to IT. The number of iterations is small and the accuracy given by is almost the same.

5. CONCLUSIONS AND REMARKS

In this paper we develop a new method combining iterated Tikhonov regularization method with Singular Value Decomposition. This new method do not need any previous knowledge of any other parameter other than the regularization parameter and compared with the method in [1] it is independent of the choice of the discretization of the derivative operator L. The discussed method in **Algorithm 1** is a very good method which finds a good approximation of $x^{\dagger}$ and it is used when the matrix A in (1) is not of very large dimension.

If the question is which zero-finder should be used, then even though it is not easy to give an accurate answer for every case, it is reliable to say that Newton method with safe guard is a very good method to use since it yields quadratic convergence and gives good numerical results.

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POLITIKAT E RRITJES EKONOMIKE NË SHQIPËRI DHE PAPUNËSIA: ANALIZË NËPËRMJET KUADRATIT MAGJIK TË KALDOR

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ABSTRAKT

Ndryshimi i strukturës së ekonomisë shqiptare pas rënies se sistemit komunist në 1991, nga një ekonomi e centralizuar në atë liberale, gjeneroi një fenomen të "natyrshëm" të sistemit kapitalist, që është papunësia. Edhe pse kanë kaluar më shumë se një çerek shekulli, ky fenomen shqetësues për shoqërinë përbën për qeverinë një prioritet kryesor të politikave të saj të zhvillimit ekonomik. Qëllimi i tyre është pikërisht, ulja e normës së papunësisë nëpërmjet rritjes ekonomike dhe zhvillimit të tregut të punës.
Për zgjidhjen e këtij problemi teoria dominante ekonomike sugjeron një rritje të fortë ekonomike duke mbajtur nën kontroll nga ana e Bankës Qëndrore normën e inflacionit në 3%. Një nga ligjet ekonomike, përkatësisht ligji i Okunit, konfirmon faktin që ka një korrelacion negativ midis normës së rritjes ekonomike dhe ndryshimit të normës së papunësisë edhe pse ky ligj mbetet gjithmonë objekt verifikimi. Në anën tjetër, ekonomisti Alban Filips, konstaton nëpërmjet kurbës së famshme të tij që një rritje e inflacionit të pagave gjeneronte një ulje norme papunësie. Numri i variablave të këtyre modele u pasurua nga ekonomisti i famshëm Nikolas Kaldor me kuadratin e tij magjik, i cili në modelin grafik vendos katër varialba: normën e papunësisë, normën e rritjes ekonomike, normën e inflacionit ose e stabilitetit të çmimeve si dhe normën e bilancit tregtar.
Në rastin e ekonomisë shqiptare, ku karakteristikat e saj nuk janë të njëjta me ato të vendeve të zhvilluara perëndimore, lidhja midis këtyre katër treguesve, mbetet gjithnjë për t'u vërtetuar. Qëllimi i këtij artikulli është të vlerësojë impaktin mbi normën e papunësisë për dekadën e fundit, respektivisht 1990-2017, të katër treguesëve makroekonomik paraqitur nga Kaldor nëpërmjet kuadratit të tij magjik. Në mënyrë indirekte në analizojmë edhe efikasitetin e politikave ekonomike (monetare dhe fiskale), në realizimin e këtij objektivi.
Për të vërtetuar këtë lidhje, ne u bazuam në të dhënat e Bankës Botërore, INSTAT dhe të BQSH. Rezultatet tregojnë një korrelacion të dobët negativ midis rritjes ekonomike dhe uljes së papunësisë.
Sugjerimi që ne japim është një orientim i politikave ekonomike në nxitjen e investimeve në sektorin e prodhimit si një faktor kryesor në rritjen reale të ekonomisë dhe punësimit si dhe një adoptim ndaj fleksibilitetit të tregut të punës.

FJALËT KYÇE:

Papunësia, kuadrati magjik i Kaldor, rritja ekonomike, inflacioni, bilanci tregtar

1. HYRJE

Në fillim të viteve 1991 Shqipëria ndërmori rrugën e vështirë të hapjes së ekonomisë së saj nga një ekonomi e mbyllur në një ekonomi e tregut të lirë. Gjatë kësaj kohe, vendi filloi t'i nënshtrohej një regjimi ri-strukturimi makroekonomik ku procesi i kalimit të ekonomisë tonë nga një ekonomi e centralizuar në një ekonomi të tregut të lirë u shoqërua jo vetëm me transformimin e mekanizmave dhe infrastrukturës të funksionimit të tregjeve, por mbi të gjitha me nevojën e zhvillimit dhe krijimit të instrumentave dhe hapësirave të reja, ekonomike, ligjore dhe institucionale me qëllim rritjen e efiçensës alokuese dhe përdoruese të resurseve publike dhe private (Civici *et al.*, 2017). Ndryshimi i strukturës së ekonomisë shqiptare, gjatë kësaj periudhe, gjeneroi një fenomen të "natyrshëm" të sistemit kapitalist, që është papunësia. Edhe pse kanë kaluar 25 vjet, ky fenomen shqetësues për shoqërinë përbën për qeverinë një prioritet kryesor të politikave të saj të zhvillimit ekonomik (Këshilli i Ministrave, 2016).

Vendi ynë në raport me vendet fqinje ka një trend pozitiv të rritjes së punësimit. Në raportin e Bankës Botërore[1], mbi tregun e punës në Ballkanin Perëndimor për vitin 2019, dhe Institutit të Vjenës për Studime Ekonomike Ndërkombëtare, thuhet se papunësia në Ballkanin Perëndimor ka shënuar ulje, duke rënë në 15.3 për qind nga 16.2 për qind në raport me vitin 2018. Sipas të dhënave të INSTAT (2019)[2], në

1 https://www.worldbank.org/en/region/eca/publication/labor-trends-in-ëb
2 http://www.instat.gov.al/media/6550/atfp-t3-2019_.pdf

tremujorin e tretë 2019, shkalla zyrtare e papunësisë në Shqipëri, për popullsinë 15 vjeç e lart, ishte 11,4 %. Kjo tregon një ulje në raport me tremujorin e tretë të vitit 2018.

Rritja ekonomike ka qënë në funskion të investimeve të huaja edhe pse nivelet e tyre janë luhatur gjatë disa viteve të fundit dhe përgjithësisht të ulëta në krahasim me standardet rajonale. Në shumë mënyra, Shqipëria është e mirëpozicionuar të tërheqë investime të huaja direkte. Portet në Adriatik, forca punëtore e edukuar dhe e shkolluar, pagat konkurruese dhe resurset natyrore, të gjithë janë elemente tërheqëse për investitorët[3]. Gjithsesi, rritja ekonomike gjatë dekadës së fundit tregon një realitet ekonomik konservator në terma të përqindjes reale së rritjes ekonomike ndaj asaj potenciale (Garo, 2018). Që kur filloi tranzicioni drejt ekonomisë së tregut në vitin 1991, ekonomia e Shqipërisë në nivele globale ka bërë përparime mbresëlënëse, me të ardhura për frymë në nivele disa herë më të larta sesa para tranzicionit. Gjithsesi, vlerësimet e matura (konservatore) sugjerojnë se një e treta e aktivitetit të plotë ekonomik është joformale, ndërsa vlerësimet më të larta variojnë nga 50 deri në 60 për qind të ekonomisë (Angjeli & Naqellari, 2018).

Një tjetër faktor është bilanci tregëtar i cili ka qënë gjithmon negativ edhe pse shqiptarët që punojnë jashtë Shqipërisë ndikojnë fuqishëm ekonominë dhe rritjen ekonomike të saj. Remitancat që ata dërgojnë përdoren më shumë për konsum sesa për investim kapitali (Naqellari & Angjeli, 2018). Banka Qëndrore e Shqipërisë është mundur dhe ka mbajtur gjatë gjithë kësaj periudhe një normë inflacioni brenda objektivit të saj (Garo, 2018).

2. KUADRI TEORIK

Për zgjidhjen e këtij problemi teoria dominante ekonomike sugjeron një rritje të fortë ekonomike duke mbajtur nën kontroll nga ana e Bankës Qëndrore normën e inflacionit në 3%. Një nga ligjet ekonomike, përkatësisht ligji i Okunit, konfirmon faktin që ka një korrelacion negativ midis normës së rritjes ekonomike dhe ndryshimit të normës së papunësisë edhe pse ky ligj mbetet gjithmonë objekt verifikimi (An, *et al.,* 2016).

Në anën tjetër, ekonomisti Alban Filips, konstaton nëpërmjet kurbës së famshme të tij që një rritje e inflacionit të pagave gjeneronte një ulje norme papunësie. Numri i variablave të këtyre modele u pasurua nga ekonomisti i famshëm Nikolas Kaldor me kuadratin e tij magjik (Kaldor, 1971).

Katrori magjik analizon katër pikat kryesore të politikës ekonomike të një vendi të caktuar (Picek, 2017, Stoica & Sudacevschi, 2019). Sipas tij, literatura ekonomike që analizon tema të tilla si rritja ekonomike dhe shpërndarja e të ardhurave, me qëllim verifikimin e efektivitetit politik të këtyre parametrave, daton prej periudhës së Adam Smith-it. Megjithatë, vetëm pas Luftës së Dytë Botërore, me përhapjen e mendimit Keynesian (se qeveria duhet të ndërhyjë në ekonomi me qëllim që të nxisë

3 https://www.umsh.edu.al/d/58/umsh-organizon-konferencen-zhvillimi-i-qendrueshem-dhe-politikat-e-punesimit-ne-shqiperi

punësimin), politikëbërësit filluan të miratojnë qëllime specifike për të përcaktuar performancën e menaxhimit të saj.Megjithëse nuk ekzistonte një përkufizim zyrtar i objektivave dhe qëllimeve për një administratë optimale qeveritare, Kaldor (1971) ishte në gjendje të përcaktonte katër qëllime që u analizuan esencialisht, respektivisht: norma e rritjes ekonomike, papunësia, tregtia e jashtme dhe norma e inflacionit. Puna e Kaldorit ndihmoi në konsolidimin e qëllimeve kryesore të menaxhimit makroekonomik dhe kontribuoi në analizën e ecurisë ekonomike bazuar në "katrorin magjik"; duke qenë një paraqitje grafike e vlerave numerike të katër variablave të propozuar.

Me anë të këtij kërkimi dëshirojmë që të analizojmë modestisht korrelacionin midis këtyre katër treguesëve makroekonomikë përgjatë gjithë periudhës së ekonomisë së tregut në vendin tonë duke u bazuar në teorinë e kuadratit magjik të Kaldor. Hipoteza jonë është se aplikimi i një politike monetare stabilizuese e nivelit të përgjithshëm të çmimeve dhe për rrjedhoj e mbajtjes së inflacionit brenda limitit +/- 3%, nuk ka dhënë një impakt në uljen e normës së papunësisë dhe gjithashtu të një bilanci tregëtar pozitiv.

3. METODA DHE MATERJALI

Metoda e përdorur për studimin tonë është pikërisht ajo grafike e modelit Kaldor (figura 1) dhe ajo e analizës statistikore të serive kohore mbi të dhënat e katër indikatorve:

- rritja ekonomike që matet nga norma e rritjes së PBB ose GDP. Në këtë fushë, objektivi i Shtetit është të favorizoj një rritje të lartë në periudhë afatgjatë.
- punësim të plotë që matet nga norma e papunësisë- Shteti duhet të ndihmoj në mënyrë direkte apo indirekte krijimin e punësimit.
- stabiliteti i çmimeve që përkthehet në inflacion, Kjo do të thotë për Shtetin të garantoj mbajtjen e fuqisë blerëse të agjentëve ekonomikë duke luftuar inflacionin që e shkatëron.
- ekuilibri i bilancit tregtar i matur nga bilanci i pagesave.

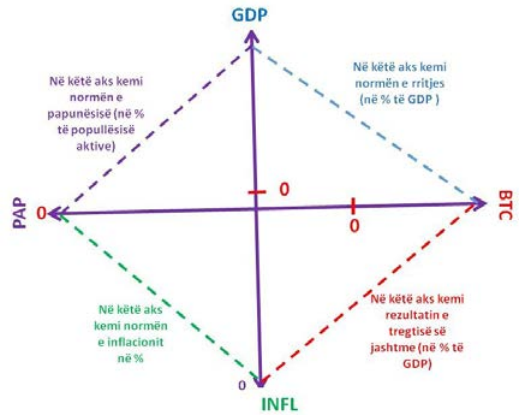


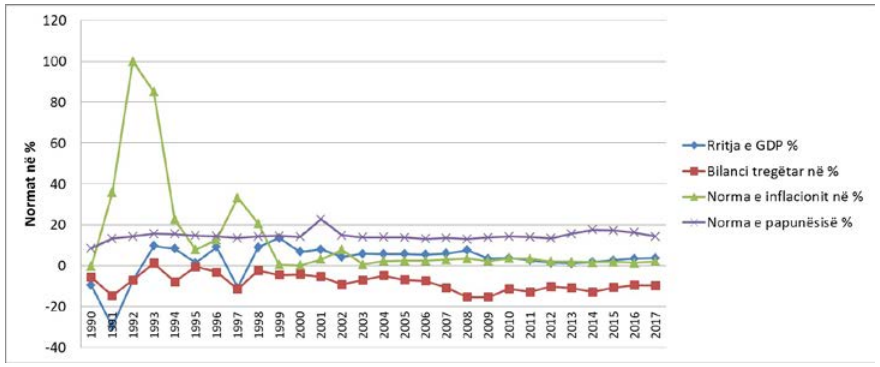
Figura 1. Modeli i kuadratit magjik të Kaldor në analizën e lidhjes midis rritjes ekonomike, inflacionit, bilancit tregëtar dhe normës së papunësisë

Të dhënat e përdorura në analizën tonë janë marrë nga INSTAT, Bankës Qëndrore dhe burimeve të tjera nga institucionet e besueshme kombëtare dhe ndërkombëtare siç janë FMN apo Banka Botërore. Paraqitja e rezultateve është në formë vizuale grafike dhe analize statistikore.

4. REZULTATI DHE DISKUTIMI

Analiza e katër indikatorëve makroekonomikë të modelit Kaldor për rastin shqiptar tregon një tjetër realitet. Shifrat e të dhënave të Bankës Botërore që janë të njëjta me ato të Bankës së Shqipërisë por edhe me ato të INSTAT, të cilat janë burime të besueshme, (figura 2), tregojnë një evolucion të diskutueshëm sidomos në fillim të viteve të para postkomuniste.

Figura 2. Evolucioni i katër treguesëve makroekonomikë në %, në Shqipëri, për periudhën 1990-2017



Burimi: përpunuar nga autorët, bazuar mbi të dhënat e BB, BSH dhe INSTAT, 2019

Në vitet 1991, kemi rritjen të lartë në përqindje të normës së inflacionit me 100% dhe kjo vjen duke u ulur deri në 7.8 % në 1995. Më pas, kjo normë rritet përsëri me 33% në vitin 1997 dhe pastaj vjen duke u ulur dhe midis periudhës 1995-1998. Padyshim rritja e parë etiketohet si periudhë hiperinflacioniste ku vendi ynë kaloi nga ekonomia e çentralizuar në atë të ekonomisë së tregut me një zhvlerësim të lartë të monedhës vendase. Ndërsa, rritja e dytë në vitin 1997, klasifikohet si stagflacion për arsye se kemi një rritje prej 33% kur rritja e normës së GDP është në terma negative prej -10.8%. Kjo përkon edhe me periudhën ku vendi ynë përjetoj krizën më të madhe financiare dhe humbjen e një kapitali të madh financiar prej më shumë se 1 miliard dollarësh. Duke filluar që prej vitit 1999 e deri në 2017 kemi një stabilitet të normës së inflacionit ku mesatarja ka qënë 2.4%.

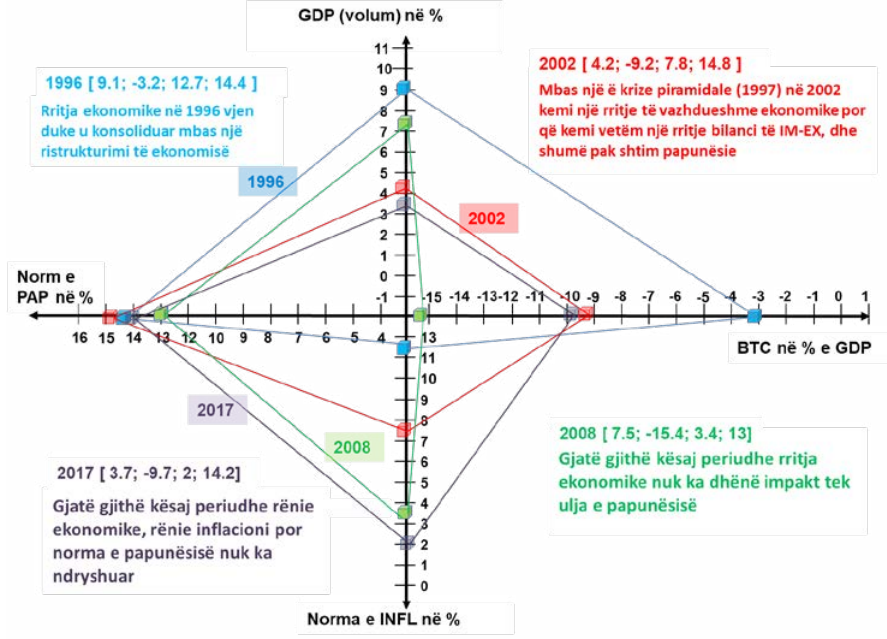
Përsa i përket indikatorit të rritjes ekonomike ne shikojmë një rrënie në vitet e para të ndërrimit të sistemit. Kjo rënie ka qënë tepër e madhe në vitin 1992 me gati 30%. Më pas, në vitin 1993, shohim që ekonomia e vendit fillon dhe rritet në mënyrë të konsiderueshme duke kapur shifrën 9.6%. Përgjat periudhës në vijim, rritja

ekonomike ka luhatje ku për shkak edhe të krizës financiare ajo bien në vitin 1997 me shenjë negative në 10.8%. Pas kësaj periudhe, kemi vetëm rritje ekonomike e cila kap shifrën maksimale në vitin 1999 me 13.5% dhe, për të vazhduar nga viti 2000 deri në vitin 2017, me një rritje mesatare 4.3%. Ndryshe paraqitet evolucioni i bilancit të tregëtar. Ne shohim që përveç vitit 1993, për të tëra vitet e tjera ai qëndron negativ. Kështu, vitet ku ai është më problematik janë 1992 me -14.7%, 1997 me -11.5% dhe duke filluar që prej 2007 deri në 2017, norma e këtij bilanci është mesatarisht -11.8%.

Analiza jonë qëndron tek norma e papunësisë. Të tre këta tregues performance makroekonomike duhet të ndikojnë direkt në ndryshimin e normës së papunësisë. Por edhe pse këta tregues në dekadën e parë postkomuniste, ka oshilacione të theksuara, përgjat gjithë kësaj periudhe, ne shikojmë që kjo normë nuk ndryshon shumë përveç vitit 2001 ku shohim një rritje të kësaj norme në 22.7%.

Gjithsesi, nëse do të heqim këtë vit, do të kemi një normë mesatare vjetore të papunësisë prej 14.4%. Nëse disa nga këto vlera që janë domethënse do ti paraqesim në kuadratin magjik të Kaldor (figura 2) do të shohim që edhe pse kemi rritje ekonomike apo rritje inflacioni, sipas teorisë ekonomike qoftë neoklasike qoftë kejnesiane do të kishim impakt në normën e papunësisë.

Figura 2. Paraqitja e kuadratit magjik të Kaldor midis rritjes ekonomike, inflacionit, bilancit tregëtar dhe normës së papunësisë, në rastin e Shqipërisë : periudha 1990-2017.



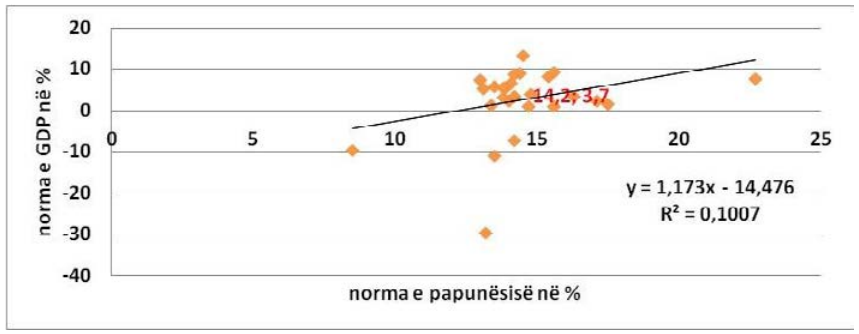
Burimi : përpunuar nga autorët, bazuar mbi të dhënat e BB, BSH dhe INSTAT, 2018

Kështu, në të katërta rastet që ne kemi vizualizuar në figurën 2, kemi një rritje ekonomike të lartë, por edhe që karakterizohen edhe nga një inflacion i lartë për dy

rastet e para. Për vitin 1996, shohim që norma e papunësisë kemi një rritje ekonomik me 9.1 %, një bilancë tregtar negativ -3.2%, një inflacion të lartë 12.7%, atëherë që norma e papunësisë është 14.4%. Normal kjo duhet të ishte më e ulët se vitet e kaluara. Po kështu edhe në vitet 2002, kemi një rritje ekonomik me 4.2 %, një bilancë tregtar negativ -9.2%, një inflacion të lartë 7.8%, atëherë që norma e papunësisë është 14.8%. Edhe për vitet 2008 dhe 2017 kemi gati të njëjtat interpretime rezultatesh: një rritje ekonomike mbi normën e inflacionit respektivisht 7.5 dhe 3.7% përkundrejt 3.4 dhe 2%, që duhet të shoqërohesh me një ulje të normes së papunësisë por që mbetet në shifrat midis 13-14%.

Për të parë më mirë këtë lidhje midis rritjes ekonomike, normës së inflacionit dhe normës së papunësisë, ne i analizuam serit kohore për të gjithë periudhën 1990-2017. Ashtu siç tregohet edhe në figurën 3, më poshtë, kjo lidhje është gati inekzistente, pra e thën ndryshe nuk kemi një korrelacion midis këtyre dy variablave. Koefiçenti i kësaj lidhej R = 0.1 është i papërfillshëm.

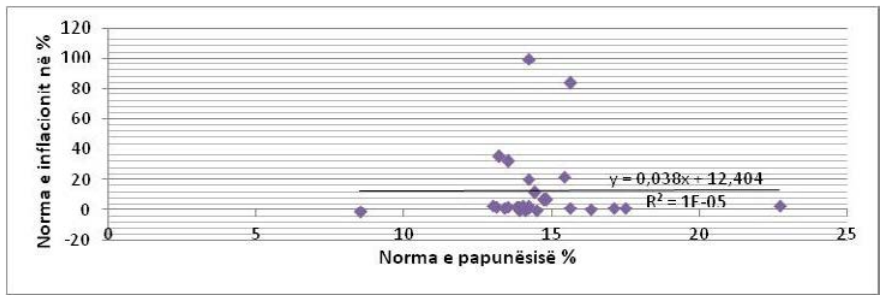
Figura 3. Korrelacioni midis normës së papunësisë dhe rritjes ekonomike, të shprehura në %, për periudhën 1990-2017



Burimi : përpunuar nga autorët, bazuar mbi të dhënat e BB, BSH dhe INSTAT, 2019

Përsa i përket impaktit të normës së inflacionit ndaj ndryshimit në normën e papunësisë, shohim gjithashtu që korrelacioni i kësaj lidhje është shumë i dobët, ose koefiçenti R = 1E – 5 është totalisht i papërfillshëm (figura 4).

Figura 4. Korrelacioni midis normës së papunësisë dhe normës së inflacionit, të shprehura në %, për periudhën 1990-2017



Burimi : përpunuar nga autorët, bazuar mbi të dhënat e BB, BSH dhe INSTAT, 2019

Nga këto rezultate mund të themi se teoria neoliberale e aplikuar mbas viteve 1992, nuk ka dhënë rezultatet e pritura. Edhe pse kemi pasur një rritje ekonomike apo një normë inflacioni të kontrolluar nga Banka Qëndrore sidomos mbas vitit 2000, nuk shohim një impakt në rritjen e punësimit apo uljen e normës së papunësisë. Ruajtja e monedhës vendase nga zhvlerësimi dhe veçanërisht mbas krizës së vitit 2008, ka ndikuar negativisht në prodhimin vendas dhe bilancin tregatar. Ekonomia shqiptare është kthyer në ekonomi importi. Shpenzimet e konsumit, të investimeve apo të investimeve qeveritare nuk përkthehen në rritje punësimi, për shkak se një pjesë e tyre del nëpëmjet mallrave të importit.

Kështu në aspektin e uljes së normës së papunësisë duhet parë me përparësi papunësia strukturore. Edhe pse konjukturat ekonomike janë përmirësuar nga ana e qeverisë, zakonisht në botën e zhvilluar, papunësia shikohet si shkak i delokalizimit të firmave, apo i zvëndësimit të fuqisë punëtore me robot nga progresi teknollogjik edhe pse shumë prej studimeve shkencore e kundërshtojnë këtë impakt. Por në Shqipëri, papunësia strukturore duhet parë tek të tjerë faktorë që lidhen me fleksibilitetin e tregut të punës. Duke parë që ky treg nuk është stabël, konstot e heqjes nga puna të punonjsëve për firmat dhe kompanitë janë të larta (kodi i punës dhe legjislacioni mbi të). Kësaj kostoje i shtohet edhe papërputhshmëria e kualifikimit të punonjsëve me vendin e punës. Kështu, në erën e informacionit shumë firmave u mungon fuqia punëtore e kualifikuar me kompetenca të teknologjisë së informacionit.

5. KONKLUZIONE DHE REKOMANDIME

Politikat makroekonomike përgjat gjithë periudhës që ne analizuam, nuk kam dhën një rezultat të kënaqshëm në rritjen e punësimit. Rezultatet tregojnë një mungesë të korrelacionit ndaj këtyre treguesëve. Kuadrati magjik i Kaldor, mbetet gjithmon një metodë e mirë për të parë këtë lidhje dhe për tu përdorur si analizë vendimarrjeje. Padyshim limitet e këtij studimi qëndrojnë në besueshmërin e informacionit të analizuar. Në Shqipëri, që prej ndryshimit të sistemit komunist, statistikat janë të një besueshmërie të ulët jo vetëm nga agjebtët ekonomikë të vendit por edhe nga organizma të besueshëm ndërkombëtarë. Kjo për faktin edhe se statistikat e prodhuara nga INSTAT, nuk përfshijnë ekonominë informale apo punësimin illegal.

Ne rekomandojmë politika të përshtatshme ku të katër indikatorët e performancës makroekonomike të jenë të lidhur në mënyrë organike. Pra, për zgjidhjen e këtij problem, ne rekomandojmë vlerësimin e filierave që rekrutojnë dhe lehtësojnë rikonvertimin professional të tyre. Por, edhe duke krijuar nga ana e qeverisë një sigurim më të madh të personave me statusin i papunë duke lehtësuar fleksibilitetin e firmave për të rekrutuar dhe liçensuar këtë kategori. Megjithat nuk duhet të limitojnë recetat tek ndërhyrjet strukturale të papunësisë, sepse papunësia rritet gjithashtu edhe nga përkeqësimi i konjukturave ekonomike. Sipas kejnesianëve, duhet të startojmë konsumin e familjeve dhe investimeve të firmave duket ulur taksat me qëllim që të rrisim prodhimin dhe për rrjedhoj të rrisim punësimin, Por këtu problem është se ekonomia shqiptare është një ekonomi importi prandaj dhe

teoria neoklasike është ajo dominante. Sipas kësaj teorie, duke qënë se shumica e mallrave dhe shërbimet prodhohen me kosto më të ulët dhe vijnë nga vende si Kina apo vende të tjera ku kostoja e punës është tepër e ulët, mënyra më e mirë është të reduktohen kostot e punës duke reduktuar përqindjen e kontributeve shoqërore dhe shëndetësore dhe, duke limituar rritjen e pagave.

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THE KEYNSIAN CROSS MODEL AND ITS DERIVED ECONOMIC MODELS ARE WRONG

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ABSTRACT

The object of this analysis will be the IS-LM Model (IS curve) derived from Dornbusch, Fischer, Starts(D,F,S) and the Keynesian Cross, from which this model is derived. This model will be analyzed: firstly, related with the Cost-Volume-Profit Model (CVP) and secondly with the investment curve on the Keynesian Cross. The CVP model does not aim to determine the equilibrium level of a product, but to determine in which unit of production, the profit is zero. Also, the purpose is to determine how fixed and variable costs are transferred to the cost of the product. In consideration is taken a manufacturing sector, costs of producing a particular product, which has a certain value, a use value, a certain utility. The Keynesian Simple Expenditure Model is the opposite of this model; it is not a production model but a consumption model, it does not create a product but destroys the product. Through this model, macroeconomic equilibrium is created. On the Y axis are the autonomous costs and revenues indexed by the marginal propensity to consume. On the X-axis is real GDP. The equilibrium is still narrowed down to two investment-saving elements. These limitations make the model incorrect. The model does not represent the real balance of the economy. It is inapplicable. From its application the conclusions are incorrect. This has also affected the IS curve model. Investments, in this model, are taken not autonomously but depended to interest rate. The conclusion of the analysis is: the Cost-Volume-Profit model cannot be fitted to the Keynesian Cross model. Adaptation derives an incorrect equilibrium model, and consequently, models built on this basis are also incorrect. Also incorrect are the conclusions drawn from the analysis of these models. The method used is the method of analysis and synthesis, of comparison, statistical methods, etc.

KEYWORDS,

investments, equilibrium model, IS-LM curve, AD-AS curve, Keynesian Simple Expenditure Model, loans, deposits, GDP, etc.

1. INTRODUCTION

The IS-LM equilibrium model was originally built by Hicks-Hansen[4]. These authors constructed the model based on the savings-investment indicators used in the Keynsian equilibrium model, and the real GDP indicator. Their aim was to observe the impact of monetary policies on the economy, using the Keynsian model's conclusion that the economy is in equilibrium when I = S.

The first indicator is the Savings indicator, which we identify with Deposits in national currency. It is denominated in national currency in order to see the effect of the Central Bank's monetary policy that affects the monetary market through the base interest rate (REPO). The increase in deposits is related to the growth of the credit base, so the larger the amount of deposits, the greater the possibility of lending, and the opposite, the smaller the amount of deposits, the lower the possibility of lending. The savings indicator, according to Hicks-Hansen, has a positive relationship with the income indicator (Y). This link is reflected in the IS model they have built.

The second indicator is the Loan indicator that we identify with the Investment indicator. This indicator is also taken in national currency (All) in order to see the effects of the Central Bank monetary policy. Loans are linked to increased output because they are linked to increased investment. Increased investment increases capital stock. Increasing capital stock increases output. In the Hicks-Hansen model, the investment indicator was taken with a negative relation to the interest rate.

This model, despite its limitations, which are not the subject of this study, is more representative of the monetary policy effect, compared to models built by other authors.

This paper will analyze the IS Model built by Dornbusch[5], Fischer[6], Startz[7].

The idea of this model was taken from Keynes's General Theory, published in 1936. This idea was developed by other authors such as Dillard, Hansen, Samuelson, etc., and was built the Model, called the Keynesian Simple Expenditure Model, or Keynesian Cross. This theory and this model, along with classical theory, have been studied and continue to be studied in all countries, and in all universities of the world. Hundreds of studies have been done based on this model, studies are underway and studies will continue. This paper aims to prove that the Keynesian Model of Equilibrium, built by Keynesians on the basis of Keynesian theory, is untrue, and consequently the models based on it are wrong.

The Keynesian Equilibrium Model and the theses raised on it form the theoretical basis for supporting government spending. In this theory, government spending is just as important to the growth of the economy as investment.

The paper notes, that this is not true, but it is required to be true by applying the

4 John R. Hicks (1904-1989) and Alvin Hansen (1887-1975), Hicks and Hansen's theory, is known as the Hicks-Hansen theory of interest. They have built the IS-LM macroeconomic equilibrium model.

5 Rudinger Donbursch. Co-author of the text "Macroeconomics". Eleventh Edition.2011

6 Stanley Fischer. Co-author of the text "Macroeconomics". Eleventh Edition.2011

7 Richard Startz. Co-author of the text "Macroeconomics". Eleventh Edition.2011

Keynsian Expenditure Model, which, in a growing economy, assumes absolutely always the total expenditure (AE) curve, below the total revenue curve (Y). Government spending is necessary, but to apply a new model of equilibrium, which truly represent the market and the economy. On the basis of the analysis comes to an important conclusion; The Keynsian model is flawed, improperly constructed, out of economic logic.

It should simply remain as an effort, as a good wish, to create an equilibrium model. It has not been applied to any country in the world because it has so many abstractions that it makes the model wrong and not representative of the economy. We have not seen any such model, built with concrete data on the economies of different countries. This model should remain in the history of economic thought because has come the time for a revision of world macroeconomic thinking, revision of monetary policy, in the context of financial markets of 21st century.

2. WHICH MODEL WAS CONSIDERED TO CONSTRUCT THE KEYNESIAN CROSS MODEL?

In General Theory John Maynard Keynes did not build any Graphic Model, did not build any figure to reflect the conclusions of his ideas. He has done some analyzes and used some common mathematical formulas, often expressing the same indicator in two forms but interpreting them as two different indicators, or interpreting one indicator in both microeconomics and macroeconomics. We will analyze Keynes's General Theory in another study. Here we will focus on the models built by neo-Keynesians after him that have been in dozens. Neo-Keynesian models are constructed according to the judgments of different authors, in their own way of interpreting Keynesian concepts. Generally, they have taken into account Microeconomic models. They have extended concepts of microeconomics to macroeconomics, in a static way, according to the interests of the purpose they had to achieve, in support of the thesis they wanted to prove. Keynes did this first with analysis and some simple mathematical formulas, then he was followed by other economists with graphical models.

In Keynesian theory the main economic model is the Keynesian Cross Model, or the Simple Expenditure Model. The model assumes that when AD (aggregate demand) = AS (aggregate supply) the economy is in equilibrium, and this is reflected in curves I and S, when I = S the economy is in equilibrium. A number of other models derive from this spending pattern. From the Keynesian Cross Model is derived the Aggregate Demand Curve Model, in the AD-AS Equilibrium Model. Derived the IS Curve, in the IS-LM equilibrium model, according to D,F,S. Is derived the IS curve from the equilibrium of I and S according to the Hicks-Hansen Model. Is derived the IS-LM model from S-I and NX, according to Mundell-Fleming.

The problem is: where are based the other post-Keynes authors who built the Keynesian Cross Model? Were they wrong in relying on a production model? What are the features of this model? Why can't a consumption model be applied based

on a production model? What are the mistakes? Why can't interest rate impact autonomous investment, etc?

2.1 What is a CVP Model?

In our opinion, to building the Keynesian Cross is used the Microeconomic Model of Total Cost Curves, Total Income and Total Product. This is a mistake that has had negative consequences on economic analysis and conclusions, at all times, since its creation.

The Model of Total Cost Curves, Total Income and Total Product are analyzed on the topic Cost-Volume-Profit or CVP. This analyze is called; dead point analyze, break point analyze (BEP, Break Even Point) or parity point analyze. Here, in these analyzes are determined the reasons why it serves, and what are its advantages.

(Salvatore D, 1989. Pg.364). "Cost-volume-profit or dead-point analysis examines the relationship between total incomes, total costs and total firm profits at different levels of production. Cost-volume-profit or dead-point analysis is often used by business executives to determine the volume of sales required by the company at the point of death, and the total profit and loss at other sales levels ".

This model serves managers in their current and prospective work. Specifically through this analysis:

- Managers determine production units where total income equals total costs, where economic profit is 0. -To look how total costs vary in different production volume alternatives. - Determine for each unit of production the total income, total expenditure and total profit. - Determine the unit of production where profit is maximized, by the difference between total income and total expenditure. - Determine fixed unit costs, TFC /TC ratio, TC/TVC, DOL operating lever indicator, etc. - In terms of average costs determine price, production method, production structure, distribution channels etc. - Allows the firm to operate on a budget to meet production obligations. - The firm can compare income and expense indicators with those of other competing firms. - Allows the firm to continue the analysis by focusing on the most important items.

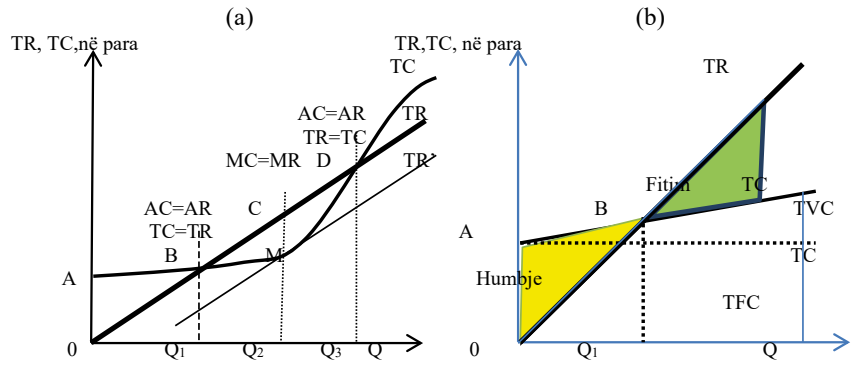
This model takes into account several definitions:

- The variable cost per unit (AVC) is assumed unchanged. It only changes if we add in the variable factors.
- Total Fixed Cost (TFC) is assumed unchanged for short-term.
- The product is supposed to be all sold.
- The price is fixed.
- Tax application is not considered.
- Market structure is taken as "Pure Competitive Market".
- The firm will produce only one type of product.

2.2 What is the BEP model from which the Keynesian Cross was built?

We construct the TR, TC curves related with Q to perform the Cost-Volume-Profit analysis (CVP = Cost-Volume-Profit).

Fig N_0.1 The curves of total revenue and expenditure. Break-Even-Point



Symbols are used in the diagram and formulas.

TR=Y=TotalIncome,TC=TotalCost,TFC=TotalFixedCost,TVC=TotalVariableCost, C = Total consumption expenditure for goods and services. Td = Direct tax. $\bar{G}$ = Autonomous government spending. $\hat{C}$ = Autonomous consumption expenditure. $\bar{A}$ = Total autonomous expenditure. $\bar{I}$ = Autonomous investment. BEP, dead point, breaking point. AD = aggregate Demand. AS = Aggregate Supply. G = Government spending as part of GDP. I = Total business investment. L = License, F = Fine. AR = Average Revenue, MR = Marginal Income, AC = Total Average Cost, AVC = Average Variable Cost. MC = Marginal Cost. MPC = c = Marginal propensity to consume. b, θ = Investment sensitivity coefficient against i. i = nominal interest rate. NBI = REPO = Base Interest Rate. IS = Investment and savings curve. The equilibrium curve of goods and services in relation with the interest. t = Tax rate. $\bar{(NX)}$ = autonomous net export.

In part (a) of the figure, on the Y-axis, are set the Total Costs curve (TC) and Total Revenue Curve (TR). On the X-axis are the output units (Q). Total Revenue Curve is for a Pure Competitive Market, where P = AR = MR. Total Revenue Curve in a Monopoly Market is a curve. Total Revenue Curve (TR) is not a right-angle halve, although it starts from the origin. The Total Cost Curve consists of, the Total Fixed Cost Curve (TFC) and the Total Variable Cost Curve (TVC).

TVC = costs that increase as production increases or decreases as production decreases.

TFC = all costs are included which do not change with the change of the product, do not increase with the increase and do not decrease with the decrease, they remain fixed.

TC = TVC + TFC. In Figure 1, point B and D are the points where TR = TC, where AR = AC, that is, total revenue equals total costs, average income equals average costs. At these two points Economic Profit is zero. These points are also referred to as points of indifference, or "Break Even Point" = dead point, parity point, break point, etc. At point B the economy separates from negative profit, while at point D separates from positive profit.

The firm that results in a positive profit must produce between point B and point D. Between these two points, there is the amount that the firm must produce to maximize its profit. This point is in that unit of production, where the difference between total revenue (TR) is greater than the amount of total expenditure (TC). This point coincides with the vertical segment, the longest between the two TR and TC curves. This point is found by subtracting a tangent to the expenditure curve (TC) parallel to the revenue curve (TR). This means that profit is maximized in that unit where Marginal Income equals Marginal Cost, or MR = MC. In this way the equilibrium of the firm is not set at point B or D, but is placed where the firm maximizes its profit, at point C, where the expenditure curve (TC) is further from the revenue curve (TR).

Part (b) of the figure shows the partial scheme of the BEP, only with point A. This part is separated to show that the Keynesian Cross, or the simple Keynesian Expenditure Model, which is a macroeconomic model, generalizes expenditure and income in economic scale, takes precisely in consideration this model, which is a Microeconomic Model.

What features does the CVP Model have?

1. It is a production model and not a consumption model; economic factors(labor and capital) are spent on a given production.
2. The Total Revenue Curve is not half angle of 90^{o}, but an ordinary slope curve.
3. The Y-axis reflects Total Revenues and Total Costs in cash, while the X-axis reflects units of production rather than cash.
4. The space from the X-axis to the point of intersection of TR with TC represents; on behalf of expenses, subtraction of total fixed costs and variable costs; on behalf of revenue, production multiplied by fixed prices.
5. In zero production units, there are fixed costs only, while in every other production unit there are fixed costs and variable costs. This means that output growth is not created by multiplying fixed costs by a multiplier. Here we can calculate an indicator, the amount of total costs in relation to fixed costs. Total costs over fixed costs give us total costs per unit of fixed costs. We can name this indicator as we like, but that does not mean that production is increased by turnover, but that production is increased by the increase in variable costs. So even at BEP (TR = TC) point there are fixed costs and variable costs.
6. In this model, where the firm results in profit, the total expenditure curve should always be below the total revenue curve. Absolutely TC should be smaller than TR.

It is precisely these features that make it impossible to apply this model to the equilibrium Keynesian model.

2.3 Defining the Concept of Fixed Costs.

It is very important to classify Fixed Costs by different authors. The classification of production costs is done in several ways. These definitions have evolved a little over time, as have the operations in accounting. The classics, the Marxists, the Keynesians, etc have spoken of the expense. For expenses studies and classifications continue till today. They are generally grouped: by the way they are spent on product costs, by surplus value, etc. We will present these concepts according to different authors, because interpretation is important in building graphs and in determining the unit where profit is maximized.

Marxists have analyzed expenditure in order to determine the source of the surplus value. They have defined living labor and materialized labor and have determined that the surplus value, or profit, derives from living labor and not from materialized labor. Materialized labor, in the form of tools and objects, is putted into production and exits from with the same cost. In this way the only source of profit is the living labor. Other economists differentiate expenditures into fixed and variable, where labor is included in both. This difference of expenditure grouping has its effect on the determination of the derived costs such as AVC, AFC and MC, on the basis of which a series of economic analyzes, are performed.

Below we will quote some authors. Their determinations on fixed costs and BEP.

Some authors call the point where the revenue curve intersects with the expense call the dead point.

"Level of income at the point of death: after referred to as the level of equilibrium income; the point at which consumer spending is exactly equal to income. This is often illustrated by the point at which the consumption function intersects the line at 45^{0} angle, in the income and expenditure model. Above this point consumption is lower than income, meaning savings: below this point consumption is greater than income, meaning non-saving". (Shim K.J. and Siegel J.G.1995. Pg. 39)

Death Point Analysis. "A technique used in evaluating a decision that takes into account sales income and costs and determines the level of sales at which the business will begin to profit. If this level is well below the expected level of sales, the decision is thought to be less risky than it otherwise would be." (A Dictionary of Finance and Banking. Pg. 54).

In another dictionary the concepts of fixed and variable factors are given, but the concept related with Macroeconomic is also given. Specifically: "The costs of producing a good can be divided into two main parts. FIXED COSTS are those that remain the same for the firm even though many goods are produced, e.g. fixed capital interest, factory maintenance, etc.

VARIABLE COSTS vary with the number of units of commodity produced, e.g. raw materials for goods, labor to produce them, etc. From a cost calculation point of view, the volume point of death is the one that provides coverage of all fixed and variable costs, given a given selling price.

It is precisely in this dictionary where is explained the pattern of turning this expenditure model into a Macroeconomic model of equilibrium between aggregate demand and aggregate supply.

The point at which consumption is exactly equal to income as illustrated by the point at which the CONSUMPTION FUNCTION intersects 45^{0} line of the INCOME-EXPENDITURE model. Below this point consumption is higher than income, which is a NON-SAVING

condition; above this point consumption is lower than income, which is a SAVINGS condition (The Myth Dictionary of Modern Economics.1992. Pg.44)

"Costs associated with fixed factors are called fixed costs. Fixed cost is the cost that does not change with the change in production." (Arnold S.R. 1998. Pg.156)

The point of death. "The product at the breaking point is the amount of product in which the total income equals the total cost such that the firm earns normal profit but not economic profit." (Orley & Amos. 1987. Pg. 414)

"The Keynesian Cross. The graph containing the Keynesian aggregate expenditure line is used to illustrate the balance between aggregate expenditure and national output. The Keynesian Cross contains the essence of Keynesian economics."(Orley & Amos. 1987.Pg. 242)

"Equilibrium. The situation in which opposing forces exactly compensate each other and there is no tendency for change. In macroeconomic terms, equilibrium is achieved when the aggregate costs of national production are equal to the amount of national product produced. .." (Orley & Amos, 1987.Pg. 242)

"Autonomous government purchases are purchases from the government sector that do not depend on the current level of production and national income..." (Orley & Amos,1987. Pg. 226)

"Autonomous investments are investment costs that do not depend on the current level of product and national income..." (Orley & Amos,1987. Pg. 214).

(Lipseey G.R, 1992 ,Pg.183). "They are those costs that do not change with production; they will be the same whether production is 1 unit or 1 million units. These costs often refer to "overhead" or "unavoidable costs". The specific of this determination is that Lipsey also determines the general expense group as part of the fixed costs.

(Henderson & Poole, 1991. Pg.250) "Total fixed costs are the costs of the opportunity of fixed inputs, such as structures and machines" . The authors in this definition state that fixed costs are the release on the cost of products of fixed inputs, so fixed costs are an expression of fixed capital.

(Roger A. Arnold. 1998. Pg.155). "Fix Factor, An input whose quantity cannot be changed as output changes in the short term.".

(Samuelson A.P, Nordhaus D. Ŵ.1855. Pg.462). "Fixed cost" represents the total of dollars spent that continues even to be spent when zero output is produced. This is a sunk cost that is completely unaffected by any change in Q ... Fixed costs (sometimes called "overhead costs" or "sunk costs", represent costs that the firm has to pay even if it does not produce any products." ... "Example "fixed costs" include bond interests, rents and directors' salaries." (Samuelson A.P, Nordhaus D. Ŵ.1855. Pg.478). Authors herein in fixed costs include sunk costs, in addition to overhead costs.

(Schiller R. B. 1986. Pg.416). "Cost of production that does not change when the rate of production is changed - e. g., cost of basic equipment". The authors relate fixed costs to enterprise equipment.

(Mankiẇ N.G, Taylor P.M. 2016. Pg.370). "Fixed costs. Some costs do not change with the amount of output produced. They are caused even if the firm does not produce at all "..." costs that do not change with the quantity of product produced ".

(Brue McK.2002. Pg.421.). "Fixed costs are those costs that do not, in total, change with changes in production. Fixed costs are associated with the very existence of a firm and therefore must be paid even if its output is zero. Such costs are rent payments, interest on a firm's debt, part of the depreciation of equipment and buildings, and insurance premiums; they do not increase even if a firm produces more." The author, besides defining the concept of fixed costs, also gives some concrete names of these costs.

(BROŴNING K.E & BROŴNING M.J.1986. Pg.196). "Total Fixed Costs (TFCs) are the costs incurred by firms that do not depend on the output to be produced. These costs are associated with fixed factors of the firm that cannot change in the short term, usually machinery and equipment. They include return of own capital (depreciation), fire insurance, property taxes". In addition to the general concept of fixed costs, the author gives concrete examples of them.

(FRANK H. R. 1994. Pg.350). "The fixed cost does not change in the short term from the change in production level. ... Other examples of fixed costs include property taxes, insurance payments, interest on loans, and all other payments that the firm has contracted in the short term that does not change with production change".

(Bernier B, Vedie Louis H. 1995. Pg.76). "Fixed Total Cost. It is the sum of the costs that do not change with production, for example all capital-related costs (depreciation, interest, insurance, taxes, etc".

(Stiglitz J.1999 .Pg. 185). "The costs associated with factors that do not change with the change in production are called fixed costs". Firm will also pay: "If it does not produce or produce at maximum capacity, the firm faces the same fixed cost" .

The conclusion of all citations by various authors is: Fixed costs represent fixed factors. There is no production without fixed cost. Fixed costs are not an aim in themselves, but they are transformed into production. They are made to produce a particular product and not to consume, not to annihilate a particular product. From them is realized production, is not consumed production. It is the production first to assume this type of expenditure, no matter how it discharges its value into production. Fixed costs are those costs that do not change with the change in production. Fixed costs exist, in the same magnitude, for certain periods of time - until the full value of the facility or machinery is discharged. Fixed unit costs represent the discharge of total fixed costs in the form of quotas for a given period of time. Fixed costs are passed on production by being discharged over the amount of units produced, over periods of time that have been determined. Thus, the more units of production are realized, the lower the fixed unit cost. In this way the cost of the product generally reduces the fixed cost as well. In this group fixed costs for a given period (usually 1 year) are mentioned; annual depreciation quota of production buildings, depreciation quota of machinery and equipment, insurance quota, property taxes, land taxes, taxes and obligations excluding income taxes, annual interest rate quota, annual payment quota for Television, cleaning quotas, Chamber of Commerce registration quotas, non-production fixed administration salaries, marketing quotas, production-inde-

pendent contract quotas, sunk costs, external consultants when not affiliated with sales, different rents, heating costs, usually central, etc.

All these, and others of this nature, are collected and discharged onto production units. The quantity Q where TR = TC is found by the formula:

$Q = \frac{TFC}{P-AVC}; unitQ = \frac{TFC}{P-AVC}; unit$ This formula is derived from the equation TR = TC. We break down total revenue and expenses and we will have TC = TFC + TVC. TVC = AVC * Q and TR = P * Q. Q * P = TFC + AVC * Q and beyond Q * P-AVC * Q = TFC, Q (P-AVC) = TFC. Here TR and TC are expressed as a function of production, one through price and the other through a variable average cost. Such an expression is normal because it is a production process. Here is the total cost with fixed and variable costs. There is no gap to insert any other elements. If we divide side by side with Y = TR we get Y / Y = TFC / Y + TVC / Y, 1 = f + v. *This indicates that the realization of the revenue unit requires fixed and variable expenses, in certain ratios, f and v.* The question is Can the product be realized by eliminating one of these cost groups? The answer is no. If we exclude fixed costs or variable costs there is no production.

Production cannot be accomplished by simply multiplying the fixed costs by a multiplier.

The work in this model is a factor that materializes other factors in the value of production, in the utility of goods. Labor cannot be replaced as a factor in product creation, with consumer spending as a factor in eliminating the product. L (expense for purchasing labor) is different from C (expense for consuming finished goods). In this paper we will argue why L is different from C.

The production curve starts from the origin of 0. Thus the firm begins the activity with a loss. Constantly increasing variable costs increases production. In this way, the increase in variable costs increases production by materializing fixed costs into realized output. Without variable costs there is no production, there is no production growth, consequently no income. They grow steadily until the firm maximizes its profit.

The firm's expenditure curve cannot represent the aggregate expenditures or aggregate demand curve. It represents the amount of expenditure needed in each production unit to achieve a certain level of income. This curve is below the revenue curve. If it is high as in the first part, up to BEP, the firm loses.

3. How is the Simple Keynsian Spending Model constructed?

D, F, S aim to build the model of an equilibrium economy, considering it as a point of equilibrium, the point where the Aggregate Demand Curve (AD) intersects the Aggregate Demand Curve (AS). At this point where total expenditure equals total revenue AE = Y, also I = S. In building their model they were based on the Simple Keynsian Spending Model, or the Keynsian Cross. This model was built before them by Dillard[8] and Hansen[9].

8 Dudley Dillard(1913.-1990, 77 years). His main book, "The Economics of John Maynard Keynes," (1948).

9 Alvin H.Hansen. (August 23, 1887 – June 6, 1975), contributions to IS-LM model.

Some abstractions have been made in the construction of the Simple Keynsian Expenditure Model.

- Equal: Gross Domestic Product, GDP = GNP = Gross National Product, GNN = National Income, NI = Personal Income, PI. All of these indicators are marked with Y. With Yd the Personal Income Available is marked. It is obtained by subtracting the total revenue Y- (Td (direct taxes) + L (patent licenses etc.) + G (fines). Yd, by model, is the income that can be spent on consumption and savings, or on consumption and investment.
- Government expenditure is assumed autonomous and is denoted by $\bar{G}\bar{G}$.
- Investment costs are assumed autonomous and are marked with Ī.
- The EX-IM external sector has been eliminated.
- The monetary market, labor market, foreign market, etc. have not been taken into account.

D, F, S have included in this simple model, the effect of monetary policies, by incorporating the interest rate, turning Investment from an autonomous aggregate to an interest rate dependent aggregate. The material will also analyze the investment group, which is the basis of building the IS-LM Equilibrium Model.

3.1 What is the way of building IS curve, from D,F.S?

The authors emphasize "From equation (2) we see that an increase in the interest rate reduces the aggregate demand for a certain level of income, because a higher interest rate reduces investment costs. Note that $\bar{A}\,\bar{A}$ which is unaffected by aggregate demand, income level or interest rate, comprises a part of investment expenditure, and precisely $\bar{I}\bar{I}$. As mentioned earlier, $\bar{I}\bar{I}$ is the autonomous component of investment spending, which is independent of interest rate (and income)". (Dornbusch - Fischer-Startz, 2011). In their conclusions the authors are based on the relationships of the following indicators:

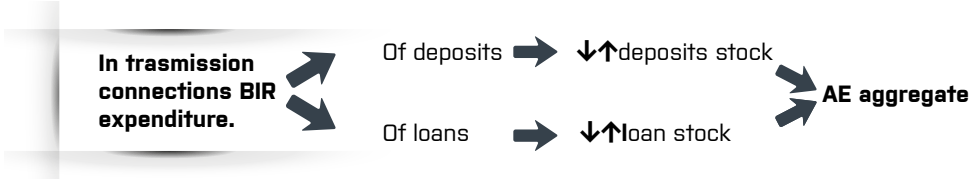
$$AD \equiv C + I + G + NXAD \equiv C + I + G + NX \text{ (equation 2)}$$
$$= [\bar{C} + c\overline{TR} + c(1-t)Y] + (\bar{I} - bi) + \bar{G} + \overline{NX}$$
$$= [\bar{C} + c\overline{TR} + c(1-t)Y] + (\bar{I} - bi) + \bar{G} + \overline{NX}$$
$$= \bar{A} + c(1-t)Y - bi = \bar{A} + c(1-t)Y - bi$$

By making this assertion on autonomous investments $\bar{I}\bar{I}$, the authors detach these investments from the growth of National Income, that is, from the growth of Gross Domestic Product. This implies that both GDP growth and GDP decline will not affect autonomous investment, so even if the stock of investment increases as output increases they will not change. They are also detached from interest rate dependency. This assumption on the independence of autonomous investments from interest rate disconnects them from the effect of central bank policies operating in the monetary market through the Base Interest Rate (BIR or REPO, repurchase agreements). Thus any decrease or increase of the BIR will have no impact on the increase or decrease of the Autonomous Investment $\bar{I}.\bar{I}.$ Its action may have an im-

pact on increasing or decreasing non-autonomous or general I investments without including autonomous investments. (Orley M. Amos, Jr.1987. Pg.214). "Autonomous investment is investment expenditure that does not depend on the current level of national income and production.".

In this way, every action of the Central Bank will have an effect on the commercial banks' interest rates, the deposit rate in All and the loans rate in All, but not on autonomous Investments. BIR decrease from Central Bank's will either increase or decrease the Deposits stock (savings) but will also decrease the interest rate on loans in All, resulting in an increase in the annual stock of loans (investments) in general. Increasing these investments will affect production growth. In this way, the Central Bank does not directly affect the growth of loan stock but indirectly, through the transmission effect, from the *BIR to i* and consequently to the loan stock.

The use of loans for direct investment is one of their uses because they can be used in other non-investment related ways. This, of course, will also affect the extent of economic growth.

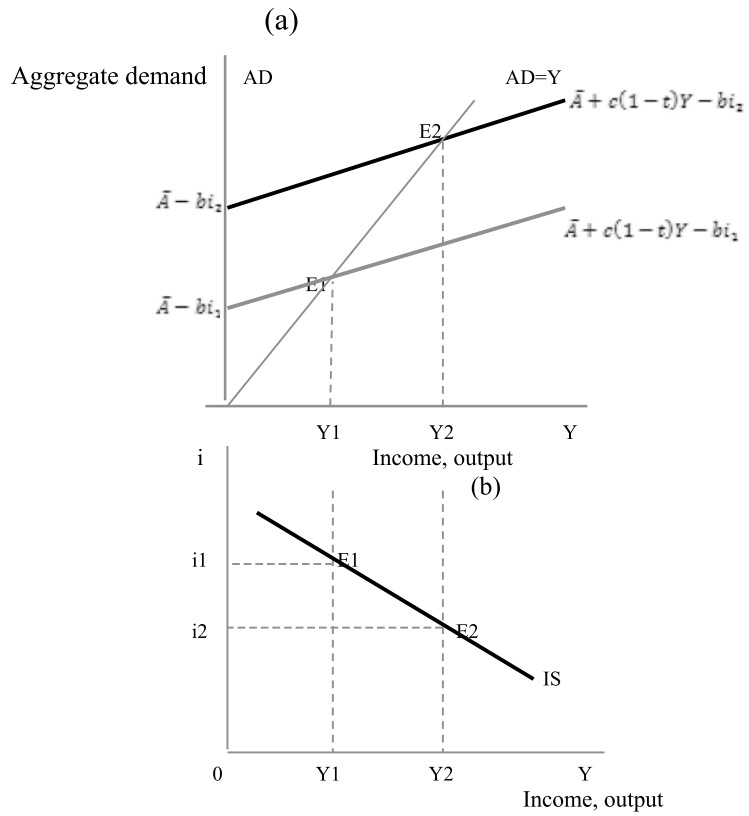


This reflects the relationship between the two policies, the policies of the Central Bank that are related to its objective of "achieving and maintaining price stability" and, on the other hand, the policies of the Commercial Banks, which are related to maximizing their profits. In this way, Commercial Banks do not always reflect, and to the same size, the change that the Central Bank makes to the REPO rate. Commercial Banks aim for their objectives and not the objectives of the Central Bank, aim at maximizing profit, expanding product markets, etc. Commercial banks decrease the interest rate on deposits more than they reduce the interest rate on loans. They maintain the magnitude of the difference between these two interest rates because it is directly related to their profits.

In the Albanian monetary market, the euro and the dollar circulate freely, covering for over 50% of total deposits and loans. Given this position and the government's need for money to cover its deficit, Commercial Banks are destined for the money, buying government debt instruments, Bonds. In this way they are less interested in decreasing the interest rate on loans in All. The interest rate on loans in euro is much lower than the rate on loans in All. This also derives from the European Central Bank Interest Rate which is less than 1.

The authors (Dornbusch-Fischer-Startz, 2011) construct this figure, which is also the IS model:

Fig.N$_0$.2 Derivation of the *IS* curve.



The figure, by the authors, was constructed by this judgment:

"For a given level of interest rate, let's say i_1, the last term of equation (2) is a constant (bi_1) and in Figure 10-5a, we can draw the aggregate demand function... but this time with an ordinance at the origin $\overline{A} - bi_1 \overline{A} - bi_1$. The equilibrium level of income earned in the usual way is Y1 at point E1. Since the level of income equilibrium is derived for a given level of interest rate (i_1), at the bottom of the figure we plot this equation (i_1, Y_1) as point E_1. This gives us a point, E_1, on the IS curve, that is, a combination of interest rate and income that cleans the commodity market." (Dornbusch-Fischer-Startz, 2011)

Once the authors have fixed this point, above the IS curve, as the equilibrium point, they ask to construct another equilibrium point. This leads them to merge the two and form the IS curve.

They find the other point of equilibrium using the interest rate. Here comes another question. Which interest rates will consider, the Central Bank BIR = REPO or ***(i)*** nominal of Commercial Banks? Given this rate we cannot include all the elements of the two curves in a graph, in a model. In our opinion, the BIR, which expresses the Central Bank's policies towards the monetary market situation, should be taken into

consideration in order to achieve its main objective of "achieving and maintaining price levels". D,F,S considers the nominal interest rate. i (nominal interest rate on loans) of Commercial Bank's is a reflection of the Central Bank's BIR but related to the narrow interest of Commercial Banks, which aim the profit.

However we take into account what the authors have taken, the decrease of ***i*** affects the increase of the loan stock because it makes them less expensive. This decrease in ***i*** does not affect I Autonomous Investments, because they are not related to interest rate and income, as the authors pointed out above, when giving the concept of autonomous investment. In this way overall investments can be increased but not autonomous investments. The authors contradict the concept given by them. They said that it does not depend on the interest rate, while in determining the equilibrium point they get it dependent on the interest rate. While building the figure, they have linked autonomous Investments to the interest rate because they point out that when interest rates decreases Autonomous Investments $\bar{I}\bar{I}$ and consequently the AE aggregate expenditure curve shifts up. Its shift upward leads to an increase in Income or GDP. Specifically they point out:

Consider a lower interest rate, i_2. Investments are higher when interest rate decreases. In terms of Figure 10-5a, this implies a high displacement of the aggregate demand curve. The curve shifts upwards because the cutoff point $\bar{A} - bi\,\bar{A} - bi$ is increased. Given the increase in aggregate demand, equilibrium shifts to point E_2, with a level of income associated Y_2. At point E_2, in panel (b), we note the fact that the interest rate i_2 implies the level of income equilibrium Y_2 - equilibrium in the sense that the commodity market is in equilibrium (or that the commodity market is cleared). Point E_2 is another point on the IS curve." (Dornbusch-Fischer-Startz, 2011).

These points that are constructed in this form according to the authors express the same relationship: the relationship between interest rates and income, when the goods and services markets are in equilibrium. In this way they build the equilibrium curve of the IS goods and services market, including monetary policies.

Interestingly, another author's (Jose De Gregorio) interpretation has the effect of monetary policy on the growth of I and the shift of its high curve. "Marking at r the real interest rate, IS corresponds to the set of points (r, Y) at which the commodity market is in equilibrium, ie, output (Y) equals total demand (A). Given that the investment depends on the real interest rate, the IS will be determined by the following relationship: $Y = \hat{C} + c(Y - T) + I(r) + G$. On the right side we have the demand for economy goods and on the left side production. Since they are equal in equilibrium, we can assume a relationship between the product and the interest rate "(De Gregorio J.2012. P. 507). The author gets the investments dependent on the interest rate. The same is true of Felix Jimenez. "The relationship between the product and the interest rate is negative. "[...] A higher interest rate reduces investment costs, so a lower savings stream is required to maintain a balance between savings and investment. Accordingly, it will be necessary to lower the product in order to restore equilibrium in the commodity market "(Jiménez F. 2006, p. 415).

The Keynesian Cross model has also been used by other authors to create the AD-AS model. Mention here Colander. Colander derives the aggregate demand curve AD precisely from the Keynesian Cross model. He uses for building the model, wealth effect, interest rates and foreign trade. Does not make any use of any concrete variable. It derives the AD curve with a negative slope. This Colander model is also wrong in my opinion because increasing the amount of money in circulation increases the price level and does not decrease it. Expansionist policies increase the price and do not reduce it. In this way, the increase in prices has the same impact on GDP as decrease of interest rates. The increase in prices is associated with GDP growth and the decrease in interest rates is associated with GDP growth. Colander in the model, also gives the multiplier effect. In this way, not only autonomous spending but also the size of the multiplier will affect GDP growth. This effect is also in the case of the Model applied by D,F,S. It is therefore necessary to give consideration to the multiplier.

What are the disadvantages of the Keynsian Cross Model, that makes it invalid.

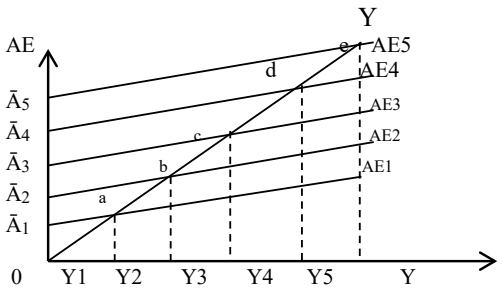
1. The Keynsian Cross model is an expense model based on a production model. Say makes this definition for the production process and for the consumption process: "just as production is an exchange which is made from the cost of production to a product, consumption is the exchange which makes a product to a pleasure" (Say JB 1803). Pg. 13.Book 3). In this way, these are completely opposite processes. The product cannot be created from destruction, much less, to grow from the function of money as a means of exchange, or as an intermediary.

2. Compared to the BEP Model; the output is not set on the X axis. On the Y-axis there is no total revenue and expenditure relative to production units. In this model Aggregate Expenditure (AE) is placed on the Y-axis and aggregate income is placed on the X-axis (real GDP). The bisector represents the equilibrium curve, with Y = AE at each point. In this model, the sbisector represents GDP expressed by expenditure (Y-axis) and income (X-axis).

3. The angle bisector is taken as the Aggregate Income curve. The aggregate expenditure curve starts, just like the fixed expenditure curve, over the Y. In this way, after the breakpoint, the Expense curve is always below the Income Curve.

This means that autonomous spending must always be increased to balance earnings. It is here that the peculiarity of this theory, of its survival over 80 years, lies. This model justifies autonomous spending, justified government spending, justified loans, justified debt, justified PPP agreements, justified concessions, etc. This growth mode is shown in figure Nr. 3. In this figure, autonomous spending has steadily increased, as the only way to increase production.

Fig. No.3 Economic growth in the Keynsian model



Source. author

On the X-axis Y revenue is set, on the Y-axis are AE costs and autonomous costs Ā, for 5 cases. Cutting the AE curve with Y (which represents the half-angle) the income is equal to the expenditure, and the economy is in equilibrium. This way balance is always achieved by increasing autonomous spending. In this model MPC (marginal propensity to consumption) is assumed unchanged and less than 1.

4. The division of total income is only made into two groups C + S (consumer spending, plus savings) and C + I (consumer spending, plus investment spending). Consequently, in equilibrium, it equals S. Investments are called inflows while savings flow.

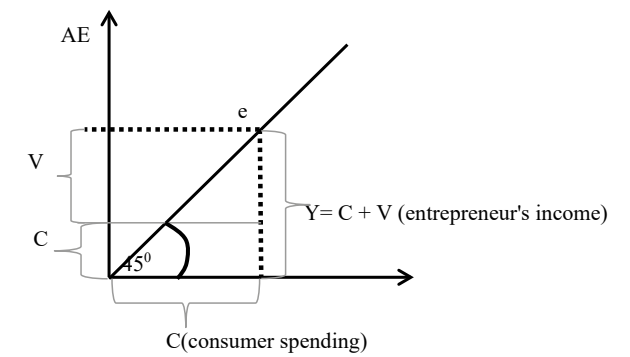
Some considerations on saving. The annual income received by economic entities is not only divided into consumption for final goods and services and savings. They go in many other directions as well. They go for investment; in debt instruments, in securities, in bank financial and non-bank financial companies, contributions to various charities, for gifts, etc. From the banks they go for direct investments in production, investments in securities, investments abroad, etc. In this aspect, also saving, which includes many voices, is a delayed consumption or a delayed investment, for the growth of the economy or in the unreal product. "What is saved every year is consumed as regularly as what is spent every year, and almost at the same time; but is consumed by a different group of people. . "... Consumption is the same, but consumers are different" (Smith A.1997.Pg.112). In this way, saving is a flow, just like investment, but a stream of redistribution. The investment is materialization directly from the firm, while the savings go to the investment with the intermediary of the bank or other entities. In this way investing and saving are both inflows and not outflows. Saving is not an immediate investment and not by investors but by users.

My concept of inbound and outbound is different. I consider the outflow of currency outside the territory, regardless of destination of use, and I understand the flow of currency from outside the territory, no matter what its destination.

In the relation between C + S and C + I we will mention some definitions of J. Keyns. Note carefully, in both of these amounts we have C (consumption costs). "Consumer spending during any period should mean the value of goods sold to consumers during that period, ..." To the best of my knowledge, everyone agrees that saving means exceeding income over consumption expenditure (Keynes MJ 1997). Pg.56). "After we have already defined income and consumption, the determination of savings, which is the excess of consumption income, flows by itself" ... defines current investment as ... "current real capital addition" ....."Is equal to what we just described as savings". "This for the period represents that portion of the income that was not used for consumption." (Keynes M.J. 1997. Pg.57). "While - says Keyns - the amount of savings is the result of the collective behavior of individual consumers, and the amount of investment is the result of the collective behavior of individual entrepreneurs, these two amounts are necessarily equal, since each is equal to the excess of income to consumption "(Keynes M. J 1997. Pg.57). It connects consumption with both expenditure and revenue, so it connects both consumers and producers. This is a completely wrong designation, because when we talk about investment, in relation to entrepreneurs, we mean spending on economic factors. With investment, as a factor, it is not consumption but the labor force, the cost of labor force that the entrepreneur has used in production, or living labor as Marx has pointed out."So, in the work process, human activity through the work tool makes a predicted change to the object of work. The process disappears into the product .... Work is joined to its object "(Marks K. 1976.Pg.248). So the work process ... "is an activity aimed at creating value for use, it is an adaptation of natural elements to human needs ..." (Marks K. 1976. Pg.251). In this way, we do not have equal amounts on both sides. In production, there is an expense of factors, a creation of consumer goods, and a consumption expense of consumption of goods, disposal, or value utilization.

The income generated by the sum C (constant capital) + V (variable capital) yields Y. This is a consumption commodity which at "equilibrium" = BEP equals the cost of acquiring it, that is, C. In this way (C + V) of the entrepreneur = Y = C (consumer spending). This way, we cannot create equations such as C + I = C + S. These equations are tautologies, which will be the subject of another study. As we said above we can build this model(F.4).

Fig. No.4 Simple model of equilibrium, production and consumption

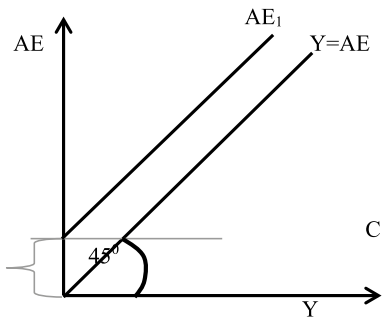


Source. author

This figure clearly shows that; the whole product goes to market, and its costs include fixed costs and variable costs.

5. According to the Model, the slope of the exenditure curve is given by the Marginal Propensity to Consume (MPC). The MPC indicates how much ALL will go for consumption of the additional 1 ALL of disposal personal income. This means that the larger the MPC the higher the output by increasing autonomous costs. If we take the marginal propensity to consume 1, the expenditure curve will be parallel to the bisector, with no cut-off point. So where will the equilibrium between expenditures and income be? According to the model the product growth will be infinite. Could this be the case? Taking MPC unchanged, the only factor contributing to the growth of the economy is autonomous expenditure. Is this true? Graphically this situation is shown in Figure 5.

Fig. No. 5. Keynsia model when MPC = 1



Source. author

According to the DSF "...Thus, the equilibrium level of production is higher, the greater the marginal propensity to consume, c, and the higher the level of autonomous spending, Ā." (DSF Macroeconomics 2011, Pg 201)

6. At the base of this model is an indicator called Multiplicator. This is a misinterpreted indicator. Money in circulation plays its role as an exchange vehicle and accelerates sales. Money is not a cause, money is a consequence. It is not true to say that "there is no production because there is no money", but it is true to say that "there is no money because there is no production". Money is a consequence, not a cause. "So when we say: Selling doesn't go because money is scarce, we get the money for the cause; is a mistake due to the fact that almost all products are selected in currency before being exchanged for other goods... "We should not say: Selling does not go well because money is scarce, but because it is other products" (Say B.J. 1803. Book 3. F. 124)

Money eliminates double coincidence. But this function does not mean that it multiplies output. Money serves as a lubricant to accelerate the movement of goods. Different authors have compared the multiplier to V (velocity of money). "The values

of the multiplier in Keynesian equilibrium turn out to be closely related to the velocity of money circulation." ... "These results show that the Keynesian coefficient is only a projection of the velocity of money with a rate of magnification at a given time scale. So they can agree and replace each other to some extent"(Yougui Ŵang, Yan Xu, Li Liu·2010).

The multiplier is a mixture of two models, the consumption model C + S with the production model C + I.

The multiplier is calculated as a ratio of 1 / s, or one above the Marginal Propensity to Save. This equals 1-MPC (c) = MPS (s), 1 - c = s, c + s = 1, which means that Marginal Propensity to Consume (MPC) plus Marginal Propensity to Save (MPS) give one . That is, we have consumption and savings units for an additional 1 lek of income. Even APS + APC = 1, which means average propensity to save plus average propensity to consume give one.

In the Keynsian cross according to formula 2, of topic 3.1 we have (D.S.F. Macroeconomics 2011): Autonomous costs Ā = Ĉ + Ī + Ḡ. In the equilibrium condition AE = Y (aggregate expenditure equal to aggregate income). AE = Ā + cY, Y = Ā + cY. Y-cY = Ā, further Y (1-c) = Ā. Here Y= $Y = \frac{1}{1-c}\bar{A}Y = \frac{1}{1-c}\bar{A}.\frac{1}{1-c} = \frac{1}{s} = M\frac{1}{1-c} = \frac{1}{s} = M$. The M multiplier multiplies autonomous costs and gives us increased output, the new level of equilibrium.If you add equal parts to equal parts the equation does not change. So we can write:

$\Delta Y = \frac{1}{1-c}\Delta\bar{A}$, (D.S. F Macroeconomics 2011. Formula 13. Pg. 201) $\Delta Y(1-c) = \Delta\bar{A}$, $1-c = \frac{\Delta\bar{A}}{\Delta Y}$

$\Delta Y = \frac{1}{1-c}\Delta\bar{A}$, (D.S. F Macroeconomics 2011. Formula 13. Pg. 201) $\Delta Y(1-c) = \Delta\bar{A}$, $1-c = \frac{\Delta\bar{A}}{\Delta Y}$

.

The ratio $\frac{\Delta\bar{A}\Delta\bar{A}}{\Delta Y\Delta Y}$ according to the Keynesian model should give MPS = s (Marginal Propensity to Save). This report does not give this result, MPS (s) = $\frac{\Delta S\Delta S}{\Delta Y\Delta Y}$. This ratio $\frac{\Delta\bar{A}}{\Delta Y}\frac{\Delta\bar{A}}{\Delta Y}$ has no relation to saving, as it gives the ratio between autonomous expenditure per lek of aggregate income, or national income. Thus with this equation the whole model falls. $\frac{\Delta S}{\Delta Y} \neq \frac{\Delta\bar{A}}{\Delta Y}\frac{\Delta S}{\Delta Y} \neq \frac{\Delta\bar{A}}{\Delta Y}$,S is related to income, while autonomous expenditure Ā is not related to income. The multiplier, according to this report, shows the amount of GDP per unit of autonomous spending. "The genuine meaning of Keynes's multiplier is that of a requirement, which indicates the quantity of the national income that is needed for the realization of one unit of investment".

3.2 How is the autonomous I and total investment graph constructed, according to D-F-S?

We proved above that the Keynsian cross model is incorrect. Now we will prove that even the investment curve is modeled incorrectly.

We look at the Keynsian model linked to the interest rate.

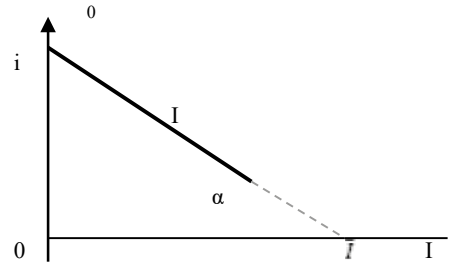
According to the authors, autonomous investments are considered as "$\bar{I}\,\bar{I}$ now means autonomous investment, that is, investment costs that are independent of both of income and interest rate". (Dornbusch-Fischer-Startz, 2011) .224. Explaining this they emphasize beyond" Now we add investments, government expenditure

and taxes, and foreign trade to our model, but we presume for the moment that each is autonomous, that means that it is defined outside the model and assumed to be independent from income. . "199.

The authors give the investment function $I = \bar{I} - biI = \bar{I} - bi$, where i is denoted the interest rate and b the sensitivity (response) coefficient of the investment to the interest rate. According to this equation, the smaller b and the greater i, the lower the investment demand and vice versa, the smaller i and the larger b- the greater will be the demand for investment.

The investment curve has a negative slope, which means that the lower the interest rate, the higher the return on capital stock and consequently the higher the demand for investment. The investment curve is as follows:

Fig. N$_0$.6 The investment curve



According to the authors, the Investment Schedule (I) shows the planned level of investment at each interest rate.

In this case tgα = b, gives the slope of the curve or the size of investment response from the change of interest rate. If b is too large for any i (loan interest rate) investment curve will tend to become very flexible. If b is small, the curve will be inelastic, so it will tend to be vertical to the X-axis.

The change in autonomous investment shifts the I investment curve, when I increases the I curve shifts to the right, and when I decreases the I curve shifts to the left.

Look here, the authors consider Autonomous Investment the investment stock required by various economic entities when the interest rate is zero. Many other authors do this as well.

Does this determination stand? This statement does not stand because the zero interest rate is a fixed rate like all others. Time has shown, especially after 2008, that interest rates can reach minus points. In this way it is not the same, and even more to equate Autonomous Investments, which do not depend on the interest rate and Investments with interest rate 0. *This is an inaccuracy of the authors.* Putting autonomous investment on the Y-axis, as it happens with the creation of the IS curve, means that the interest rate is taken 0.

The other inaccuracy in this case consists of the size of Autonomous Investments. Autonomous investments $\bar{I}\,\bar{I}$ are considered as the maximum of investment

spending opportunities. According this curve there cannot be greater demand for investment, and this is precisely determined by the zero interest rate. The zero rate is seen in this case as the limit of investment opportunities.

This finding is not true. It is untrue because the interest rate on loans is lowered by commercial banks when there is no demand for loans, so when the loan requirements are very low they are stimulated precisely by lowering their interest rate. In this way there can be no limit to the amount required by banks at zero interest rate. The maximum can also be achieved in cases where the interest rate on loans is relatively high, and this depends on the size of business requirements, the development of the economy. When the economy is in a potential product, and the status quo needs to be preserved, loan requirements in particular periods are very small, going to zero, though the banks stimulate them with very low interest rates.

This happened in Europe after 2008 when the European financial crisis came to light. The interest rates of the Securities decreased to zero and with a negative sign. They decreased in the Scandinavian countries and in Italy. The lack of sensitivity when the rate goes to zero is explained by the elasticity coefficient.

Coefficient of elasticity. An important indicator that shows the effect of interest rate on growth of loan stock is the elasticity of loans from interest rate. Lowering the loan rate to zero does not mean that businesses will become more interested in attracting more loans. This because;

The amount of loans depends on two factors.

- First, the needs of economic entities for loans and
- Second, there are the citizens' needs for loans for residential apartments or other interests.

If the economy is in potential product, the economy needs for loans are not large, so they are able to provide output growth as a function of population growth, as well as the need to apply new technologies. This is observed in Western European countries, where loan requirements are low. Although interest rates fell near to zero in 2008, this rate did not have a significant impact on loans growth. Interbank lending was stimulated, and debt instruments with negative interest rates again had no appreciable impact. In this way, loans determinant are firstly the needs of the economy and the conditions of the loans, as well as their interest rates by type.

In developing countries where the needs of economic entities are high, there is more demand for loans and consequently higher interest rates. But even in these countries if rates fall to zero, stimulation has little effect as the elasticity coefficient goes to zero.

The idea that loans will grow by lowering their interest rate to 0 is not correct. There is a certain limit below which even if it goes down there is no impact. In this way the curve becomes very inelastic. This generally leads to the "Liquidity Trap" which means that the monetary policy transmission effect of the Central Bank is lost. Lowering Repo rate have no effect on deposit and investment growth or have only symbolic effects. This effect has occurred in the Albanian economy in certain years.

We take specifically the Albanian economy, using the Investment Indicator in Lek, and the interest rates in Lek loans as well as the REPO rate;

Table N_0.2 Loans in All, REPO, Loan Interest Rate in All and their Elasticity Coefficients.

	Loans All	REPO in %	Interesit rate on loans %1	ε	ε
2008	114,051.9	6.25	11.11	REPO	i
2009	140,479.9	5.25	12.04	-1.448	1.557
2010	157,197.30	5	11.29	-2.499	-0.833
2011	188,779.10	4.75	11.17	-4.018	-8.371
2012	215,122.70	4	10.28	-0.884	-0.745
2013	219,933.00	3	9.52	-0.089	-0.118
2014	233,443.00	2.25	7.66	-0.246	-0.099
2015	240,793.90	1.75	7.79	-0.142	0.545
2016	259,547.60	1.25	5.89	-0.273	-0.072
2017	273,261.90	1.25	5.98	xx	0.734
2018	268,872.20	1	5.65	0.080	0.061

Source. Bank of Albania and Authors

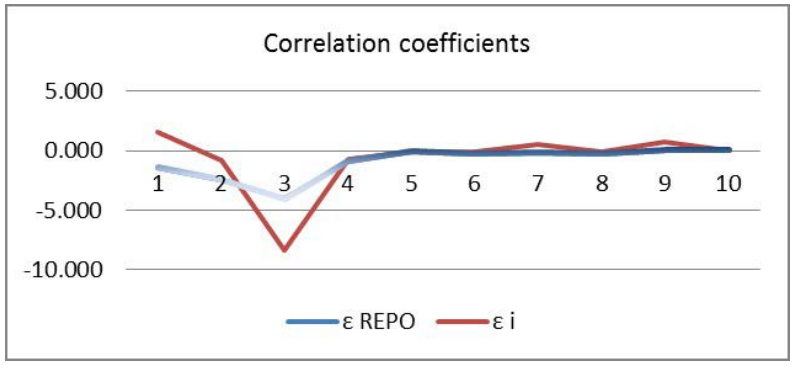


Fig.N_0.7 The dynamics of correlation coefficients.

Source. Authors

These data clearly show that the reduction of the loan interest rate to zero has no significant effect on the growth of credit stock. So the idea that we have a maximum loan in the interest rate of 0 is incorrect. The maximum may even be at a higher interest rate. From the analysis of the table data we draw the following conclusions:

-The loan elasticity coefficient with REPOs from 2013 onwards is less than 0.27, and in 2018 it is with the plus sign which means that the REPO rate has decreased, and the loan level has also decreased.

- The elasticity coefficient of interest rates of loans in lek compared with loan stock from 2013 is less than 0.1. In 2015, 2017 and 2018 it is with positive sign. This means that lowering the interest rate has led to a decrease in the level of loans, or an increase in the interest rate has led to an increase in the loan stock.

Finally the use of investment in the Keynsian cross creates a number of problems.

= When expenditures increases, it is not necessary to increase income as well, so shifting the curve upwards is not necessarily always going to affect income growth.

= Not all expenditures are directly related to production growth. When expenditures related with investment increase, production does not increase immediately because production requires a certain amount of time, especially agricultural production and seasonal production. There is not always a consistency of working time with production time.

= bi_1 is taken constant by many authors? bi_1 is not constant, it is constantly changing.

= Zero interest rate is not the end point of investment interest rates.

= Interest rate 0 does not assume the maximum planned investment demand.

= Investment is discharged on production in the form of interest quotas.

As described above, the Investment Curve has the following characteristics:

Loans that commercial entities withdraw from Commercial Banks have interest rates that range from minus rates to zero and positive rates, as such they have curves that depend on these interest rates. In this way, the Loan Curves obtained from Commercial Banks have always a negative slope, positive slope or are completely inelastic when there is an unchanged interest rate.

This is absolute. In this way, when building the investment demand curve associated with bank loans, we should never associate it with an minimum or maximum autonomous as it is done today.

= The total investment curve is represented by three segments.

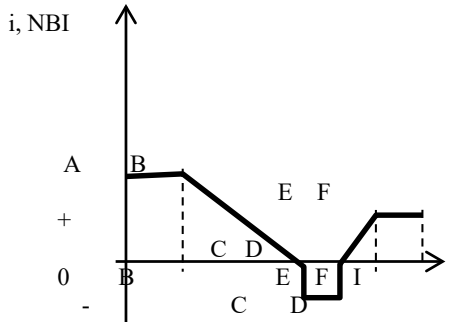
Horizontal segment (AB, CD and EF), are segments of investment with fixed interest rate, with horizontal curve. This curve shows that Entities and Banks have similar interests at this rate. These interests are generally consistent with the objectives of the Central Bank.

The negative slope segment (BC) represents the investments with a falling interest rate. In decreasing interest rates of investment we consider that there are four reasons.

- First, the reduction of economic entities' demand for loans.
- Second, finding other investing destinations of money, besides loans.
- Third, the reduction of REPO interest rates when the Central Bank verifies that the Inflation Rate is below the lower limit set by it.
- Fourth, the presence of currency in the monetary market, which consitute about 50% of loans and deposits.

The vertical segment (DE) represents that part of the graph when interest rates increase as loan demand increases. This is the case in cases of economic growth, especially in developing countries.

Fig.N_0.8 Loan Demand Curve (Investment)



Source. author

On the Y axis is the interest rate of commercial bank loans and at the same time BIR = REPO. The latter is used because it enables the graphing of all the curves we require to construct the I, S, and IS-LM models.

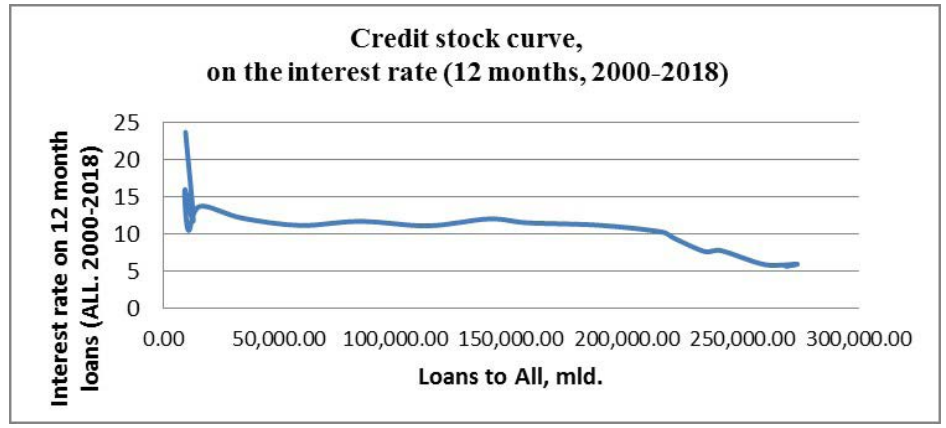
In the Albanian economy, there is not always a negative relationship between the interest rates on lek loans and their stock. This is shown in Table No.2.

Table No.2 Stock dynamics of loans (mld All) and interest rates (12 months)

	Loans,mld, All	Interest rate on 12 month loans (ALL)
2000	9,500.00	23.7
2001	12,810.00	11.9
2002	9,221.88	16
2003	10,700.91	10.52
2004	15,694.05	13.73
2005	33,720.63	12.16
2006	59,156.50	11.16
2007	84,836.43	11.73
2008	114,051.89	11.11
2009	140,479.85	12.04
2010	157,197.30	11.52
2011	188,779.10	11.17
2012	215,122.70	10.28
2013	219,933.00	9.52
2014	233,443.00	7.66
2015	240,783.90	7.77
2016	259,547.60	5.89
2017	273,261.90	5.98
2018	268,753.00	5.65

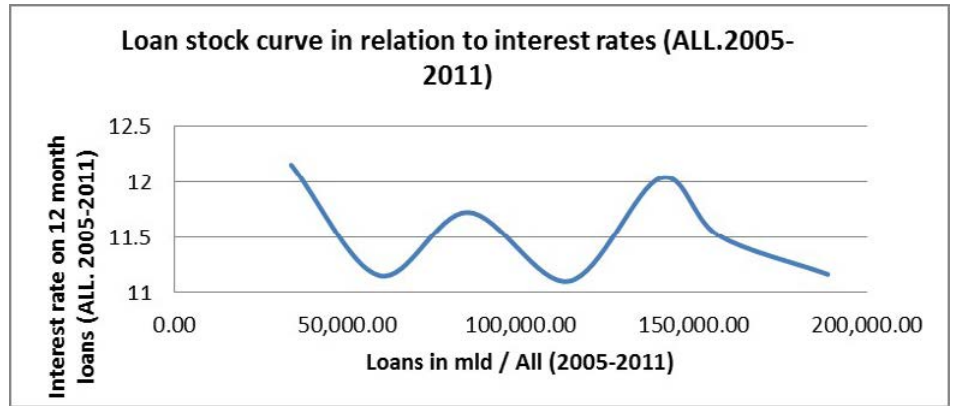
Source. Bank of Albania

Fig. No. 7 Loan curve in All, with regard to interest rate (12 months) 2000-2018



Source. author

Fig. No.10 Loan Stock Curve (mld All) regarding the interest rate (12 months) 2005-2011



Source. author

The table data and graphs show the conclusions drawn from the theoretical analysis of the credit curve. The data show that not all years have a negative relationship between the interest rate and the loan stock. This has occurred in 2003-2004, 2006-2007, 2008-2009, 2014-2015 and 2016-2017. The interest rate has increased in these years, and the credit stock has also increased. In 2018 the loan interest rate on All was 5.65% while the loan stock was 268,753.00 billion. In 2017 the loan interest rate was higher than in 2018, it was 5.98%, the loan stock was higher than in 2018, it was 273,261.90 billion. The data show that there is no regularity in the relation between interest rates and credit stock. The demand for credit, as explained above, has a number of reasons related to the economy, while the interest rate is not always a determining factor of its growth.

CONCLUSIONS AND RECOMMENDATIONS

Overall, we have provided the conclusions at the end of each analysis. Here are some of the main conclusions of this paper.

1. In the BEP model, the cut between the income and total expenditure curves does not give the firm's equilibrium point, but gives the unit of production, where economic profit is zero.
2. The Keynsian cross model taken as the basis for constructing the IS equilibrium curve is incorrect. Since this model is incorrect, even the models created based on this model are incorrect. In this way the IS curve is also incorrect. It does not represent the effects of monetary policy, the effects of the policies of the Central Bank.
3. The Keynsian cross model assumes the aggregate demand curve the same as the firm expense curve (in BEP). According to this model, this curve is always below the income curve, so that the economy needs to be in equilibrium to have autonomous spending increasing. This model justifies autonomous spending, foreign loans, government debt, PPPs, concessions etc.
4. The multiplier may not be used for the purpose for which it was created. This is an indicator of effectiveness in the production model, TR / TFC. In its calculation, the production model and the consumption model are mixed. It cannot be used in the consumer sphere. In this sphere money plays its role as a means of exchange, where the commodity circulates through money.
5. The investment curve does not start from 0 as the credit stock limit, but it can also start from the minus. Starting from the minus, the Hicks-Hansen model (IS-LM) cannot be created.
6. There is not always a negative relationship between interest rates and credit stock, but many times there is a positive relationship. In this way, the investment curve can be positive, negative, and parallel to the X-axis.
7. Lowering the interest rate on loans to All, toward zero, does not always have an incentive effect. In this situation, the coefficient of elasticity between the loan stock and the interest rate goes to zero.
8. We recommend that the Keynsian cross model be developed in the History of Economic Doctrines, and that all models built on this basis be revised as inaccurate, biased and inapplicable models.

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MARKET MODEL WITH NO CURVE INTERSECTION AND UNIQUE PRICE THAT OVERTURNS THE KEYNSIAN MODEL

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ABSTRACT

In this paper a new model of aggregate market is realized. The existing model is first analyzed, with the negative slope aggregate demand curve and the positive slope aggregate supply curve. The point where the curves intersect is considered as the Equilibrium Point. The author's opinions on the consequences of fiscal policies in the economy are given, arising from the use of this model. It has been concluded that some of the consequences are out of economic logic, untrue, inconsistent with reality. It has been found that the model is not applicable in economics. The aim is to build a market model that is applicable to the economy and to assist the relevant institutions involved in economic analysis. Following the analysis, the New Model was developed, a model that can be applied in any economy. The difference with existing models is that; demand curves (AD) and aggregate supply (AS), are positive slopes, are always above the same price level and are not expected. Between them creates an equilibrium curve that we consider GDP. The analysis is accomplished by creating a three-page isometric market model. Comparison, description, statistical, geometric, etc. methods were used in the analysis.

KEYWORDS.

Macroeconomic model, economic growth, real and nominal GDP, deflator, inflation, demand, aggregate supply etc.

1. INTRODUCTION.

Economic models are a reflection of reality through signs, numbers, figures, lines, etc. They are used to analyze various economic phenomena, to analyze the trends and dynamics of macroeconomic indicators, the performance of monetary markets and so on. These models need to be as close to reality as possible to assist the legislative and executive bodies, the government, the Central Bank and the institutions concerned. To help economics students and students of the Faculty of Economics and beyond.

One of the most important models in macroeconomics is the aggregate market model, the aggregate demand model (AD) and the aggregate supply (AS) model. The aggregate market model in macroeconomics, with some changes, is a reflection of the individual market model in microeconomics, with equilibrium points.

From the analysis that has been done, to dozens of papers published abroad and domestically, it has never been possible to use the current aggregate market model. The difficulty in constructing and interpreting the model was an incentive to do this study. This study provides thoughts on a new aggregate market model. The essence of this model stems from the positive direction of the Aggregate Demand (AD) curve. Demand and aggregate supply, in the model, stand opposite each other, as two positive sloping curves, always above the same aggregate price. It is this price that achieves equilibrium, even though AD does not equate to AS. There is no fixed equilibrium as stated in the Keynsian cross model. There is no casual equilibrium, equilibrium point, only when AD = AS at a given price. Equilibrium can be created even when there is a greater increase in demand or supply. This is balanced by rising or falling prices. In this way we have permanent equilibrium. price and quantity differences are exceeded. Only in these cases is there a temporary imbalance. There is no ideal balance. When two sides of an equation are equal (2 = 2) this does not mean that the objects they represent are in equilibrium. This becomes even more difficult in the field of macroeconomics, where equilibrium is most often seen as the movement of opposing interests of sellers and buyers, as equilibrium involving the psychology of the individual. If it were not for the psychology of the individual, then everything would be accurately predicted and there would be no financial crises, recessions, and depressions associated with supply-demand imbalances. It is precisely this reason that answers the question; how do people make accurate calculations on planet movements, space bending, global warming, and they can't predict recessions, depression and financial crises?

his study, with unexpected AD-AS curves facing each other at the same price, is closer to the reality of the aggregate market for goods and services.

2. AGGREGATE DEMAND AND OFFER MARKET MODEL THAT INTERSECT. A THEORETICAL TREATMENT AND SOME QUESTIONS ARISING FROM THE ANALYSIS.

In the theory of economics when analyzing supply and demand, the internal structure of the commodity, the types of labor and the contradictions contained in the commodity are not taken into account. Demand and supply are taken into account, reflecting their price laws. Alongside this theory there are other theories, such as the theory of consumer behavior, which tries to argue that, under the law of the individual demand curve, is the downward marginal utility curve. They also determine the negative slope of the individual demand curve in microeconomics. This slope, along with three other arguments, such as the effect of real balance sheets, interest rates and foreign trade, is also taken into account for the negative slope of the aggregate demand curve of the economy as a whole. The slope of the Aggregate Demand curve will not be discussed in this analysis. The aggregate demand curve will be considered as a negative slope curve. This implies the negative relationship between Aggregate Price and Aggregate Demand.

The aggregate market model, studied in the Economics textbooks (J.illiam J. Baumol & Alan S.Binder, 1991, cited by some authors in the bibliography), is almost the same in all countries of the world. Two models are studied, the classical model and the Keynsian model. On the X-axis is GDP real while the Y axis sets the Aggregate Price or Deflator P / D price.

In the Classic model, the Aggregate supplycurve is considered completely vertical. The aggregate demand curve is considered as negative slope. The point where the aggregate demand and supply curves intersect is the equilibrium point of the economy. This indicates that the product is a potential product and has frictional, voluntary unemployment. The market is clean. There is no inventory surplus and no shortages. Any state intervention in the economy leads to an increase in the price and not to an increase in the economy. Wages are considered flexible.

In the Keynsian model, the AS curve is considered completely horizontal, while the AD curve is considered with negative slope. Where curves are expected, there is a balance in the economy. If government spending increases the AD curve shifts to the right. This means that state intervention in the economy affects GDP growth and does not affect price increases. In this way Keynes considers state intervention in the economy effective. For this he departs from the American economy of the 1930s. He uses the concept of involuntary unemployment, effective demand, etc. (Keynes M.J. 1997).

The curve between the classical model and the Keynsian model is called the intermediate curve or intermediate space. The schematic of the intermediate model, used in almost all economics textbooks, is shown in Figure No.1.

In this model, the X axis sets the Gross Domestic Product (GDPr), while the Y axis sets the aggregate price or Deflator Price (P / D).

AD denotes aggregate demand curve, AS denotes aggregate supply curve, P / D denotes aggregate price or deflator price, Pe denotes aggregate price in equilibrium, where AD = AS = GDPe,

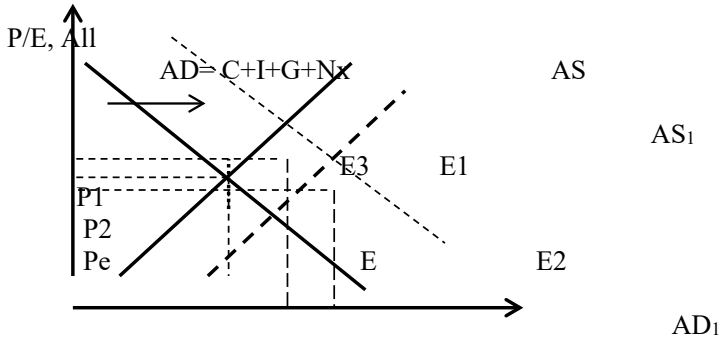
GDP is denoted Gross Domestic Product, r is real and n is nominal.

Aggregate demand consists of C + I + G + Nx, where C denotes expenditure on final goods and services, I denotes gross business investment expenditure, G denotes government purchases, and Nx denotes net exports (Ex-Im).

This figure studies in theory how an aggregate market operates.

Only four cases were considered in the analysis, two cases of demand growth, with and without supply response and two cases of supply growth, with and without demand response (there are other cases when demand and supply come down, because the curvature cutoff levels are determined by the degree of reaction of the variables). We have to note that neither of them is indifferent to the other, so when the demand is acting, the supply is responding and when the supply is operating, the demand is responding. The action of one variable and the reaction of the other variable give immediate impact, even at the price level. However we will, for the sake of study, look at cases where it responds, and when the responsible variegate does not respond.

Fig.N_0.1 Aggregate market model, in case aggregate demand increases



If the price level is a consequence of the action and counteraction of supply and demand, in many cases it is the cause of their action and counteraction. In this way, price has an active role in the market. Its active role depends not only on the demand / supply ratio but also on a number of other internal and external factors, economic and political. In this way, many other factors influence the position of the demand and supply curves in the aggregate market. One of the main factors that interferes with the economy is the state. Impacts on market variables (AD, AS and P / D) give rise to fiscal policies, monetary policies, income policies, foreign trade policies, etc. All of these policies are linked, and coordinated with one another. They are related to internal and external factors.

This section will deal simply, in theory, with the aggregate market, without factor analysis. It will analyze how market players respond to output, costs and prices.

Any analysis that takes place takes into account, what is called Equilibrium Point, the point where the curves intersect.

2.1. Aggregate Demand Growth (Fig. No.1)

Case 1.

When aggregate supply (AD) increases and aggregate supply (AS) does not respond. This figure shows that as aggregate demand increases, Aggregate Bid (AS) increases, production and at the same time Aggregate Price (P / D) increases. In this model, the conclusions after each movement are drawn from the intersections between the curves relative to the axes. So in this model the market trends are determined, regardless of how that might happen in reality. Why is this happening? This is because the supply and demand curves deal with predetermined directions, one with positive slope and the other with negative slope, without knowing what they will be in the future. In this way it becomes a static model and not suited to reality.

Author's remark on the model: a) There is not always economic growth from rising costs, because not all spending elements lead to increased output. Investment-related costs increase production. b) The increase in costs is not directly associated with the increase in production immediately.

Demand growth in AD1, with equilibrium at E1 cutoff, indicates that AS production will increase in GDP1 and the Price level in P1. According to this figure the increase in costs will also impose an increase in production. The question arises; why will it impose an increase in production, when firms can simply realize a price increase? Firms just need to raise salaries for inflation-indexed employees if there is an increase in the price level, and there is no need to increase output. This way new equilibrium can be created at point E3.

Case 2.

When aggregate supply (AD) increases and aggregate supply (AS) reacts. When costs rise, so does the supply. In the very short run only the price increases, while in the other periods the production increases.

Model observation by the author. There is no intrinsic reason for the supply to exceed demand and affect the price drop. Sellers (producers) seek to sell at high prices, rather than increase production over demand to reduce prices. This action is beyond the logic of their interests. Here, in this bid movement, there is no practical and theoretical argument. Bid shifting depends on a variety of factors and is not like shifting demand. Increasing production (AS bid) requires growth of economic factors, capital increase, investment, technological upgrades, takes time to set up production machineries or economic lines. Production cannot immediately accompany increased costs.

Increasing costs without increasing output will stimulate price increases. Demand may rise immediately (for example in the case of increases in the salaries of state administration employees, or in the case of increases in the minimum wage), while supply may not increase immediately.

2.2. Aggregate Bid Increase (Fig. No.2)

In the face of this case the question arises; why will aggregate supply increase?

-Cause 1.

When aggregate supply increases and aggregate demand does not respond. According to the figure when aggregate supply AS increases, the price decreases and production increases. In the figure the balance shifts from E to E1 where the

quantity has increased and the price level has decreased. What is the logic of such a trend? This tendency is due to the position of the curves, because there is no economic logic to explain it.

Our observation. In our opinion the increase in supply does not always lead to a decrease in the price level, but rather preserves the existing price, or increases at a slower pace. To explain this trend we rely on the theory of microeconomics.

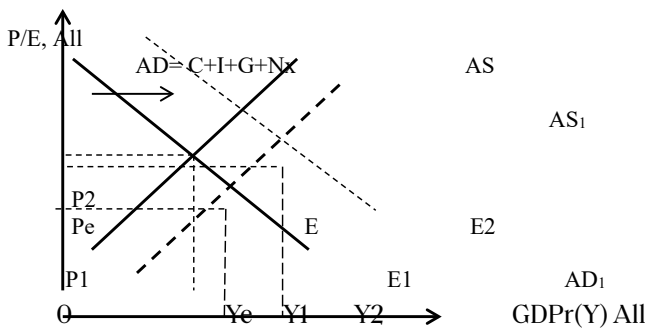
In the case of Microeconomics we have three supply positions in the long run. The positions, directions, and trends of the supply curve in the long run for a given commodity are determined by the costs, the price of the factors needed to produce the commodity. Three cases stand out.

= *The first case,* when factor costs increase. The increase in factor costs is explained by the rarity of economic factors, as the costs of extraction and processing increase. The supply curve in this case is a positive slope. This is also the most general case.

= *Second case,* when factor costs are reduced. When factor costs come down the supply curve has a negative slope. Commodities that have a downward factor cost are rare, so the downward sloping supply curve is for specific commodities only. It is precisely in this case that we are in agreement with the general trend of the AS curve, whose rise causes a fall in the aggregate price level.

= *Third case,* where the cost of factors does not change. In the case where the price of factors does not change then the supply curve is flat. This also makes the price of the commodity not change. This is also a case that is often encountered because it has the effect of replacing factors and the effect of technological improvements. These effects (in addition to costs) cause the price level to remain unchanged or slightly above average.

Fig.N_0. 2 Aggregate market model, when aggregate supply increase



-Cause 2.

Increase in aggregate supply is associated with aggregate demand response. In this case, according to the figure, the new equilibrium will go to E2, the price will increase as well as the quantity produced.

Our observation. There is no reason for the demand curve to shift to the right because the increase in supply has led to a decrease in aggregate price and an increase in aggregate production. If this position holds there is no reason for demand to shift to the right because production has increased and prices have fallen. Exactly what the customer wants. The consumer is looking for low-priced goods. That has happened, so why should the amount of spending continue to increase? These are four cases analyzed.

All of the analysis cases mentioned above (according to the existing aggregate market model) are not substantiated and proven by practice. They are not proven by the Albanian economy data.

There are 4 more cases where the curves shift left. Even these cases, like those analyzed above, are unjustified, although they occur less frequently. In our opinion the decrease in aggregate demand and supply can only occur in cases of conflicts between countries, in the case of armed conflicts, in the event of a collision of superpowers for markets, for technology, for areas of influence, depletion of raw material sources etc.

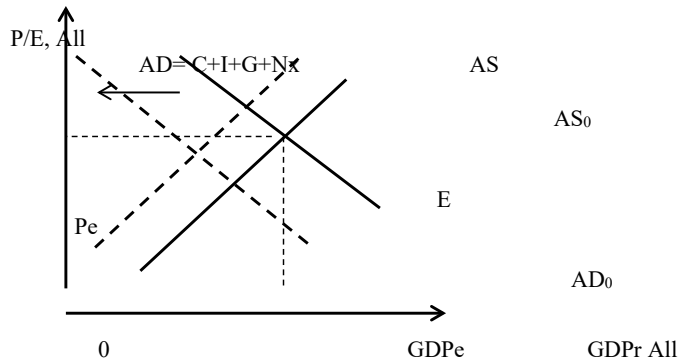
-Cause 1.

When the Bid curve shifts left. When the aggregate supply curve shifts to the left, price increases and output decline. This case is rare because it occurs in cases of natural disasters, fires, earthquakes, floods or in wars. This is also due to the policies of powerful oligopolies, especially in the field of fuel (OPEC) and natural gas.

Offer does not respond without action of the request. It can react when there are cases of rising costs. But even in this case, when there is demand it does not tend to decrease. Today's economies show that production is steadily increasing, except in the case of recessions in different countries. So this case is a special case, even if it does.

The world economy is globalized, so if a negative phenomenon occurs in one country it is transmitted through politics, through political and economic agreements, to other countries. This is especially true for small countries such as Albania, which in our opinion many of the economic indicators do not depend on the domestic policies of the state (mention here the exchange rates and the inflation rate).

Fig.N_0.3 Aggregate market model. The case when the demand and supply decreases



-Cause 2.

When the demand drops and the curve shifts to the left. Price and quantity should be reduced. It is not always true. In the real world, this is not always the case. If supply were to respond, production would continue to fall, raising the price level. Could such a case have happened? Such a case could only happen with this curve setting because in the real world it does not. This case is beyond any economic logic.

From the analysis a simple conclusion can be drawn. All of these assumptions that were interpreted are partially valid for the analysis of the economy from the microeconomic perspective, for particular commodities, and not in the aggregate market area. However, they point out the disadvantages of the equilibrium model with a semicolon.

In the aggregate market we do not have the same logic and the same influencing factors, in the aggregate market operate a complex of factors, the financial market and the foreign market operate, state economic policies operate, competition operates, market dominant structures, etc. Prices depend on costs but also on market structure. It depends on the form that dominates, monopolies, oligopolies dominate, or monopolistic competition dominates, so there is no general rule for defining patterns. It is therefore important to analyze concrete indicators of an economy. The analysis of the above models does not give results to serve the economy, the results give the analysis according to the new proposed model.

3. CONSIDERATIONS ON THE CONCEPT OF EQUILIBRIUM

3.1 Aggregate market equilibrium according to post-Marxist authors

Some considerations for the concept of equilibrium given by economists of different currents and time periods. The following are some considerations of the post Keynesian theory of market equilibrium. 'The state of stable conditions in which all the important factors remain more or less constant over a period, and there is little or no natural tendency for change. For example, a market is said to be in equilibrium if the amount of goods that buyers want to buy at the current price matches the amount that sellers want to sell at that price. It is also called steady state '(Business Dictionary, 2018). 'The state of an economic system in which all factors for change are balanced, thus the tendency for change is zero. An economic system is considered in equilibrium when all the major variables, when all significant variables show that they do not change over a period of time '(Greenŵald D. 1983). 'Balanced situation between opposition forces. It is a situation in which all economic agents have no incentive to change their economic behavior. '(Shim.J & Siegel J. 1995). 'The situation in which the forces that determine the behavior of certain variables are balanced and thus do not pressure the variables to change. It is a situation in which all the actions of economic agents are mutually sustainable. ' (Graham Bannock, R.E. Baxter and Evan Davis. 1987). '... it is a situation in which economic agents or aggregates of economic agents such as markets have no incentive to change their economic behavior.' (Pearce D. 1992). 'The state in which an economy is situated, when changes in the forces and factors that operate in it, are themselves mutually compensated and themselves eliminated in such a way as not to cause this situation to change' (Pano A. 2002). For an individual market it states: 'Market equilibrium is determined by the price where the quantity of goods that buyers seek and buy is exactly equal to the quantity that providers offer and sell' (Ŵaud. R.1992). '... the situation in which the quantities demanded and the quantities offered in a market or group of markets are equal' (Abel. A & Bernanke B. 1998). 'A concept in which opposing dynamic forces cancel each other out. In the short run, the intersection of the aggregate demand curve with the aggregate supply curve determines the equilibrium in the economy. In the short term the price level is fixed and production is changing. In the long run it is determined by the intersection of the AD curve with the potential output curve '(Colander, David C. 2001). 'The situation in which an economic entity is at rest; or in which the forces acting on the unit are in equilibrium so that there is no tendency for change. Macroeconomic Equilibrium: A GNP level at which the target aggregate demand equals the target aggregate supply '. (Samuelson P & Nordhaus Ŵ.1855). 'The GNP equilibrium level will be at the point of the horizontal axis where the C + I + G + X-M curve intersects the 45 degree line.' (Mansfield E. 1992). 'The situation that existed when the opposing forces exactly compensated each other and there is no natural tendency for change.' 'In market terms equilibrium is achieved at the price at which the quantity offered is correct, the same as the quantity demanded'. In macroeconomic terms, equilibrium is achieved when the costs of national production are exactly the same as the national product produced '. (Orley M., Amos Jr. 1987). 'The equilibrium still requires the demand for national production to equal its supply, or the total injections with total flows to be equal'. (Either J. 1988). Other authors view the balance in terms of employment and desired inventories. 'Equilibrium refers to a situation in which consumers and firms have no incentive to change their behavior.' In the macroeconomic sense. The equilibrium level of demand-side GNP is one in which total costs equate to output. In such a situation firms have their inventory remaining at desired levels; so they have no incentive to change production or prices'. 'The economy achieves equilibrium in full employment only if the amount of revenue that consumers will save in full employment is equal to the amount that investors want to invest.' 'If these two sizes can be unequal, then full employment will not be an equilibrium for the economy' (Baumol Ŵ & Blinder A.1991). 'A balance between counteraction forces or processes, especially supply and demand (commonly interpreted as market clearing). A state in which neither party has reason or power to change its position (a state of rest). A situation in which all parties make their preferred choices (implying that factor markets are clean). A condition in which expectations are met. (Hayes M.2006). In the above statements it is noted that the authors generally conceive of equilibrium as a reconciliation between aggregate demand and supply, for a given level of price, as a reconciliation between savings and investments in full employment, when firms do not have excess inventories. Very few see it as a movement of interests that cannot be accurately calculated.

3.2 Some considerations of Marxist theory of supply and demand

The concept of commodity, capital, rent, profit, and some other economic concepts are dealt with in more detail in Marxist theory. This section will provide some considerations, in the light of Marxist theory of supply-demand and the possibility of achieving equilibrium.

What explanations have Marxists given of the problems of demand, of the problems of the balance between demand and supply? On the demand Marx analyzes another philosopher of the time, Prudon (he was a member of the French Parliament, developing his philosophy on anarchism). In essence it states that; if demand remains unchanged, the price of a product decreases to the extent that supply increases; that is, the more abundant a product is relative to demand, the lower the price and the lower the supply relative to demand, the higher the price of the product offered. the rarer the demand-side products are, the more expensive they are; These truths say Marx 'are almost banal' (Marx K. 1978).

Speaking precisely of this problem he says that they (mention Prudon) identify price with rarity and value with abundance '... according to them' exchange value and rarity are equivalent terms'.

'Once you have presented abundance as use value and rarity as exchange value - there is nothing easier to prove that abundance and rarity are inversely proportional to each other, - z. Prudon identifies use value with supply and exchange value with 'request. (Marks K. 1978). Creates usage value, utility-supply and exchange value, opinion-demand.

According to Marx the struggle is not between 'utility and opinion; it is made between the exchange value the seller requires and the exchange value the buyer offers. The exchange value of the product is always the result of these contradictory assessments' ... What comment can be made about this statement? The struggle is between the price the seller demands and the price the buyer offers, so the price of the product is the result of these contradictions. 'Ultimately demand and supply put production and consumption in front of one another, but production and consumption relying on individual exchange'. (Marks K. 1978).

What does Marx say next. 'The benefit of the commodity is ascertained by the consumer, even when it is useful, it is not merely useful, because during production it is exchanged for all production costs, so it has a range of exchange values. Thus 'the manufacturer offers not only a useful item but also an exchange value'. (Marks K. 1978). 'So in supply and demand we find, on the one hand, a product, for which exchange values are spent, and the need to sell this product, on the other - the means, for which exchange values are also spent, and the desire to buy'. (Marks K. 1978).

According to Marx, 'Competition between sellers, and competition between buyers, is an indispensable element of the struggle between buyers and sellers, a struggle that results in exchange value'. (Marks K. 1978).

The logic of the classics (Weston citizen) is this, supply increases as demand increases, demand increases only increases prices. What Marx says about this: 'But even the most basic experience tells us that in some cases the increase in demand does not change the commodity market prices at all, while in other cases it only causes the temporary rise in market prices that follows by the increase in supply '. (Marks K & Engels V.I, F. 1958).

Marx mentions the considerations of a well-known person of the time (Lord Loderellin). He had studied the changes in the exchange value, starting from the law of supply and demand, or of the rarity and abundance in relation to demand. According to him the value of an item can be increased when the quantity of this item is reduced or when the demand for it is increased; it may be reduced as a result of an increase in the quantity of this item or a decrease in demand '. (Marks K. 1978). Thus the value of the thing can change for eight reasons, four from supply and four from demand.

What explanation does Riccardo gives, according to Marx, of the law of supply and the law of demand. Ricardo makes an assessment based on market structure, defining monopoly and competitive market. It is precisely the theory we study today in microeconomics. According to him "The value of products, which are the monopoly of a particular person or society, varies according to the law laid down by Lord Loderelli; it declines with the increase in supply of these products and rises with the increase in demand for buyers. Their price has nothing to do with their inherent value. As for the price of the items that are subject to competition among the sellers, and the quantity of which can be added within moderate limits, it does not depend, after all, on the relation between supply and demand, but on increasing or decreasing production costs".

How much should the manufacturer produce, what should the offer be? Who defines it? This question is answered by Marxist theory. 'Only fluctuations in supply and demand tell the producer the amount in which he must produce a given commodity, in order to receive, at least, production costs. And since these oscillations happen all the time, in the various branches of production there is a constant attraction and investment of capital '. (Marks K. 1978). Marx illustrates this statement with a Ricardo statement on production investment. 'Only as a result of these fluctuations, capital is directed precisely to the proper proportion, and no more, to the production of the various commodities for which there is demand. As prices rise or fall, profits rise above their general level or fall below this level, and therefore capital is sometimes introduced into a particular branch of production, sometimes withdrawn from it, according to this or that change in it '(Marks 1978).

How Marxist theory explains the intrinsic relation between supply and demand.

Considerations on market supply and demand. Marx points out: 'Supply and demand regulate only temporary fluctuations in market prices. They may explain why the market price of a commodity rises above or falls below its value, but they cannot explain this value at all. ' (Marks K & Engels V.I, F. 1958). 'The moment the equilibrium between supply and demand is established, and therefore they cease to operate, the market price of the commodity coincides with its true value, at the normal price around which its market prices fluctuate.' (Marks K & Engels VI, F.

1958). 'On the other hand, market price volatility, sometimes rising above value, or above natural price, sometimes subtracting value, depend on supply and demand volatility. Devaluations of market prices by values are continuous'.

What does Adam Smith say about this balance? 'The natural price is the central price, against which the prices of all commodities are constantly aimed. Different circumstances of the case may sometimes keep them at a much higher level, and may sometimes lower them below the natural price but, whatever the obstacles, which remove commodity prices from this stable center and unchanged , they are constantly aiming for it. ' (Marks K & Engels V.I, F. 1958). '... if supply and demand balance each other, then commodity market prices will correspond to their natural prices, that is, their values, which are determined by the value of the socially necessary labor for the production of these commodities'. (Marks K & Engels V.I, F. 1958). 'But supply and demand must aim continually balancing one another, though they do so only by compensating for one swinging one another, rising with a drop, and vice versa '(Marks K & Engels V.I, F. 1958). 'Generally, the values of all commodities are realized solely on the basis of equalization of market prices, changing without reconciling the equation, which is caused by the unbroken oscillations of the ratio between supply and demand '. 'Looking at the issue from another point of view we can show that not only supply but also demand is determined by production costs' (Marks K & Engels F, V.I, 1958).

For equilibrium, while stressing that supply-side fluctuations always drive the price of goods into production costs. 'In reality the true price of goods is above or below the cost of production; but also the landings cover each other, so within a short time, if we consider, in general, the good or bad state of the industry, the commodities are exchanged between them according to the costs of production, so their price is determined by the costs of production '. (Marks K & Engels V.I, F. 1958).

It is said of moving capital and labor from one branch of production to another; ' Capital and labor move from the least profitable to the most profitable, and this process of shifting capital and labor continues, until supply in one branch of industry grows as demand increases, while in other branches it shrinks, how much demand has dwindled. Once this change is made, then in the various branches of production, usually, the overall rate of return is set again '. (Marks K & Engels V.I, F. 1958).

3.3 Equilibrium is not a simple equation

In the author's opinion, taking into account classical, Marxist, Keynesian and Albanian reality the balance is not a simple equation.

= **Model treatment in microeconomic terms.**

In the microeconomic model, point E, where the demand curves D intersect with the supply curve S, for a given commodity, is taken as the equilibrium point. At this point, the quantity demanded corresponds to the quantity offered for the same price level. At point E the market is considered clean. Any say clean? It means that there is neither an abundance of goods nor a shortage. Then, can we call the market in equilibrium exactly when the market has zero commodities at the end of the day or period? In the opinion of the author no. The market is not in equilibrium when it remains empty, with no commodity on one side and no money on the other. The market is in equilibrium when buyers have money at the end of the day and sellers have goods at the end of the day or period. The buyer with the seller every minute, hour, day of the year, have the same price between them, so they set a price line, but the seller has more goods than he sells and the buyer has more money than he buys.

In the market in the broadest sense, there is no perfect match between the demand of buyers and the supply of sellers, because buyers want to buy different goods but have no money or are not the goods they want. In terms of demand is money, the ability to pay, what defines the concept of demand, and matches it with the offer (in the concept of demand, in the texts of the microeconomics) it states "... willing and able buyers...". This means that the demand generates the supply. If we remove this condition then demand is never matched with supply because people have their needs growing and for competing goods. This also happens on the other side of the market, on the supply side. There are also production restrictions there.

The collision between the interests of sellers and buyers including the element of taxes, taxes, imports and other factors creates the common curve of execution of goods. This way we have a quantity of goods sold every day, which for the seller is a product - revenue, and an expense for the buyer. It is only in this sense that we have equilibrium, in the manner of expression of production, and not that the Demand matches the Bid. The commodity becomes commodity when sold, when it is converted into consumption, when it passes from group I to group C. Switching from one group to another changes its position, status, but does not change the size of GDP. We emphasize once again that if they match, the markets will start to remain empty and the restriction will start, until producers increase their production.

= *Simple equilibrium setting model.*

At the same price demand and supply face each day. In every unit of sale, in every commodity market, prices are displayed. These prices are at the same time for the seller who sells the goods, and for the customer who buys the goods. It does not sell at a price of X, and the buyer buys at a price of Y. If the seller sells a commodity of 4 leks (for example) the buyer of 4 leks will also buy it.

In this way, their quantity is placed on a shelf, on a price line. When the price changes, it changes for both parties at the same time, for both sellers and buyers. Both sides react. We do not look at equilibrium as: Quantities Offered and Required, equal to the same aggregate price. To our judgment this is a non-continuous, static equilibrium. This is the product of the propensity for balance, the D-S collision. This is because not all buyers find the merchandise they are looking for, and not all sellers sell all the merchandise they trade in a given period of time. Consumers, in general, have more money than commodities they buy and sellers have almost always more commodities than they sell.

That the price is the same for both the seller and the buyer is accepted by

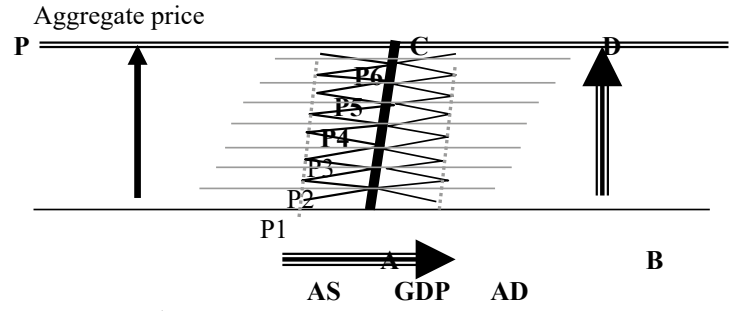
everyone. But why not admit that demand is also positive? When GDP is expressed by expenditure it is called demand, when it is expressed by production it is called supply. How, then, is the Requirement likely to be a negative slope when it accompanies the Offer that is a positive slope?

We see equilibrium as a phenomenon with 3 tangible elements. In addition, we have the psychological side of two "collective individuals" that go into the process of selling and buying. This is where the problem of equilibrium lies. No one can predict the "collective individual" psychology that sells as a single unit, and no one can predict the "collective individual" psychology that one buys as a single unit. If this were achieved then there would be no recessions, depressions, financial crises and other negative market phenomena. It is for this reason that we consider the market in equilibrium when we do not have equality between AD and AS but have a state of indifference on one side to the other.

One pair buys, one pair sells, and none of them react as a whole. If we had a reaction as a whole, to the "collective individual" then there would be a problem, either pressure to change prices, or pressure to change the quantity of goods offered. Both are related to the amount of money the "collective individual" has and the amount of goods the "collective individual" possesses. If each of them exceeds a certain limit, then market changes occur. The "collective individual" who owns the money uses it as a means of exchange because after the quantity of money is another product sold. So we have commodity exchange. "The coin money that will serve to sell your products, and the purchase you make for another's products, and later, serve the same use between the other two contractors; it will serve others; and to others again, without end" (Say J.B.1803). It goes on to say "So when we say: Selling doesn't go because money is scarce, we get the funds for the cause; is a mistake due to the fact that almost all products are settled in currency before being exchanged for other goods... "We shouldn't say: Selling doesn't go well because money is scarce, but because it's other products." (Say J.B.1803). "It is good to note that a finished product offers, from this moment, an outlet for other products for all its value". We original "Il est bon de remarquer qu'un produit terminé offre, dès cet instant, un débouché à d'autres produits pour tout le montant de sa valeur". (Say J.B. 2000. Pg.125). This is also called the "Law of Say". In this way both sides depend on the needs of individuals. The quantity of money if it does not reflect the value of the goods distorts the "equilibrium" in the market. The market price should normally change, from the change in the cost of goods from technological upgrades, or from increased production. Raising wages by the Government (for example), does not represent any kind of commodity, is arbitrary market interference. It changes the ratio in the exchange of goods in favor of the goods to be purchased, increasing its price. Shifts the Price line up, without shifting the quantity of production to the right. The state, by raising wages, decreases the value of manpower goods, because the increase in wages, price of manpower, is not accompanied by an increase in its productivity. Price, being in a plan, affects both the buyer and the seller at the same time. The model operation technique is shown in Figure 4.

Fig.N_0.4 Creating Equilibrium Price

How do we perceive the price of equilibrium?



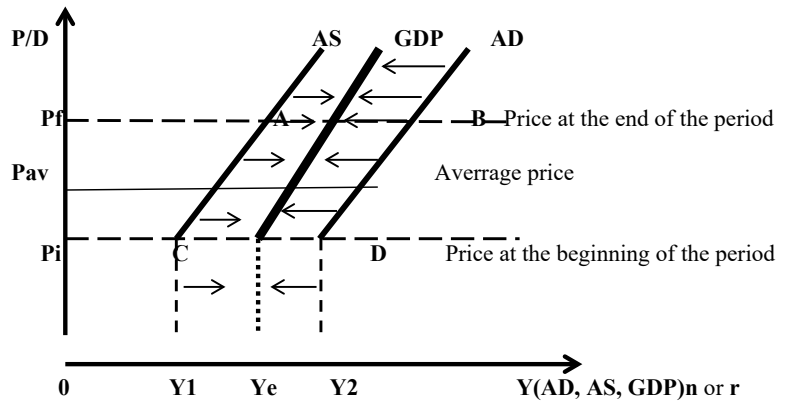
Source. Author

In Figure 4 on the X-axis is set GDP, AD and AS.

On the Y axis is the price P. The ABCD quadrant is built. The ABCD frame usually has the shape of a parallelogram, sloping to the right. When there is no economic growth it can also be in the form of a rectangle. Price has an upward tendency, but may also decrease in the short run. Thus this movement is reflected through two left-wing arrows. The general price trend is represented by the right-hand arrow. She is upward. The demand shifts left-to-right creating a curve, in zigzag shape, with a positive tendency to the right. There are similar trends in offerings.

In this way the equilibrium is not represented by a cut point but by a line. Just as the up and down price fluctuates, with increasing tendency, so does the left-right production, always with increasing tendency. From Figure No. 4 we can create Figure No. 5 which gives the general market trend over the medium or long term. On the right side of the figure is the Domestic Demand (AD) curve, on the left side the Value Added Curve (AS) and the GDP curve in the middle. The essence of this model is: Increasing AD does not shift the AS curve to the right. In this way the theory falls that the addition of each element of AD can lead to increased output. G ç n increase in price increase.

Fig. N_0. 5 Creating an aggregate market with the respective equilibrium



Source. Author

This is the most general model of an aggregate market. The positive slope of the AD curve is also proven by the three effects, the wealth effect, the interest rate effect and the foreign trade effect (Naqellari A 2018). The function of this model is shown in isometry in figure Nr. 8. in this paper.

4. Applying the New Model to the Albanian economy

The equilibrium concept and the theoretical construction of the relevant model can be applied concretely with the data of the Albanian economy. In this section we will build three market models. We will not take Real Indicators, but will consider nominal indicators related to P / D. In the first model we set the Aggregate Supply (AS) represented by Gross Value Added (GVA), the Aggregate Demand (AD) represented by Internal Demand, and Nominal GDP (GDPn). In the second model we will put the Internal Demand with its components and in the third model the Total Consumption with its components.

First Model. In the first model we place on the X axis, GDP, Value Added (GVA) and Internal Demand (AD), on the Y axis we set the Deflator Price.In this original model, it is possible to analyze these macroeconomic indicators. GVA is calculated as the difference between Production and Intermediate Consumption. Domestic demand is calculated as the sum of Final Consumption and Gross Fixed Capital Formation. GDP is calculated by the expenditure method and the production method.

The difference between GDP, which we consider "Equilibrium Curve", Domestic Demand and Value Added is that: GDP has been influenced by fiscal policies, monetary policies, and thirst-related policies related to the other two indicators. GDP is a consequence of their internal combination. AD reflects all types of policies related to consumer spending, government spending and investment. In this way, these indicators can be analyzed: trends, long-term dynamics, degree of linkage, effect of fiscal policies, monetary policies, foreign policies, etc.

Changes between the proposed Aggregate Market model and the existing model.

1. The three curves are positive slopes.
2. The curves are not cut with each other. In exceptional cases, they change places.
3. Expenditure and revenue on curves are always supported on a straight line parallel to the X-axis, representing the level of the Aggregate Price.
4. Between the Demand and Supply curve the GDP curve is set.

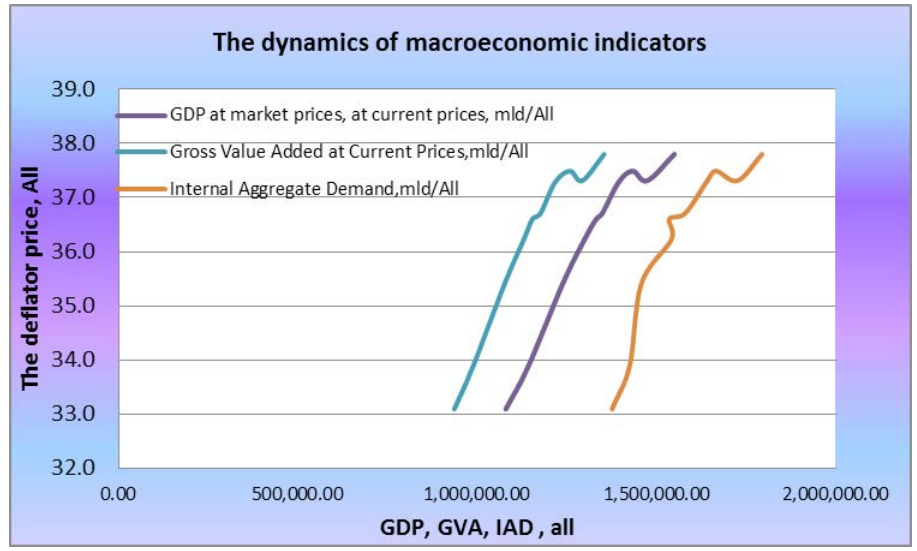
The GDP curve is the output curve expressed through expenditure and income. It is related to the real output produced in the market and the realized output expressed in the form of money. In this way we have new product realization through the old product. Returning new product to commodity, from existing commodities in the form of money. This is an effective requirement, in the classical sense. ""The market price of each particular commodity is determined by the ratio between the quantity actually marketed and the demand of those who are ready to pay the natural price of the commodity or the full value of the rent, labor and profit it takes to bring it in shop. These people can be called effective buyers and their demand is an effective demand because it is enough to bring the goods to market. It differs from absolute demand. It can be said in some way that even the poor man is in demand for a 6-horse carriage, he too might want to have one, but his demand is not effective because the commodity on the market can never be brought because of its" (Smith A. 2000).

Table N_0. 1 Nominal GDP, Value Added, Internal Demand and Deflator Price

	The deflator price, All	GDP at market prices, at current prices, mld/All	Gross Value Added at Current Prices,mld/All	Internal Aggregate Demand,mld/All
2008	33.1	1,080,676.00	936,917.00	1,377,018.84
2009	33.9	1,143,936.00	989,796.00	1,426,271.44
2010	35.4	1,239,645.00	1,077,485.00	1,459,002.28
2011	36.2	1,300,624.00	1,131,121.00	1,543,058.13
2012	36.6	1,332,811.00	1,154,747.00	1,536,736.06
2013	36.7	1,350,053.00	1,177,698.00	1,581,376.82
2014	37.3	1,395,305.00	1,217,843.00	1,640,129.85
2015	37.5	1,434,307.00	1,259,726.00	1,666,935.61
2016	37.3	1,475,251.00	1,293,975.00	1,727,258.35
2017	37.8	1,551,281.33	1,355,126.0	1,795,445.79

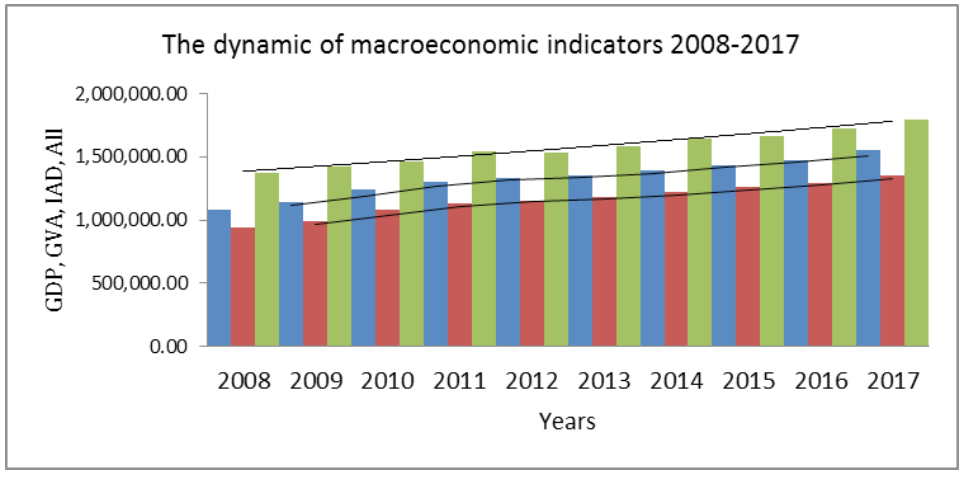
Source. Bank of Albania. INSTAT. The deflator price is calculate by the author.

Fig.N_0.6 Internal Demand Curves, Nominal GDP and Gross Value Added, in mld All



Source. Author

Fig.N$_0$.7 The dynamic of macroeconomic indicators (2008-2017)

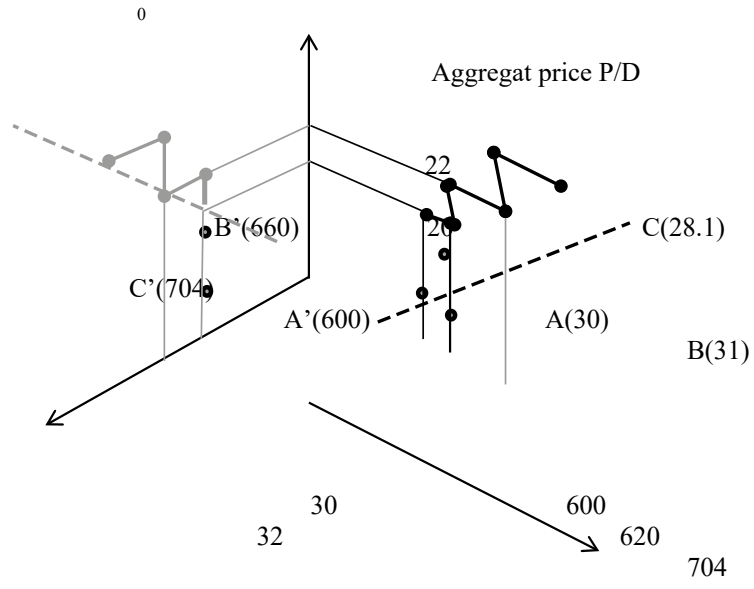


Source. Author

The data of the macroeconomic indicators of the Albanian economy are shown in Figures 6 and 7. The figures show that the curves are positive slope. They reflect the differences between the two market patterns. Here is a look at the link between Gross Domestic Product, Value Added and Gross Domestic Product. The swing of the GDP curve between the GVA and UN curves shows the effect of economic policies. Here is a special case where Fiscal Balance and Trade Balance are equal. This situation causes the curves to merge into a single curve, which would be the equilibrium curve. This is not the case, or it can rarely happen. There may be positive exports, this will change the setting without changing trends.

The impact of fiscal and monetary policies on the model is illustrated by the expansion of the New Market model. We can present the New Market Model in three planes, in isometry. On the vertical axis we set the Deflator price, on the right axis we set the Aggregate Expenditure (or GDPn). At the cut-off point, the real units, calculated as a division of nominal GDP by aggregate price, are placed. Merging the semicolons forms the Real Demand curve. On the left axis we place the Aggregate Bid on the unit. Aggregate units are listed at aggregate prices. The units of commodities multiplied by the aggregate price are placed at their cutting point. By joining their oscillations we obtain the nominal demand curve. Graphically, Figure 8 shows the three dimensional model of the aggregate market. If we consider the trends, we can change their names, one we call the supply curve, and the other the demand curve.

Fig.N$_0$.8 The three-dimensional model of the aggregate market



Source. Author

- Position 1. It is the starting position. On the AD axis we have 600 mld, at the price of 20All, at point A we have 30 (600/20) mld units and at A 'we have 600 (30x20) mld.
- Position 2. Expansionary fiscal policy applies. Costs rise to 620 billion. This 20All increase requires 31 billion units of merchandise. Firms do not increase production but raise the price to 22 All to offset this increase (this is because production does not increase immediately like salaries or bonuses). So we get to point B and B '.
- Position 3. The increase in price makes it possible to provide not 31 billion units as demand but 28.1 billion units.
- Position 4. As prices rise, producers increase production and sales to index inflation growth.

This is done to maintain their profits and not reduce the real purchasing power of their employees.

They do not increase production because prices went up. They want high prices.

Position 5. Starts all over again. The amount of money in circulation increases, prices rise, product rises to offset inflation, and this bond continues. The opposite will happen if production increases.

Continuing the link creates demand and supply curves, both with positive slopes. Sellers fit the market not in the interest of consumers but in the interest of their profit.

Conclusions differ.

1. Increasing demand does not lead to increased production. Increasing demand leads to higher prices. When purchasing power drops significantly, output increases.
2. The rise in prices and inflation results in the indexation of wages. Wage indexing brings about increased output. This is because owners want to keep their profits.
3. Increasing the supply does not lead to a decrease in prices, but to the same prices or increase. In exceptional cases the prices are reduced.
4. Increasing demand and supply over the long run results in increased production and increased prices.

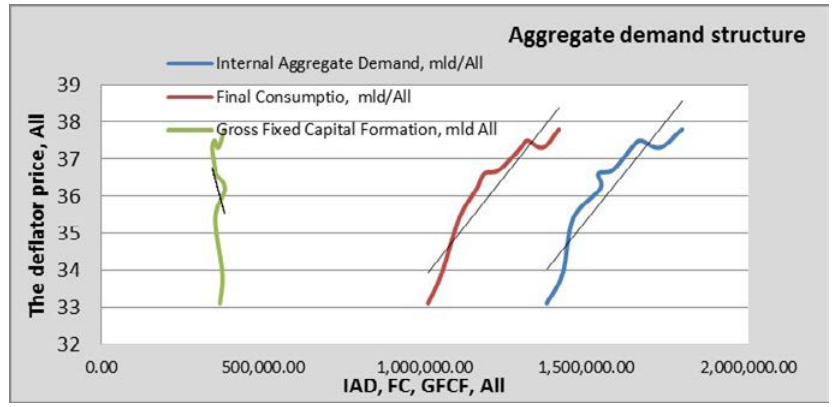
The Second Model. This model shows the Internal Demand structure. Domestic demand is not only related to the Cost of Goods produced locally. Internal demand includes all types of consumer spending as well as investment costs. The structure of consumption and investment expenditure is determined by INSTAT in support of EUROSTAT. From the table data we study the structure of internal demand. The conclusion is clear. Investment spending has been declining, while the share of consumer spending has increased. This link complements the theory (in today's macroeconomic textbooks) that even increasing non-productive consumption expenditure (G + C) increases GDP, and consequently the economy. Exactly with the model we have applied, this connection that is in vogue today is contradicted. The increase in costs expresses the increase in production. Production increases and this brings about the growth of intermediaries, money in circulation. We repeat Sayn. "So when we say: Selling doesn't go because money is scarce, we get the money for the cause; it is a mistake that comes from the fact that almost all products are selected in currency before being exchanged for other goods "(Say J.B.1803).

Table N_0.2 Aggregate demand structure (2008-2017)

	The deflator price, All	Final Consumptio, mld/All	In% of demand	Gross Fixed Capital Formation, mld All	In% of demand	Internal Aggregate Demand, mld/All
2008	33.1	1,010,136.90	73.4	366,881.90	26.6	1,377,018.80
2009	33.9	1,052,102.40	73.8	374,169.00	26.2	1,426,271.40
2010	35.4	1,106,590.20	75.8	352,412.10	24.2	1,459,002.30
2011	36.2	1,161,113.90	75.2	381,944.30	24.8	1,543,058.10
2012	36.6	1,183,692.10	77.0	353,044.00	23.0	1,536,736.10
2013	36.7	1,229,289.00	77.7	352,087.80	22.3	1,581,376.80
2014	37.3	1,297,285.90	79.1	342,844.00	20.9	1,640,129.90
2015	37.5	1,316,771.20	79.0	350,164.40	21.0	1,666,935.60
2016	37.3	1,365,269.70	79.0	361,988.60	21.0	1,727,258.30
2017	37.8	1,414,895	78.8	380,551	21.2	1,795,446

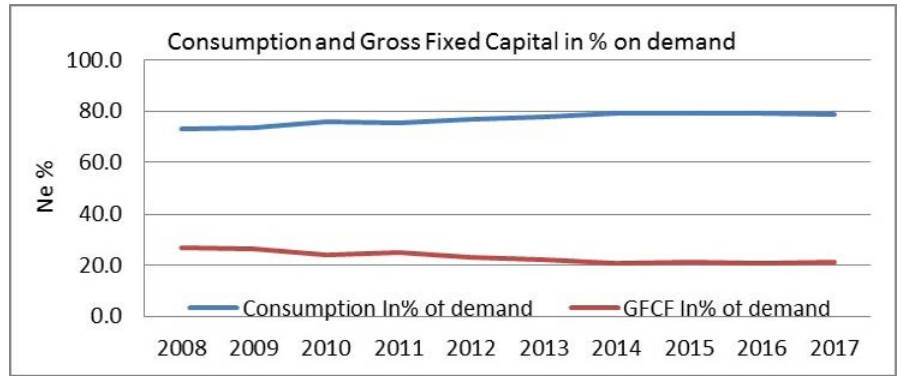
Source. INSTAT. The deflator price is calculate by the author.

Fig.N_0.9 Building a new domestic demand model



Source. Author

Fig. 10 Konsumi dhe kapitali në % ndaj KB(AD)



Source. Author

From this figure it can be seen that consumption occupies the main weight in the structure of domestic demand. This is not to say that demand has driven up consumption, as is often said today. "Economic growth has been supported by the expansion of public and private consumption, while net exports and investments have declined (Sejko G. 6/11/2019). Such statements are repeated in each quarterly and annual analysis.

We reiterate that spending is a way of expressing production, not that production is increased by consumption. Investment growth has an impact on economic growth, they add capital which boosts output and employment. In the case of the Albanian economy, capital dynamics shows that it has no impact on the growth of the economy. It has declined in percentage to domestic demand.

The Third Model. This model reflects the structure of Final Consumption expenditures.

The data of table No.3 show the structure of Final Consumption. The main share in the final consumption is the consumption of the population. This consumption also includes consumption in state administration and non-profit making organizations. Administration expenses (G = NG) include overheads for material purchases and other operating expenses. In this way, government spending is not recorded in the bloc, but it is included along with spending by the rest of the population. The structure of budget expenditures and revenues is reflected in the Fiscal Balance Sheet. The same can be said for the investment group.

This merger cannot differentiate investment spending as a separate item involving employee pay with its supplements, raw materials, fixed assets and other production elements. Thus, with this structure of INSTAT calculation, it is difficult to analyze the impact of investment on economic growth.

The table gives the structure of expenditure by composition. The main occupation is the final expenditure of the population with over 87%, government expenditure with over 12% and a small, negligible share of the expenditure for the companies of non-profit organizations (NGOs). This structure clearly shows the difficulty of the analysis. For an accurate analysis the budget should be broken down, the employment should be taken into consideration, etc. In the author's opinion, this expenditure structure has been made to make it easier to justify government spending in the context of overheads.

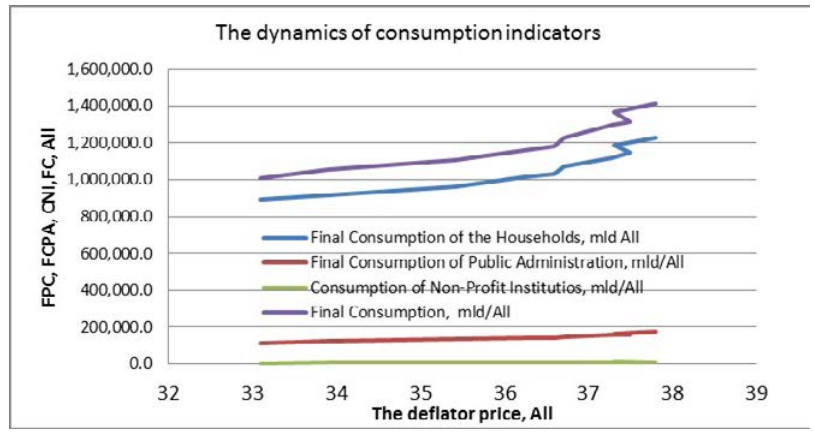
Table N_0.3 Final consumption structure (2008-2017)

	The deflator price, All	Final Consumption of the Households, mld All	In% to Final Consumption	Final Consumption of Public Administration, mld/All	In% to Final Consumption	Consumption of Non-Profit Institutios, mld/All	In% to Final Consumption	Final Consumption, mld/All
2008	33.09	892,776.2	88.4	112,162.9	11.1	5,197.8	0.5	1,010,136.9
2009	33.89	918,650.9	87.3	127,084.8	12.1	6,366.7	0.6	1,052,102.4
2010	35.41	961,911.8	86.9	138,311.7	12.5	6,366.7	0.6	1,106,590.2
2011	36.23	1,011,825.7	87.1	142,732.6	12.3	6,555.5	0.6	1,161,113.9
2012	36.6	1,032,477.9	87.2	144,540.9	12.2	6,673.3	0.6	1,183,692.1
2013	36.71	1,073,608.6	87.3	148,850.0	12.1	6,830.4	0.6	1,229,289.0
2014	37.28	1,119,647.5	86.3	159,788.5	12.3	7,582.5	0.6	1,297,285.9
2015	37.49	1,146,557.8	87.1	159,360.6	12.1	10,852.8	0.8	1,316,771.2
2016	37.31	1,186,804.6	86.9	165,938.3	12.2	12,526.8	0.9	1,365,269.7
2017	37.8	1,226,151.2	86.7	177,820	12.6	10,924	0.8	1,414,895.2

Source. INSTAT, Bank of Albania. The deflator price is calculate by the author.

The final consumption trends in years are also given in the following graph. Consumer spending is the main weight. This weight gives the misconception that rising consumer spending is the main factor driving economic growth.

Fig.N_0.11 Link between consumption and Deflator Price



Source. Author

CONCLUSIONS.

Aggregate, Keynesian, classical and intermediate market models studied in macroeconomics, according to the study, they are practically inapplicable. From the analysis of the intermediate model, it results that some of the conclusions are out of economic logic. The model is static, with projected conclusions that often do not match the reality of the market. Existing models cannot perform economic analysis. From the author's research on applying aggregate market models to scientific journals inside and outside Albania, no work has been found to use and utilize them.

The material provides some variations from the existing model, and some conclusions differing from those resulting from the existing model. These differences between models make the proposed Model, a New Model with value for economics and researchers.

1. The three curves are positive slopes.
2. The curves are not cut with each other. In exceptional cases, they change places.
3. Expenditure and revenue on curves are always supported on a straight line parallel to the X-axis, representing the level of the Aggregate Price.
4. Between the Demand and Supply curve the GDP curve is set.

Conclusions differ.

1. Increasing demand does not lead to increased production. Increasing demand leads to higher prices. When purchasing power drops significantly, output increases.

2. The rise in prices and inflation results in the indexation of wages. Wage indexing brings about increased output. This is because owners want to keep their profits.
3. Increasing the supply does not lead to a decrease in prices, but to the same prices or increase. In exceptional cases the prices are reduced.
4. Increasing demand and supply over the long run results in increased production and increased prices.

RECOMMENDATIONS.

The New Market Model presented alongside the classic, Keynesian and Marxist model will help interested parties. It will help scholars to reassess state intervention in the economy, the role of state-owned property as competitors of the private, market-to-production ratio, and so on. It will help them analyze the components of GDP and their role in the growth of the economy. It will serve to understand production as a priority, not the costs of growing the economy, assessing cause as a priority, and not a consequence.

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ESTIMATIONS OF EXHAUSTIVENESS IN THE PRODUCTION APPROACH-MISREPORTING BY PRODUCERS (N6)

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ABSTRACT

The purpose of National Accounts is to ensure an exhaustive description of the economy by compiling statistics that cover as far as possible the activities belonging to the non-observed economy. The exhaustiveness of GDP estimates in Albania was improved by using the updated techniques for the estimates of non-observed economy (NOE). The estimates are based on the EUROSTAT tabular approach to exhaustiveness of national accounts and on the OECD Handbook. Based on Labor Force Survey, Structural Business Survey and Household Budget Survey data, seven types of the non-exhaustiveness (N1-N7) are identified and a direct estimation of the NOE was compiled.
This paper explains step by step the methodology of estimating (NOE, type N6) by using Franz Method (Income based). This is a simplified version of the method proposed by Franz (1985), which is based on the principle that the receipts and costs data for an enterprise must be coherent. The theoretical justification behind this principle is that self-employed workers will change their employment status unless they receive at least the same income as they would have earned for the same time working in paid employment in the same type of economic activity (opportunity costs). In cases where the data collected in the basic statistics indicate that self-employed persons have a lower income, there is a good reason to assume that the difference is compensated for by incomes which are not declared to the tax authorities and to official statistics.
The present methodological paper is also an outcome of INSTAT. It has been prepared by me while estimating this component under IPA 2012 MB Statistical Programme: "Description of sources and methods GNI compilation", in Albania.

KEYWORDS:

non-observed economy, Franz method (N6), underreporting, exhaustiveness adjustments, official statistics

INTRODUCTION

The main purpose of National Accounts is to offer an exhaustive description of an economy. This means that the aim of compiling statistics is to cover as far as possible the productive activities belonging to the Non-Observed Economy (NOE). The exhaustiveness of GDP estimates was improved by using the updated techniques for the estimation of non-observed economy (NOE). The estimates are based on the EUROSTAT tabular approach (ETA) and on the OECD Handbook. Based on the Labor Force Survey, Structural Business Survey and Household Budget Survey data, N1-N7 types of the non-exhaustiveness are identified and a direct estimation of the NOE was realized. The Labor Input Method was applied to estimate NOE N1 and N6 types of the EUROSTAT tabular approach for all activities except for agriculture, financial sector, and public administration. Also, to estimate underreporting (NOE, N6) the Franz method was introduced.

Franz Method

Franz method[10] (Income based): This is a simplified version of the method proposed by Franz (1985), implies that income of the self-employed worker should be coherent with average compensation of employees for the relevant activity. The theoretical justification behind this principle is that self-employed workers will change their employment status unless they receive at least the same income as they would have earned for the same time working in paid employment in the same type of economic activity (opportunity costs). In cases where the data collected in the basic statistics indicate that self-employed persons have a lower income, there is a good reason to assume that the difference is compensated for by incomes which are not declared to the tax authorities and to official statistics. A key additional assumption for such a comparison of income is a reference income for the self-employed which can be compared with wages and salaries of the employees. There are considered as N6 underreporting of gross output or over-reporting of intermediate consumption in order to evade (or reduce) income tax, value added tax or social security contributions. Two types of methods are developed for estimation of N6; the first is labor input method (LIM) for evaluation of under declared employees and the second "Franz Method (1985)" in order to correct the underreporting of output by producers.

There are two hypotheses for underreporting:

- In hypothesis 1, the business under-reports turnover while reporting costs in

10 See Franz A. (1985), Estimates of the hidden economy in Austria on the basis of official statistics, The Review of Income and Wealth, 4, 1985.

full. Once it has been established that the income of the self-employed worker is lower than that of the employee, the income from self-employment is reassessed. The same amount is transferred to receipts, costs remain unchanged and value added is thus increased.

- In hypothesis 2, the business declares the same value added, reporting turnover in full but this time over-reporting costs by the same amount as that by which the first had under-reported turnover. The method leads to the same reassessment of value added.

Franz Method in Albania

In Albania the Franz method is used for underreporting according to hypotheses 1 and the process of correction for underreporting is done as following:

Step 1: Identification of enterprises that fulfill the above conditions to apply Franz method. This new methodology is applied to a sub-sample of SBS which includes only the enterprises that have a legal form such as: (1) physical person, (4) limited liability company and (5) simple society. Furthermore, from this sub-sample, are chosen only the enterprises that have less than 49 workers. This means that only "Small – up to 5 employees" and "Medium – from 5 to 49 employees" enterprises are taken into account and excluding those that are considered "Large – 50 and more employees". In order to take in account the business life cycle of the enterprises, the correction method is applied differentially according to the years of activity of the enterprises that fulfill the above conditions. For all the enterprises that have up to 1 year of activity the method is not applied while for, the enterprises that have from 1 to 2 years of activity the method is applied at 50%. The method is fully applied for those enterprises that have more than 2 years of activity. This distinction is done because the method does not require enterprises that have negative gross profit, event that according business life cycle may occur in the early years of an enterprise.

Step 2: Calculation of compensation of employees by employees and incomes (gross profit) of self-employed.

In the first case, the average salary calculated for employees, (MVP> 0) and (MPPV = 0) is imputed. These companies have not reported data on "salaries" and only have information on "social security".

In the second case, the average compensation calculated on employees is imputed for all enterprises (MPV = 0) and (MPPV> 0). These companies report data on "salaries" and have no information on "social security".

In the third case, at least one self-employed is imputed in all enterprises that (MPV = 0) but only employees (MPVV> 0), since it is not possible for the selected legal forms to have at least one self-employed.

In the fourth case, the same structure is used as before, for all enterprises that have declared self-employed only (MVP> 0), have no employees (MPPV = 0) and on the other hand have declared "wages" and "social security".

After doing all the adjustments, it is very important to recalculate:

- per capita gross profit of the self-employed
- per capita compensation of employees with the new compensation of paid employees and the new number of self-employed and employed persons.

Step 3: Adjustments are done for working hours between employees and self-employed. Adjustments of per capita of step 2 are done to take into account of different working time of employees and self-employed. The ratio between the hours worked by the two categories provides a correction factor, which is applied to the actual earnings of the worker in the specific enterprise in question. The adjustment coefficient of average amount of hours worked is taken from LFS data.

Step 4: Comparisons of per capita income of self-employed and per capita compensation of employees by size of enterprise and NACE Rev.2 breakdown. As it was specified before, the method has the aim to compare per capita income of self-employed with per capita compensation of employees which is now adjusted to the different working hours of the employee respect the employer. If the difference between the two values is negative, then "reported value added" and "reported output" from enterprises is revaluated with the amount of negative differences by obtaining in this way "revaluated value added" and "revaluated output". Intermediate consumption is not affected by the revaluation of output and value added since the latter two are changed with the same amount.

Step 5: By taking into account economic branches and dimensional classes, calculate:

a) The ratio between "adjusted value added" and "value added" reported from the enterprises
b) The difference between "adjusted value added" and "value added" reported in the enterprises, which is after divided to the number of total workers (self-employed plus employees). This is called revaluation coefficient.

Step 6: The amount of the revaluation grossed up to universe of enterprises underlying in national accounts is obtained by multiplying the coefficient calculated in the step 5 with the number of employed from all other enterprises that have the same that have the same features of legal form and economic activity of the enterprises in which Franz method is applied.

The most affected sectors by underreporting of incomes for year 2017 are the trade activities NACE G that compound about 50% of total amount of revaluation. It is followed by manufacturing NACE C and construction activities NACE F with respectively 11% and 10 %. As well accommodation and food services activities NACE I, Professional, scientific and technical activities and Private Human health and social work activities NACE Q have a large percentage of revaluation by 12 %, 11% and 14%.

Table: Exhaustiveness adjustment with Franz method

GDP BY PRODUCTION APPROACH	in Million ALL						
	Eurostat Tabular Approach						
	N1	N2	N3	N4	N5	N6	N7
Output						357,217	
Intermediate Consumption						200,133	
Value Added						157,084	
%						54%	

Source: INSTAT

RECOMMENDATIONS

In the future, methodologies should be further developed to check the consistency of the time series of intermediate consumption / value added ratios; value added \ employees; wages \ to employees.

Estimates of the Franz method need to be improved by focusing on the over-reporting of expenditures and costs.

LITERATURE

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NJË SHOQËRI E TRONDITUR NGA NDRYSHIMI...

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ABSTRACT

Epoka dixhitale është realitet edhe në Shqipëri. Me studime të rregullta apo me investime që lidhen me aftësitë aplikative, rinia te ne është e përfshirë në ndryshimet e epokës dixhitale. Jemi në një realitet që mes gjeneratave ka një çarje. Brezat e rinj zotrojnë kulturë dixhitale, dinë ta përdorin atë dhe mundet të shprehen me gjuhën dixhitale, Ata dinë të ndertojnë mendim dhe projektim dixhital. Ndërkohë brezat e vjetër, kanë eksperiencë pune, përvojë në administrim të tipit tradicional, dhe arsyetime që nuk është se nuk vlejnë, por nuk mundet të komuniohen me të tjerët sepse vijnë nga një pervojë metodologjike pune shumë të respektuar por tashmë të tejkaluar. Në këto kushte shoqëria jonë është e tronditur nga ndryshimi. Përball tij duhet kujdes, matje parametrash social dhe antropologjik, njohje e gjendjes dhe hedhje e treguesve në një matricë kombëtare." A e dini se çfarë kanë të përbashkët markat e mëdha si Netflix, Amazon dhe Apple? Edhe pse ata të gjithë veprojnë disi në hapësirën dixhitale, ato nuk janë të padurueshme për disa nga vështirësitë që mund të krijojnë në epokën dixhitale.Kur bëhet fjalë për thjeshtimin e proceseve, uljen e kostove, optimizimin e kujdesit ose forcimin e marrëdhënies me klientin, përfitimet i tejkalojnë rreziqet. Dije se është e nevojshme të zbatohen mjetet e duhura, pavarësisht nga madhësia e kompanisë."[11] Jashtë kulturës dhe mardhënieve dixhitale as jetohet as investohet as nuk mund të ndryshosh shoqërinë.

11 https://reviewalert.com/6-main-obstacles-faced-by-companies-in-the-digital-age

6 janë sfidat kryesore me të cilat përballen kompanitë në epokën dixhitale. Është e domosdoshme të mësohemi me pengesat dhe përgatitemi t'i kapërcejmë ato! Le ti shohim nga afër një e nga një.

Sfida e parë. Kuptoni nevojën për të ndryshuar.Një studim i publikuar nga Altimeter citon kulturën e kompanisë si një nga sfidat kryesore në ditën e transformimit dixhital. Jo vetëm që punonjësit i rezistojnë ndryshimit, por edhe menaxherët gjithashtu. **Frika, skepticizmi dhe madje edhe sabotimi janë pengesa që duhet të tejkalohen.**

Sfida e dytë. Mbajeni përqendrimin te qëllimi i vërtetë. Digitaliteti nuk duhet të shihet si një risi. Qëllimi i tij është të ndikojë në modelin e biznesit dhe të inovojë mënyrën sesi menaxhohen produktet dhe shërbimi ndaj klientit. Si rezultat, **ju duhet të rishikohet çdo ndryshim të bërë në proceset e tyre.**

Sfida e tretë. Kënaqja e nevojave të klientit. Sot, konsumatorët përdorin telefonat e mençur në shumicën e aktiviteteve të përditshme: me to bëjnë kërkime, bëjnë blerje, hyjnë në rrjetet sociale, etj. Tashm është bërë shumë më e lehtë dhe më e shpejtë për të marrë atë që dëshironi. Njerëzit presin rezultate dhe përgjigje të menjëhershme. Kompanitë duhet ta shohin këtë si një mundësi!

Sfida e katërt. Menaxhimi i një vëllimi të madh informacioni. Është e rëndësishme të jesh i vetëdijshëm për sjelljen e konsumatorit, në mënyrë që të mund të personalizosh fushat dhe të konvertosh më shumë rezultate tek klientët. Por si mund ta bësh këtë? Të dhënat e bollshme ofrojnë mënyra të reja për të mësuar më shumë rreth audiencës së synuar. **Kështu, ne mund të mbledhim informacione në lidhje me preferencat e konsumatorit, blerjet tuaja të fundit, etj.**

Sfidat e pestë. Matja e rezultateve. Rreth 53% e ndërmarrjeve moderne janë të pakënaqur me aftësitë e tyre analitike. Kjo mund të duket absurde, por ama ka shumë kuptim. Ka më shumë të dhëna për të mbledhur, dhe mosmatja e treguesve të duhur mund të jenë me pasoja të rrezikshme. **Zgjidhja e problemit është të implementojmë teknologji të inteligjencës artificiale për të përmirësuar mbledhjen e të dhënave dhe përpjekjet e personalizimit.**

Sfida e gjashtë. Investimi te kapitali njerëzor.Bizneset që duhet të rinovojnë infrastrukturën e tyre themelore kërkojnë më shumë investime. Kjo është veçanërisht sepse nuk është vetëm çështje e zëvendësimit të makinave, por e gjetjes dhe mbajtjes së njerëzve të aftë për ta shndërruar kompaninë në mënyrë dixhitale. **Menaxhimi i talentit është thelbësor për të kualifikuar, kultivuar dhe ruajtur forcën e punës.**

Si paraqitet gjendja në Shqipëri? Interesim ka dhe puna ka nisur. Për as edhe një arsye nuk mund t'I shmagesh kësaj prirje globale. Prania e shumë partnerëve relevantë në tregun shqiptar si dhe prania e instrumenteve inteligjentë qoftë në përdorimin vetiak janë tashmë realitete të prekshme. Në dhjetor të vitit 2016 në Shqipëri u organizua një aktivitet goxha pretendues. Me gërma të mëdha u shkruajt:" **Si po transformohet edukimi në Shqipëri?" Michael Kogeler ishte prezent në "Konferencën Transformimi Dixhital i Edukimit"**.

Konferenca prezantoi disa prej projekteve më të rëndësishme në sektorin e edukimit dhe ICT-së në Shqipëri të realizuara falë partneriteteve private dhe publike për ekselencë në edukim.

Ja deklarat e tre minsitrave të asaj kohe, po i citoj në ligjëratë të drejtë:
"Transformimi dixhital nuk është më një opsion, teknologjia është jeta e përditshme e miliona njerëzve në mbarë botën. Në Europë pritet që brenda 5 viteve të ardhshme të krijohen një milion vende të reja pune nga teknologjia. Ky mbase është një diskutim që mund ta bëjmë vetëm ne sepse për një fëmijë sot nuk ka asgjë të re," Ministrja e Inovacionit dhe Administratës Publike, zj. Milena Harito. **"Sfida jonë është si të takojmë tregun modern të punës me edukimin dhe në këtë kuadër kjo është një sfidë mjaft e vështirë.** Në 25 vitet e fundit në Shqipëri ai që ishte harruar ishte edukimi profesional. Megjithatë shenjat janë të mira sepse sot kemi dyfishin e kapaciteteve në shkollat profesionale." Ky ishte qëndrimi i Ministrit të Mirëqënies Sociale dhe Rinisë, z. Blendi Klosi. "Të edukohesh me teknologji do të thotë të kesh një qasje të re të të gjithë shoqërisë. Koha që jetojmë sot është ajo e cila mbyll hendeqet e komunikimit. Integrimi në shoqëri vjen me komunikimin dhe në veçanti sot komunikimin dixhital në thelb të të cilit qëndron edukimi. Nëse vijojmë me sistemin tradicional të edukimit, investimi në këtë sektor do të vinte shumë më vonë sesa nevojat," tha zv Ministrja e Arsimit, zj. Nora Malaj. Në konferencë u prezantuan disa prej projekteve më të rëndësishme në edukim dhe IT-n të realizuara falë bashkëpunimeve gjithëpërfshirëse mes institucioneve publike dhe private për ekselencën në edukimin në Shqipëri. 3 vite të shkuara arritjet ishin si më poshtë.

- **Projekti i konektivitetit në 20 shkolla në Shqipëri:** Më shumë se 15,000 studentë kanë qasje në Wi-Fi një projekt i financuar nga Microsoft dhe mbështetur nga Ministria e Mirëqënies Sociale dhe Rinisë. Komunikimi dhe angazhimi mes mësuesve dhe studentëve nuk ka qenë asnjëherë më i lehtë një proces tashmë i mundur nga çdo vend dhe çdo paisje. Drejtori i Microsoft Albania, z. Sokol Vladi së bashku me Ministrin e Mirëqënies Sociale dhe Rinisë z. Blendi Klosi firmosën simbolikisht në konferencën finalizimin e projektit.
- **60 shkolla pilot do të përfitojnë nga Office 365 dhe Intune**: Projekti u inicua nga Ministria e Edukimit dhe Sportit dhe do të lançohet nga një partner i Microsoft siç është Infosoft. Office-365 do të ofrojë një platformë qëndrore komunikimi dhe bashkëpunimi mes studentëve dhe mësuesve shqiptarë falë aplikacioneve popullore dhe mjeteve të fuqishme që mundësojnë mënyra të reja të ndërveprimit, mësime interaktive dhe një proces mësimor individual.
- **Sistemi i Menaxhimit të Mësimit:** Do të implementohet gjerësisht nga të gjitha shkollat K-12 dhe do të prezantohet nga Bit Media.
- **Projekti i "Ngushtimit të Hendekut të Aftësive Dixhitale**": **U prezantua nga British Council me synimin për të eleminuar njëherë e mirë pengesat që gjenden mes sektorit të edukimit dhe botës së biznesit në Ballkanin Perendimor përfshi Shqipërinë.**

"Më pyesni a ka bërë Shqipëria përparësi në teknologji? Në të vërtetë keni shumë për të bërë, të gjithë kanë shumë për të bërë jo vetëm Shqipëria. Si po transformohet edukimit? Duke i dhënë një fëmije një tablet ku mund të kryejë detyrat shkollore me më lehtësi? Jo, transformimi i edukimit do të thotë të ndryshoh mënyrën sesi bota funksionon. 65% e studentëve në të ardhmen do të bëjnë punë që sot nuk ekzistojnë. Si do të kërkojnë një punë inekzistente? Për këtë duhet të edukojmë fëmijët në një mënyrë tjetër," **u shpreh Menaxheri për 15 Shtete të Europës Qëndrore dhe Lindore pranë Microsoft, Michael Kogeler.** Misioni i Microsoft është ti mundësojë çdo individi dhe çdo organizate në planet të arrijë më shumë dhe studentët janë në zemër të këtij misioni. Fokusi i Microsoft në edukimin teknologjik është një nismë në zhvillim për tu dhënë mësuesve dhe studentëve mundësinë e përdorimit të teknologjive moderne në kurrikulat tradicionale dhe për të ndihmuar gjeneratat e reja të jenë më kompetitivë në tregun e punës.[12]

Shoqëria jonë është në ndryshim, por ka shumë rëndësi të analizojmë gjendjen me qëllimin e mirë për të thënë se ku jemi, çfarë kemi realizuar, si dhe me çfarë kosto; ku kemi mbetur mbrapa, pse dhe si mund të përshpejtojmë rritmine ndryshimit. Në botën dixhitale ndryshimet qofshin ato instrumentale qofshin ato të IQ (Intelligence-Quality) janë aq dinamike sa që nëse nuk i ndjekë dhe nuk familjarizohesh me to, krejt në mënyrë të beftë e gjen veten të mbetur mbrapa dhe të zhgënjyer me prapambetjen tënde. Edukimi dixhital duhet të jetë pjesë e edukimit shkollor që në moshat e njoma, që në fëmijëri jo thjesht si argëtim apo mënyrë që t'u zërë kohën fëmijëve me qëllim që t'u sigurojë kohë të lirë prindërve. **Mendimi dhe instrumenti është një binom universal si në vertkalen historike gjithëkohore ashtu edhe në shtrirjen horizontale të kohës kur jetohet. Tashmë pa humbur më kohë duhet një stradegji kombëtare për edukimin gjithëshoqëror me qëllimin që edhe ne si antropologji të përfshihemi në atë që njihet "web society". Lypsen objektiva, afate, plan veprimi, instrumenta, partnerët dhe rreshtimet në rrjete homologe.** Të mendojmë në mënyrë të avancuar fal mundësive eksploruese, kërkuese, analizuese, dhe projektuese të ndërgjegjes dhe edukimit dixhital. Historia ka treguar se vende që në një perjudhë të kohës kanë qenë të prapambetur, duke u përfshirë në programe të edukimit me teknologjitë e reja kanë realizuar në një kohë relativisht të shkurtër ndryshime epokale.Eksperianca koreanojugore[13]

Ne si antropologji nuk e kemi as edhe një herë të vetme këtë përvojë historike që të jemi përfshirë në një revolucion teknologjik. Ne duhet ta provojmë edukimin me teknologjinë dixhitale. Një sipërmarje e tillë kombërtare duhet të lëvizi në disa

12 https://businessmag.al/si-po-transformohet-edukimi-ne-shqiperi-michael-kogeler-ne-konferencen-transformimi-dixhital-i-edukimit/

13 https://www.hindawi.com/journals/edri/2015/783593/ "Ne kemi hetuar perceptimet e mësuesve të letërsisë dhe të arteve gjuhë në Kore, në lidhje me teknologjitë e komunikimit interaktiv (TIK) në udhëzime. Sondazhi adreson mundësinë e përdorimit të tyre në aplikacione dhe teknologji të ndryshme të lidhura me TIK, qasjen në mbështetje teknike, shpeshtësinë dhe rëndësinë e përdorimit, dhe pengesat dhe konceptet e integrimit të TIK-ve. Të dhënat përshkruese dhe korrelacionale raportohen të jenë efektive në fushën e TIK-ut dhe janë të disponueshme në nivelin kombëtar.Mësuesit e Koresë së Jugut sigurojnë qasje në disa mjete dhe aplikacione, që të jenë të kufizuara . Ne i krahasojmë të dhënat nga ky studim me gjetjet tona nga një studim i ngjashëm i kryer në SH.B.A. dhe diskutojmë se çfarë zbulimet zbulojnë në lidhje me integrimin e TIK-ut në udhëzimet e shkrim-leximit në Korenë e Jugut. Implikimet për politikën arsimore në Korenë e Jugut janë diskutuar. Për shembull, pavarësisht se raportuan më shumë barriera sesa homologët e tyre amerikanë, mësuesit e Koresë së Jugut raportuan që përdorin TIK më shpesh sesa mësuesit nga SH.B.A."

korsi, në edukimin shkollor, në afësimin aplikativ, në ndërtimin e projekteve që kanë impact zhivillimi shoqëror dhe ekonomik, në kërkim për ide të reja që shiten në treg, në projekte madhore vendore dhe ndërkombëtare me vende në rajon. **Duhet instaluar konferenca kombëtare e edukimit dixhital e përvitshme, me qëllim që një herë në vit të shohim ku jemi, çfarë ka ndryshuar, ku jemi mbrapa, çfarë kërkojnë kompanitë e mëdha globale që kontrollojnë tregun global, si mund të përshpejtohet zhvillimi i gjithanshëm i vendit.** Në një farë kuptim duhet të mësojmë dhe të zotrojmë gjuhën e sotme globale të komunikimit shkencor. Koha ikën, ajo nuk të pret e as të lutet. Le të ndjekim prirjen që karakterizon vende të tjera të cilët që në shkollën elementare në mënyrë të programuar krahas kreativitetit, prirjeve, edukimit moral dhe me art; janë të angazhuara që komunikimi të jetë përmes kësaj semantike të re që jo vetëm komunikon, por edhe mendon, madje si edhe duket ecuria edhe do të ndjejë në të ardhmen e afërt. Mbetja mbrapa nuk duhet kërkuar as sot as edhe nesër mes justifikimeve që vijnë nga prapambetja historike. Një përpjekje e tillë jo vetëm që do ishte e pamjaftueshme por edhe qesharake. Jetohet në shoqërinë e lirisë. Tregoje veten se çfarë je në gjëndje të bësh. Të dalim nga një model i kapërxyer edukimi dhe formimi shkollor tejet të kapërxyer, të iluminimit me riprodhim mekanik të dijes. Kreativitet, sipërmarje, teknologji e avancuar këto janë sfidat tona.

KREATIVITET, SIPËRMARJE, TEKNOLOGJI E AVANCUAR.

Një episode sa një histori, e cila tregon se kur do të përfshihesh në sipërmarrje mundesh. Tek lëvizja fshtrave të bregut drejt Sarandës me makinë, një djalë më ngriti dorën. U ndala dhe e mora në makinë. Mendova se ishte nga Saranda. Jo ai ishte nga Gramshi. Nuk qe më shumë se 19 vjeç. Punonte bashkë më të atin si çoban. Kullotën e kishin marë me qira. Ai atë ditë po shkonte në Sarandë që të paguante në bankë qiranë e kullotës. Kjo është sipërmarrja. Të rinj që në zonën e Beratit dhe Lushnjës bëjnë biznes duke shitur produkti bujqësore jashtë Shqipërisë. Po kështu në zonat veriore ka shumë të rinj që janë përfshirë në punët në bujtina apo mbledhjen e produkteve të natyrës bio me qëllim tregëtimin e tyre. Edhe në qytetet e mëdha ka të rinj që përshihen në punë e vështirë të sipërmarrjes por edhe marin frytet e saj. Ka pasur edhe raste të krijimit të "start upeve". Pa dashur të bëjmë një inventar të rasteve dhe arritjeve, është më rëndësi të shtrojmë një pyetje thelbësore. Pse të rinjt ikin nga Shqipëria dhe nuk zgjedhin si alternativ sipërmarrjen në vendin e tyre?! Çfarë pengon? "285 mijë të rinj duan të emigrojnë. Janë rreth 300 mijë të rinjtë shqiptarë të cilët duan të largohen nga vendi, thotë fondacioni "Friedrich Ebert" në raportin më të fundit për të rinjtë në rajonin e Europës Juglindore. Sipas këtij raporti, 43% e të rinjve shqiptarë duan të largohen nga vendi. Pak më shumë se gjysma e tyre, do të donte të largohej nga Shqipëria për më shumë se 20 vite, thuhet në studimin i cili është kryer në formën e një ankete. Nga ana tjetër, 1 në 3 të rinj shprehet se nuk ka aspak ndërmend që të emigrojë nga vendi. Rreth 76% e atyre që duan të largohen, ndërkohë, japin si arsye kryesore atë ekonomike, ashtu si pjesa tjetër e vendeve të Ballkanit

Perëndimor, por edhe të Europës Juglindore.Me një potencial emigrimi në rreth 285 mijë të rinj, Shqipëria është e dyta në rajon, vetëm pas Rumanisë, që ka një popullsi bindshëm më të lartë. Të dhënat duket të jenë alarmante në këtë drejtim. Sa i përket zgjedhjes kryesore të të rinjve shqiptarë për të emigruar, në vend të parë qëndron Gjermania me 26%, në vend të dytë Mbretëria e Bashkuar me 18% dhe më pas Italia, me 16%. Nga ana tjetër, të pyetur se si ata e vlerësojnë situatën socio-ekonomike në vend, me një notë nga 1-5, të rinjtë shqiptarë i japin vetëm 2.2, që është nota më e ulët ndër të gjitha vendet e rajonit. Nga krahu tjetër, të pyetur të vlerësojnë situatën socio-ekonomike në Bashkimin Europian, të rinjtë shqiptarë japin notën 4.4, më të lartën mes vendeve të rajonit.Mesa duket, është pikërisht diferenca mjaft e lartë në perceptimin e dy realiteteve, atij në vendin tonë dhe atij në vendet e zhvilluara, ajo që i shtyn të rinjtë shqiptarë që të dëshirojnë në masë të largohen nga vendi."[14]

Realiteti jashtë të josh sepse janë kushtet ekonomike, pagat, ritmi, mënyra si funskionon shoqëria, kushtet e jetesës, pra moderiniteti që mungon në Shqipëri. Mendojmë se shkak është edhe mosdalja nga mentaliteti se Shteti nuk mendon për popullin.

Është gati e frikëshme që ende mes antropologjisë sonë ka mbetur mentaliteti që zgjidhja është shteti, është qeveria. Po është e sakt edhe në tezat e socialdemokracisë që si thotë Anthony Giddens se "qeveria nuk është armiku, ajo është zgjidhja" kur ballafaqon tezën e tij me liberlademokracinë e cila njeh si autoritet vetëm tregun. Gjithësesi politika duhet të krijojë kushtet favorizuese të sipërmarjes. Edukimi për sipërmarjen në shumë vende nis që në rininë e hershme. **Është e pa pranueshme që ende tek ne mbaron shkollën e lartë dhe nuk ka eksperiencë apo aftësi për punë, ndërkohë që vetë tregu i punës kur të rekruton të kërkon eskperiencë pune, e cila mungon.** Duket si kontradiktore gjendja, por ndërkohë që mijëvjeçari i tretë konsiderohet si Mijëvjeçari i sipërmarrjes. Megjithëse kjo lloj veprimtarie është zgjeruar, dinamizuar dhe ka prodhuar goxha energji ndryshimi, po në këtë realitet gjejmë të rinj jo aktivë dembelë dhe ankues." Sipërmarrësi i Mijëvjeçarit. ... Një brez që është përshkruar si dembel, narcisistic dhe i paaftë për të qëndruar në një punë, janë përshkruar si më sipërmarrësi i të gjitha brezave të mëparshëm."[15] Bizneset e vogla në mijëvjeçarin e ri tejkalojnë bizneset e vogla të perjudhës që njihen si Baby Boomer, dhe shumë nga potenciali i këtyre sipërmarrësve të rinj mbetet i pashfrytëzuar. Sipas një studimi të kryer, titulluar Millennials (pra njerëzit ose njeriu i këtij mijëvjeçari) - Amerikanët e lindur midis 1977 dhe 1995–janë gjetur si gjenerata më sipërmarrëse. Gjysma e Millennialsve, planifikojnë të fillojnë një biznes në tre vitet e ardhshme dhe më shumë se gjysma thanë se me burimet e duhura ata do të linin punën e tyre për të filluar një biznes në gjashtë muajt e ardhshëm. **Kur bëhet fjalë për çlirimin e potencialit të tyre sipërmarrës, Millennialsit përmendin dy**

14 /shqiperia-e-gjymtuar-ose-rreth-520-mije-persona-jane-larguar-prej-2007-es-285-mije-te-rinj-duan-te-emigrojne/

15 entrepreneurship and new generations

faktorë të rëndësishëm". Paratë si faktori më kufizues. Studimi zbuloi se më shumë se 13 milion Millennials thanë se nuk dinë se ku të kërkojnë ndihmë për të filluar ose drejtuar një biznes dhe kjo është arsyeja numër një që i pengon ata ata të fillojnë biznesin e tyre, me gati gjysmën e tyre që raportojnë se qasja daj kapitalit është pengesa më e madhe për ta. Bazuar te shifrat demografike një Millennials ka më shumë të ngjarë të ketë filluar një biznes të vogël sesa të dy Baby Boomers (ata të lindur në mes 1946 dhe 1964) dhe Generation Xers (ata të lindur në mes 1965 dhe 1976), dhe ata mezi presin të jenë shefat e tyre dhe të marrin përgjegjësinë për sigurinë e tyre financiare, Millennials e dinë se duhet të përfshijnë më shumë burime për të ndërtuar biznese të suksesshme.

Pra janë tre gjëra që edhe të rinjt tanë duhet ta mësojnë:

1- **Paratë për investim**
2- **Si të orjentohemi dhe ku duhet të drejtohemi**
3- **Përfshirja e sa më shumë burimeve për të ndërtuar burime të suksesshme.**

`Përveç këtyre kushteve duhet që ai që hyn në një sipërmarrje të ketë ide, qasje inovatime, motivim për të bërë ndryshimin. Parimi i sotëm është: "Më jep ide që të të jap para**" Nga ide të reja me pak para lindin iniciativat që sjellin ndryshimin. Tregu e pranon inovacionin kreativ pa as më të voglin paragjykim, e rëndësishme është që të qarkullojë paraja dhe kapitali, të rritet fitimi në treg dhe zgjerohet demografija konsumatore.** Në buxhetin e shtetit çdo vit duhet të ketë një fond garancie për sipërmarjen që grupe të vogla që ju dalin garant bankave me qëllim që të nxitet kjo iniciativë e sipërmarrjes. Përvoja në Angli është e tillë që për të nxitur biznesin në viten e para që ta provosh atë, lejohesh të realizosh pa ngarkesë fiskale. Ndrësa në Shqipëri tatohesh ende pa e kryer biznesin sa e nis. Tek realiteti ynë, nga njëra anë % e ngarkesës fiskale është e lartë,nga ana tjetër edhe % e kreditimit bankar po shumë e lartë. **Në një vend ku tregu nuk është i orientuar, kreativiteti është shumë i ulët, zhvillimi në vend numuro, inovacioni në parametra gati të papërfillshëm, është tejet e vështirë t'u thuash të rinjëve, mos u largoni nga atdheu.** Prej disa vitesh vendi është në një zhvillim kaotik sipas principit thjesht të hapim vende pune, por se ku, si dhe çfarë impakti, kanë ata sektorë në një zhvillim të qëndrueshmëm dhe sa shërbejnnë në tërheqjen e gjeneratave të reja për t'u përfshirë në iniciativën e sipërmarrjes, kjo as që shtrohet. Qoftë inkubatorët e biznesit qoftë sistemet universitare spin-off, apo iniciativat e pushtetit lokal tek ne, e ndezën këtë ndryshim por nuk është se e mbajtën flakën ndezur. Peter S Cohan[16] jep disa rekomandime se si mund të jesh i sukseshëm në startup in tënd. Leti listojmë ato duke i pare më nga afër.

16 Cohan shkruan për revistën Forbes, dhe Hungry Start-up për revistën, Wall and Main, dhe Worcester Telegram & Gazette. Ai është anëtar i Rrjetit të Wharton Blog, i cili mori çmimin e Arit në Këshillin për Përparimin dhe Mbështetjen e Arsimit (CASE) 2013 Programi i Akordimeve të Qarkut II. [4]

1. VLERËSONI MARRËDHËNIET NJERËZORE.
"Sipërmarrësit nuk mund ta bëjnë këtë vetë, kjo do të thotë se ata duhet të punësojnë njerëz të talentuar. **Trajtoni njerëzit e talentuar me respekt dhe sigurohuni që ata janë një përshtatje e mirë me vlerat e kompanisë**. Për shembull, Google punëson njerëz shumë të zgjuar të cilët përshtaten me qasjen e tij jokonvencionale për zgjidhjen e problemeve. Google ka përdorur qasjen e saj të famshme të drejtuar nga të dhënat **në vendimmarrje për të identifikuar tiparet e lidhura me menaxhimin efektiv. Dhe i ka përdorur ato njohuri për të punësuar dhe promovuar peope që demonstrojnë këto aftësi.**

2. NXITJA E PUNËS NË GRUP.
Nëse një sipërmarrës punëson njerëz të talentuar, ai ose ajo duhet të kërkojë që ata të debatojnë për zgjidhje. **Kërkojuni atyre të përdorin aftësitë e tyre për të zhvilluar zgjidhje më të mira për të punuar së bashku sesa do të mundonin vetë**. Në vitet e fundit, Google ka inkurajuar më shumë punën në ekip, gjë që ka ndihmuar kompaninë të sjellë ide të reja si Google Glass në realizim.

3. EKSPERIMENTONI NË MËNYRË TË EGËR.
CEO-të e fillimit duhet t'i rezistojnë nxitjes për të përsosur produktet e tyre përpara se t'i nisin pregatitjen e tyre. Përkundrazi, ata duhet të ndërtojnë versione të shpejta, të lira të produkteve të tyre, të marrin përshtypje nga tregu dhe të përmirësojnë produktin si përgjigje.Google inkurajoi këtë lloj eksperimenti të egër **duke i lënë punonjësit e saj të shpenzojnë 20 përqind të kohës së tyre duke punuar në projekte me interes personal.**

4. PËRMBUSHNI ANGAZHIMET.
Një startup nuk do të ketë sukses nëse ekipi nuk i di qëllimet e menaxhimit dhe më pas udhëheqësit veprojnë në përputhje me rrethanat. Dhe udhëheqësit që u tregojnë njerëzve të tyre se do të bëjnë një gjë, por ata vetë do të bëjnë të kundërtën, ata do ta humbin besimin.Google me siguri është përpjekur të ndjekë vlerën e tij të shprehur shpesh "mos u bëj i djallëzuar". Mjerisht, jo gjithmonë ka arritur sukses, siç është kur vendosi të censurojë rezultatet e kërkimit në Kinë në 2006. Ai u ndal në vitin 2010. Mos bëni të njëjtin gabim. Eshtë më mirë që një startup të heqë dorë nga një mundësi biznesi sesa të shkelë vlerat e saj thelbësore.

5. LUFTONI VETËKËNAQËSINË.
Mos lejoni që suksesi i një produkti ose shërbimi të veçantë ta ndalojë kompaninë të kërkojë mënyra më të mira për të përmbushur nevojat e klientëve. **Për të luftuar vetëkënaqësinë, të ruani një paranojë të shëndetshme dhe të jeni gjithnjë në kërkim se si të adoptoni teknologji të reja që do t'u japin klientëve një vlerë superiore.Konsideroni sesi Netflix u shndërrua nga një shërbim DVD-me postë, në një ofrues online të transmetimit.** Jo vetëm që Netflix e ka menaxhuar tranzicionin me mjeshtëri, por gjithashtu ka shtuar aftësi të reja si krijimin e shfaqjeve të

njohura dhe menaxhimin e marrëdhënieve me ofruesit e shërbimeve me një hapsirë më të gjërë.

6. FITONI PËRMES MJETEVE TË SHUMTA.
Mos lejoni që fillimi të varet nga një produkt që konkurrentët mund të kopjojnë. **Mbroni burimet e të ardhurave dhe fitimit duke qenë të mirë në disa aftësi kryesore që janë të vështira për t'u kopjuar nga rivalët.** Nën drejtimin e Steve Jobs, Apple mund të hynte në bizneset ekzistuese (si MP3 player, smartphone dhe tablet) dhe të shkurtojë vetë një pjesë të madhe të "byrekut" të fitimit. Apple fitoi përmes mjeteve të shumta: **Kishte dizajn të shkëlqyeshëm produktesh, marketing të shkëlqyeshëm dhe shërbim ndaj klientit, një zinxhir efikas furnizimi dhe aftësi për të motivuar ofruesit e palëve të treta siç dëshmohet nga suksesi i iTunes dhe App Store.**

7. JEPNI KOMUNITETIT.
Drejtimi i një fillimi është veçanërisht sfidues sepse pronarët e bizneseve nuk mund të paguajnë sa duhet për të tërhequr talentin e lartë. Por ata mund të kompensojnë paketën më të vogël të pagave duke zhvilluar një mision domethënës. Shqyrtoni rastin e Embrace Innovations, Drejtori i Përgjithshëm i të cilit, Jane Chen, unë intervistova në Qershor 2011. Ndërmarrja sociale u fillua në përpjekje për të shpëtuar jetën e foshnjeve të parakohshme në vendet në zhvillim. Në Indi, shumë foshnje të parakohshme vdiqën pasi nuk u mbajtën të ngrohtë gjatë një udhëtimi katër-orësh në spital.Për shkak të misionit të saj frymëzues, kompania tërhoqi punëdhënës të talentuar, të cilët zhvilluan një qese të vogël të gjumit me materiale speciale, në gjendje të mbanin foshnjat në temperaturën e duhur. Kjo shpëtoi shumë jetë."[17]

* * *

Bota është e përfshirë në një ndryshim dinamik gati gati prej fantashence. Flitet për agjendën 2030 që ka në qendër energjinë e rinovueshme. Edhe Bill Gate është përfshirë në të, me kontribute dhe projekte. OKB ka hartuar një plan veprimi për energjinë. Biznesi do të përfshihet në atë që njihet si ndërtimet ekologjike. Duket ndoshta si imagjinare por në vitet që vijnë do të ndërtohet një qytet sa New Yorku brena një dite. Nëse nuk mendojmë sot që të përfshihemi në këtë ndryshim gjigand, do jemi jo të fundit por të harruarit e kësaj bote.

17 https://www.entrepreneur.com/article/237930

A STUDY OF ANYPOINT PLATFORM. COMPARISON WITH OTHER INTEGRATION PLATFORM

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ABSTRACT

This study will highlight the development of one of the most important platforms recently, the Anypoint platform, its study including the purpose of creation, use, comparison with Biztalk Server and some ways of implementing it.
Studying enterprise service bus ESB platforms is of interest to users to choose the high quality platform and the least cost. It enables easy integration of existing systems, regardless of the different technologies that applications use.
AnyPoint platform is a complete application programming interface (API) that helps companies build application networks for applications, data, and devices. This hybrid integration platform includes integration of PaaS (platform as a service), ESB (enterprise service bus), SOA (service-oriented architecture) and a unified solution for managing and designing APIs.
Mule, considered the runtime engine of the AnyPoint platform, is a Java-based service between the integration service bus (ESB) and the integration platform that allows developers to connect applications together quickly and easily, allowing them to share data. It enables easy integration of existing systems, regardless of the different technologies that applications use, including JMS (Java Message Service), Web Services, JDBC (Java Database Connectivity) etc. Communication with this platform emphasizes real-time data exchange, integration with a logical and facilitation approach for any company offering its services.

KEY WORDS:

AnyPoint Platform, Mule Soft, Mule-ESB, Service Oriented Architecture (SOA), ESB communication, Rest web service.

Always and more importance to technology development and increase comes with great strides to advanced communication technology, application development and support in the economics hand in a practical way and mitigation. The possibility of finding a possible solution to application integration, large companies like Microsoft and Mule Soft launch their integration platforms applications businesses and companies to achieve integrity, high performance and success in the market. Specifically, this study will highlight the development of one the most important platforms recently, her research included the goal of creating and offering opportunities in the process of integration of applications, its use AnyPoint built on the studio, where it the last is built on the components as Visual Studio, RAML language, etc. variety of components, comparison with other integration platforms in this case BizTalk Server, as well as including several ways to implement.

Development and study of AnyPoint platform offered by Mule Soft, based on Mule ESB and other diverse components. Mule, considered as a runtime engine AnyPoint platform is a service based on Java where between enterprise service bus (ESB) and integration platform allows developers to connect applications to quickly and easily together, being allowed to exchange data.

AnyPoint platform solve various problems of relations with SOA architecture, SaaS services and Application Programming Interfaces such as: different configurations, the composition of components, etc. Connectivity between applications it is an integrated platform, more productive, creates a hybrid network applications and data.

The main objectives of the study will be clearly explained in the respective topics ranging from the basic concept of application integration in a SOA architecture, its contribution on this platform, widely familiarity with ESB communication, involvement of Mule ESB on the basis of which built AnyPoint platform. The study of the latter and comparing it with another integration platform as BizTalk Server, highlighting its advantages and disadvantages, and the final part will include the realization and implementation to be carried out through the platform.

SERVICE ORIENTED ARCHITECTURE (SOA)

A SOA-oriented architecture to service is essentially a collection of services. These services communicate with each other. Communication can include simple transfer of data or may include two or more services coordinating some activity. SOA is a paradigm and discipline of design that helps IT (information technology) to meet business requirements, services that are unlocked and can interact with each other

regardless of the type of service, meaning that a particular service may be specific platform or protocol. The main focus of this study highlight his goal, link the main tools that built this platform of applications integration -> SOA-> ESB-> MULE ESB-> ANYPOINT platform.

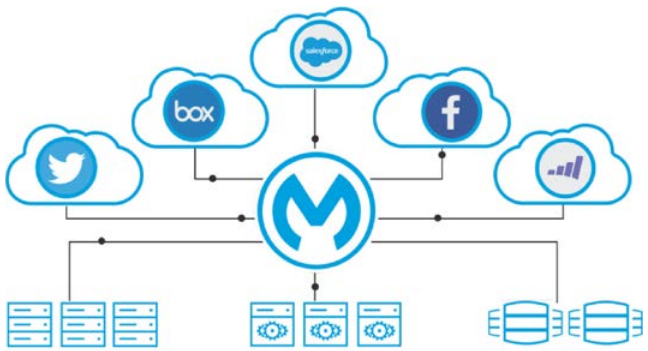


Figure 2: The interaction between applications.The key to integration platforms he goal

ESB (ENTERPRICE SERVICE BUS) COMMUNICATION

ESB is a key infrastructure that allow to different applications to communicate across two main ways standarts-based or pot-level-comunication. ESB provides communication services through network protocols such as HTT, TCP, UDP, etc, where together with infrastructure when it built ESB enabling key features such as publishing, hosting, subcriben, and asynchronous request-response messages. ESB comes as an acronym of the words: service channel enterprise.

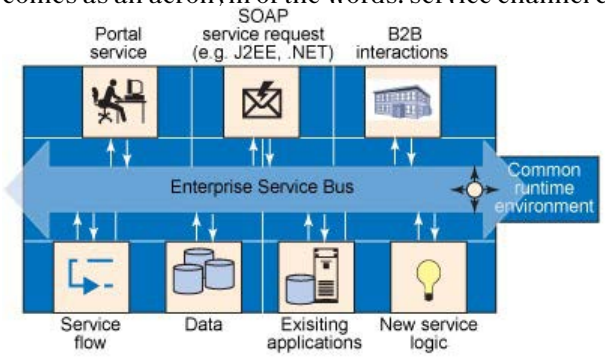


Figure 3: Communication through adapter provided by ESB

ESB architecture has several basic principles, the main focus is to turn off systems from each other, allowing them to communicate in a consistent and manageable way. Enterprise service bus as a component-based architecture model used for

the design, implementation, interaction and communication between software applications that interact gone mutually SOA. As a set of principles and methods set designs and develops IT functionality best business which are built as software components that can be reused whenever necessary.

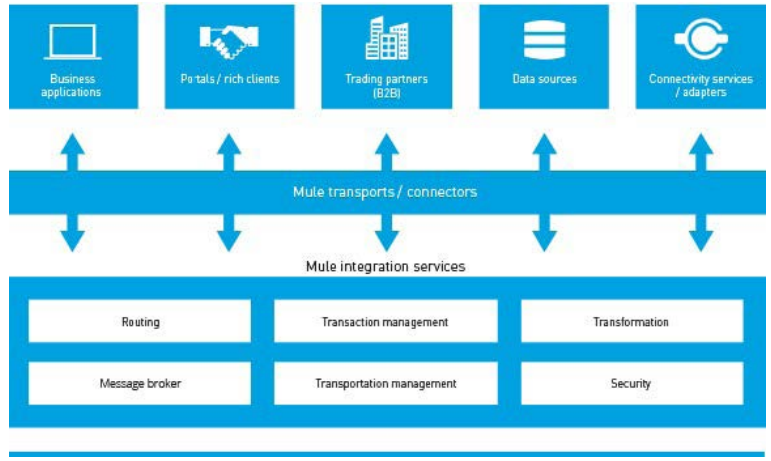


Figure 4: Mule ESB integration Services

Development of applications integration tends to be a major conflict. Usually conflicts resulting from the integration of a large number of components, regardless of whether the web services, databases or other systems. Each component is different, which is expected to enter data in a specific format and returns the information in a specific format combination of all these ingredients in a use case will be implemented on the basis of modern platform Mulesoft's and development tools and implementing it offers.

The idea that there should be stuck out of the development environment MuleSoft is profitable offers tesafe. Having an intuitive development environment and easy to use is extremely important to increase productivity and reduce the cost of development. MuleSoft provides a development environment called mule-studio, which is based on Eclipse.

Mule Soft provides AnyPoint platform to perform data integration and applications across existing system. It's based mainly on Java platform is complemented with connectivity features API-Led and other products AnyPoint characterized for connectivity, and high composability in control. Mule Soft as a runtime engine platformesAnypoint,it is described as an easy platform ndewith Java-based interaction (ESB) and integration platform that allows developers to connect applications together quicklye and easily, enabling them to exchange data. They are also suitable for scenarios where the free bond is required, scalability and sustainability. Mule ESB is the foundation of the platform is AnyPoint for connection to any application, data source or programming interface, either in the cloud or on the local environ-

ment. With AnyPoint platform, Mule Soft provides a comprehensive integration platform, which is based on reliable technology open source, eliminating costs and effort required for a point-to-point integration.

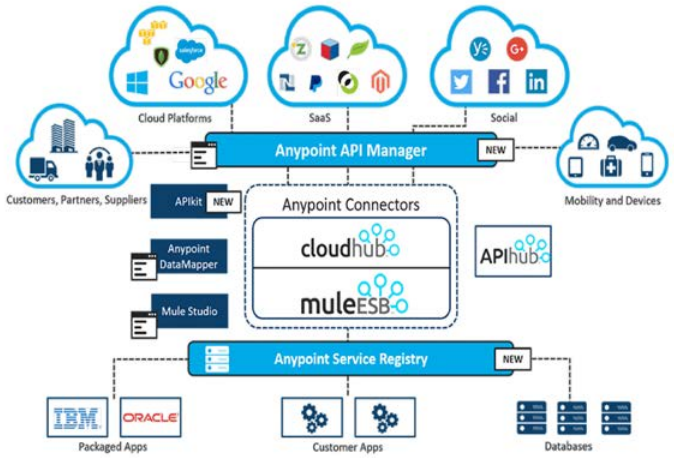


Figure 8: Introduction to Anypoint Platform

STUDY ANYPOINT PLATFORM

The unified MuleSoft's Anypoint Platform is the leading platform connectivity for SOA, SaaS and API to perform data integration and applications across existing system. It's based mainly on Java platform is complemented with connectivity features API-Led and other products Anypoint characterized per connectivity, and high composability in control. It is an integrated platform, more productive, creates a hybrid network applications and data.

Anypoint Platform is the only solution that allows companies to realize their true digital transformation realization of connectivity led by API. In particular, Anypoint platform is the only solution that enables ultimate connection with all API, service orchestration and integration needs of applications through a unified unit. Anypoint platform combines applications and data in these environments, which then allows developers to connect, organize and allow the combination of internal or external endpoint. AnyPoint platform is considered as one of the 50 best products of IT Management Software.

BENEFITS OF ANYPOINT PLATFORM

AnyPoint platform brings together existing Mule Soft platforms, including Mule ESB, Cloud Hub and connectors, with new functions dedicated to the creation of the API. Helps users deal with connectivity challenges across the SOA, SaaS and API. The system is an integrated solution, highly productive, integrated hybrid that allows users to create a network of peaceful application between applications, data and equipment led the API connection.

AnyPoint platform comes with an array of services that allows users to perform key processes such as analysis, identity management, business group management, high availability, and security logging.

AnyPoint platform is loaded with features and functionalities that architects and developers throughout the company should develop, build and manage rapidly throughout the life cycle of applications and their products, AnyPoint platform is created using open technologies to encourage reuse, modularity and cooperation, which improves the productivity of developers and accelerates the speed project.

To integrate software into another, Mule Soft has a visual studio which is called AnyPoint studio with a development and integration environment based on Eclipse. AnyPoint studio is based on five divisions consisting of the components on the field of making connections, there are three key features that the message flow, the global elements, XML configuration. Also and other key characteristic of the platform is to monitor the project to build, through chart graphics, reports, dashboards, etc. AnyPoint platform uses RAML file (Full REST API Modeling Language. RAML used for designing APIs, using an easily editable text plan for communication between different applications.

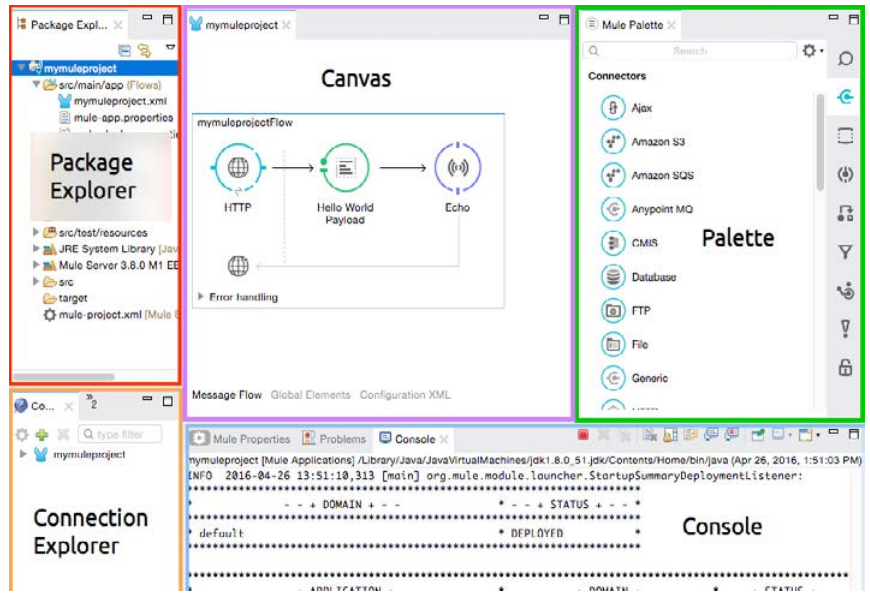


Figure 10: Anypoint Studio

FUTURE OF ANYPOINT PLATFORM

The future development of this platform rests firmly with the goal of further expansion which could escalate for any purpose or service to different businesses, enabling the incorporation in IOT, Big Data or analytical processes, it's because sup-

posed to expand the business evolution participating. One of the goals focuses on the importance that should be taken AnyPoint platform:

- Involvement in IOT (The Internet of things more)
- API Development-Led Connectivity
- Dynamic expansibility on mobile devices

BIZTALK SERVER

Microsoft BizTalk Server (or simply "BizTalk") is an Inter-Organizational-Middleware-System (IOMS) which enables companies to automate business processes through the use of customized adapters to communicate with different softwars systems used in an enterprise. Created by Microsoft, offers enterprise application integration, business process automation, business to business communication, message broker and monitoring of business activity. BizTalk Server is Microsoft's central platform for Enterprise Application Integration (EAI) and Business Process Management (BPM) offering integration and automation capabilities of XML and Web Services technologies.

Comparison Anypoint with Biztalk Server Platform

The main aim of the study is comparison of AnyPoint platform integration with other platforms as BizTalk Server. The Mule Soft solutions for Microsoft BizTalk enabling users to utilize existing Microsoft IT investments and logic written in .NET integration AnyPoint platform. With AnyPoint Mule Soft platform, BizTalk customers can tackle the immediate challenges of integration and develop a robust API and cloud strategy for the future.

AnyPoint Platform	BizTalk Server
• It is a platform for integration and the development of Internet-based businesses of all sizes. • They include the management of large data • Integration of applications, the web services etc. • Software is designed and launched by Mule Soft.	• It is a solution of automation of business processes for businesses of all sizes. • It provides and manages the integration of applications together with automation services, monitoring and communication. • This software was developed by Microsoft Corporation.
Software Type: standalone	Software Type: Standalone, On Premise
Clients: medium businesses, large businesses,	Clients: small businesses, medium businesses, large businesses,
• Features of the Anypoint Platform Programming designs and manages all enterprise integration strategy in same place, providing premises for the integration of cloud and cloud-to-cloud integration. It contains more than 100 links Anypoint to crawl and simple connections drop. This reduces the overall cost of the SOA's delivery up to 65% maintenance fees and development. • Anypoint platform offers seamless integration with legacy systems to utilize business data and the processes related to them. • Automation and optimization of business processes. • It includes integration of applications, many data resources and support for multiple platforms	• Features of the BizTalk Server Software Streamlines Integration line of business applications using adopters, in addition to integrating databases. This includes applications and databases such as Oracle, SAP, JD Edwards, Microsoft SQL Server, and others. Support is provided for a set of standards to enterprises such as HIPPA, SWIFT, and HL7. • BizTalk Server features full engine business rules and also provides monitoring of business activities by providing an aggregated view of the different business processes. • It provides graphical models of business processes, as well as graphical mapping using Visual Studio.

Based on recent studies researchers have defined some key reasons to choose Anypoint Platform against Biztalk Server:

- Ease of replicating,
- Reliability
- Extensibility,
- Support for SaaS platform and Hybrid Developers,
- Access to the source code,
- Provision of easily developing means,
- Low Cost
- Support
- Full support in innovative developments.

CONCLUSION

Today is business environment is extremely competitive. No company, no matter its size or the industry in which it is certain to be challenged by competition. To mitigate this risk, it is important to consider the implementation of best practices of micro-services in order to change soon, easily renewed and meet goals.

Since the integration of applications is seen as one of the most challenging ways recently, platforms required quality and greater integration development in ordere to provide high business development and low costs. Therefore we are required to make the right choice for the integrated mode and applications in our business in order to achieve the highest level of quality, qualification and profit.

Organizations that have successfully laid a foundation for ongoing innovation and agility, have adopted the micro-architecture services to respond rapidly endless business requirements through the use of this integration platform as AnyPoint.

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THE IMPACT OF USING TECHNOLOGY IN TEACHING INEQUATIONS (ALBANIA CASE)

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ABSTRACT:

Technology provides new opportunities that may transform teaching methods and cognitive processes. The purpose of this article is to show the advantages of integrating technology in teaching mathematics, especially the facilities of using GeoGebra application in teaching inequation concept. A study was conducted in two high school classes in Albania. In Class A GeoGebra was implemented in teaching inequations, while in Class B GeoGebra was not implemented in teaching inequations. Afterwards the students of the two classes took a test related to the concept of inequation.
Moreover the students of the first class completed a questionnaire regarding their experience of learning through technology. Study results show that using GeoGebra application when teaching inequations minimizes the time of sketching graphs in class, improves significantly the ability of students to perceive situations graphically and to solve inequations geometrically. Furthermore technology helps a teacher associate subject content with real world situations and encourages a student to put their mathematic skills in use in everyday life.
Regarding to the study results it is recommended to implement technology regularly in teaching process in order to have a higher commitment by the students, cognitive result development and a more interacting environment.

KEYWORDS:

technology, teaching, GeoGebra, inequations

INTRODUCTION

Technology has profoundly influenced every aspect of life by offering facilities and advantages. Education is affected by technology development. Learning through technology is a discipline evolving swiftly because of the opportunities offered by it. Jonassen and Reeves (1996) assert that learning from computers means that students review basic computer skills and academic content; whereas learning through computer implies an integrated approach to computers as part of a broader learning process. Similar to technological innovation, education constantly changes, [4]. Changes in values take place, new curricula are introduced, and new technologies redefine how we teach and learn, [8]. Technology enables the implementation of new strategies and methods in teaching by improving different aspects of learning. Garrison and Anderson (2003) through their community of inquiry model assert that the true uniqueness of e-Learning lies in its multidimensional forms of multiplicative communication and interaction, [2].

The latest report of State Inspectorate for Education (ISHA) in Albania and particularly the report on teaching and learning, asserts that there are a lot of steps in the process of teaching unfulfilled by teachers. "In Albania, mostly in public schools, teachers focus on active students, while the students who have difficulties in the cognitive process are not given the proper attention", it says in the 2018 report of State Inspectorate for Education (ISHA), which is the latest report where data was processed based on the inspections of State Inspectorate for Education (ISHA) at different educational institutions, [7]. "Teaching is adequate, scientifically speaking, but teachers only focus on active students, leaving the inactive students and the students who have difficulties in the cognitive process not included ", the report asserts, [5]. That is the reason why implementing technology in teaching process becomes necessary.

On the other hand, while a new textbook is being used in Albanian schools, the implementation of new technology in teaching process is necessarily required. Using technology has rarely been efficient in Albanian schools in the aspect of encouraging students to get the information in the demonstrated form. It has been estimated that teaching and learning should be based not only on textbooks as the main source, but also on alternative sources, such as digital learning, [7]. This paper gives specific reasons why this alternative source should be used.

The economy level in Albania and the insufficient fund of Ministry of Education, Sport and Youth (MASR) makes it almost impossible to invest in the latest technology for schools, so teachers have to come up with new methods, which are more economical and easily accessible by the students.

Mathematics, because of the constant need to perceive complex situations, offers very good opportunities for implementing technology in teaching. The integration of computer programs into mathematical disciplines promotes the development of logical reasoning. GeoGebra is an interactive geometry, algebra, statistics and calculus application, intended for learning and teaching mathematics and science from primary school to university level.

There are a lot of applications that can be integrated in math lessons, but GeoGebra is commonly used because it is free of charge, easily accessible and it doesn't require advanced computer skills. This program can be implemented in different areas of mathematics, but this paper is focused on the implementation of GeoGebra in teaching inequations.

In their contribution to the International Group for the Psychology of Mathematics Education (PME Group) in 2004 Boero and Bazzini referred to inequalities as "an important subject from the mathematical point of view; a difficult subject for students; a subject scarcely considered till now by researchers in mathematics education", [1].

Even though inequations are part of the mathematics curriculum in middle school, students still encounter multiple problems understanding inequations in high school. The school mathematics curriculum "consists mostly of instrumental elements, there is little effort in these books to try to create concept images", [6].

This paper aims to show the advantages of integrating technology into mathematics teaching, especially the facilities of using GeoGebra application in teaching the inequation concept. The research questions are:

- Are there any differences in students' performance when implementing GeoGebra in teaching inequations?
- Does the use of GeoGebra improve students' ability to have a more complete perception of inequations?
- Does the integration of technology in education create an interactive environment?
- Does technology implementation in teaching impact students' motivation to learn?

Method

In order to understand the advantages of implementing technology in teaching, GeoGebra was integrated in teaching inequations. The participants of this study were two high school classes in Elbasan, Albania. In Class A, GeoGebra was implemented in teaching inequations, while in Class B, GeoGebra was not implemented in teaching inequations.

Then a short test was conducted with the students of both classes regarding the concept of inequation. Also, each student in the class in which the GeoGebra application was used completed a questionnaire regarding their experience of learning through technology.

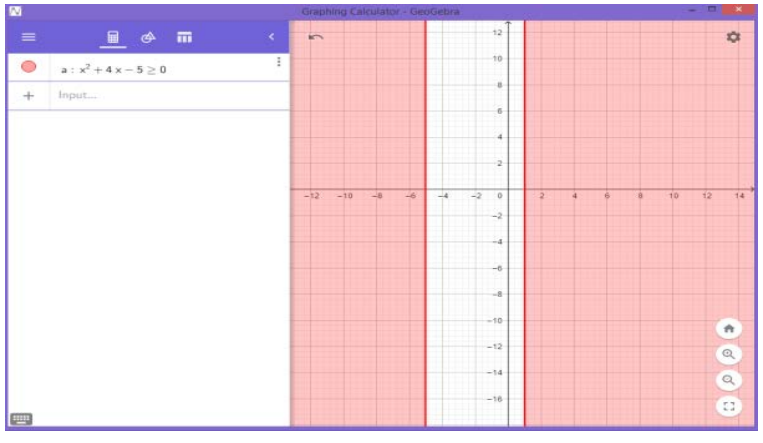


Figure 1. Graphical solution of $x^2 + 4x - 5 \geq 0 x^2 + 4x - 5 \geq 0$ using GeoGebra.

Let us show step by step how the solution of $x^2 + 4x - 5 \geq 0 x^2 + 4x - 5 \geq 0$ is found using GeoGebra. Although GeoGebra shows the solution of the inequation directly, while teaching, the teacher breaks down the problem of finding the solution step by step, in order for the students to solve each step using learned skills. For every step, the teacher gives instructions and graphs the required elements using GeoGebra

Step 1: Graph $y = x^2 + 4x - 5 y = x^2 + 4x - 5$

(The students apply their skills in graphing parabolas. Firstly they find the parabola vertex. If the parabola equation is $y = ax^2 + bx + c y = ax^2 + bx + c$ then the parabola vertex is $C(m,n) C(m,n)$ where

$m = \frac{-b}{2a}$, $n = \frac{-D}{4a}$, $m = \frac{-b}{2a}$, $n = \frac{-D}{4a}$, $D = b^2 - 4ac$ $D = b^2 - 4ac$.

After that students find the points where the parabola intercepts with ox axis, so they solve equation $x^2 + 4x - 5 = 0 x^2 + 4x - 5 = 0$)

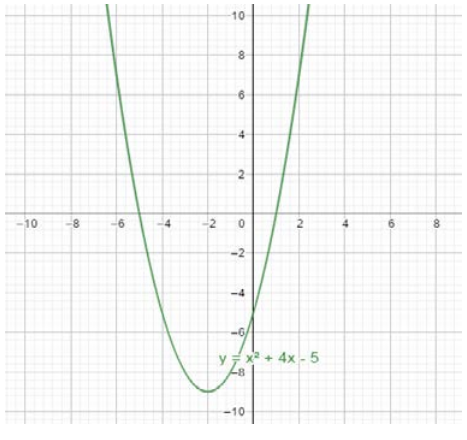


Figure 2.

Step 2: Graph $x = -5, x = 1 x = -5, x = 1$ (where $x = -5, x = 1$ $x = -5, x = 1$ is solution of equation $x^2 + 4x - 5 = 0 x^2 + 4x - 5 = 0$)

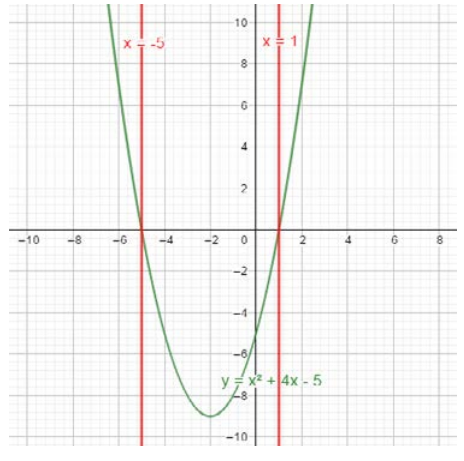


Figure 3.

Step 3: The area defined by $x = -5 x = -5$ and $x = 1 x = 1$ in which the graph of $y = x^2 + 4x - 5 y = x^2 + 4x - 5$ is above the ox axis, show the graphical solution of $x^2 + 4x - 5 \geq 0 x^2 + 4x - 5 \geq 0$.

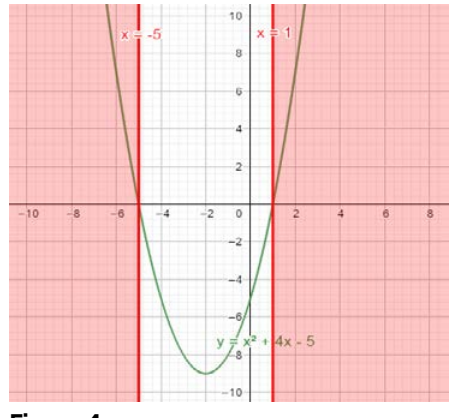


Figure 4.

Instruments

The instruments used in this study are the test and the questionnaire.

The test has 6 exercises related to the concept of inequation. Exercises were related to interpreting a region through inequations, graphing the area represented by an inequation system, deciding if a point is part of a shaded region, solving inequation algebraically and using graphic method. Moreover a real life problem related to inequations was part of the test. The purpose of this test was to evaluate the students' concept image of inequation when GeoGebra is implemented in teaching inequations.

The questionnaire have questions related to GeoGebra and implementation of technology in teaching. The purpose of the questionnaire is to find out students' opinion about GeoGebra and teaching through technology.

Results

Class A – GeoGebra was implemented in teaching inequations
Class B – GeoGebra was not implemented in teaching inequations

After evaluating the students' test answers, the results concerning the research questions are presented below:

Question	Class A	Class B
1	83%	77%
2	67%	47%
3	67%	60%
4	43%	43%
5	50%	10%
6	57%	33%

Table 1. Correct answers according to question and class

Class A students have performed better in the test than the students of Class B. There are substancial differences between the performance of Class A and Class B students in the test regarding the questions related to graphical presentation of inequations. While working on the concept of inequation, the most difficult part for the students is solving a quadratic inequation graphically. Students understand the steps involved in the grapic method, they correctly build the graph of the function associated with the inequation, but they are not able to determine the region which is the solution of the inequation,[3]. Using GeoGebra the graphical solution of an inequation can be obtained in a short period of time, so students can solve a lot of inequations during the lesson. The students can also visualize the graph better because in any case the zone that is the solution of the inequation it's shown clearly by this application.



Figure 5.Some wrong students' geometrical solution of $x^2 + 4x - 5 \geq 0$ $x^2 + 4x - 5 \geq 0$ taken from the tests [3]

Wrong answers like these can be found often in the tests of Class B students, while in the tests of Class A students wrong answers related to graphical perception of inequations can be rarely found. Almost every student of Class A, who has graphed $y = x^2 + 4x - 5\, y = x^2 + 4x - 5$ correctly, has also managed to determine the zone that is the solution of the inequation accurately.

After analysing the answers of the Class A students in the questionnaire, 93% of them did not have difficulties using GeoGebra, in fact, they seem to think that it is very convenient. 77% of the students declare that this application has helped them to better perceive the situations regarding the concept of the inequation. 83% of them claim that implementation of technology in education creates an interactive environment and makes the lesson more interesting. Moreover, 77% assert that implementing technology-related methods in teaching stimulates their desire to learn.

CONCLUSIONS

Study results show that using GeoGebra application when teaching inequations minimizes the time of sketching graphs in class, improves significantly the ability of students to perceive situations graphically and to solve inequations geometrically. Furthermore technology helps a teacher associate subject content with real world situations and encourages a student to put their mathematic skills in use in every-day life. Also implementing technology in teaching impacts students' motivation to learn. Regarding to the study results it is recommended to implement technology regularly in teaching process in order to have a higher commitment by the students, cognitive result development and a more interacting environment.

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APPLICATIONS OF THE IDEALS IN THE BOHNER-TYPE INTEGRALS

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ABSTRACT

This paper represents some applications to various problems of mass theory and integration, using the concept of exhaustive sequences and local convergences. Alongside the relativization of the equi-integrable functions, new ones on Bohner-type ideal integrals and a new study on the application of symmetric differences have been presented; in the theory of mass and continuous functions, continuing the results of Boccuto, Das and Dimitriou.

KEY WORDS:

Bohner type ideal integrals, Symmetric differences, Point-wise I -convergence, Ideal exhaustiveness, Banach spaces, Weak convergence, Weak compactness"
ΔΔ- continuity, Δ Δ- convergence in a discrete way.

DEFINITION 1.1.

(a) Let Y be a set that is not the empty set , Y¹Æ. FamilyℑℑÌP(Y) is called ideal of the set Y if and only if, that for A, BÎℑ ℑ it follows that, AÈBÎℑ ℑ and for every AÎℑ ℑ and B Ì A we will have B Îℑℑ.

(b) The ideal ℑ ℑ is called non-trivial iff and only if,ℑℑ¹Æand yïℑ.ℑ. A non-trivial ideal is called acceptable when it contains the sets with only one point on it.

Let (T,Σ,μ) (T,Σ,μ) be a space with probabilistic measure $\mu\mu$, where T is an random set on a line, $\Sigma\Sigma$-Borel's algebra and μ is a defined measure.

Definition 1.2: The function $f:T\to Xf:T\to X$, where X is a vector space is called a simple function according to $\mu\mu$, if for every family of measurable sets $\{E_i\}$ $\{E_i\}$that have no common point ,so$E_i\subset T\,E_i\subset T$ and $E_i\cap E_j=\emptyset E_i\cap E_j=\emptyset$, for$i\neq ji\neq j$, where$T=\bigcup_{i=1}^{n}E_i\;T=\bigcup_{i=1}^{n}E_i$ and $f(t)=x_i\,f(t)=x_i$, for $t\in E_it\in E_i$, i=1, 2,..., n.

As we know before, the simple function is defined $f(t)=\sum_{i=1}^{n}x_i\chi_{E_i}$ $f(t)=\sum_{i=1}^{n}x_i\chi_{E_i}$, where χ_{E_i} χ_{E_i} is an characteristic function of E_i E_i.

Definition 1.3 : The function$f:T\to X\;f:T\to X$ is called ℑ ℑ-measurable on T , T ,if for every tÎT, $\varepsilon>0\,\varepsilon>0$ and $A\subset\Im\,A\subset\Im$ there is a sequence of simple functions$f_n:T\to X\;f_n:T\to X$ for which we have
$|f_n(t)-f(t)|<\varepsilon\,|f_n(t)-f(t)|<\varepsilon$ for $n\in\mathbb{N}\backslash An\in\mathbb{N}\backslash A$.

Proposition 1.4: The linear combination of functions ℑℑ-measurable (measurable ideals) is an ℑℑ-measurable function.

Definition1.5. The subsequence $(f_{n_k})_{k\in\mathbb{N}}$of the sequence $(f_n)_{n\in\mathbb{N}}\xrightarrow{\Im}f$ is called fundamental iff, for $A'=\{n_1<n_2<\cdots<n_k<\cdots\};f_{n_k}\xrightarrow{\Im}f$ for $n\in\mathbb{N}\backslash A'$ where$A'\subset A$.

Definition1.6:.Let(I,Σ,μ) be a measurable complete space with a non-negative measure. The sequence of measured functions $(f_n)_n$in I is **ℑ -convergent according to the measure μ** to the function f, if for each ε> 0 and σ> 0 there is an essential subsequence $(f_{n_k})_{\nu}$of the sequence $(f_n)_n$ such that: $\mu\{t:|f_{n_\nu}(t)-f(t)|\geq\sigma\}<\varepsilon$for $n_k\in\mathbb{N}\backslash A'$ and t ∈I. We denote $f_n(t)\xrightarrow{\Im-\mu}f(t)$.

Definition1.7. The sequence of measured functions $(f_n)_n$with values in $\mathbb{R}$ is called $\Im$-fundamental according to the measure μ , $S \subset \Im$, if there is a natural number $(\sigma, S) \subset \mathbb{N}\backslash A$ and there is a subsequence $(f_{n_k})_k$of $(f_n)_n, if\ \forall \varepsilon > 0$ and $\sigma > 0, \mu\{t: |f_{n_k}(t) - f(t)| \geq \sigma\} < \varepsilon$.

Proposition1.8. If the sequence $(f_n)_n$ $(f_n)_n$ is $\Im\Im$-convergent to f in $\Im$ $\Im$ it is $\Im\Im$-fundamental.

Proposition 1.9. $\Im\Im$-limit of the sequence $(f_n(t))_n$ $(f_n(t))_n$according to the measure μ μ is unique with the proximity of equivalence.

Proposition 1.10. If the sequence $(f_n)_n$ $(f_n)_n$is a $\Im - \Im -$fundamental-sequence in the $T \subset \mathbb{R} T \subset \mathbb{R}$, then there exists an $\Im - lim_k \int f_k(t)d\mu$ $\Im - lim_k \int f_k(t)d\mu$.

Definition 1.11. The function $f: T \to Xf: T \to X$ is called $\Im$ $\Im$-Bochner integrable, if there is a fundamental sequence of simple functions $(f_k)_k(f_k)_k$ such that, $(f_k)_k$ $(f_k)_k$ is $\Im\Im$-integrable to f. $\Im - lim_k \int |f_k(t) - f_N(t)|d\mu = 0$ $\Im - lim_k \int |f_k(t) - f_N(t)|d\mu = 0$ almost everywhere $\Im - B - \int f(t)d\mu$ $\Im - B - \int f(t)d\mu$ and is called $\Im$ $\Im$-Bochner integral.

2. APPLICATIONS OF SYMMETRIC DIFFERENCE IN MASS THEORY.

Let X be an infinite set and Σ⊂P (X) a σ-algebra. The set of all finite sum measures with real values in Σ will be marked (Σ); and with Ca (Σ) the linear subspace of ba (Σ), consisting of all σ-sum measures in Σ.

The following are the meanings of the esoteric ideals and the ideals of other convergences in the framework of mass theory.

Definitions 2.1.

(a) For a positive mass λ ∈ ba (Σ) and A, B∈Σ (pseudo) - λ- the distance between A and B is determined by the equation: d λ (A, B) = λ (AΔB) where Δ denotes the symmetric difference .

(b) A mass μ ∈ ba (Σ) is a constant λ- I, in the E∈Σ set, if for every ε> 0 there is δ> 0 and A ∈ I such that, for any F∈Σ that d_λ (F, E) = λ (FΔE) <δ to have | μ (F) -μ (E) | <ε for n ∈N \ A.

(c) It will be stated that μ is continuous λ- I in Σ, if μ is continuous λ- I in any E∈Σ.

We note that, as defined in mass theory, μ is λ-absolutely continuous if μ is

λ-continuous at në. By agreement, when F⊂E we will say that E is continuous λ when for any ε> 0, ∃δ> 0 such that when d_λ (F, E) =λ (E \ F) <δ we will have | μ (F) -μ (E) | = | μ (E \ F) | <ε.

Similarly, when E⊂F then d_λ (F, E) = λ (F \ E) <δ we will have for n∈N \ A, μ (F \ E) <ε, when E = F, d_λ(E, F) = 0.

The sequencef_nf_n of simple functions is called the determinant sequence of functions of the function f.

That is easily proved the proposition:

If$(f_n)(f_n)$ and$(g_n)(g_n)$ are two determinant and fundamental sequences of the $\Im - lim\ f_n(t)\, d\mu = \Im - lim\ g_n(t)\, d\mu$

This proves that the proposition is correct.

Note that, as defined by the measure theory, μ is λ-absolutely continuous if μ is λ-continuous in ∅. By agreement, when F⊂E we will say that E is λ continuous, when for any $\varepsilon > 0, \exists \delta > 0\ \varepsilon > 0, \exists \delta > 0$ such that $d_\lambda(F,E) = \lambda(E\backslash F) < \delta$ $d_\lambda(F,E) = \lambda(E\backslash F) < \delta$ we will have$|\mu(F) - \mu(E)| = |\mu(E\backslash F)| < \varepsilon$ $|\mu(F) - \mu(E)| = |\mu(E\backslash F)| < \varepsilon$.

In the same way, when$E \subset FE \subset F$ then$d_\lambda(F,E) = \lambda(F\backslash \mathrm{E}) < \delta$ $d_\lambda(F,E) = \lambda(F\backslash \mathrm{E}) < \delta$ we will have for $n \in \mathbb{N}\backslash A, \mu(F\backslash E) < \varepsilon$ $n \in \mathbb{N}\backslash A, \mu(F\backslash E) < \varepsilon$,when $E = FE = F, d_\lambda(E,F) = 0 d_\lambda(E,F) = 0$.

Proposition 2.2. (a) If $F_1 \subset F_2 \subset \cdots \subset F_n \subset F_1 \subset F_2 \subset \cdots \subset F_n \subset$ where, $F_n \in \Sigma F_n \in \Sigma, F_n \in ba(\Sigma) F_n \in ba(\Sigma)$ and $F = \bigcup_n F_n F = \bigcup_n F_n$, $\mu \in ba(\Sigma) \mu \in ba(\Sigma)$, or (b) for the sequence $E_1 \supset E_2 \supset \cdots \supset E_n \supset$ $E_1 \supset E_2 \supset \cdots \supset E_n \supset$... when$E_n \in ba(\Sigma), E_n \in \Sigma E_n \in ba(\Sigma), E_n \in \Sigma$and E $\lim_{n\to\infty} \mu(F\Delta F_n) = \lim_{n\to\infty} \mu(E_n \Delta E) = 0$ntinuous and

It follows that: $\lim \mu(F_n) = \mu(F)$ dhe $\lim \mu(E_n) = \mu(E)$ □

Definition 2.3.

Let $\Im\Im$-be an acceptable ideal in N.The sequence of measures $(\mu_n)_{n\in\mathbb{N}}$ $(\mu_n)_{n\in\mathbb{N}}$ from $ba(\Sigma)$ $ba(\Sigma)$ is $\Im\Im$-exhaustive in $E \in \Sigma\, E \in \Sigma$, if for each $\varepsilon > 0 \varepsilon > 0$, there exists $\delta > 0\, \delta > 0$ and the set $A \in \Im\, A \in \Im$ such that, $|\mu_n(E) - \mu_n(F)| < \varepsilon\, |\mu_n(E) - \mu_n(F)| < \varepsilon$ for each $F \in \Sigma\, F \in \Sigma$ that $d_\lambda(E,F) < \delta d_\lambda(E,F) < \delta$ and for each $n \in \mathbb{N}\backslash A n \in \mathbb{N}\backslash A$.

It says that the sequence $(\mu_n)_{n\in\mathbb{N}}$ $(\mu_n)_{n\in\mathbb{N}}$ is $\Im\Im$-exhaustive in $\Sigma\,\Sigma$, if the sequence is $\Im\Im$-exhaustive for each $E\in\Sigma E\in\Sigma$.

(b) It says that the sequence $(\mu_n)_{n\in\mathbb{N}}$ $(\mu_n)_{n\in\mathbb{N}}$ is $\Im_\alpha\Im_\alpha$-convergent to μ μ in the set $E\in\Sigma\,E\in\Sigma$, if for each sequence$(E_n)_n(E_n)_n$in $\Sigma\,\Sigma$,for which $\Im$ $\Im$-limit $d_\lambda(E_n,E)=0d_\lambda(E_n,E)=0$ we take $\Im-lim_n\mu_n(E_n)=\mu(E)$ $\Im-lim_n\mu_n(E_n)=\mu(E)$.

It says that the sequence $(\mu_n)_{n\in\mathbb{N}}$ $(\mu_n)_{n\in\mathbb{N}}$ is $\Im_\alpha$ $\Im_\alpha$-convergent to $\mu\mu$ in Σ, Σ, if it is $\Im_\alpha$ $\Im_\alpha$-convergent to μ μ in every $E\in\Sigma\,E\in\Sigma$.

(c) It says that the sequence $(\mu_n)_n$ $(\mu_n)_n$ is $\Im_\delta\Im_\delta$-convergent toμ μ in the set $E\in\Sigma\,E\in\Sigma$, if for each $\varepsilon>0,\varepsilon>0$, there exists $\delta>0$ $\delta>0$ such that,for each $F\in\Sigma\,F\in\Sigma$ and $d_\lambda(F,E)<\delta\,d_\lambda(F,E)<\delta$ we have $|\mu_n(F)-\mu(E)|<\varepsilon$ $|\mu_n(F)-\mu(E)|<\varepsilon$ for $n\in\mathbb{N}\backslash An\in\mathbb{N}\backslash A$.

The set of all subsets $F\in\Sigma\,F\in\Sigma$,for which $d_\lambda(F,E)<\delta d_\lambda(F,E)<\delta$ for a fixed δ δ we will denote V_δ^E and will be called neighborhood of E. It seems clear that $d_\lambda(E,E)=0.\,d_\lambda(E,E)=0.$ Consequently E Î V_δ^E.

Notation 2.4. The sets $\{V_\delta^E\}\{V_\delta^E\}$ are used as a substructure of a topology, where the openings are

G = {union of sets by Σ} which have neighborhood of each element of them

It is proved that:

(1) The union of G_nG_n is opened.

(2) The intersection of an finite number of opened sets is an opened set.

We call this, a topology of neighborhood of the sets.

For each ε> 0, there is a δ> 0 such that, for every $F\in V_\delta^E F\in V_\delta^E$ we will have: $|\mu_n(F)-\mu(E)|<\varepsilon|\mu_n(F)-\mu(E)|<\varepsilon$.

Proposition 2.5. From the above definitions, it is clear that, when $(\mu_n)_n(\mu_n)_n$is $\Im_n\Im_n$-convergent, it is and $\Im_\delta$ $\Im_\delta$-convergent.

We state that if the sequence $(\mu_n)_n(\mu_n)_n$is $\Im_\alpha\Im_\alpha$--convergent, it is also $\Im_{\delta_a}$ $\Im_{\delta_a}$–convergent.

(2) Measure μ μ is λ λ- continuous .

3. D-CONTINUITY

Let (X, Σ, λ) and (Y, Σ', μ) be two measured spaces and the sets P(X) and P(Y) of them.

Definition 3.1. The set function f : X ®Y is called Δ-I continuous in the subset A, if for each

ε> 0 there exists δ(ε) > 0 such that , for every set G ÎP(X)ÇΣ that λ(GΔA)<δ to have μ(f(G)Δf(A)) <ε.

To denote B(A, δ) = { G ÎP(X) ÇΣ : λ(GΔA) <δ } that is an open ball with the support of A and B(f(A), ε) open ball with the support of f(A) the above definition can be geometrize:

The set function f is continuous in the subset A of X if for every open ball B(f(A), ε) from P(Y) there exists an opened ball B(A, δ) from P(X) such that , for each GÎ B(A, δ) it follows that f(G) Î B(f(A), ε) (or f(B(A, δ) Ì B(f(A), ε)).

Definition 3.2.

(a) It is said that the sequence (f_n) Δ-converges in a discrete way to an element G ÎG, where G is a collection of sets, if for each element ε> 0,there exists $n_0(\varepsilon,G)$ ÎN such that, for n > $n_0(\varepsilon,G)$ we have $\mu(f_n(G)\Delta f(G))<\varepsilon$.

(b) It is said that the sequence (f_n) Δ-converges in a uniform way if for each ε> 0 and any G ÎG,there exists $n_0(\varepsilon)$ ÎN such that, for n > $n_0(\varepsilon)$, we have $\mu(f_n(G)\Delta f(G))<\varepsilon$.

(c) It is said that the sequence (f_n) is Δ-exhaustive in the subset G ÎG where G is a collection of sets, if for each ε> 0,there exists a natural number $n_0(\varepsilon)$ ÎN and δ>0 such that for n > $n_0(\varepsilon)$ and every subset H Ì B(G, δ we have $\mu(f_n(H)\Delta f_n(G))<\varepsilon$.

Proposition 3.3. Let f_n, f : X ®P(Y) be a set of functions. If the sequence (f_n) is Δ-convergent in an uniform way and with terms Δ- continuous then it converges to f Δ- continuous.

Proposition 3.4. If the sequence (f_n) Δ-converges in an uniform way in P(X) to the function f, then it is Δ-exhaustive in each GÎP(X) .

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ANIMATIONS AND UNITY IN DIFFERENT FIELDS

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ABSTRACT

An important moment in the architect's work is the presentation of the work to a client or audience. For a business too, the marketing aspect or the analysis process, where the data is associated with updated graphics are very important. In medicine too, the animation of different aspects of demonstrations is very important.
These animations can be provided by computer software, and today there are a lot of software that provide animations in 2D and 3D.
Unity is a software that is considered one of the most successful in animations. In fact, this is a program created for games. For this reason it is rich with different functionalities that help in the creation of an animation.
Why can't these functionalities be used in other fields too? The objective of this article to demonstrate some essential features of Unity and some examples of its applications in different fields like architecture, business or education. More specifically, this paper deals with how Unity can be part of the 'view' component of web applications in order to create a 'view' with animations.
Artistically, the craft of animation has spurred amazing advancements in storytelling since its inception. Computer animation owes its theoretical base to the Walt Disney Studios. "Snow White and the Seven Dwarfs", released in 1938, was Disney's first animated feature length film. Each "frame" of a Disney animation was a piece of acetate containing about 1/24 of a second's content. When 24 still frames are projected in one second, human perception combines the frames to see movement.
Introducing this program in the school curriculum would open a new field of cooperation between computer science and other disciplines.

WHY IS ANIMATION IMPORTANT?

People give different opinions about the importance of the animations. [1]

Jason Cangialosi, Partner & COO at Worker Studio says: To properly answer such a question, one would need the context of meaning as to what's important. Economically important? Artistically important? Culturally important? Historically important?

The broad answer: animation is important to all of the above.

Economically, animation provides employment to hundreds of thousands of artists, animators, producers and technicians to satisfy the huge demand for diverse content in the world.

Culturally, it'd be hard for many of us to imagine a childhood without all of the animated characters that fill our imagination. Their existence is owed to techniques developed by Disney and other pioneers.

Raima Mishra, Software Engineer says: Animation or 3d Animation is important because it encourages us to tell stories and to communicate thoughts and feelings and concepts in a unique, easy-to-perceive manner that can be understood by both young children and adults. Animation has helped connect people all over the world.

Danae Santibañez: [2] concerning the importance of the Representation in Architecture mentions that: Introducing movement to drawings and diagrams is an excellent way to show the development and progress of ideas fundamental to a project. When it comes to architectural drawings, it's fundamental to understand what information needs to be highlighted and what is the best way to show it, getting rid of all the extra data to focus attention on the main asset.

Mary Strain [3], a professional editor, says: Animation brings the power of imagination and creativity to your marketing, and has grown far beyond cereal or game ads. It gives you the power to demonstrate almost any product or service to your clients, sometimes so realistically that it's hard to believe it's not actual video. The motion and color of animation grabs attention, explains instantly, demonstrates what has yet to be realized and is an effective marketing tool when precisely tailored to your target demographic.

Life Science companies in "Powerpoint vs. animated video" say picture is worth a thousand words. If that is true, then an animation must be worth 1000 pictures! People who often give public talks and presentations know the trick – they start by showing an animated video that "breaks the ice", promotes a discussion, and sparks interest.

ANIMATIONS AND UNITY

Unity is a game engine and IDE developed by Unity Technologies that can work across multiple types of platforms or operating environments. You create an animation in Unity. When you decide to build it for publication, you choose a platform to deploy the product. The product created can be targeted to web plugins, desktop platforms, video game consoles, and mobile devices.

There is more than one way to create animations in Unity:

- One is to use the classic components of an animations. Unity calls this capability "Animator". The animation and a C# script are attached to a GameObject. GameObjects are the fundamental objects in Unity. They inclide: characters, props and scenery. Empty game objects are also used for such tasks as organization and sometimes as containers for colliders.

  Using the UI of Unity the components Animator, Animation and C# scripts are created. In Animator some states and transitions between them are defined. In Animation some properties are defined as object of animation, for example rotation or position or scale. The animation is attached to some state of Animator. And in the Script in Update function you use some code to achieve what you need as animation.[4] The Update function is so-called because it "updates" the position of each object every frame.
- The Animation component in the process of creation of an Animation can be an external resource. They are called Animation Clips like **Humanoid animations,** captured at a motion capture studio, Animations created from scratch using different software such (such as Autodesk® 3ds Max® or Autodesk® Maya®), or Animation imported from 3rd-party libraries (eg, from Unity's asset store)|
- Unity is a game engine and game engines require Physics to be simulated using a **Physics Engine**. The Physics Engine tries to simulate real-world physics in a game (an animation) so that the objects in the animation demonstrate natural physical phenomenon. For example:
  - The **Physic Material** is used to adjust friction and bouncing effects of colliding objects. Using a sliding scale from 0 – 1, developers can control reaction movement from being on ice to moving very slowly like stone. Typically a physic material is attached to a collider.
  - **Colliders** are used to detect collisions. Colliders can be the same size, smaller, or larger than the objects they belong to. Thus they can also be used as triggers, telling an animation to begin or end whenever another object hits the collider.
  - **Rigidbody** allows you to add mass to a body just like a normal body in the real world which will have mass, weight, will behave differently on different kind of forces and gravity. [5]

Therefore animations can be created in Unity by using this Physic engine elements in C# code.

Update() is the typical function used to create an animation, because it is executed repeatedly once per frame. As the frame rate varies the repeat rate varies. It should be noted that this characteristic can cause animation quality problems. Sloppy development could result in large variations of rendering calls. The resulting frame rate variation that might produce jerky movements. This situation is exacerbated on integrated graphics machines. Developers should be cognizant of the type of machine used for animation playback. Some developers place physics code in FixedUpdate() to minimize graphic call spikes.

An example of a simple animation created in the third way such as an architect would be interested is considered in this article. This work needs the following to proceed: The product of the architect (for example a house) created in different architectural software like CAD, Revit, Maya can be imported as a model. Typically, animation data is imported with the FBX format. Owned by the American software company Autodesk, FBX promotes interoperability by allowing data to be ported from one application to another. For Unity3D development this is particularly important. Often models are created in one format, then imported to Unity for use in an animated scene. The imported FBX file contains animation data that defines linear movement of objects.

Some developers prefer to create a Prefab[18] from the original model. In Unity prefab creation is a drag and drop process. First the model is imported, created, or modified in the Unity Scene View. Once the developer has the model exactly the way she wants it, she drags the model to a Prefab folder placed inside the Assets folder. The original object is subsequently deleted. It is replaced by an exact copy (the Prefab) which positioned in the Scene by dragging back from the Prefab folder. As many Prefabs as desired can be created. Using the Prefab workflow can be especially helpful in cases where there is a need for several instances of the same object. Once inserted into a Scene, the object's Prefab link can be broken so it can be modified, if so desired.

A GameObject, the house in our case, can be created in this way using the Prefab. Other type of assets can be created for the project like materials, textures, shaders. The work can be done automatically and partially by code. In this example some GameObjects are created on the scene like a plane, four walls and the house in the middle. A script is attached to the House object and a user interface is created using some buttons, where each of them performs a task. Initially, when you run the program, the house is rotated, due to the code that we have in Update function.

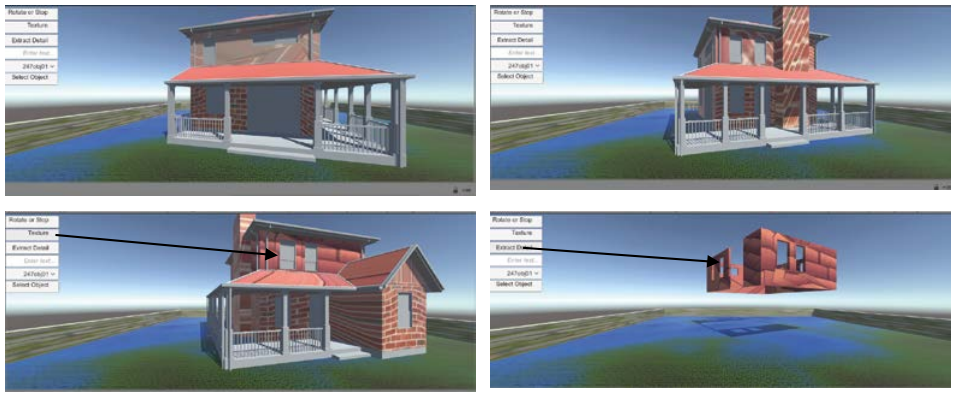
```
void Update()
{ spawn.transform.Rotate(new Vector3(rotationAroundX, rotationAroundY,
    rotationAroundZ) * Time.deltaTime); }
```

where:

- spawn represents an instance of the GameObject, the house.
- new Vector3(rotationAroundX, rotationAroundY, rotationAroundZ) represents the direction of the house rotation, based on some float values of rotationAroundX, rotationAroundY, rotationAroundZ.
- related to a frame Time.deltaTime is the amount of seconds of processing the previous frame. It is typically used to minimize performance differences across machine capability.

18 Unity's Prefab system allows you to create, configure, and store a GameObject complete with all its components, property values, and child GameObjects as a reusable Asset.

Clicking on the buttons we get different view of the animation. We can stop and restart the rotation, we can change the texture of a detail of the house continuously, we can extract a detail and rejoin it again with the whole house.



Communication of Unity with browser

WebGL enables you to view the 3D animation created with Unity directly in your browser. With this capability, the animation becomes part of a web application. Thus animations created in Unity can be used in different fields, because the web applications are used everywhere today.

This is possible using Unity program.

When the program is built in this platform some specific folders with some files on them are created. The folders are named Build, and TemplateData, which contain the content for the web of product created in Unity, and a file index.html which is accessible from a browser and makes possible communication of the content for the web with the browser in two directions:

The web page calls functions inside the **content for the web**.

The **content for the web,** provided in the built process, calls functions in the web page.

We have considered in this article the case when web page calls functions inside **content for the web**.[6]

Integration of Unity inside a Web Application and Connection with a database.

An important aspect related to an animation is the possibility to make it flexible at runtime. This means the user might want to enter our data and change different properties of animation at runtime. It would be interesting to make the animation part of a web application. This would connect the animation with the information of a database what will make the animation flexible at runtime.

As we mentioned before, the content for the web produced by WebGL is included in the files in Build and Template folders and index.html file with help the browser to communicate with it.

The goal here is to integrate content for the web in a Web application. For this reason, we include its two folders in the environment of a web application. The file index.html will play two roles. One of communication with content for the web and one of communication with web application. There is a need to send some data from the web application to Unity. This can be achieved through the file index.html

For this reason, this html file is converted into a JSP file that communicates with a servlet. Then, a servlet can communicate with a database and send the necessary information to index.JSP now. In this file some JavaScript functions can be added that make possible communication with content for the web at run time. It is possible to send and receive data between the animation and this JSP file through these functions written in JavaScript language.

We have considered a very simple example as an animation: a cube whose size is increased in time and after a while the size restarts again with the initial value. And we are trying to change this animation adding in this animation the rotation of the cube at runtime based on some data that come from JSP file. We could consider these data read from a database.

Let us represent just a few pieces of code used in this communication Animation-Web Application

In the web application we have a model that corresponds to the GameObject in unity, which is the cube, Some of properties of the cube are represented and respective accessors and mutators.

This model possibly communicates with a database.

A servlet as controller accesses the data from the database continuously or based on the user request, and sends these data into a JSP using a code like that:

```
HttpSession session=request.getSession();
session.setAttribute("angle",rotationAngle);

RequestDispatcher dispatcher =
 request.getRequestDispatcher("/index.jsp");
dispatcher.forward(request, response);
```

The JSP file in fact is the index file generated by the building process but converted in JSP by our request.

This is so, because we need to get here the data from servlet. The code for this is

```
<%String angle= String.valueOf(session.getAttribute("angle"));
 %>
```

From this JSP file we need to access different methods in Unity scripts that would change the animation at run time. For this we need to add a JavaScript function in our JSP and inside this function to use the syntax:

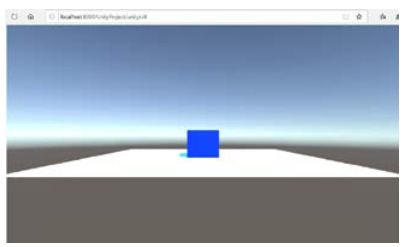
```
unityInstance.SendMessage("Cube", "updateV1", String(value));
```

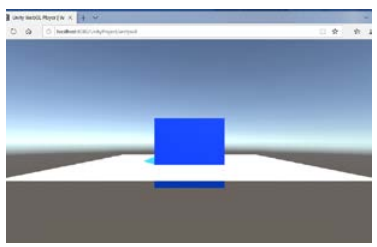
It is important to know the parameters of this method. The first represents the name of the GameObject in Unity. To this GameObject is attached a script in C# and the second parameter represents the name of a function in this script that will be called from the JavaScript function in the file index.jsp. The third parameter represents a value transmitted to this function as a parameter, which will cause the change of the existing animation. This function in JavaScript

```
function SendMessageToUnity(value)
{unityInstance.SendMessage("Cube", "updateV1", String(value)); }
```

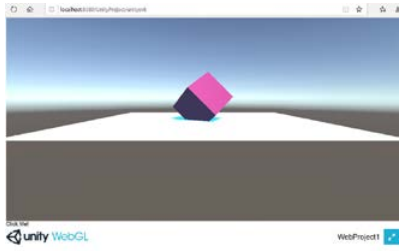
can be called from a onclick element of a form, like this:

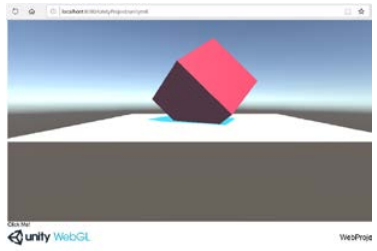
```
<button type="button" onclick=" SendMessageToUnity (<%=angle%>)">Click Me!
```





Before clicking the button





After clic king the button

CONCLUSIONS

Animations play an important role in improving the style and quality of work in different fields.

Unity is one of the best software platforms for creating not only games, but animations in different fields. The possibility of using Prefabs created from imported models from any architectural software is helpful in creating animated presentations.

The possibility of integration of a content for the web produced by WebGL into an independent web application makes possible animation of the view component of MVC web application in different fields.

The creation of games themselves, which is the first goal of Unity, would be very helpful and attractive in the education process of young people.

Therefore, including Unity learning in the school curricula would give to young people good skills to create animations useful in different fields.

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ENTERPRISE RESOURCE PLANNING IN ALBANIA (FINANCIAL SYSTEMS)

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INTRODUCTION

Our topic is Enterprise resource planning in Albania.They are the most important systems which help businesses nowadays around the world. We choose to work on it because based on our experience we know the importance of them in Albanian businesses.The purpose of this paper is togive more information and to show the importance of them on small and medium businesses (SME) in Albania. We hope to motivate all businesses to apply them.
This paper is organized in three main parts: general information for ERP, the importance of ERP Systems andERP Systems in Albania. We will describe what are ERP, how important are them in business life and describe a small example about AlphaWeb.
The advantage of ERP is to help business to grow and manage their situation better. Customers will become more happier than ever and that is the main purpose of the business.

WHAT IS ERP?

Enterprise resource planning (ERP) refers to a type of software that organizations use to manage day-to-day business activities such as accounting, procurement, project management, risk management and compliance, and supply chain operations. A complete ERP suite also includes enterprise performance management, software that helps plan, budget, predict, and report on an organization's financial results.(www.commprog.com)

By collecting an organization's shared transactional data from multiple sources, ERP systems eliminate data duplication and provide data integrity with a single source of truth.

Today, ERP systems are critical for managing thousands of businesses of all sizes and in all industries. To these companies, ERP is as indispensable as the electricity that keeps the lights on.

ERP systems are designed around a single, defined data structure (schema) that typically has a common database. ERP is the vehicle for integrating people, processes, and technologies across a modern enterprise.(www.oracle.com)

For example: Consider an automotive business retail, which buy and sell spare parts. It buys different parts from Germany (import them from it) and sells them to Albanian clients. This retail business has different departments: purchase (which is responsible for purchase goods and their procedures in Albanian costumer clearance), sales (which is responsible for selling goods on the market) and financial (which is responsible for making payments of purchases, calculate VAT every month, declare on the state imports, sales, inventory etc). Both three departments collaborate with each other. A purchaser will have to order goods based on the sales reports (which goods are sold) and a financial makes costs analysis of goods based on the reports of them, which consists of their purchase price, sales price and it's circulation.

All these data, which are necessary for each department, are stored, allocated on the system.

THE IMPORTANCE OF ERP SYSTEMS

It's impossible to ignore the impact of ERP in today's business world. As enterprise data and processes are corralled into ERP systems, businesses can align separate departments and improve workflows, resulting in significant bottom-line savings.

The ERP systems will continue to be one of the largest fastest-growing and the most influential players in the IT field well into the new millennium.(Gorishti)

At the same time, ERP is an application and software architecture that facilitates information flows between various business functions inside and outside an organization and, as such, is an enterprise-wide information system.

Enterprise resource planning (ERP) systems are used by organizations looking to manage their business functions within a centralized and integrated system. It

is a collaborative platform that guarantees effective management of all company activities related to finance and accounting, sales and marketing, production, supply chain, warehousing, planning, HR, business analytics, etc.

ERP stores all entered data into a single database, allowing all departments to work with the same information. There are a lot of reasons, which give the importance of using ERP systems. Below are the main reasons: (www.oracle.com) (www.commprog.com)

More money saved: ERP unifies many of the systems that may currently be fragmented in your organization.By unifying systems, you help your staff utilize their time more efficiently. Moreover, your organization saves money with ERP by eliminating the need for users to be trained on several systems.

Improved collaboration: a central database reduces any hesitation or stalling during projects, since all team members have access to the company-wide data they need. All data are compiled, stored, shared and accessed through a single system.

Better Analytics: A central database of information also aids in improving your analytics and reporting.

Improved Productivity: An ERP system can automate your most tedious tasks and the staff members are bound to make a mistake.

Happier Customers: ERP provides customer satisfaction in a few different ways, such as customer relationship management (CRM) tool or can be easily integrated with one.

Simplified Compliance and Risk Management: ERP systems often provide tools to manage risk.

Improved Inventory Monitoring: It also bolsters reporting, as tracking technologies provide more accurate numbers.

Improved Production Planning and Resource Management: ERP provides insight into all manufacturing operations including the shop floor.

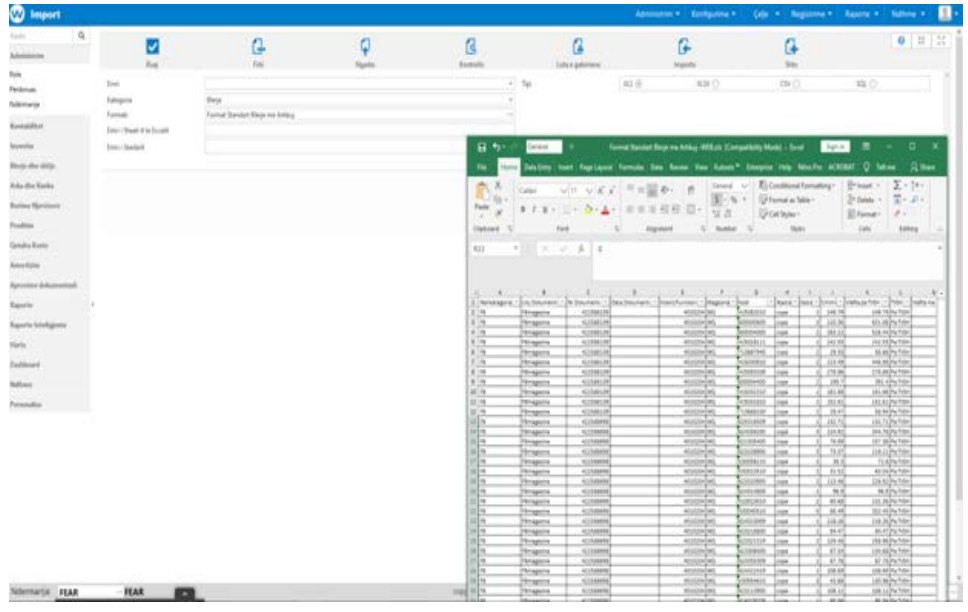
ERP SYSTEMS IN ALBANIA

There are a lot of ERP used systems in Albania such as: AlphaWeb, Financa5, IMPRO, Bilanc, Microsoft Dynamic AX, Microsoft Dynamic NAV, ORACLE, SAP etc.

Regarding to a recent study, 95% of SME don't have an ERP System, due to the fact that almost of Albanian Business are not structured and don't operate with a business plan and are too sceptic of implementing ERP Systems.(www.imb.al) Although this fact, many businesses have started to implement these systems,as they have a lot of advantages such as: Integration of different processes that business operates and centralize all data of Business.

We have taken in consideration as a study AlphaWeb Business. It is an ERP systems in cloud that allows employee in different divisions to access and rely on the same information for their specific needs. It's a shared database that supports multiple functions used by different businesses.

Fig.1: A detailed view of Purchase Reports and it's downloaded format in excel



Reference 1: Authors

AlphaWeb is developed by IMB(Instituti I Modelimeve ne Biznes) and is a most widely used system in Small and Medium Business (SME). There are 6000 businesses in Albania who use this system. It is suitable for all types of businesses such as: Banks, NGO, Accounting Offices, Constructions, Retails, etc.

AlphaWeb as an ERP System, offers a wide range of modules and activities, in order to simplifies the accounting process. These modules/activities include: Purchase, Sales, Cash Register, Banks, Stocks, Warehouse, Accounting.

AlphaWeb gives the opportunity of making reports which are too important for accountants. They are:

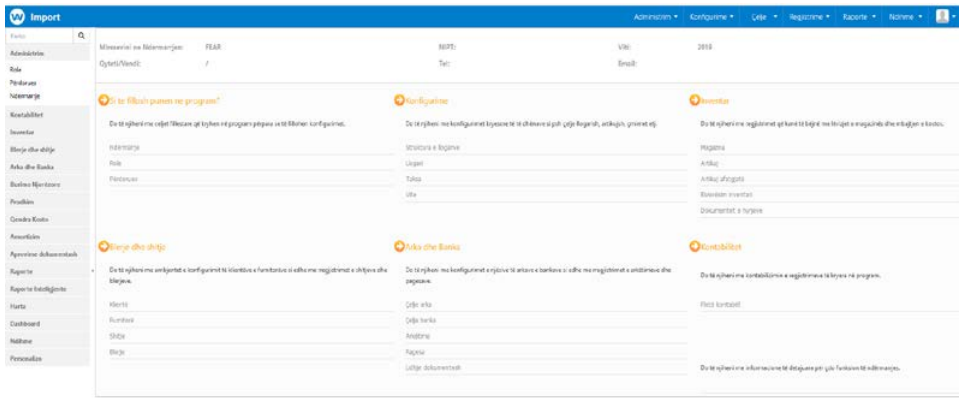
- Reports of inventory;
- Reports of Sales and Purchases;
- Reports of Banks and Cash Register;
- Reports of Situations of Clients and Suppliers.

Based on these reports, all accounts can make different analyses for businesses. The most important analysis is Break Even Point, with which the business can determine the number of units or money of revenue needed to cover total cost. In that way the business can make better decisions for it's progress. What is more these reports help accountants also on creating the annual Financial Statement (Bilanc), which is declared on the QKB.

It is attached also with Statement of Income and Expenses, Statement of Changes in Equity, Statement of Cash Flow, Statement of property, plant and equipment

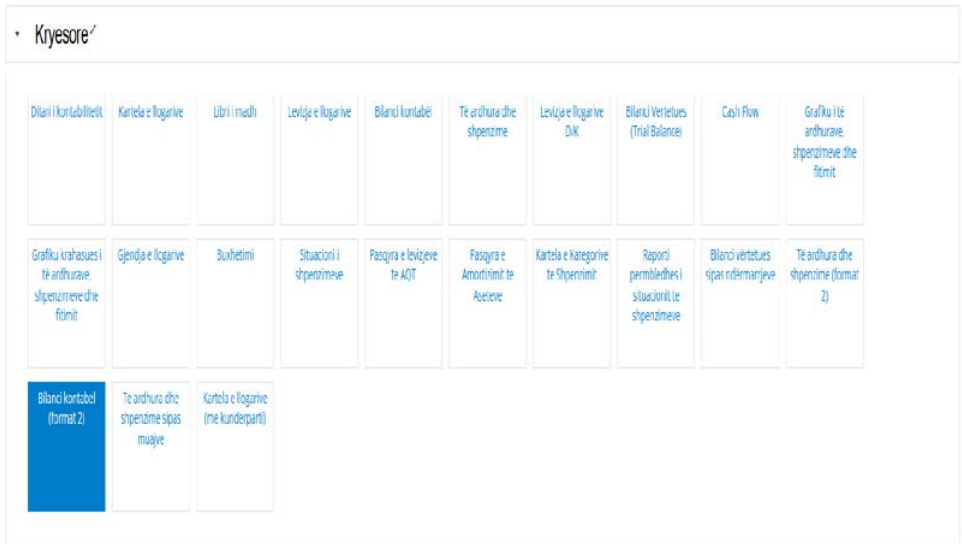
and the Inventory of Goods for Sale. Both of them are declared on Taxes and are mandatory to be implemented by every business. In case of non-delivery/non-declared one of the statements above, a business is fined by state.

Fig.2: View of AlphaWeb System



Reference 2: Authors

Fig.3: A detailed view of main reports in AlphaWeb



Reference 3: Authors

To conclude the ERP systems will help the small and medium business in Albania for better performance and will make them to win more. It will make them to work and follow a business plan which is a rare way of work in Albania.

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EXHAUSTIVE NETS ON FUNCTION SPACES

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ABSTRACT

The observation of a-convergence is done in many publications in different contexts and tools. Recently, we defined the da and a*-convergence in metric space and we emphasized the in every case d-converge or so called locally uniform convergence open new ways for study relationships in different spaces. In this paper we extend the convergence of sequences to net's convergence and have relativised many known prepositions.

KEYWORDS:
exhaustiveness, exhaustive sequence, exhaustive net, d-converge, locally compact space, separated convergence, everywhere not dense set

1- EXHAUSTIVE FUNCTIONS

We now introduce a new notion of exhaustiveness [1] which is close to the notion of equi-continuity. ([1] Gregoriades & Papanastassiou 2008)

Definition 1.1. Let (X, d), (Y, p) be metric spaces, x ∈ X, $\mathcal{F}$ be a family of functions from X to Y and $f_n: X \to Y, n \in \mathbb{N}$.

(1) If $\mathcal{F}$ is infinite, we call the family $\mathcal{F}$ exhaustive at x if for each ε > 0 there exists δ > 0 and A a finite subset of $\mathcal{F}$ such that: for each $y \in S(x,\delta)$ and for each $f \in \mathcal{F}\backslash A$ we have that $p(f(x),f(y)) < \varepsilon$

(2) In case where $\mathcal{F}$ is finite we define $\mathcal{F}$ to be exhaustive at x if each member of $\mathcal{F}$ is continuous function at X.

(3) $\mathcal{F}$ is called exhaustive if $\mathcal{F}$ is exhaustive at every x∈X.

(4) The sequence $(f_n)_{n\in N}$ is called exhaustive at x if for all ε > 0 there exist δ > 0 and $n_0 \in \mathbb{N}$ such that for all $y \in S(x,\delta)$ and all $n \geq n_0$ we have that $p\left(f_n(y), f_n(x)\right) < \varepsilon$

(5) The sequence $(f_n)_{n\in N}$ is called exhaustive if it is exhaustive at every x ∈ X.

Notice that in the most interesting case where $(f_n)_{n\in N}$ is a sequence of functions for which $f_n \neq f_m \; for \; n \neq m$, then the family $\mathcal{F} = \{f_n / n \in \mathbb{N}\}$ is exhaustive at some $x_0 \in X$ if and only if the sequence $(f_n)_{n\in N}$ is exhaustive at x_0.

Remarks 1.2. [1]

(1) An equi-continuous family is an exhaustive family such that for each ε > 0 the finite set A in Definition 1.1 can be taken to be the empty set. So equi-continuity implies exhaustiveness.

(2) Saying that $\mathcal{F}$ is exhaustive does not imply that there exists a finite subset of $\mathcal{F}$ (call it A) such that $\mathcal{F} \setminus A$ is equi-continuous. (That is because the set A in the definition depends on ε >0.).

Example 1.3.[1] For n ∈N define $f_n: \mathbb{R} \to \mathbb{R}$ such that $f_n(x) = \frac{1}{n}$, for $x \leq 0$, $f_n(x) = \frac{1}{2n}$ for x >0. Obviously there is no continuous function f_n at 0. We claim that the sequence of functions $(f_n)_{n\in N}$ is exhaustive at 0.Let ε> 0, then there exists an integer $n_0 > \frac{1}{2\varepsilon}$ such that δ = 1, for all y ∈ (−1, 1) and for all $n \geq n_0$ we have that $|f_n(y) - f_n(0)| \leq \frac{1}{2n} < \varepsilon$. So we get the exhaustive sequence of discontinuous functions that converges to a continuous function.

Definition 1.4. The net on metric(topologic) space X is called a function which maps an ordered set D to X. The net is denoted $\{x_\sigma : \sigma \in D\}$ where x_σ is a point of the space X defined by element σ of D. In the case when D is denumerable set we use the symbol $\{x_i : i \in I\}$ or $(x_i)_{i\in D}$. The ordered relation of D is denoted $\leq$ for two elements $\sigma_1 \ and \ \sigma_2$ from D. we have write everywhere $\sigma_1 \leq \sigma_2$ when σ_1 is before σ_2. The point x from X is called limes of net $(x_\sigma)_{\sigma\in D}$ if and only if for every neighborhood U of the point x there exists an element $\sigma_0 \in D$ such that $\sigma_0 \in D$ for every $\sigma \geq \sigma_0$. Then we can say that the net $(x_\sigma)_{\sigma\in D}$ converges to the point x. Unlike the sequences, the net can converges to many points at same time.

2. δ_a-CONVERGENCE OF NETS

Proposition 2.1:Let X and Y be two metric spaces and also $f_n, f: X \to Y$. The net (f_n) is δ_a-convergent to f if and only if $(f_n)_{n\in\mathbb{N}}$ is δ_a-convergent to f as a sequence according to the definition 1.1.

Proof: It is evident that from the δ_a-convergence of the nets $(f_i)_{i\in I}$ derives as a special case of the δ_a-convergence of the sequence $(f_n)_{n\in\mathbb{N}}$.

Let e suppose that the sequence $(f_n)_{n\in\mathbb{N}}$ δ_a- converges to f and y be an element such that $y \in S(x,\delta)$ and we want to prove that the nets $(f_i)_{i\in I}$ δ_a-converges to $f(x)$.

Let consider the opposite assertion. The sequence $(f_i)_{i\in I}$ doesn't converges to $f(x)$. This means that there exists an $_0$>0 and x∈X such that for every 0<δ<1 and $n_1 > n_0$ there exists y∈ S(x, δ) for which $p(f_{n_1}(y), f(x)) \geq \varepsilon_0$ .By repeating the same procedure $< \frac{1}{-}$ and $n_2 \geq n_1$ will be found an element y such that $y \in S\left(x, \frac{1}{2}\right)$ to derive $\left(f_{n_2}(y), f(x)\right) \geq \varepsilon_0$, and same for $\delta_k \leq \frac{1}{k}$, we will found y such that $y \in S\left(x, \frac{1}{k}\right)$ to derive $\left(f_{n_k}(y), f(x)\right) \geq \varepsilon_0$, and proceeding in this way indefinitely.

By an appropriate recount we mark $m=n_k$ when $k \to \infty$ and $m_0=\sup\{n_k\}$ then for $m>m_0$ there exists an δ such that for $y \in S(x,\delta)$ it follows $\left(f_m(y), f(x)\right) \geq \varepsilon_0$ that contradicts our assumption of δ_a- convergence of the sequence $(f_n)_{n\in\mathbb{N}}$.

In the Theorem (3.2.12 [6]) we can substitute α-convergence with δ_a convergence and with some adequate modifications of the proof we reach the same conclusion. This substitution will be made in the following statements (Theorems 3.2.13, and 3.2.14. [6]

Theorem 2.2. :Let $f: X \to Y$ and the net of functions $(f_i)_{i\in I}$ such that mapp X to Y. The following propositions are equivalent:

1) $f_i \xrightarrow{\delta_a} f$;

2) $f_i \xrightarrow{pw} f$ and the net $(f_i)_{i\in I}$ is exhaustive.

Corollary 2.3. :If the net $(f_i)_{i\in I}$ is exhaustive and f is δ_a-limit then the function f is an continuous function.

PROOF

The only issue that is not the same in this proof as compared to that in Theorem 1, 3.3[6]. is the implication $(1) \Rightarrow (2)$.

We suppose that $f_i \xrightarrow{\delta_a} f$ meanwhile the net of functions f_i is not exhaustive to any point $x_0 \in X$. Then, for every $\varepsilon > 0$ we will have that for all the open neighborhood V of the point x_0 and for all elements $i \in I$, will be found an element $x \in V$, such that for every $k \in I$, such that for $i \leq k$, we have :

$p\left(f_k(x), f_k(x_0)\right) \geq \varepsilon.$ $(*)$

We mark with ζ_{x_0} the family of all the open neighborhood of the point x_0. For two open neighborhood $U_1, U_2 \in \zeta_{x_0}$ we define $U_1 \leq U_2$ if and only if $U_2 \subset U_1$. Thus the set ζ_{x_0} is ordered. We denote by $M = \left\{(k,V) \in I \times \zeta_{x_0}\right\}$, where there exists $x \in V$ such that $p\left(f_k(x), f_k(x_0)\right) \geq \varepsilon_0$. The set $I \times \zeta_{x_0}$ is with a partially ordered. Let prove that the set M is ordered with respect to the relation $(*)$. In fact for $i \in I \ and \ for \ all \ V \in \zeta_{x_0}$, there exists $k \in I$ such that $i \leq k$ and $(k,V) \in M (**)$.

By the axiom of choice we have can found a net $\left(x_{(k,V)}\right)_{(k,V)\in M}$ in X such that $p\left(f_k\left(x_{(k,V)}\right), f_k(x_0)\right) \geq \varepsilon_0$ and $x_{(k,V)} \in V$ for all $(k,V) \in M$.

It is obvious that for $x_{(k,V)} \xrightarrow[(k,V)\in M]{} x_0$ and from the hypothesis of δ_a-convergence of the net $f_i(x_{(k,V)}) \xrightarrow[(k,V)\in I\times M]{} f(x_0)$

This means that for x_0 there exists V and k_0 such that $k \leq k_0$ and $x_{(k,V)} \in \zeta_{x_0}$ then $p\left(f_k\left(x_{(k,v)}\right), f_k(x_0)\right) < \varepsilon$.

This contradicts the assumption and we proved that the net $(f_i)_{i\in I}$ is an exhaustive family.

Theorem 2.4.: Let X be locally compact and (Y,p) a metric space and the

functions $f_i, f: X \to Y$, $i \in I$, where I is an ordered set. The following propositions are equivalent:

(1) The net $(f_i)_{i\in I}$ is δ_a-convergent to the function f.

(2) Function f is continuous and for every compact set $K \subseteq X$ the net of functions $(f_i)_{i\in I}$ converges uniformly to f in K.

From the this Theorem derives that when X is a locally compact space then δ_a -convergence in $C(X,Y)$ which provided from the topology of the uniform convergence in the compact sets. In the proof of the Theorem we have to use with the regular spaces. If the set I is ordered and J⊆I is cofinal in I then J is also ordered. This means that when $(x_i)_{i\in I}$ is a net then for every J we are in conditions of subnet $(x_j)_{j\in J}$.

PROOF

$(1) \Rightarrow (2)$ From the corollary (2.3), the function f is continuous. Let K be a compact subset of X. If the net $(f_i)_{i\in I}$ will not converge uniformly to the function f in K, then for every $\varepsilon > 0$ and for every $i \in I$, there exist an element $j \in J$, such that

$i \leq j$ and $x \in K$, to have that $p\left(f_j(x), f(x)\right) \geq \varepsilon$.

We denote that

$J = \left\{j \in I: that\ exists\ any\ element\ of\ \ x \in K\ such\ that\ p\left(f_j(x), f(x)\right) \geq \varepsilon\right\}$

.

The set J is cofinal in I. According to the Axiom of Choice, there exist the net $(x_j)_{j\in J}$ in K such that $p\left(f_j(x_j), f(x_j)\right) \geq \varepsilon$ for every $j \in J$. $(*)$

Since K is a compact space we will find a subnet $(x_{j_\mu})_{\mu\in M}$ and $x_0 \in K$ such that $x_{j_\mu} \xrightarrow{\mu\in M} x_0$. As we mentioned above , $\delta_a - convergence$, is also applied and for subnets, so we have $f_{j_\mu} \xrightarrow{\delta_a} f$ which implies that $f_{j_\mu}(x_{j_\mu}) \xrightarrow{\mu\in M} f(x_0)$. Regarding to the continuity of the function f it follows the result $f(x_{j_\mu}) \xrightarrow{\mu\in M} f(x_0)$ .This means that $p(f_{j_\mu}(x_{j_\mu}), f(x_{j_\mu})) \xrightarrow{\mu\in M} 0$ which contradicts $(*)$.

$(2) \Rightarrow (1)$ We consider the net $(x_\mu)_{\mu\in M}$ in X which converges to the point x_0. Since X is a locally compact space, there exists a neighborhood of a point x_0, which we mark with U_0, for which the its closure $\overline{U_0}$ is a compact space. We choose

one $\mu_0 \in M$, such that for all $\mu \in M$ that $\mu_0 \leq \mu$, to have $x_\mu \in M$. We define $L = \{x_\mu : \mu_0 \leq \mu\}$ and K= $\overline{L}$. Then the space K is a closed subset of $\overline{U_0}$,which is compact. It follows from the hypothesis that the net $(f_i)_{i\in I}$ converges uniformly in K. As we know f is a continuous function , so we have $p\left(f_i(x_\mu), f(x_0)\right) \leq \varepsilon$ for $x_\mu \in U_0$ and $\mu_0 \leq \mu$ that proves that $f_i \xrightarrow{\delta_a} f$.

We can substitute α-convergence with δ_a-convergence even in the following statement, by specifying some relations attributed to α-convergence but they are also similar to α*-convergence and δ_a -convergence how it is treated to the proof of Gregoriades[1] .

Proposition 2.5.: Let X be a regular space and Y be a metric space with at least two elements . The following propositions are equivalent:

(1) X is a locally compact space.

(2) For all given nets $(f_i)_{i\in I}$ from X to Y and for all the functions $f: X \to Y$ the net $(f_i)_{i\in I}$ δ_a-converges to the function f , if and only if f is a continuous function $(f_i)_{i\in I}$ that converges uniformly to f in every compact subspace of X.

Proof: Implication $(1) \Rightarrow (2)$ derives from Theorem 2.4.

$(2) \Rightarrow (1)$ If we assume that despite fulfilling of the point (2) the space X is not locally compact. This is accomplished if we define a net of functions, which converges uniformly to the continuous function f in every subset of X but in other side it is not δ_a-convergent to the function f.

We denote by K the family of all compact subsets of X. We put the ordering relation for $K_1, K_2 \in \mathrm{K}$, such that $K_1 \leq K_2$, if that $K_1 \subseteq K_2$, so the set $(K, \leq)\ is\ an\ ordered\ set$. We fix two elements $y_1, y_2 \in Y$, where $y_1 \neq y_2$. For every $K \in \mathrm{K}$ we take the function $f_K: X \to Y$ such that $f_K(x) = y_1$, if that $x \notin K$. Also, we specify $f(x) = y_0$ for every $x \in X$.

Now let prove that the sequence $(f_{\mathrm{K}})_{K\in\mathrm{K}}$ is not δ_a-convergent to the function f . Although based on the assumption that X is not locally compact then there exists any $x_0 \in X$, such that for every closed set F, where $x \in F^0$, there exists a net $(x_i^F)_{i\in I^F}$ in F for which does not exist a convergent subnet. We denote I the union of all non intersecting subset I^F, this for all elements $i \in I$, there exist an unique set F that is $i \in I^F$. For , $j \in I$, we denote $i \leq j \Leftrightarrow i \in I^F$ and $j \in I^C$ and $[or\ F \equiv C\ or\ i \leq_F j\ when\ C \subset F\ but\ C \neq F]$.

It is not difficult to see that the ordering relation $\leq$ is a partial ordering relation in I, also I is totally ordering . Let $i \in I^F$, $j \in I^C$, we denote $L = F \cap C$ then $x_0 \in L^0$. *Suppose that* $F \cap C = C$. If $F \subset C$ then $j \leq i$. If $F \equiv C$ then, since $(I^F, \leq_F)$ totally ordering , we can find any $k \in I^F$, such that $i, j \leq k$. As $k \in I^F$ this brings that $i, j \leq k$.

Let suppose now that $F \cap C \subset F$. If that $F \cap C = C$ then $C \subset F$ so $i \leq j$.

If $F \cap C \subset C$ then any $k \in I^{F \cap C} = I^L$ satisfy the relation $i, j \leq k$.

Now for $i \in I$, we determine $x_i = x_i^F$, where F is the only set for which $x_0 \in F^0$ and $i \in I^F$. Let we prove that $x_i \to x_0$. Really , if the set U is an open set and $x_0 \in U$, using the fact that X is a regular space, there exist the closed set F for which $x_0 \in F^0 \subseteq F \subseteq U$. Now let be $i_0 \in I^F$. If exists $i \in I$, where $i_0 \leq i$ and $i \in I^C$ then $C \subseteq F$ and from the chosen element x_i^C we will have $x_i = x_i^C \in C \subseteq F \subseteq U$.

Finally, let's prove that $f_k(x_i) \nrightarrow f(x_0) = y_0$. Let $K \in \mathrm{K}$ be an element and $i \in I$ where $i \in I^F$. It is necessary to find that $j \in I$ such that $i \leq j$ and $f_K(x_j) = y_1$, i.e. $x_j \notin K$. We define $\mathcal{J}^F = \{j \in I^F : i \leq j\}$ and note that $\mathcal{J}^F$ is a closed totally ordering set. It is noted that for each $\mathcal{J} \subseteq \mathcal{J}^F$ which is cofinal in $\mathcal{J}^F$ *is also cofinal in* I^F. That means that the subnet $(x_j^F)_{j \in \mathcal{J}^F}$ is also a subnet in $(x_i^F)_{i \in I^F}$. This proves that the set K cannot contain the net $(x_j^F)_{j \in \mathcal{J}^F}$ but on the other hand K as a compact set will have a convergent subnet $(x_i^F)_{i \in I^F}$. This contradicts the choice made to $(x_i^F)_{i \in I^F}$. In the meantime we have found $j \in \mathcal{J}^F$ such that $x_i^F \notin K$. So $i \leq j$ induce $x_j \notin K, x_i = x_j^F \notin K$, that proves the proposition.

3. LOCAL SEPARATED CONVERGENCE

Let study the families of functions given in the products of sets $X \times Y$ and to give the definitions of exhaustiveness, α-convergence and other local convergences studied above in a complementary subset of a set everywhere not dense. Let X,Y,Z be metric spaces and a function $f: X \times Y \to Z$. For each $y \in Y$ we mark with f^Y the function $(x \to f(x,y))$ for each $x \in X$. Also we note f_x the function $(y \to f(x,y))$ for each $y \in Y$. In the case when we have the sequence of functions $(f_n)_{n \in \mathbb{N}}$, the corresponding sequence of functions we denote with f_n^y

and $f_{n,x}$. We have to work with the functions in any subset $G = A \times B$ of the product $X \times Y$. In this case we will say that the function f^y is a function defined in A for each $y \in B$. The same is the situation true for f_x.

Definition 3.1: Let X,Y,Z be metric spaces and the functions $f_n, f: X \times Y \to Z$. We say that the sequence $(f_n)_{n \in \mathbb{N}}$ is separated exhaustive if and only if for each $y \in Y$, the sequence $(f_n^y)_{n \in \mathbb{N}}$ *is exhaustive* and for every $x \in X$, same that the sequence $(f_{x,n})_{n \in \mathbb{N}}$ *is* exhaustive.

Also it is said that the sequence $(f_n)_{n \in \mathbb{N}}$ is α-convergent separated $(\delta, \delta_a, \alpha^*\ convergent\ separated)$ if and only if the sequence f_n^y is α -convergent $(\delta, \delta_a, \alpha^* - convergent)$ to f^Y and also $f_{x,n}$ converges to f_x. In the case when the functions are defined in any $G \subseteq X \times Y$, we holds the same definitions as above where the sequences $(f_n^y)_{n \in \mathbb{N}}$ and $(f_{x,n})$ are defined in X and Y respectively. The analogy with the known notions of the separated continuous functions (with two variables) and the sequences uniformly convergent separated it is obvious. As it be expected , separated exhaustiveness does not bring the proper exhaustiveness also as the separated convergences given above does

$$f(x,y) = \begin{cases} \dfrac{x-y}{x+y} & if\ x^2 + y^2 \neq 0 \\ 0 & if\ x^2 + y^2 = 0 \end{cases}$$ the functions $f_n, f: \mathbb{R}^2 \to \mathbb{R}$ such that :

We denote that $f_n = f + \frac{1}{n}$. We see that $f_n \overset{u}{\to} f$ converges uniformly while f is not continuous, which brings that $(f_n)_{n \in \mathbb{N}}$ is not even α-convergent, even δ_a *is not convergent*, (α^*-convergent to f).

From the Theorem 2.3.,the sequence $(f_n)_{n \in \mathbb{N}}$ is not exhaustive . Meanwhile the sequence $(f_n)_{n \in \mathbb{N}}$ is separated exhaustive .

Let be $\bar{x} \in S\left(0, \delta = \frac{1}{n}\right)$ for each $y \in \mathbb{R}$ we will have $f_n^y(\bar{x}) = f_n(\bar{x}, y) = \frac{\bar{x}-y}{\bar{x}+y} + \frac{1}{n} \to \frac{\bar{x}-y}{\bar{x}+y} = 1$ also for $\bar{y} \in S\left(0, \delta = \frac{1}{n}\right)$ and for each $x \in \mathbb{R}$. $f_{n,x} = \frac{x-\bar{y}}{x+\bar{y}} + \frac{1}{n} \to \frac{x-\bar{y}}{x+\bar{y}} = -1$ .So $f_n^0 = 1$ and $f_{n,0} = -1$. We see that the sequence $(f_n)_{n \in \mathbb{N}}$ δ_a-converges in a separate way but it doesn't δ_a − convergent as a whole . This brings that (f_n^y) and $f_{x,n}$ are separated exhaustive but the sequence $(f_n)_{n \in \mathbb{N}}$ is not exhaustive. To the reference [18] Example 4.1.2 it is proved the same result for the α-convergence.

We recall that the set $A \subseteq X$ is called everywhere not dense if and only if $(\bar{A})^0 = \emptyset$. The set A is called poor if and only if when it is a union of a sequence of everywhere not dense sets. According to Bear those are called also first category sets. The complement of a poor set is called everywhere not dense if the set X\A is poor. An well-known result of Classic Mathematics given by Namioka [7] proves that the separate continuity implies the continuity in any complementary of a subset everywhere not dense of the determined set $X \times Y$. Meanwhile, if X and Y are compact spaces, this subset will be in the form $A \times Y$. A simple variation of this proof done for the above results realized in [5] can be realized also for exhaustiveness.

In [6] is formulated and proofed in the Theorem 4.1.3.

Let $(X,d),(Y,p),(Z,q)$ be three metric spaces and the functions $f_n: X \times Y \to Z$.Suppose that for each $y \in Y$ every function $f_n^y: X \to Z$ is continuous and the sequence $(f_n)_{n\in\mathbb{N}}$ is separate exhaustive. Then there exist an everywhere dense set (the complement of a set everywhere not dense) $G \subseteq X \times Y$ such that the sequence $(f_n)_{n\in\mathbb{N}}$ is exhaustive in every point $(x,y) \in G$.

Remark 3.3. We note that when G_0 is a subset of X$\times$ Y as the AxB form, we can repeat the same proof buy using the constrained in G_0 . However the set that is gained $G \subseteq G_0$ will be everywhere not dense in G_0 , this means that the set $G_0 \backslash G$ will be also everywhere dense . As a result if in the above Theorem our function is defined only in the set $G_0 = A \times B \subseteq X \times Y$ the conclusion is that there exist a set $G \subseteq G_0$ such that $G_0 \backslash G$ is everywhere not dense ,and the sequence $(f_n)_{n\in\mathbb{N}}$ is exhaustive in every point $(x,y) \in G$. This remark helps us in the following result.

Corollary 3.4.: Let X,Y,Z be three metric spaces and the functions $f_n: f: X \times Y \to Z$. Suppose that every function f_n^y is continuous.

(1) If the sequence $(f_n)_{n\in\mathbb{N}}$ converges to f with help of δ_a-separated convergence then there exists an everywhere dense set $G \subseteq X \times Y$ such that for all the points $(x,y) \in G, \exists \delta > 0$ and $n_0(x,y)$ such that for $(\bar{x},\bar{y}) \in S[(x,y),\delta]$ we have $p\big(f_n(\bar{x},\bar{y}), f(x,y)\big) < \varepsilon$. In particular the sequence $(f_n|_G)_{n\in\mathbb{N}}$ is δ_a -convergent to $f|_G$.

(2) Suppose that X and Y are compact spaces. If the function f_x is continuous and the sequence $(f_n)_{n\in\mathbb{N}}$ converges to the function f uniformly separated, then there exists an everywhere densed set $G \subseteq X \times Y$ such that for every point (x,y),there exist $\delta > 0$ and $n_0(x,y)$ such that for $n > n_0$ and $(\bar{x},\bar{y}) \in S[(x,y),\delta]$ to derive that $p\big(f_n(\bar{x},\bar{y}), f(x,y)\big) < \varepsilon$. This means that the sequence $(f_n|_G)_{n\in\mathbb{N}}$ δ_a-converges to $f|_G$.

Proof: For (1) we note that the sequence $(f_n)_{n\in\mathbb{N}}$ converges pointwise. Then we use in [6]the theorem 4,1,3 and the remark 2.7.

To prove the point (2) we need the remark ([6]4.1.4.) that says that if G_0 is a subset of the cartesian product X x Y in A x B form we can repeat the same proof by using the restriction of G_0.

First, we note that the function f is separate continuous meanwhile for each $y \in Y$,we have that $f_n^y \xrightarrow{u} f^y$ and each f_n^y is continuous. From the result of Namioka (see [4] and [5],[7]) there exists an everywhere dense set $G_0 \subseteq X \times Y$ such that the function f is an continuous function in every point $(x,y) \in G_0$. As X and Y are compact spaces ,the set G_0 is in the $A \times Y_0$ $form$. From this derives that the restriction $f|_{G_0}$ is a continuous function consequently is even separated continuous. From the proposition [xx] the sequence $(f_n|_{G_0})_{n\in\mathbb{N}}$ δ_a -converges to $f|_{G_0}$ separated. From this derives that the sequence $(f_n|_{G_0})_{n\in\mathbb{N}}$ is separated exhaustive. As G_0 is in the $A \times Y$ $form$, from the corollary ([6], 4.1.4) there exist the set $G \subseteq G_0$ such that $G_0 \backslash G$ is a poor set and the sequence $(f_n|_{G_0})_{n\in\mathbb{N}}$ is exhaustive in every point $(x,y) \in G$. By applying the proposition 2.3. for the restriction in G_0 we take that for all $(x,y) \in G$,there exist $\delta > 0$ and $n_0(x,y)$ that for $n > n_0(x,y)$ and $(\bar{x},\bar{y}) \in S([x,y],\delta)$ to derive that $p\big(f_n(\bar{x},\bar{y}), f(x,y)\big) < \varepsilon$. It should be noted that $X \times Y|_{G_0} = \big(X \times Y|_{G_0}\big) \cup (G|G_0)$. That follows that G is a dense set in $X \times Y$.

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FROM RDMS TO GRAPHDB USING PYTHON

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ABSTRACT:

Recently with the rapid development of technology we are dealing with the concept of BIGDATA. In addition of this data increases the difficulty in managing as well as using in order to get information as quickly as possible, this information is kept safe and managed as easy as possible. Adding this data increases the difficulty in managing and using data in order to get information as quickly as possible. Also our challenge is to keep this information safe and manage it as easy as possible. This data increase has made unstructured data produced every second.
Traditional RDBMS Systems have found it difficult to take care of unstructured data because of the infrastructure they have. The need to use NOSQL systems arises. The database used for this research is a recent trend, will provide information on how to get acquainted with the advantages that this kind of database brings, such as performance, security.
The purpose of this topic is to conduct a study on Graph Database, its structure, how it stored data and how to use it. How performative it is, how it fits into the programming languages and how much affect its use to facilitate the management and security of BIG DATA.

KEY WORDS:

GraphDb, Algorithm, Neo4j, Python, Performance

INTRODUCTION

In the last two years, we have seen great inventions and innovations taking place in the field of Data Science or Data Analytics platform, due to the sudden overload of information generated from various sources of data. This data overload is called "Big Data". To do Big Data processing, manipulation and administration, we have a lot of data. Databases can be broadly divided into two categories namely relational databases (RDBMS) and non-relational or NoSQL databases. It has been noted that RDBMS is not suitable for handling Big Data compared to NoSQL databases since RDBMS has some serious limitations to processing Big Data.

Recently in the last few years, under NoSQL Databases, Graphical Databases have emerged as one of the main databases for storing data which contains relational data. Since the advent of social networks like websites like Facebook, LinkedIn, Instagram and E-commerce, Amazon, eBay, Walmart, Flipkart, Snapdeal, etc. Graphic databases have become the industry standard. "Graphic databases are a powerful optimized technology that connects billions of pieces of related data to help create new sources of value for customers and enhances operational capability for customer service. After all, clients are people and people are shaped by their relationships. Because graphs link data between entities and provide links to obtain more detailed information, they are suitable for scenarios in which relationships are important, such as online security, social network analysis, e-recommendations. trade, dependency analysis, and predictive analytics "(Forrester May 28, 2015). Under the Graphic Platform being built for Graphic Databases, Graphic Analytics reveals the essence of real-world networks through their links.

Businesses use this knowledge to model processes and make valuable predictions about how things like information or failure spread; flow and capacity to transport resources; and impacts on group dynamics and sustainability. Anticipating complex network behavior and defining the right actions is extremely valuable to advances in science and business, as well as protection against vulnerabilities. In general, graph analytics plays a very important role by revealing hidden meaning to promote discovery for new information. In recent years, real-time recommendation systems have become increasingly popular and important. In the field of e-commerce, users or customers want to get relevant suggestions and recommendations for the different products you want to buy. Real-time referral systems provide users with all the information they need. These systems help find and generate the personal interests of each user registered in a particular system.

Relational databases though are a very important element for storing it data in different organizations, researchers realized that they were suffering from a number of problems.According to Jatana, the creation of mobile applications is increasing the amount of data.Unstructured, while Pokorny, says that with the proliferation of cloud computing and the growth of with the large amount of internet usage, it is becoming impossible to maintain and efficiently manage it data through relational databases.Relational databases, although widely used, suffer from a number of drawbacks such as:

The SQL language they use is not a very suitable language for very complex analytics and applications.SQL is very asymmetric, complex constraints and calculations can only be performed within records.It is easy to lose performance control.Relational databases do not support high scalability until a given point can be used better, but beyond that point the database must be distributed. When the amount of data is very large then the relational database must be shared on multiple servers making their management complex.

THE ACID THEOREM

Transactions are a very important issue and concept for relational databases. According to Jim Gray the concept of transaction is key to structuring applications for data management. According to him, the transactions had to obey the protocol, or it did or they do not and cannot be changed after they occur. He create the first three elements of system: Atomicity, Consistency, and Sustainability. But according to Harder and Reuter in the year 1983 required the addition of the fourth element of isolation, calling the whole theorem ACID. For relational databases this theorem is a necessary obligation for transactions. Let us briefly outline what the ACID theorem means:

- **Atomicity** - all operations, operations are performed, or none of them are performed. If one part of the transaction fails, then the whole transaction fails.
- **Consistency** - The transaction must meet all the rules set by the system, no transaction remaining half completed.
- **Isolation** - Each transaction is independent of itself which means the transactions are executed sequentially one after the other.
- **Sustainability** - at the moment the transaction is completed, it will remain so even in the event of errors, power losses or crashes.

The ACID theorem proved very successful in processing transactions on a reliable and relational. But with the advent of the Internet, the addition of unstructured data and the subsequent need for more flexibility in terms of scalability, design,processing, costing and disaster recovery made relational databases limited,not supporting them. For this reason, the researchers thought it was time to look for another alternative.

As mentioned above the relational data, although selected in most developments, have their own problems for which possible solutions should be suggested.

The ACID theorem of relational databases has been shown to be a problem for complex data storage, with Conflict arising between various aspects of high availability in distributed systems that are not fully solvable — known as CAP theorems. A distributed database system consists of weakly linked sites that do not share physical components with one another. Regardless of the type of application or service, it is very important that the information they use has a high consistency, is secure, protected and has the ability to tolerate errors. In a distributed system,

management robustness (C), availability (A) and error tolerance (P) are important. , availability or fault tolerance.

- **Error Tolerance** - The system continues to function despite the loss of the arbitrator message or the failure of part of the system.
- **Consistency** - All nodes see the same data at the same time. It is equivalent to a single updated copy of the data.
- **Availability** - Any request received from a node without system failure should result in a response. Even when serious network failures occur, each request must be terminated.

Distributed systems require the use of two of the elements of the CAP theorem.

Why graph database is gaining popularity?

- The data retrieval speed when using Graph Database is 60% higher than that of traditional relational databases.
- Graph Database, unlike relational databases, offers flexibility because it stores data in graph form making it easier to connect, store, and modify data.
- Graph Database makes it possible to create data relationships as ribs of a graph by avoiding JOIN between tables that degrade performance on relational bases.
- Data relationships are not stored in memory enabling low memory usage consequently providing us with high performance.

SECURITY AND GRAPH DATABASE.

GRAPH DB offer new methods to detect fraud cycles and other sophisticated frauds with a high degree of accuracy, and are capable of stopping advanced real-time fraud scenarios mainly for banking systems where the data is very high. interrelated.

As security is one of the foremost and most important topics in the data world this type of database is ideal for setting up and maintaining a secure network.

- Graph-based databases are seen as the ideal means of overcoming these barriers threatened by potential attacks.
- CYPHER, the language that this database uses, provides a simple semantic to identify graph cycles, to roam all links that exist on the graph in real time

AGILE AND GRAPH DATABASE METHODS.

- Graph Database works best with the Agile way of developing different systems. This type of database being flexible enables it to evolve and adapt to any business demand change.
- This database is designed to allow easy and efficient maintenance of systems

GRAPH DATABASE AND NETWORKS

- Using Graph Database, you can interconnect your network, data center, and IT assets to help with troubleshooting, analysis and capacity, or outage planning.
- A graphical database allows you to connect many monitoring tools and gain critical insights into the complex relationships between different network or data center operations.

From dependency management to automated monitoring through microservices, the uses for graphs in network operations and IT are endless.

REAL RECOMMENDATION SYSTEMS AND GRAPH DATABASE.

- The key element of recommendation systems is data interconnection, which best supports Graph Database.

These systems are becoming key to the success of any business and this type of database is a key element in building them, leaving behind relational databases.

Python and Graph Database.

Graph Database offers many applicable algorithms on graph data.

- These algorithms are best suited to the Python language as a language close to machine language which is often used for data analysis and processing being one of the most recommended languages for building real recommendation systems.
- In my study, some of the most commonly used algorithms in this type of database have been implemented, with real data collected through a survey.
- A comparison of how Python and Java implementations are implemented shows that Python offers simplicity in implementation, higher performance than Java.

This paragraph concludes the research work and gives some recommendations for future work for this study. It can be seen from the literature review how previous studies or research helped to gain an understanding of algorithms, graphs that had been previously implemented for different use cases. The main focus of the research was on real-time recommendation systems. Also, various graphical databases in previous research provided valuable information, but had some limitations. For the technical development of use cases, a graphical data model was constructed; and Cypher's various questions were written and executed. Finally, the facility containing the proposed solutions to the two requirements has been developed.

The algorithms implemented on graphs provided much deeper insight into the field of Graph Database. The results of the various queries were very helpful in providing a real-time recommendation system for any type of business and compared to traditional, relational databases, performance is much higher. As a future recommendation, the implementation for both use cases may be to create a cloud environment in order to build on the Neo4j database, with real-time data access.

This research can be expanded by implementing more graphical algorithms for different business case use. The study of this topic is endless and there are great opportunities to find new, innovative and intuitive cases for Neo4j users.

LAPLACE METHOD FOR DIMENSIONAL TIME FRACTIONAL MODEL OF

NAVIER-STOKES EQUATION

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ABSTRACT

In this research paper, a hybrid method called Laplace Adomian Decomposition Method (LADM) is used for the analytical solution of the system of time fractional Navier-Stokes equation. In this paper, a new approximate solution of time-fractional order multi-dimensional Navier–Stokes equation is obtained by adopting a semi-analytical scheme: "Fractional Reduced Differential Transformation Method ".
The solution of this system can be obtained with the help of Maple software, which provide LADM algorithm for the given problem. Moreover, the results of the proposed method are compared with the exact solution of the problems, which has confirmed, that as the terms of the series increases the approximate solutions are convergent to the exact solution of each problem.
Three test problems are carried out in order to validate and illustrate the efficiency of the method. The scheme is found to be very reliable, effective and efficient powerful technique to solve wide range of problems arising in engineering and sciences. The small size of computation contrary to the other schemes, is its strength.
The accuracy of the method is examined with help of some examples. The LADM, results have shown that, the proposed method has higher rate of convergence as compare to ADM and HPM.

KEYWORDS:

Laplace Adomian Decomposition Method (LADM); Navier-Stokes equation; Caputo Operator

1. INTRODUCTION

In engineering and natural sciences many problems are modeled by linear and non linear parabolic and hyperbolic partial differential equations. Fractional calculus deals with the differential and integral operators with non-integral powers. Noting that the integer-order differential operator is a local operator while the fractional-order differential operator is non-local, it means that the next state of a system depends not only upon its current state but also upon all of its previous states. It is more realistic and is one of the main reasons why the fractional calculus has become so popular.

In the recent years, advances of fractional differential equations have a great attention due to their numerous applications in a wide range of nonlinear complex systems arising in fluid mechanics, viscoelasticity, mathematical biology, life sciences, electrochemistry and physics.

For these classical partial differential equations LADM can be used effectively with initial as well as boundary conditions. The present method was initially used by Suheil-A-khuri for the solution of ordinary differential equations .

It is slightly difficult to find the exact solutions of non linear differential equations, due to which the combination of two powerful methods, laplace transform and

Adomian Decomposition Method called LADM has been used to find the exact solutions of non linear differential equations. The analytical solution of the well known non linear fractional diffusion and wave equations by using LADM are presented in . Fractional differential equations have created attention among the researcher due to exact description of non-linear phenomena, especially in nano-hydrodynamics where continuum assumption does not well, and fractional model can be considered to be a best candidate. These findings invoked the growing interest of studies of the fractal calculus in many branches of science and engineering.

It was used very effectively on a wide range of physical models of partial differential equations, such as Burger's equation is a non linear PDE of second order, which have many applications in sciences and technology. The numerical solutions of three dimensional Burger's equation and Riccati differentialequations by using LADM have been discussed in . LADM is also used for the numerical solution of a special mathematical model for vector born diseases . Delay differential equation have a vital role in the field of biology and economics has been solved by LADM .

Nonlinear Volterra integraland integro-differential equation solving for Modification LADM .

Fractional calculus is a branch of mathematical analysis which can be used in modeling to define derivatives and integrations of fractional order.

Although it is considered an old topic, but for the last few decade, fractional calculus is launched as an important topic by the scientists and researchers.

The Navier-Stokes equation is known as Newton second Law for fluid substance, has been derived in 1822 by Claude Louis Navier and Gabriel Stokes. Navier-Stokes equation is an important model to describe many physical phenomena in applied sciences. This model have the capacity of modeling weather, ocean current, water flow in pipes and air flow around a wing. A very special case was considered, which has established the relationship between pressure and external forces acting on the fluid to the responses of fluid flow . The Navier-Stock equation is also used to derive the connection between viscous fluid with rigid bodies and considered a best tool in the field of thermohydraulics, meteorology, petroleum industry, plasma physics and technology .

Several mathematicians have applied different techniques for the solution of Navier-Stock equation. Among these methods, Kumar et al. have implemented modified Laplace decomposition method for the analytical solution of fractional Navier-Stokes equation coupled method is the combination of He-Laplace transform (HLT) and Fractional Complex Transform (FCT) is used to solve

Navier-Stock equation . Fractional Reduced Differential Transformation Method (FRDM) is also implemented for the numerical solution of time fractional Navier-Stock equation , see also .

2. DEFINITIONS AND PRELIMINARIES CONCEPTS

In this unit, among few definitions of fractional calculus, presented in the article due to Riemann Liouville, Grunwald Letnikov, Caputo, etc., first folks simple descriptions and introductions are reconsidered, which we want to comprehend our education.

Definition 1. *The fractional integral of Riemann Liouville $f \in \mathbb{C}_n$ of the direction $\beta \geq 0$ is defined by*

$$I_x^\beta g(x) = \begin{cases} g(x) & \text{if } \beta = 0 \\ \frac{1}{\Gamma(\beta)} \int_0^x (x-v)^{\beta-1} g(v) dv & \text{if } \beta > 0, \end{cases}$$

where Γ denote the gamma function define by,

$$\Gamma(\omega) = \int_0^\infty e^{-x} x^{\tau-1} dx \qquad \omega \in \mathbb{C},$$

Definition 2. *The Caputo definition of fractional derivative of order β is given by the following mathematical expression*

$$D_x^\beta g(x) = \frac{1}{\Gamma(n-\beta)} \int_0^x (x-t)^{n-\beta-1} g^{(n)}(t) dt.$$

for $n-1 < \beta \leq n$, $n \in \mathbb{N}$, $x > 0$, $g \in \mathbb{C}_t$,$t \geq -1$.

Hence, we require the subsequent properties given in next Lemma.

Lemma 1. *If $n-1 < \beta \leq n$ with $n \in \mathbb{N}$ and $g \in \mathbb{C}_x$ with $x \geq -1$, then*

$$D_x^\beta I_x^\beta g(x) = g(x),$$

$$I^\beta x^\lambda = \frac{\Gamma(\lambda+1)}{\Gamma(\beta+\lambda+1)} x^{\beta+\lambda}, \qquad \beta > 0, \lambda > -1, \quad x > 0,$$

$$D_x^\beta I_x^\beta g(x) = g(x) - \sum_{k=0}^{n} g^{(k)}(0^+) \frac{x^k}{k!}, \qquad \text{for} \quad x > 0.$$

In this study, Caputo fractional derivative operator is reasonable because other fractional derivative operators have certain disadvantages. Further information about fractional derivatives, are found .

Definition 3. *The Laplace transform of $g(x)$, $x > 0$ is defined by*

$$G(s) = \mathcal{L}[g(x)] = \int_0^\infty e^{-sx} g(x) dx,$$

where s can be either real or complex.

Definition 4. *The Laplace transform in term of convolution is given by*

$$\mathcal{L}[g_1 \times g_2] = \mathcal{L}[g_1(x)] \times \mathcal{L}[g_2(x)],$$

where $g_1 \times g_2$, define the convolution between g_1 and g_2 ,

$$(g_1 \times g_2)x = \int_0^x g_1(t) g_2(x-t) dx.$$

The Laplace transform of fractional derivative is given by

$$\mathcal{L}\left[D_x^\beta g(x)\right] = s^\beta G(s) - \sum_{k=0}^{n-1} s^{\beta-1-k} g^{(k)}(0), \qquad n-1 < \beta < n,$$

where $G(s)$ is the Laplace transform of $g(x)$.

Definition 5. *The Mittag-Leffler function $E_\beta(p)$ for $\beta > 0$ is defined by the following subsequent series*

$$E_\beta(p) = \sum_{n=0}^{\infty} \frac{p^n}{\Gamma(\beta n+1)}, \qquad \beta > 0, \quad p \in \mathbb{C}.$$

LAPLACE ADOMIAN DECOMPOSITION METHOD

In this unit, we present, Laplace Adomian decomposition method for solving, multi dimensional Naiver-Stokes equation written in an operator form

$$
\begin{aligned}
&D_t^{\beta}(f_1)+f_1\frac{\partial f_1}{\partial x_1}+f_2\frac{\partial f_1}{\partial x_2}+f_3\frac{\partial f_1}{\partial x_3}=\rho\left[\frac{\partial^2 f_1}{\partial x_1^2}+\frac{\partial^2 f_1}{\partial x_2^2}+\frac{\partial^2 f_1}{\partial x_3^2}\right]\\
&-\frac{1}{\rho}\frac{\partial p}{\partial x_1},\\
&D_t^{\beta}(f_2)+f_1\frac{\partial f_2}{\partial x_1}+f_2\frac{\partial f_2}{\partial x_2}+f_3\frac{\partial f_2}{\partial x_3}=\rho\left[\frac{\partial^2 f_2}{\partial x_1^2}+\frac{\partial^2 f_2}{\partial x_2^2}+\frac{\partial^2 f_2}{\partial x_3^2}\right]\\
&-\frac{1}{\rho}\frac{\partial p}{\partial x_2},\\
&D_t^{\beta}(f_3)+f_1\frac{\partial f_3}{\partial x_1}+f_2\frac{\partial f_3}{\partial x_2}+f_3\frac{\partial f_3}{\partial x_3}=\rho\left[\frac{\partial^2 f_3}{\partial x_1^2}+\frac{\partial^2 f_3}{\partial x_2^2}+\frac{\partial^2 f_3}{\partial x_3^2}\right]\\
&-\frac{1}{\rho}\frac{\partial p}{\partial x_3},
\end{aligned}
\tag{1}
$$

with initial conditions

$$
\begin{cases}
f_1(x_1,x_2,x_3,0)=f(x_1,x_2,x_3),\\
f_2(x_1,x_2,x_3,0)=h(x_1,x_2,x_3),\\
f_3(x_1,x_2,x_3,0)=g(x_1,x_2,x_3).
\end{cases}
\tag{2}
$$

Applying the Laplace transform to (1), we have

$$
\begin{aligned}
&\mathcal{L}\left[D_t^{\beta}(f_1)\right]+\mathcal{L}\left[f_1\frac{\partial f_1}{\partial x_1}+f_2\frac{\partial f_1}{\partial x_2}+f_3\frac{\partial f_1}{\partial x_3}\right]=\mathcal{L}\rho\left[\frac{\partial^2 f_1}{\partial x_1^2}+\frac{\partial^2 f_1}{\partial x_2^2}+\frac{\partial^2 f_1}{\partial x_3^2}\right]\\
&-\mathcal{L}\left[\frac{1}{\rho}\frac{\partial p}{\partial x_1}\right],\\
&\mathcal{L}\left[D_t^{\beta}(f_2)\right]+\mathcal{L}\left[f_1\frac{\partial f_2}{\partial x_1}+f_2\frac{\partial f_2}{\partial x_2}+f_3\frac{\partial f_2}{\partial x_3}\right]=\mathcal{L}\rho\left[\frac{\partial^2 f_2}{\partial x_1^2}+\frac{\partial^2 f_2}{\partial x_2^2}+\frac{\partial^2 f_2}{\partial x_3^2}\right]\\
&-\mathcal{L}\left[\frac{1}{\rho}\frac{\partial p}{\partial x_2}\right],\\
&\mathcal{L}\left[D_t^{\beta}(f_3)\right]+\mathcal{L}\left[f_1\frac{\partial f_3}{\partial x_1}+f_2\frac{\partial f_3}{\partial x_2}+f_3\frac{\partial f_3}{\partial x_3}\right]=\mathcal{L}\rho\left[\frac{\partial^2 f_3}{\partial x_1^2}+\frac{\partial^2 f_3}{\partial x_2^2}+\frac{\partial^2 f_3}{\partial x_3^2}\right]
\end{aligned}
\tag{3}
$$

and using the differentiation property of Laplace transform, we get

$$
\begin{aligned}
\mathcal{L}(f_1)&=\frac{f(x_1,x_2,x_3)}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left[f_1\frac{\partial f_1}{\partial x_1}+f_2\frac{\partial f_1}{\partial x_2}+f_3\frac{\partial f_1}{\partial x_3}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2 f_1}{\partial x_1^2}+\frac{\partial^2 f_1}{\partial x_2^2}+\frac{\partial^2 f_1}{\partial x_3^2}\right]-\frac{1}{s^{\beta}}\mathcal{L}\left[\frac{1}{\rho}\frac{\partial p}{\partial x_1}\right],\\
\mathcal{L}(f_2)&=\frac{h(x_1,x_2,x_3)}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left[f_1\frac{\partial f_2}{\partial x_1}+f_2\frac{\partial f_2}{\partial x_2}+f_3\frac{\partial f_2}{\partial x_3}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2 f_2}{\partial x_1^2}+\frac{\partial^2 f_2}{\partial x_2^2}+\frac{\partial^2 f_2}{\partial x_3^2}\right]-\frac{1}{s^{\beta}}\mathcal{L}\left[\frac{1}{\rho}\frac{\partial p}{\partial x_2}\right],\\
\mathcal{L}(f_3)&=\frac{g(x_1,x_2,x_3)}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left[f_1\frac{\partial f_3}{\partial x_1}+f_2\frac{\partial f_3}{\partial x_2}+f_3\frac{\partial f_3}{\partial x_3}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2 f_3}{\partial x_1^2}+\frac{\partial^2 f_3}{\partial x_2^2}+\frac{\partial^2 f_3}{\partial x_3^2}\right]-\frac{1}{s^{\beta}}\mathcal{L}\left[\frac{1}{\rho}\frac{\partial p}{\partial x_3}\right],
\end{aligned}
\tag{4}
$$

Adomian solutions are

$$
\begin{cases}
f_1(x_1,x_2,x_3,t)=\sum_{j=0}^{\infty}u_j,\\
f_2(x_1,x_2,x_3,t)=\sum_{j=0}^{\infty}v_j,\\
f_3(x_1,x_2,x_3,t)=\sum_{j=0}^{\infty}w_j,
\end{cases}
\tag{5}
$$

and the nonlinear terms are define by the infinite series of Adomian polynomials,

$$
\begin{cases}
N_1(f_1)=\sum_{j=0}^{\infty}A_j,\\
N_2(f_2)=\sum_{j=0}^{\infty}B_j,\\
N_3(f_3)=\sum_{j=0}^{\infty}C_j.
\end{cases}
\tag{6}
$$

$$
\begin{aligned}
A_j&=\frac{1}{j!}\left[\frac{d^j}{d\lambda^j}\left[N_1\sum_{i=0}^{\infty}(\lambda^i u_j)\right]\right]_{\lambda=0},\\
B_j&=\frac{1}{j!}\left[\frac{d^j}{d\lambda^j}\left[N_2\sum_{i=0}^{\infty}(\lambda^i v_j)\right]\right]_{\lambda=0},
\end{aligned}
\tag{7}
$$

using LADM solutions in equation (4), we get

$$
\begin{aligned}
&\mathcal{L}\left(\sum_{j=0}^{\infty}u_{j+1}\right)=\frac{f(x_1,x_2,x_3)}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left(\frac{1}{\rho}\frac{\partial p}{\partial x_1}\right)\\
&-\frac{1}{s^{\beta}}\mathcal{L}\left[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{2_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_2}+\left(\sum_{j=0}^{\infty}f_{3_j}\right)\frac{\partial\left(\sum_{j=0}^{\infty}f_{1_j}\right)}{\partial x_3}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_2^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_3^2}\right],\\
&\mathcal{L}\left(\sum_{j=0}^{\infty}v_{j+1}\right)=\frac{h(x_1,x_2,x_3)}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left(\frac{1}{\rho}\frac{\partial p}{\partial x_1}\right)\\
&-\frac{1}{s^{\beta}}\mathcal{L}\left[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{2_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_2}+\left(\sum_{j=0}^{\infty}f_{3_j}\right)\frac{\partial\left(\sum_{j=0}^{\infty}f_{2_j}\right)}{\partial x_3}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_2^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_3^2}\right],\\
&\mathcal{L}\left(\sum_{j=0}^{\infty}w_{j+1}\right)=\frac{g(x_1,x_2,x_3)}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left(\frac{1}{\rho}\frac{\partial p}{\partial x_1}\right)\\
&-\frac{1}{s^{\beta}}\mathcal{L}\left[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{2_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_2}+\left(\sum_{j=0}^{\infty}f_{3_j}\right)\frac{\partial\left(\sum_{j=0}^{\infty}f_{3_j}\right)}{\partial x_3}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_2^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_3^2}\right].
\end{aligned}
\tag{8}
$$

Applying the linearity of the Laplace transform,

$$
\begin{cases}
\mathcal{L}(u_o)=\frac{f(x_1,x_2,x_3)}{s}+\frac{1}{s^{\beta}}\mathcal{L}\left(\frac{1}{\rho}\frac{\partial p}{\partial x_1}\right),\\
\mathcal{L}(v_o)=\frac{h(x_1,x_2,x_3)}{s}+\frac{1}{s^{\beta}}\mathcal{L}\left(\frac{1}{\rho}\frac{\partial p}{\partial x_2}\right),\\
\mathcal{L}(w_o)=\frac{g(x_1,x_2,x_3)}{s}+\frac{1}{s^{\beta}}\mathcal{L}\left(\frac{1}{\rho}\frac{\partial p}{\partial x_3}\right).
\end{cases}
\tag{9}
$$

$$
\begin{aligned}
\mathcal{L}\left(\sum_{j=0}^{\infty}u_{j+1}\right) &= -\frac{1}{s^{\beta}}\mathcal{L}[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{2_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_2}\\
&+\left(\sum_{j=0}^{\infty}f_{3_j}\right)\frac{\partial\left(\sum_{j=0}^{\infty}f_{1_j}\right)}{\partial x_3}]+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_2^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_3^2}\right],\\
\mathcal{L}\left(\sum_{j=0}^{\infty}v_{j+1}\right) &= -\frac{1}{s^{\beta}}\mathcal{L}[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{2_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_2}\\
&+\left(\sum_{j=0}^{\infty}f_{3_j}\right)\frac{\partial\left(\sum_{j=0}^{\infty}f_{2_j}\right)}{\partial x_3}]+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_2^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_3^2}\right],\\
\mathcal{L}\left(\sum_{j=0}^{\infty}w_{j+1}\right) &= -\frac{1}{s^{\beta}}\mathcal{L}[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{2_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_2}\\
&+\left(\sum_{j=0}^{\infty}f_{3_j}\right)\frac{\partial\left(\sum_{j=0}^{\infty}f_{3_j}\right)}{\partial x_3}]+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_2^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{3_j})}{\partial x_3^2}\right].
\end{aligned}
\tag{10}
$$

For $j=0$, and $j=1,2.....\infty$.

$$
\begin{aligned}
\mathcal{L}(u_1) &= -\frac{1}{s^{\beta}}\mathcal{L}\left[u_0\frac{\partial(u_0)}{\partial x_1}+v_0\frac{\partial(v_0)}{\partial x_2}+w_0\frac{\partial(u_0)}{\partial x_3}\right]+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(u_0)}{\partial x_1^2}+\frac{\partial^2(u_0)}{\partial x_2^2}+\frac{\partial^2(u_0)}{\partial x_3^2}\right],\\
\mathcal{L}(v_1) &= -\frac{1}{s^{\beta}}\mathcal{L}\left[u_0\frac{\partial(v_0)}{\partial x_1}+v_0\frac{\partial(v_0)}{\partial x_2}+w_0\frac{\partial(v_0)}{\partial x_3}\right]+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(v_0)}{\partial x_1^2}+\frac{\partial^2(v_0)}{\partial x_2^2}+\frac{\partial^2(v_0)}{\partial x_3^2}\right],\\
\mathcal{L}(w_1) &= -\frac{1}{s^{\beta}}\mathcal{L}\left[u_0\frac{\partial(w_0)}{\partial x_1}+v_0\frac{\partial(v_0)}{\partial x_2}+w_0\frac{\partial(w_0)}{\partial x_3}\right]+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(w_0)}{\partial x_1^2}+\frac{\partial^2(w_0)}{\partial x_2^2}+\frac{\partial^2(w_0)}{\partial x_3^2}\right].
\end{aligned}
\tag{11}
$$

Next applying the inverse Laplace transform, we can calculate u_j, v_j and w_j $(j>0)$. In specific cases the exact result in the closed form can also be achieve.

Example 1. *Consider time-fractional order of two-dimensional Navier-Stock equation with* $q_1=-q_2=qas$,

$$
\begin{aligned}
D_t^{\beta}(f_1)+f_1\frac{\partial f_1}{\partial x_1}+f_2\frac{\partial f_1}{\partial x_2} &= \rho\left[\frac{\partial^2 f_1}{\partial x_1^2}+\frac{\partial^2 f_1}{\partial x_2^2}\right]+q,\\
D_t^{\beta}(f_2)+f_1\frac{\partial f_2}{\partial x_1}+f_2\frac{\partial f_2}{\partial x_2} &= \rho\left[\frac{\partial^2 f_2}{\partial x_1^2}+\frac{\partial^2 f_2}{\partial x_2^2}\right]-q,
\end{aligned}
\tag{12}
$$

with initial conditions

$$
\begin{cases}
f_1(x_1,x_2,0) = -\sin(x_1+x_2),\\
f_2(x_1,x_2,0) = \sin(x_1+x_2).
\end{cases}
\tag{13}
$$

Applying the Laplace transform to (12), we have

$$
\begin{aligned}
\mathcal{L}\left(\sum_{j=0}^{\infty}u_{j+1}\right) &= \frac{f_{1_j}}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_2}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{1_j})}{\partial x_2^2}\right],\\
\mathcal{L}\left(\sum_{j=0}^{\infty}v_{j+1}\right) &= \frac{f_{2_j}}{s}-\frac{1}{s^{\beta}}\mathcal{L}\left[\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_1}+\left(\sum_{j=0}^{\infty}f_{1_j}\right)\frac{\partial(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_2}\right]\\
&+\frac{\rho}{s^{\beta}}\mathcal{L}\left[\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_1^2}+\frac{\partial^2(\sum_{j=0}^{\infty}f_{2_j})}{\partial x_2^2}\right].
\end{aligned}
\tag{14}
$$

$$
\begin{aligned}
u_o &= \mathcal{L}^{-1}\left[\frac{-\sin(x_1+x_2)}{s}\right] = -\sin(x_1+x_2),\\
v_o &= \mathcal{L}^{-1}\left[\frac{\sin(x_1+x_2)}{s}\right] = \sin(x_1+x_2),
\end{aligned}
\tag{15}
$$

$$
\begin{aligned}
\mathcal{L}(u_1) &= -\frac{1}{s^{\beta}}\mathcal{L}\left[-\sin(x_1+x_2)\frac{\partial(-\sin(x_1+x_2))}{\partial x_1}+\sin(x_1+x_2)\frac{\partial(\sin(x_1+x_2))}{\partial x_2}\right]\\
&+\frac{1}{s^{\beta}}\mathcal{L}\rho\left[\frac{\partial^2(-\sin(x_1+x_2))}{\partial x^2}+\frac{\partial^2(-\sin(x_1+x_2))}{\partial x_2^2}\right]+\frac{1}{s^{\beta}}\mathcal{L}(q),\\
\mathcal{L}(v_1) &= -\frac{1}{s^{\beta}}\mathcal{L}\left[-\sin(x_1+x_2)\frac{\partial(\sin(x_1+x_2))}{\partial x_1}+\sin(x_1+x_2)\frac{\partial(\sin(x_1+x_2))}{\partial x_2}\right]\\
&+\frac{1}{s^{\beta}}\mathcal{L}\rho\left[\frac{\partial^2(\sin(x_1+x_2))}{\partial x^2}+\frac{\partial^2(\sin(x_1+x_2))}{\partial x_2^2}\right]-\frac{1}{s^{\beta}}\mathcal{L}(q),
\end{aligned}
\tag{16}
$$

$$
\begin{cases}
u_1 = \mathcal{L}^{-1}\left[\frac{2\rho\sin(x_1+x_2)}{s^{\beta+1}}+\frac{q}{s^{\beta+1}}\right],\\
v_1 = \mathcal{L}^{-1}\left[\frac{-2\rho\sin(x_1+x_2)}{s^{\beta+1}}-\frac{q}{s^{\beta+1}}\right],
\end{cases}
\tag{17}
$$

Example 2

Consider time-fractional order two dimensional NS Eq. (7) subject to the initial condition

$$\boldsymbol{u(x,y,0) = -e^{x+y},\quad v(x,y,0) = e^{x+y},}$$

Using FRDTM on Eqs. (7), (14), we obtained the following recurrence relation:

$$
\begin{cases}
\frac{\Gamma(1+(1+k)\alpha)}{\Gamma(1+k\alpha)}U_{k+1}+\sum_{\ell=0}^{k}\left(\frac{\partial U_\ell}{\partial x}U_{k-\ell}+\frac{\partial U_\ell}{\partial y}V_{k-\ell}\right)=\rho_0\nabla^2(U_k)+g_1\delta(k),\\
\frac{\Gamma(1+(1+k)\alpha)}{\Gamma(1+k\alpha)}V_{k+1}+\sum_{\ell=0}^{k}\left(\frac{\partial V_\ell}{\partial x}U_{k-\ell}+\frac{\partial V_\ell}{\partial y}V_{k-\ell}\right)=\rho_0\nabla^2(V_k)-g_1\delta(k),\\
U_0=-e^{x+y},\quad V_0=e^{x+y}.
\end{cases}
$$

On solving the system (15), we have

$$
\begin{aligned}
&U_1(x,y) = -\tfrac{2\rho_0}{\Gamma(1+\alpha)}e^{x+y}+\tfrac{g}{\Gamma(1+\alpha)};\quad V_1(x,y)=\tfrac{2\rho_0}{\Gamma(1+\alpha)}e^{x+y}-\tfrac{g}{\Gamma(1+\alpha)}\\
&U_2(x,y) = -\tfrac{(2\rho_0)^2}{\Gamma(1+2\alpha)}e^{x+y};\quad V_2(x,y)=\tfrac{(2\rho_0)^2}{\Gamma(1+2\alpha)}e^{x+y}\\
&U_3(x,y) = -\tfrac{(2\rho_0)^3}{\Gamma(1+3\alpha)}e^{x+y};\quad V_3(x,y)=\tfrac{(2\rho_0)^3}{\Gamma(1+3\alpha)}e^{x+y}\\
&\vdots\qquad\vdots\qquad\vdots\qquad\vdots\\
&U_k(x,y) = -\tfrac{(2\rho_0)^k}{\Gamma(1+k\alpha)}e^{x+y};\quad V_k(x,y)=\tfrac{(2\rho_0)^k}{\Gamma(1+k\alpha)}e^{x+y},\ \forall k\geqslant 2
\end{aligned}
$$

By using inverse FRDT, we have

5.CONCLUSIONS

In this paper, Laplace Adomian decomposition technique is assumed for the time-fractional lassical Navier-Stokes solution of with given initial conditions. In this paper, fractional reduced differential transformation method is adopted for the numerical simulation of time-fractional model of Navier–Stokes equations with initial conditions.

The analytical solution is given in for the power series for the given problem. The fractional derivative is considered in the Caputo sense. The analytical results have been given in terms of a power series.

Test problems are carried out in order to validate and illustrate the efficiency of the method. The proposed solutions agree excellently with HPM and ADM , and are approximated without any discretization, transformation, perturbation, or restrictive conditions.

The solution of the above three problems has shown, that the rate of convergence of the present method is overlapping or high than ADM and HAM. Moreover LADM have minimum calculations, simplifications as compared to ADM and HPM .

Author Contributions: The authors have equally contributed to accomplish this unding: Sarhad University of Science and Information Technology, Peshawar, Conflicts of Intere In this paper, fractional reduced differential transformation method is adopted for the numerical simulation of time-fractional model of Navier–Stokes equations with initial conditions. The fractional derivative is considered in the Caputo sense. The analytical results have been given in terms of a power series. Test problems are carried out in order to validate and illustrate the efficiency of the method. The proposed solutions agree excellently with HPM [15] and ADM [16], and are approximated without any discretization, transformation,

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SOLUTION OF SYSTEMS OF DIFFERENTIAL EQUATIONS WITH THE METHOD OF DIFFERENTIAL TRANSFORMATION

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ABSTRACT

In this paper, we present an analytical solution for different systems of differential equations by using the differential transformation method.
Solutions of some systems of ordinary and partial differential equations have been analyzed by using the Differential Transformation Method (DTM) and compared with solutions of other numerical methods.
This method can be used to solve some ordinary and partial differential equations in a short time by using very simple computer commands and codes.
The convergence of this method has been discussed with some examples which are presented to show the ability of the method for linear and non-linear systems of differential equations. We begin by showing how the differential transformation method applies to a non-linear system of differential equations and give two examples to illustrate the sufficiency of the method for linear and non-linear stiff systems of differential equations. The first chapter, the basic definition of its Differential Transformation Method and properties are given.
In the last chapter, examples are solved by using the differential transformation method and are compared with other solutions of numerical methods. These results show that the technique introduced here is accurate and easy to apply.

KEYWORDS:

Systems of differential equations; Stiff differential system; Differential transformation; Taylor's series expansion; Differential transformation method, systems of ODEs and PDE.

INTRODUCTION

The purpose of this paper is to employ the differential transformation method to systems of differential equations which are often encounter in many branches of physics, chemical and engineering. A variety of methods, exact, approximate, and purely numerical are available for the solution of systems of differential equations. Most of these methods are computationally intensive because they are trial-and-error in nature, or need complicated symbolic computations.

The Differential Transformation Method is a method aiming to find the Taylor expansion of differential equations. Since many functions can be written in the polynomial form, polynomial solutions of differential equations can be obtained with this method.

In , the Euler method, the Taylor method, serve as an introduction to numerical method for solving systems of differential equations, see also. The differential transformation technique is one of the numerical methods for ordinary (partial) differential equations which uses the form of polynomials as the approximation to the exact solution. The high-order Taylor method can also be applied to systems of differential equations, see also .

However, the Taylor method requires the calculation of high-order derivatives, a difficult symbolic and complex problem. The concept of differential transformation was first proposed by Zhou , and it was applied to solve linear and non-linear initial value problems in electric circuit analysis.

Jang states that "the differential transform is an iterative procedure for obtaining Taylor series solutions of differential equations". Although the Taylor series method requires more computational work for large orders, the present method reduces the size of computational domain and is applicable to many problems easily. Abbasov et al used the method of differential transform to obtain approximate solutions of the linear and non-linear equations related to engineering problems and observed that the numerical results are in good agreement with the analyticalsolutions.

In this paper, the differential transformation technique is applied to solve the linear, non-linear and stiff systems of differential equations.

The method can be used to evaluate the approximating solution by the finite Taylor series and by an iteration procedure described by the transformed equations obtained from the original equation using the operations of differential transformation. The differential transformation technique can be used to obtain both numerical and analytical solutions of both linear and non-linear differential equations.

The present paper has been organized as following: In Section 2, basic definitions of the differential transformation are introduced. The operational properties of the differential transformation are shown in Section 3. Numerical examples have been presented in Section 4, to illustrate the effectiveness of the proposed method.

BASIC DEFINITIONS

With reference to the articles we introduce in this section the basic definition of the differential transformation:

Definition 2.1. If u(t) is analytic in the domain T, then it will be differentiated continuously with respect to time t,

$$\frac{d^k u(t)}{dt^k} = \emptyset(t,k), \quad for\ all\ t \epsilon T \qquad (2.1)$$

for t=t_i, then $\emptyset(t,k) = \emptyset(t_i,k)$, where k belongs to the set of non-negative integers, denoted as the K-domain.

Therefore, Eq. (2.1) can be rewritten as $U(k) = \emptyset(t_i,k) = \frac{d^k u(t)}{dt^k}$ (2.2)
where U(k) is called the spectrum of u(t) at t=t_i .

Definition 2.2. If u(t) can be expressed by Taylor's series, then u(t) can be represented as $u(t) = \sum_{k=0}^{\infty} \left[\frac{(t-t_i)^k}{k!}\right] U(K)$ (2.3)
Eq. (2.3) is called the inverse of U(k). Using the symbol "D" denoting the differential transformation process and combining (2.2) and (2.3), it is obtained that

$$u(t) = \sum_{k=0}^{\infty} \left[\frac{(t-t_i)^k}{k!}\right] U(K) \equiv D^{-1}U\ (k) \qquad (2.4)$$

Using the differential transformation, a differential equation in the domain of interest can be transformed to an algebraic equation in the K-domain and the u(t) can be obtained by a finite-term of Taylor's series plus aremainder.
Thus

$$u(t) = \sum_{k=0}^{\infty} \left[\frac{(t-t_i)^k}{k!}\right] U(K) + R_{n+1}(k) \qquad (2.5)$$

THE OPERATION PROPERTIES OF DIFFERENTIAL TRANSFORMATION

If u(t) and v(t) are two uncorrelated functions with time t where U(k) and V(k) are the transformed functions corresponding to u(t) and v(t) then we can easily proof the fundamental mathematics operations performed by differential transformation and are listed as follows:

1. If $z(t) = u(t) \pm v(t)$ then,

   $$Z(k) = U(k) \pm V(k). \qquad (3.1)$$

2. If $z(t) = \alpha u(t)$ then,

   $$Z(k) = \alpha U(k). \qquad (3.2)$$

3. If $z(t) = \frac{du(t)}{dt}$ then,

   $$Z(k) = (k+1)U(k+1). \qquad (3.3)$$

4. If $z(t) = \frac{d^2 u(t)}{dt^2}$ then,

   $$Z(k) = (k+1)(k+2)U(k+2). \qquad (3.4)$$

5. If $z(t) = \frac{d^m u(t)}{dt^m}$ then,

   $$Z(k) = (k+1)(k+2)\dots(k+m)U(k+m). \qquad (3.5)$$

6. If $z(t) = u(t)v(t)$ then,

   $$Z(k) = \sum_{\ell=0}^{k} V(\ell)U(k-\ell). \qquad (3.6)$$

7. If $z(t) = t^m$ then,

   $$Z(k) = \delta(k-m), \delta(k-m) = \begin{cases} 1, & \text{if } k = m, \\ 0, & \text{if } k \neq m. \end{cases} \qquad (3.7)$$

8. If $z(t) = \exp(\lambda t)$ then,

   $$Z(k) = \frac{\lambda^k}{k!}. \qquad (3.8)$$

9. If $z(t) = (1+t)^m$ then,

   $$Z(k) = \frac{m(m-1)\dots(m-k+1)}{k!}. \qquad (3.9)$$

10. If $z(t) = \sin(\omega t + \alpha)$ then,

    $$Z(k) = \frac{\omega^k}{k!}\sin\left(\frac{\pi k}{2} + \alpha\right). \qquad (3.10)$$

11. If $z(t) = \cos(\omega t + \alpha)$ then,

    $$Z(k) = \frac{\omega^k}{k!}\cos\left(\frac{\pi k}{2} + \alpha\right). \qquad (3.11)$$

12. If $U(k) = D[u(t)]$, $V(k) = D[v(t)]$, and c_1 and c_2 are independent of t and k then,

    $$D[c_1 u(t) + c_2 v(t)] = c_1 U(k) + c_2 V(k). \qquad (3.12)$$

13. If $z(t) = u(t)v(t)$, $u(t) = D^{-1}[U(k)]$, $v(t) = D^{-1}[V(k)]$,

    $$D[z(t)] = D[u(t)v(t)] = U(k) \otimes V(k) = \sum_{\ell=0}^{k} V(\ell)U(k-\ell), \qquad (3.13)$$

    where $\otimes$ denotes the convolution.

Therefore, the transform of $u^m(t)$, where m is a positive integer, can be obtained as follows:

$$D[u^m(t)] = U^m(k) = U^{m-1}(k) \otimes U(k) = \sum_{\ell=0}^{k} U^{m-1}(\ell)U(k-\ell). \qquad (3.14)$$

transform of $u^m(t)u^m(t)$, where m is a positive integer, can be obtained as follows:

$$D[u^m(t)] = U^m(k) = U^{m-1}(k)$$

NUMERICAL EXAMPLES

In this section, the differential transformation technique is applied to solve different systems (linear, nonlinear and stiff) of differential equations. To illustrate the method proposed in this paper, we consider the following examples:

Example 1. We first start by considering the following non-linear system :

$$\frac{dy_1(x)}{dx} = -y_1(x), \tag{4.1}$$

$$\frac{dy_2(x)}{dx} = y_1(x) - y_2^2(x), \tag{4.2}$$

$$\frac{dy_3(x)}{dx} = y_2^2(x), \tag{4.3}$$

with initial conditions, $y_1(0) = 1$, $y_2(0) = 0$ and $y_3(0) = 0$.

Taking the differential transformation of Eqs. (4.1), (4.2), (4.3) respectively, we get

$$Y_1(k+1) = -\frac{1}{(k+1)}[Y_1(k)], \tag{4.4}$$

$$Y_2(k+1) = \frac{1}{(k+1)}\left[Y_1(k) + \sum_{\ell=0}^{k} Y_2(\ell)Y_2(k-\ell)\right], \tag{4.5}$$

$$Y_3(k+1) = \frac{1}{(k+1)}\left[\sum_{\ell=0}^{k} Y_2(\ell)Y_2(k-\ell)\right], \tag{4.6}$$

with

$$Y_1(0) = 1, \tag{4.7}$$

$$Y_2(0) = 0, \tag{4.8}$$

$$Y_3(0) = 0. \tag{4.9}$$

From (2.2), (4.4), (4.5), (4.6), (4.7), (4.8), (4.9) the set of values $Y_1(k+1)$, $Y_2(k+1)$ and $Y_3(k+1)$ of $y_1(x)$, $y_2(x)$ and $y_3(x)$ with the differential transformation method are presented in Table 1, respectively.

Table 1.Differential transformation values of Example 1 for k = 0,1,2,

k	$Y_1(k+1)$	$Y_2(k+1)$	$Y_3(k+1)$
0	−1	1	0
1	1/2	−1/2	0
2	−1/6	−1/6	1/3
3	1/24	5/24	−1/4
4	−1/120	1/40	−1/60
5	1/720	−71/720	7/72
6	−1/5040	19/1008	−47/2520
7	1/40,320	1469/40,320	−7/129
⋮	⋮	⋮	⋮

From (2.3) and all values in **Table 1**, for k = 0, 1, 2, ... , n, ... , the solutions of the given non-linear differential systems (4.1), (4.2), (4.3) can be written in the closed form as follows:

$$y_1(x) = 1 - x + \tfrac{1}{2}x^2 - \tfrac{1}{6}x^3 + \tfrac{1}{24}x^4 - \tfrac{1}{120}x^5 + \tfrac{1}{720}x^6 - \tfrac{1}{5040}x^7 + \tfrac{1}{40,320}x^8 + \ldots, \tag{4.10}$$

$$y_2(x) = x - \tfrac{1}{2}x^2 - \tfrac{1}{6}x^3 + \tfrac{5}{24}x^4 + \tfrac{1}{40}x^5 - \tfrac{71}{720}x^6 + \tfrac{19}{1008}x^7 - \tfrac{1469}{40,320}x^8 + \ldots, \tag{4.11}$$

$$y_3(x) = \tfrac{1}{3}x^3 - \tfrac{1}{4}x^4 - \tfrac{1}{60}x^5 + \tfrac{7}{72}x^6 - \tfrac{47}{2520}x^7 - \tfrac{7}{129}x^8 + \ldots \tag{4.12}$$

Table 2 .gives the numerical results (4.10)–(4.12) for Example 1. These results illustrate accurately by using the differential transformation method. We achieved a good approximation with the differential transformation series with eight terms only.

Example 2. We next consider stiff system of differential equations ;

$$\frac{dy_1(t)}{dt} = -\kappa_1 y_1(t) + \kappa_2 y_2(t) y_3(t), \tag{4.13}$$

$$\frac{dy_2(t)}{dt} = \kappa_3 y_1(t) + \kappa_4 y_2(t) y_3(t) - \kappa_5 y_2^2(t), \tag{4.14}$$

$$\frac{dy_3(t)}{dt} = \kappa_6 y_2^2(t), \tag{4.15}$$

where $\kappa_1 = 0.04$, $\kappa_2 = 0.01$, $\kappa_3 = 400$, $\kappa_4 = 100$, $\kappa_5 = 3000$ and $\kappa_6 = 30$. The initial conditions are given by $y_1(0) = 1$, $y_2(0) = 0$, $y_3(0) = 0$.

Example 3 .Consider the following stiff system of differential equations

$$\frac{dy_1(t)}{dt} = -20y_1(t) - 0.25y_2(t) - 19.75y_3(t), \tag{4.25}$$

$$\frac{dy_2(t)}{dt} = 20y_1(t) - 20.25y_2(t) + 0.25y_3(t), \tag{4.26}$$

$$\frac{dy_3(t)}{dt} = 20y_1(t) - 19.75y_2(t) - 0.25y_3(t), \tag{4.27}$$

with initial conditions

$$y_1(0) = 1, \tag{4.28}$$

$$y_2(0) = 0, \tag{4.29}$$

$$y_3(0) = -1. \tag{4.30}$$

The analytic solutions of the problem is

$$y_1(t) = \tfrac{1}{2}\left[\exp\left(\tfrac{-1}{2}t\right) + \exp(-20t)(\cos(20t) + \sin(20t))\right], \tag{4.31}$$

$$y_2(t) = \tfrac{1}{2}\left[\exp\left(\tfrac{-1}{2}t\right) - \exp(-20t)(\cos(20t) - \sin(20t))\right], \tag{4.32}$$

$$y_3(t) = -\tfrac{1}{2}\left[\exp\left(\tfrac{-1}{2}t\right) - \exp(-20t)(\cos(20t) - \sin(20t))\right]. \tag{4.33}$$

CONCLUSION

The differential transformation method is a powerful tool which enables to find analytical solution in case of linear and non-linear systems of differential equations.

The method has been successfully applied to linear and non-linear stiff systems of differential equations. This method is better than numerical methods, since it is free from rounding off error, and does not require large computer power. In the present paper, the method yields a series solution which converges faster than the series obtained by another methods .

The numerical results obtained by present method are compared with the analytical solutions.

It is shown that the results are found to be in good agreement with each other. This study shows that the Differential Transformation Method can be applied to solve some systems of ordinary and partial differential equations.

The results in examples show that the solutions obtained with coincide with the solutions obtained with other methods in the literature. Besides this, the method can be easily adapted to many computer programs. Because it uses only simple operations. For all these reasons, can be used easily to solve some different type .

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LENDING TO INDIVIDUALS AND BUSINESSES IN OUR REGION

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ABSTRACT

This paper intends to present a proper study of Lending to individuals and businesses in our region. We will focus on the latest lending statistics in Albania. So important is the financing of foreign investors in the country and how much space our legislation allows for this phenomen and the measures taken by the government.
We will also analyze the banking's sector position in Albania where evidenced that business credit accelerated growth rates at the beginning households slowed growth rates at the end of 2018.
What is seen is that banking progress sector is the risk that is delays present in the lending process.
The measures taken by the Bank of Albania during the recent years make a reduce in lending interest rate, which has fueled the country's economy in recent years, which must be monitored continuously. At the end of this paper will analyze the global aconomic and financial developments of recent years, which shows that financing conditions have manowed somewhat and have shown volatility, which has reflected uncertainties in the development of the world economy and conditions for tightening the monetary policy of the Federal Reserve.

KEY WORDS:

investment, loans, the banking sector, non-resident, the global economy

HYRJE

Ne vijimesi te studimit per aktivitetin kredidhenes ne vendin tone, lindi idea e studimit mbi kredidhenien vitet e fundit, kryesisht 2018-2019. Eshte bere nje studim ne sektorin bankar ne Shqiperi ku jepen statistika ne vite se si i financojne bankat kryesisht subjektet rezidente, individe dhe biznese, analiza dhe ecuria se si ka vazhduar ky proces financimi.

Ne kete punim do te fokusohemi gjithashtu do te shohim ecurine e zhvillimeve ekonomike dhe financiare nderkombetare te viteve te fundit.

OBJEKTI DHE RISHIKIMI I LITERATURES

Objekt i ketij punimi eshte te evidentoje arsyet se pse shume individe, por sidoemos biznese ne Shqiperi preferojne te realizojne investime brenda vendit, lehtesirat dhe pengesat qe hasin ato ne vendin e tyre, rezultatet nga pritshmerite qe kane.

Do perpiqemi qe ne fund te dalim ne disa konkluzione dhe rekomandime te vlefshme dhe konkrete te cilat duhet te merren ne konsiderate ne vijimesi ne menyre qe regjimi aktual i Investimeve ne Shqiperi te permiresohet, padyshim nepermjet masave te marra nga shteti Shqipetar.

METODOLOGJJIA

Per punimin e ketij paper do te bazohemi kryesisht ne te dhenat e publikuara nga Banka e Shqiperise lidhur me analiza, studime dhe pozicionin e kredimarresve rezidente ne sektorin bankar, ecuria e kreditimit te tyre nga ana e bankes dhe monitorimin e ketij procesi nga Banka e Shqiperise.

3.1.a Procesi i kreditimit ne Shqiperi ne vitet 2018-2019

Sipas te dhenave te fundit te vitit 2018, kursimet e individeve rezidente u rriten me 1.2% ose me 13 miliarde leke gjate periudhes, por mbeten 16 miliarde leke me te uleta ne krahasim me fundin e vitit 2017. Depozitat ne leke dhe ne valute vijojne te zene mbi 80% te kursimeve te pergjithshme te individeve, nderkohe qe investimet ne obligacione, bono thesari dhe ne fondet e investimeve zene perkatesisht 6.9%, 5.3% dhe 5.1% te totalit te mjeteve financiare te individeve. Gjate periudhes, individet kane rritur investimet e tyre ne formen e depozitave (kryesisht ne formen e depozitave ne valute), nderkohe qe investimet ne bono thesari dhe ne fonde investimi kane rene lehte ne terma nominale (perkatesisht me 8% dhe 10%) dhe ne peshe, ndaj struktures se investimeve.

Gjate periudhes (6m II 2018), pozicioni kreditor i individeve eshte zgjeruar, ndersa pozicioni debitor i bizneseve eshte ngushtuar. Per sektorin e individeve, rritja e depozitave me 3% ka qene me e shpejte se rritja e kredise me 1.8%, dhe kontributin kryesor ne rritjen e depozitave e ka dhene monedha e huaj. Si rezultat i kesaj ecurie, pozicioni kreditor i sektorit eshte zgjeruar me 3.2%. Per sektorin e biznesit, depozi-

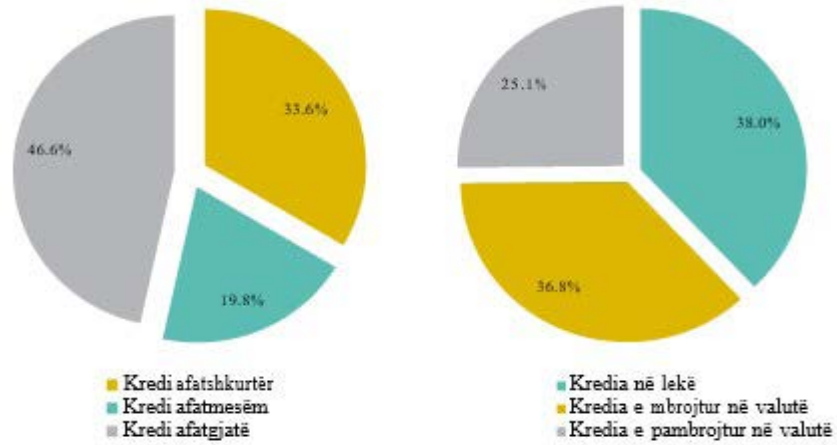
tat u rriten me 4.7%, ndersa kredia u tkurr me 0.8%. Edhe ne kete rast, kontributi i monedhes se huaj ka qene i rendesishem. Si rezultat, pozicioni debitor i bizneseve u ngushtua me 7.1%.

3.1.b Kreditimi i bizneseve dhe Rreziku i kredise

Gjate gjysmes se dyte te vitit 2018, teprica e kredise se dhene per bizneset eshte zvogeluar dhe ndikimin kryesor ne kete ecuri e ka dhene kredia per bizneset rezidente. Pesha e kredise ne valute vijon te luhatet rreth vleres 62%, pa shenuar ndryshime gjate periudhes, ndersa pesha e kredise se pambrojtur nga levizjet e pafavorshme te kursit te kembimit ndaj totalit te kredise per bizneset u ngjit ne nivelin 25%. Ne strukturen e kredise per bizneset sipas afatit te maturimit, eshte verejtur nje rritje e lehte e kredise afatshkurter dhe afatmesme, perkunder renies se kredise afatgjate. Teprica e kredise se dhene per bizneset rezidente, gjate periudhes, u tkurr me 3.1 miliarde leke (ose me 1%), ne nivelin 318 miliarde leke. Kontribut ne kete ecuri dhane tkurrja e teprices se kredise per "pasuri te paluajtshme" dhe asaj per "kapital qarkullues". Sipas monedhave, kontributin kryesor ne ngushtimin e teprices se kredise per bizneset rezidente, gjate periudhes, e dha tkurrja e kredise ne monedhen vendase, me rreth 1.8 miliarde leke (ose 1.4%), ndjekur nga kredia ne dollar amerikan, e cila u tkurr me 1.3 miliarde leke (ose 6%).

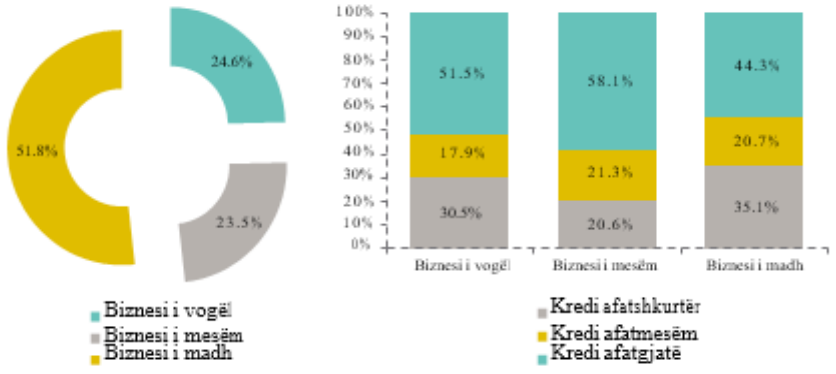
Gjate vitit 2018, eshte rritur pesha e kredise per bizneset e vogla dhe te mesme. Peshat e kredise per keto dy kategori te bizneseve jane ngjitur perkatesisht ne 24.6% dhe 23.5% te totalit te kredise per bizneset, ndersa pesha e kredise per bizneset e medha ra ne 51.8%. Gjate periudhes, per te tre llojet e bizneseve te ndara sipas madhesise, eshte verejtur rritje e peshes se kredise afatmesme. Kjo dukuri ka qene me e theksuar ne rastin e biznesit te mesem. Per biznesin e mesem dhe biznesin e madh eshte rritur pesha e kredise ne leke, ndersa per biznesin e vogel eshte rritur pesha e kredise ne valute. Ngarkesa me borxh e bizneseve ka shenuar nje renie te lehte gjate periudhes dhe vleresohet ne nivele te perballueshme nga bizneset. Ne baze te vrojtimit mbi gjendjen financiare dhe huamarrjen e bizneseve, rezulton se rreth 42.2% e bizneseve te anketuara kane nje hua per te paguar, dhe ky raport ka shenuar nje renie te lehte me 1.3 pike perqindje krahasuar me periudhen e kaluar. Pesha e bizneseve huamarrese eshte me e larte ne sektorin e tregtise (56.1%) dhe ne sektorin e ndertimit (45.3%), por keto pesha kane rene ne krahasim me periudhen e meparshme. Vlera totale e huase rezulton afersisht sa gjysma e vleres se kapitalit te ndermarrjes per 79.5% te ndermarrjeve huamarrese. Ngarkesa e borxhit eshte me e larte tek ndermarrjet e medha. Rreth 22.6% e ndermarrjeve te medha deklarojne se vlera e huase eshte e barabarte ose me e madhe se vlera e kapitalit. Duke i analizuar rezultatet e pergjigjeve sipas sektoreve, rezulton se gjate periudhes, sektori i tregtise ka peshen me te larte te ndermarrjeve qe kane nje ngarkese huaje mbi vleren e kapitalit te ndermarrjes, i ndjekur nga sektori i industrise.

Gra k 27. Struktura e kredisë për bizneset sipas afatit të maturimit (majtas) dhe monedhës (djathtas)



Burimi: Banka e Shqipërisë.

Gra k 28. Struktura e kredisë së bizneseve sipas madhësisë dhe afatit



Burimi: Banka e Shqipërisë.

Cilesia e portofolit te kredise per bizneset ka shenuar permiresim ne te gjithe perberesit e saj, gjate periudhes dhe ne terma vjetore. Ne dhjetor 2018, raporti i kredise me probleme per bizneset (RKP) zbriti ne nivelin 14.3%, nga 17.1% dhe 16.9% perkatesisht ne qershor 2018 dhe dhjetor 2017.

Pjesa me e madhe e ndermarrjeve huamarrese (73.5%) deklarojne se pagesa e huase arrin deri ne 20% te te ardhurave te tyre, dhe kjo peshe ka rene me 1.8 pike perqindje krahasuar me gjashtemujorin paraardhes. Barra e pageses se huase rendon me teper tek ndermarrjet e vogla, per te cilat numri i ndermarrjeve qe raportojne se kjo

pagese e kalon 20% te te ardhurave, ze rreth 33% te totalit te grupit. Per ndermarrjet e mesme, kjo peshe eshte 24%, ndersa per ato te medha, pesha eshte 25.5%.

Kerkesa per kredi nga ana e bizneseve mbetet e moderuar. Rreth 49% e ndermarrjeve te pergjigjura kane deklaruar se "nuk ka asnje mundesi" qe te kerkojne nje kredi bankare ne gjashtemujorin e ardhshem. Kjo peshe rezulton ne renie per ndermarrjet e mesme dhe te medha dhe lehtesisht ne rritje ne rastin e ndermarrjeve te vogla.

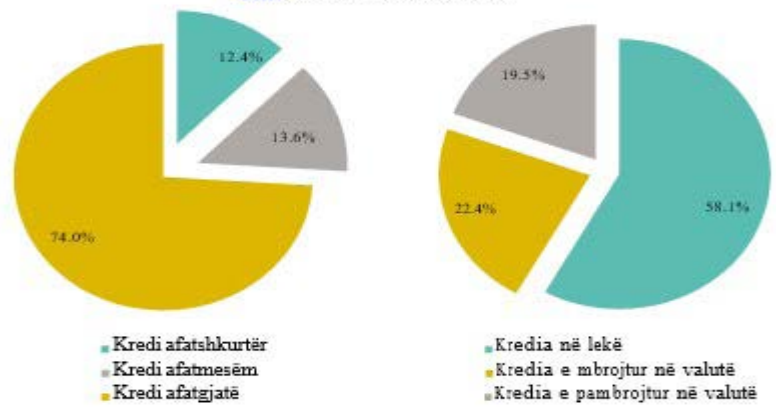
Indeksi i vleresimit te planifikimit te huamarrjes per gjashtemujorin e ardhshem, krahasuar me periudhen e kaluar, ka shenuar renie per ndermarrjet e vogla dhe ka mbetur i pandryshuar per ndermarrjet e medha. Nga ana tjeter, ky indeks eshte rritur dukshem ne rastin e ndermarrjeve te mesme, duke treguar qe ne krahasim me ndermarrjet e vogla dhe te medha, ndermarrjet e mesme kane gatishmeri me te larte per te marre hua gjate gjysmes se pare te vitit 2019.

Persa i perket monedhes se huamarrjes se ndermarrjeve, gjate 6-mujorit te dyte te vitit 2018, 46% e ndermarrjeve te vogla, 49.3% e ndermarrjeve te mesme dhe 35.7% e ndermarrjeve te medha, deklarojne se huate e tyre jane vetem ne monedhen vendase, ndersa pjesa tjeter eshte ne valute (euro dhe/ose dollare) dhe /ose e kombunuar (leke dhe valute). Huamarrja ne monedhen evropiane rezulton me e perdorur nga ndermarrjet e medha (53% e tyre), duke tejkaluar momedhen vendase dhe me pak nga ndermarrjet e mesme (41.3%). Ne rastin e ndermarrjeve te vogla, peshat e ndermarrjeve qe kane marre hua ne leke dhe ne eruo, kane rezultuar pothuajse te njejta.

3.1.c Kreditimi i Individeve dhe Rreziku i kredise

Gjate vitit 2018, kredia per individe u rrit me 1.8%. Rritja ka ardhur si pasoje e rritjes se kredise per individet ne leke, gje qe ka sjelle edhe rritje te peshes se kredise ne leke ne strukturen e pergjithshme te kredise. Brenda kredise ne valute, pesha e kredise se pambrojtur ne valute ndaj teprices totale te kredise ne valute dhene individeve ra ne 46.5%, nga rreth 52% nje gjashtemujor dhe nje vit me pare.

Gra k 22. Struktura e kredisë për individë sipas afatit të maturimit (majtas) dhe monedhës (djathtas)



Burimi: Banka e Shqipërisë.

Cilesia e portofolit te kredise se individeve eshte permiresuar gjate gjithe vitit 2018, dhe kontributin kryesor e ka dhene kredia ne leke. Gjate periudhes, raporti i kredive me probleme ra me 1.2 pike perqindje ne nivelin 6.4%. Per portofolin ne leke, raporti i kredive me probleme ra me 1 pike perqindje, ne nivelin 5.5%, ndersa raporti i kredive me probleme ne valute shenoi 8.8%, pa ndryshime te rendesishme gjate vitit. Tek portofoli ne valute, cilesia e portofolit te kredise se pambrojtur nga rreziku i kursit te kembimit eshte permiresuar ndjeshem. Rritja e nivelit te arketimeve vijon te jape kontributin kryesor ne renien e kredise me probleme per individet. Ngarkesa me borxh e familjeve mbetet ne nivele relativisht tepershtatshme dhe ka ardhur ne renie. Nga vrojtimi i gjendjes financiare dhe huamarrjes se familjeve rezulton se, ne fund te gjashtemujorit te dyte 2018, rreth 26% e familjeve shqiptare kane te pakten nje borxh per te paguar.

Kerkesa per huamarrje e familjeve vijon te mbetet e moderuar. Sipas vrojtimit, rreth 63% e te pergjigjurve kane deklaruar se "nuk presin te marrin hua te re ne 6 muajt e ardhshem", dhe kjo peshe eshte rritur lehte krahasuar me 6-mujorin e kaluar. Indeksi i mundesise per te rimarre nje hua te re ka rezultua 0.157, si dhe ka rene lehte ndaj vleres se llogaritur nga vrojtimi i kaluar dhe krahasuar me nje vit me pare, duke mbetur nen mesataren afatgjate.

Familjet huamarrese raportojne se kesti i huase, gjate periudhes referuese, ka rene si pasoje e renies ne normen e ponderuar te interest te kredise per individet. Rreth 59% familjeve huamarrese deklarojne se aftesia e tyre paguese nuk ka ndryshuar, ndersa pjesa tjeter deklarojne kryesisht permiresim krahasuar me 6-mujorin paraardhes dhe me nje vit me pare. Per 6-mujorin e ardhshem, shumica e familjeve nuk presin ndryshime ne aftesite e tyre paguese. Mundesia per te marre hua gjate pjeses se pare te vitit 2019, eshte vleresuar se ka pasur disi renie krahasuar me 6-mujorin e kaluar dhe me nje vit me pare, gje qe deshmon per nje kerkese ende te paqendrueshme te familjeve per huamarrje.

AFTESIA E SEKTORIT BANKAR PER TE PERBALLUAR RREZIQET

Aftesia e sektorit bankar per te perballuar rreziqet, vleresohet duke analizuar gjendjen e tij te kapitalizimit dhe te perfitueshmerise, si edhe duke provuar pershtatshmerine e ketyre treguesve ne skenare stresi nepermjet ushtrimit te proves se rezistences.

Ne fund te periudhes, raporti i mjaftueshmerise se kapitalit te sektorit bankar shenoi nivelin 18.5%, duke rene me 0.2 pike perqindjeje kundrejt fundit te vitit 2018, dhe duke mbetur dukshem mbi nivelin minimal te kerkuar per kete tregues prej 12%. Ecuria ne treguesin e mjaftueshmerise se kapitalit eshte diktuar nga renia e vleres se aktiveve te ponderuara me rrezik dhe renia e vleres se kapitalit rregullator. Rezultati financiar i sektorit per periudhen ishte ne nivele te mira. Treguesit e rentabilitetit te sektorit, kthimi mbi aktivet (RoA) dhe kthimi mbi kapitalin (RoE) rezultuan perkatesisht 1.5% dhe 14.3%, duke qene prane niveleve te nje viti me pare, dhe me te larta se ne fund te vitit 2018. Gjate periudhes, marzhi neto nga interesat

zbriti ne 3.4%, kundrejt 3.8% nje vit me pare, duke reflektuar renien e te ardhurave nga interesi.

Pershtatshmeria e treguesve te mesiperm, eshte verifikuar gjate ushtrimit te proves se rezistences, me skenare qe supozonin ndryshime te pafavorshme ne treguesit makroekonomike dhe financiare per periudhen 2019-2020. Si edhe me pare, pjese e supozimeve ekstreme ne skenarin e renduar (me nje probabilitet te ulet ndodhje) ishin tkurrja e forte e ekonomise dhe e kredise, rritja e shpejte e normave mesatare te interesit dhe nençmimi i forte i kursit te kembimit. Ne pergjithesi, rezultatet e provave tregojne se sektori bankar mbetet i kapitalizuar dhe me performance te mire ne skenaret qe permbajne supozime me probabilitet ndodhjeje me te larte. Ne skenaret me ekstreme, banka te veçanta dhe sektori bankar ne teresi do te kishin nevoje per rritje te kapitalit.

Mbeshtetur ne kete analize, Banka e Shqiperise vlereson se gjendja e kapitalizimit dhe e perfitueshmerise se bankave paraqitet aktualisht e pershtatshme per te perballuar rreziqet e veprimtarise. Si edhe me pare, nevojitet qe bankat te analizojne dhe testojne aftesine e tyre per te perballuar rreziqet e ndryshme, ne menyre te rregullt, ne perputhje me kerkesat e kuadrit rregullativ mbikeqyres.

LEGJISLACIONI SHQIPETAR LIDHUR ME MASAT PER FINANCIMIN VENDAS DHE TE HUAJ

Me zhvillimin e ekonomise se tregut Shqiperia ofron shume mundesi per investitoret si:

- Kosto e prones dhe e punes eshte e ulet
- Popullsia eshte e re dhe e arsimuar
- Stabilitet makroekonomik
- Pozite gjeografike e tille qe te ofron mundesi te shumta per zhvillimin e tregetise, sidoemos me vendet e BE-se.
- Sektori privat eshte teresisht i privatizuar. Ne Shqiperi operojne disa nga bankat me te njohura nderkombetare, prania e te cilave ka rritur financimin ne ekonomi.

Nder problematikat dhe pakenaqesite qe ekzistojne ne vend permendim ato qe lidhen me :

- Zbatimin e legjislacionit
- Vjeljen e taksave
- Rimbursimin e TVSH
- Burokracite ne pergjithesite

*Problem tjeter i evidentuar eshte se gjysma e kompanive te anketuara nuk gjejne dot njerez me aftesite e duhura profesionale. Per shumicen e kompanive te huaja Zyrat e Punes ofrojne akses sasior dhe jo cilesor dhe konsiderohen te padobishme nga keto kompani.

Nga ana e Ministrise se Financave dhe Ekonomise eshte menduar hartimi i nje projektligji per Investimet, i cili ka lindur domosdoshmerisht pasi legjislacioni ne fuqi i jepte nje mbrojtje shtese investimeve te huaja, por jo atyre vendase. Ne keto kushte u mendua qe hartimi i nje ligji te unifikuar investimesh, do te mbroje njesoj si inestimet vendase, ashtu edhe ato te huaja duke u pershkruar nga parimet e transparences, barazise dhe trajtimit pa diskriminim te investitoreve. Miratimi i ketij ligji pritet te realizohet brenda vitit 2019.

ZHVILLIMET EKONOMIKE DHE FINANCIARE NDERKOMBETARE

Maturimi i ciklit te ekonomise globale, zbehja e efekteve te politikave ekonomike mbeshtetese ne vendet e zhvilluara dhe perdorimi i tarifave si instrument ne trajtimin e mosmarreveshjeve tregtare mes ekonomive me te medha te botes, kane pasur efekt negativ ne rritjen e tregtise dhe te ekonomise globale. Kushtet ne tregjet financiare te rajoneve te zhvilluara jane shtrenguar disi gjate muajve te fundit te vitit, duke reflektuar shqetesimet mbi pershkallezimin e tensioneve tregtare dhe pritjet per ngadalesim te rritjes ekonomike. Ne tregjet financiare te rajoneve ne zhvillim, dinamikat e zhvillimeve kane qene te ndryshme, nderkohe qe vendet me struktura te dobeta makroekonomike dhe klime politike te pasigurt jane karakterizuar nga rritje e presioneve financiare. Presionet inflacioniste globale kane mbetur te ndrydhura, duke reflektuar renien e çmimeve te naftes, por pritet te rriten gradualisht si rezultat i shterimit te kapaciteteve te lira ne ekonomine globale. Aktiviteti ekonomik boteror pritet te vijoje te dobesohet me tej gjate 2019 dhe te stabilizohet ne dy vitet qe do te pasojne. Shumica e vendeve anetare te eurozones kane regjistruar rritje ekonomike vjetore pozitive, por ritmi i rritjes eshte ngadalesuar gjate dy tremujoreve te fundit te vitit 2018. Aktiviteti ekonomik eshte mbeshtetur nga forcimi i kerkeses se brendshme, nderkohe qe aktiviteti tregtar ka dhene kontribut negativ. Kushtet ne tregun e punes kane vijuar te permiresohen ne shumicen e vendeve te Eurozones dhe punesimi eshte rritur pertej nivele te parakrizes.

Si rezultat, norma e papunesise se ketij rajoni ra ne 7.9% ne fund te vitit 2018, duke shenuar vleren me te ulet qe nga tetori i vitit 2008. Presionet inflacioniste u dobesuan ne muajt e fundit te vitit, ndikuar nga renia e çmimeve te naftes dhe produkteve ushqimore. Ne keto kushte, Banka Qendrore Evropiane (BQE) ka vijuar te ruaje politiken monetare lehtesuese, ndonese programi i lehtesimit sasior perfundoi ne dhjetor te vitit 2018.

Ne sektorin banker evropian, kreditimi ka vijuar te regjistroje norma positive dhe te qendrueshme rritjeje, ndonese ne nivele te moderuara. Kjo ecuri eshte mbeshtetur nga kushtet ende te favorshme te financimit dhe rritja e kerkeses per kredi ne te gjitha kategorite e saj. Renia e pergjithshme e normave te interesit te kredise per te gjithe segmentet e klienteles dhe ne shumicen e vendeve te Eurozones, reflekton nje transmetim me uniform te politikes lehtesuese monetare te BQE-se gjate periudhes.

Ne tregjet financiare boterore, kushtet e financimit jane shtrenguar disi dhe kane shfaqur nje luhatshmeri me te larte. Kjo ecuri ka reflektuar paqartesine mbi zhvillimin e ekonomise boterore dhe mbizoterimin e pritshmerive per shtrengimin e politikes monetare te Rezerves Federale. Si rezultat, indekset kryesore te tregjeve

te kapitalit kane shfaqur paqendrueshmeri dhe spread-et e tyre jane zgjeruar. Ne tregjet e vendeve ne zhvillim, dinamikat kane qene me te larmishme dhe te lidhura shpesh me faktore specifike. Flukset hyrese te kapitalit ne keto vende jane moderuar ose jane kthyer ne negative, per shkak te kushteve me te shtrenguara te likuiditetit ne vendet e zhvilluara dhe rritjes se tensioneve tregtare.

Pritjet me pak optimiste per ecurine e ekonomise boterore, apo ekonomise se rajoneve te medha, jane reflektuar edhe ne ecurine e tregjeve te tjera. Keshtu, ne tregjet e kembimit te monedhave euro ka shfaqur nje prirje nençmuese. Ne tregjet e lendeve te para, çmimet e metaleve dhe te produkteve bujqesore, gjithashtu kane qene ne renie gjate periudhes. Çmimi i naftes eshte luhatur gjate gjysmes se dyte te vitit 2018, por prirja renese eshte forcuar ne tremujorin e fundit te vitit, duke shenuar nivelin 55-60 dollare amerikane per fuçi.

Ne rajonin e ballkanit Perendimor, aktiviteti ekonomik ka vijuar te zgjerohet, por dinamikat e rritjes kane qene te ndryshme nga njeri vend ne tjetrin. Ne tremujorin e trete te vitit 2018, ekonomia e rajonit u rrit me 3.7% ne nivel vjetor, e mbeshtetur kryesisht nga rritja e investimeve dhe e konsumit privat. Ritmi i rritjes eshte ngadalesuar ne krahasim me tremujorin paraardhes (rritje prej 4.3%), ndikuar kryesisht nga ulja e normes se rritjes ekonomike ne Serbi. Zgjerimi ekonomik ka vijuar te stimuloje krijimin e vendeve te reja te punes, gje qe ka sjelle renien e papunesise ne te gjitha vendet e rajonit. Pavaresisht ecurise pozitive, kushtet ne tregun e punes vijojne te mbeten sfiduese dhe normat e papunesise ne nivele dyshifrore. Per shkak te bazes se ulet te prodhimit dhe konkurrueshmerise se dobet, nivelet e larta te deficitit tregtar mbeten nje burim dobesie per te gjitha vendet e rajonit.

KONKLUZIONET

Sektori bankar mbetet segmenti kryesor i ndermjetesimit financiar ne Shqiperi. Ne lidhje me sistemin bankar, Banka e Shqiperise e vlereson shume te rendesishem rigjallerimin e disa institucioneve, aktiviteti i te cilave perben nje pjese te voegel te tregut bankar.

Prania e bankave te huaja ne vend sjell permiresime duke nxitur aplikimin e standarteve nderkombetar te kontabilitetit, raportimit, kontrollit gje qe ndikon ne mbarevajtjen e bankave, por edhe te bankes qendrore.

Gjate gjysmes se dyte te vitit 2018, teprica e kredise se dhene per bizneset eshte zvogeluar dhe ndikimin kryesor ne kete ecuri e ka dhene kredia per bizneset rezidente.

Ne dhjetor 2018, raporti i kredise me probleme per bizneset (RKP) zbriti ne nivelin 14.3%, nga 17.1% dhe 16.9% perkatesisht ne qershor 2018 dhe dhjetor 2017.

Indeksi i vleresimit te planifikimit te huamarrjes per gjashtemujorin e ardhshem, krahasuar me periudhen e kaluar, ka shenuar renie per ndermarrjet e vogla dhe ka mbetur i pandryshuar per ndermarrjet e medha. Nga ana tjeter, ky indeks eshte rritur dukshem ne rastin e ndermarrjeve te mesme, duke treguar qe ne krahasim me ndermarrjet e vogla dhe te medha, ndermarrjet e mesme kane gatishmeri me te larte per te marre hua gjate gjysmes se pare te vitit 2019.

Cilesia e portofolit te kredise se individeve eshte permiresuar gjate gjithe vitit 2018, dhe kontributin kryesor e ka dhene kredia ne leke.

Pesha e bizneseve huamarrese eshte me e larte ne sektorin e tregtise (56.1%) dhe ne sektorin e ndertimit (45.3%), por keto pesha kane rene ne krahasim me periudhen e meparshme.

Prapeseprape, parashikueshmeria e regjimit te investimeve ka nevoje te permiresohet. Regjimi aktual i investimeve eshte i rregulluar prej mjaft ligjesh kuadro ligjore dhe ligjesh sektoriale, per te cilet nevojitet te krijojne nje unifikim te regjimit rregullator per te terhequr me teper investime.

Ofrimi i nje kuadri te pershtatshem ligjor dhe rregullator per sektorin permes permiresimit dhe modernizimit te kuadrit ligjor per investimet ne linje me praktikat me te mira nderkombetare dhe nxitjen dhe promovimin e zhvillimit dhe aplikimin e standarteve e praktikave te mira nderkombetare.

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THE QUALITY CONTROL OF PRODUCTION PROCESS USING COEFFICIENT OF VARIATION. EMPIRICAL ANALYSIS WITH DATA FOR THE COMPRESSIVE STRENGTH OF CONCRETE.

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ABSTRACT

There are many practical situations in which we are interested to study the homogeneity of a population Ω such as textile, concrete, plastic material, wood etc. In case of concrete, as one of tenth materials with the more risk in the world, designers and builders are very concerned about the fact that his compressive resistance being within allowed(permissible)licensed limits in the entire structure. In this paper, homogeneity of a population is controlled by the control charts for coefficient of variation.
The control chart is one seven instruments that Deming includes to the statistical quality control methodology. They are widely used to concrete industry to provide that the designed strength is being achieved and maintained within the limits as it is predicted in the CEN Guide (Product Standards and conformity assessment guideline, CEN / TC N6287, 2000-11-09).
In this paper is presented a control chart for coefficient of variation based on the values of compressive strength of concrete, the value $c_0 c_0$ of coefficient of variation based on technical criteria and the p[c > $c_0 c_0$]= $\theta_0 \theta_0$.
Selection of the concrete was due to the development of the construction industry in Albania after 90s.

INTRODUCTION

The production process operates over time by producing a series of products that can be considered as elements of the population Ω, all of the elements that the process can produce. If we measure the same characteristic X in each product, is observed a degree of variation in the values.

Such variation may be due to environmental conditions, performance of an instrument, differences in raw materials, differences in the performance of operators ect. Shewhart, in his work, divides the production processes in two groups: the processes that display natural variation and processes that additionally display special sources of variation. Shewhart described the first processes as being in statistical control while the second processes as not being in statistical control. In the case when the production process is not in statistical control, the correction operations are needed to return the process in statistical control.

The presence of variability completely justifies the use of statistics and statisticalmethods. The value of the variable(characteristic) X in a single product is seen as the value that the random variable receives with a certain probability.

A value of a measurement that corresponds to the desired value for a characteristic X for a product is called the target value for that characteristic. These target values are usually bounded by a range of values that, if the values of variable X is in that range than the product satisfies the quality requirements. The largest allowable value for a quality characteristic is called the upper specification limit (USL), and the smallest allowable value for a quality characteristic is called the lower specification limit (LSL). Some quality characteristics have specification limits on only one side of the target. For example, the compressive strength for concrete has a target value and a lower specification limit, but not an upper specification limit.

Deming (1982) in his philosophy about continuous improvement of production processhas defined the control charts as one of the seven instruments that are included in the methodology of Statistical Quality Control.

The control chart is an instrument to monitor the production process: if some unusual sources of variability are present, than some points in the control chart are outside the limits and then the corrective action are necessary to be made to remove these unusual sources of variability.

A control chart is a graphical presentation of a sequence of statistical tests to control the status of the production process.

The process is out of control if:

1. 1 or more points are outside the control limits
2. 2 out of 3 consecutive points are out of guard limits
3. 8 consecutive points all above or below target line (central line)
4. 4 out of 5 consecutive points are more than one standard deviation from target line and in one side of it.

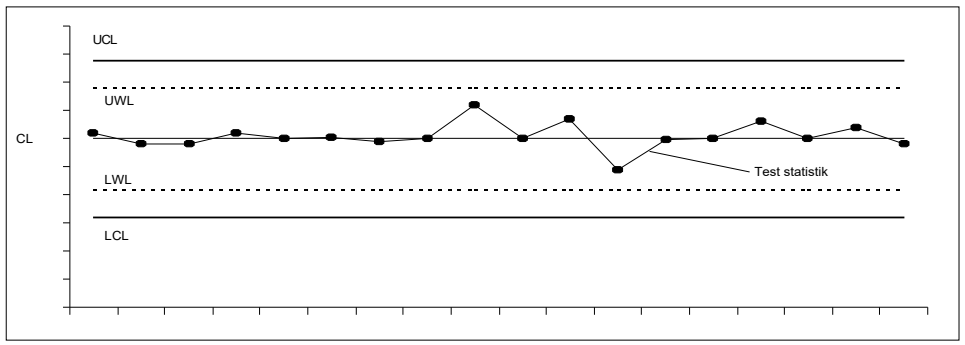
Control charts are used in the concrete industry as an instrument of quality control. They can be used to monitor a variety of its characteristics e.g. its resistance,

consistency, water/cement ratio etc.

The control charts, widely used nowadays, in the case of concrete ensure that the characteristic compressive strengthis obtained and maintained within the licensedlimits as provided in the CEN (Product standards and conformity assessment guideline, CEN/BT N6287, 2000-11-09).

The construction of a control chart is done using the probability distribution of a random variable X. In this paper, is used the asymptotic probability distribution of the coefficient of variation.

Graph 1: An example of a Control Chart



Monitoring variability is a vital part of modern statistical process control. The conventional Shewhart R and S charts address the setting where the in-control process readings have a constant variance. In some settings, however, it is the coefficient of variation, rather than the variance, that should be constant(Hawkins, Kang, Lee, and Seong, 2007).

Monitoring the coefficient of variation (CV) is a successful approach to Statistical Process Control when the process mean and standard deviation are not constant. In recent years the CV has been investigated by many researchers as the monitored statistic for several control charts (Achouri, Castagliola, Celano, and Psarakis, 2013).

Based on technical criteria, is fixedthe value CV for the coefficient of variation that the entire population to be called homogeneous.

From the values taken from a lot for compressive strength of concrete, we can calculate the values of coefficient of variation.If the calculated values are greater than the fixed value CV, than the production is out of control and the correction operations are needed to ensure the homogeneity of the population.

In this paper is presented a control chart for coefficient of variation based on the values of compressive strength of concrete, the value $c_0 c_0$ of coefficient of variation based on technical criteria and the p(c > $c_0 c_0$)= $\theta_0 \theta_0$.

METHODOLOGY

The values of coefficient of variation c, are calculated from the formula:

c $= \frac{s}{\bar{x}}$, where:

c – is the sample coefficient of variation

s – is the sample standard deviation

$\bar{x}$ – is the sample mean for the values of the randon variable X (in our case compressive strength of concrete)

It is known that the asymptotic probability distribution of coefficient of variation is:

$$c = \frac{s}{\bar{x}} \xrightarrow{n\to\infty} N\left(\gamma; \frac{\gamma^2}{2(n-1)} \cdot (1 + 2 \cdot \gamma^2)\right)$$

(Miller, 1991)

where, γ – is the population coefficient of variation

So, $\theta_0 = \underset{n\to\infty}{p}(c > c_0) = 1 - p(c < c_0) \cong 1 - \Phi\left(\frac{c_0 - \mu^*}{\sigma^*}\right)$ (1)

because: c $\longrightarrow$ N (μ^*, σ^{*2})

(Powell, 2005)

From equality (1): $\Phi\left(\frac{c_0 - \mu}{\sigma^*}\right) \cong 1 - \theta_0$, or $\Phi\left(z_{1-\theta_0}\right) = 1 - \theta_0$,

Where: $z_{1-\theta_0} = \frac{c_0 - \mu^*}{\sigma^*}$ or $c_0 = \mu^* + \sigma^* \cdot z_{1-\theta_0}$

When a lot is inspected, we do not accept the lots for which $p(c > c_0) > \theta_0$,

or: $\mu^* + \sigma^* \cdot z_{1-\theta_0} > c_0$

The linear function v= $\mu^* + \sigma^* \cdot z_{1-\theta_0}$, has normal distribution because is the linear combination of variables with asymptotic normal distribution.

$v \xrightarrow{n\to\infty} N(E(v), \sigma^2(v))$

The parameters are:

$$E(v) = E(\bar{c}) + E(s_c) \cdot z_{1-\theta_0} = \mu^* + \sigma^* \cdot z_{1-\theta_0}$$

$$\sigma^2(v) = \sigma^2(\bar{c}) + \sigma^2(s_c) \cdot z^2_{1-\theta_0} = \frac{\sigma^{*2}}{n} + \frac{\sigma^{*2}}{2(n-1)} \cdot z^2_{1-\theta_0} \quad (2)$$

(variables $\bar{c}$ and s_c are independent).

The question is:

For which value t_0, from $v = \bar{c} + s_c \cdot t_0 > c_0$, we can conclude for the homogeneity of the entire population with given confidence level?

The solution of the problem consists in the construction of a control chart from which it is possible to conclude for the homogeneity of the population with a given probability, based on the value $\theta = p(c > c_0)$ when the permitted value of defective part is θ_0.

$$t_p(\theta) \cong \frac{z_{1-\theta} + u_p \cdot \sqrt{\frac{1}{n} \cdot \left(1 - \frac{u_p^2}{2 \cdot n}\right) + \frac{z_{1-\theta}^2}{2 \cdot n}}}{1 - \frac{u_p^2}{2 \cdot n}} \qquad (3)$$

(Leka, 1989)

Where the value u_p is founded from the equation $\Phi(u_p) = p$ and n is sample size. Based on formula (3), we can calculate the value t_p when we know the number θ. The formula (3) gives us the upper control limit for percentile t_p, based on which we accept or not that the production process meets the requirements. For a given significance level α, we replace the number p with α in formula (3):

$$t_0 = t_\alpha(\theta_0) \cong \frac{z_{1-\theta_0} + u_\alpha \sqrt{\frac{1}{n}\left(1 - \frac{u_\alpha^2}{2 \cdot n}\right) + \frac{z_{1-\theta_0}^2}{2 \cdot n}}}{1 - \frac{u_\alpha^2}{2 \cdot n}} \qquad (4)$$

(Leka, 2011)

Where $\Phi(u_\alpha) = \alpha$. So, the value $t_\alpha(\theta_0)$ is the upper control limit for the values of the statistic t= $\frac{c_0 - \bar{c}}{s_c}$. So, we can control in continuity the quality of concrete by coefficient of variation, when the defective part is θ and the permited standard value is θ_0.

DATA ANALYSIS

As an illustration, we can refer the data taken for compressive strength of concrete from Ferro-Beton Company.

In this situation, the standard values for defective part and coefficient of variation are: $\theta_0\theta_0$ = 3% and c_0c_0 = 5%. For $\alpha\alpha$=0.025, we want to control if the production process is in control or not.

From production process of concrete, for n=20, we calculate the value $\bar{c}\bar{c}$ = 0.0408.

Then, $t = \frac{c_0 - \bar{c}}{s_c} t = \frac{c_0 - \bar{c}}{s_c} = \frac{0.05 - 0.0408}{1.373} \frac{0.05 - 0.0408}{1.373}$ = 0.006701,

From formula (4) we find $t_\alpha(\theta_0) = 2.87 . t_\alpha(\theta_0) = 2.87.$ As t << 2.87, there is no reason not to accept that the production process is in control.

CONCLUSIONS

Statistical process control is a tool useful in achieving process stability and improving capability through the reduction of variability.

The fundamental uses of a control chart are: Reduction of process variability; Monitoring and surveillance of a process and Estimation of product or process parameters.

In this paper, it was possible to construct a control chart for coefficient of variation, to control if a lot from production process of concrete meets the technical criteria. This control chart enables us to conclude with a given probability for the entire population, based on a sample with "n" elements.

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RELIABILITY AND SECURITY ISSUES DURING THE LIVE MIGRATION USING KVM HYPERVISOR

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ABSTRACT:

Virtualization is an innovative technique designed to increase the level of abstraction of the system. It enables IT users to make more and more use of computer performance. The most essential part of virtualization is the hypervisor. To accomplish the maintenance of one host server, we need to transfer all the virtual machines that this host carries to another host server with the minimum outage for end users. More importantly, if the virtual load is increased and needs more resources, the infrastructure should be able to automatically locate a host server with appropriate resources and transfer the virtual machines to that host. And the whole process should be completely transparent to end users. Virtual machine migration, especially real-time migration, is an important issue in Grid and Cloud Computing systems for load balancing, scalability, failure tolerance, hardware maintenance. Security and reliability are critical issues when migrating to virtual machines which must be accepted by the IT industry. Although performance improves during live migration, there are two issues to consider: reliability and security. This paper proposes how to migrate guest virtual machines from one server to another virtual machine server. The paper discusses issues related to the steps taken to realize live migration with KVM and requirements related to security and reliability .

KEY WORDS:

Virtualization, Virtual Machine, KVM, Hypervisor, Live Migration

ROLI I INVESTIME TË HUAJA DIREKTE NË SHQIPËRI DHE EFEKTET NË PUNËSIM DHE TREGUN E PUNËS

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ABSTRAKT

Shqipëria pas viteve 1990 u gjend përpara nevojës për një transformin te strukturës ekonomike të saj nga një ekonomi e centralizuar në një ekonomi tregu. Në kushtet kur popullsia e saj në këtë tranzicion vinte më e varfër se kurrë, në objektivat e Shqipërisë prania e investimeve të huaja direkte, nëpërmjet joint venture apo privatizimeve me pjesmarjen e kapitalit të huaj u bë një politikë kryesore e Shtetit shqiptar. Kalimi i viteve 2000 , pasi Shqipëria kishte 10 vjet tranzicion dhe pothuaj tërë ekonomia , me përjashtime të sektorëve strategjikë ishte e një strukturë krejt tjetër dhe roli i investimeve të huaja direkte , format dhe metodat e tyre të joshjes dhe efekteve kishin ndryshuar.
Pikërisht ky artikull synon në qasjen e investimeve të huaja direkte në Shqipëri kjo e realizuar nëpërmjet joint-ventures, krijimit të filialeve të huaja , privatizimeve dhe blerjes së aksioneve nga kompanitë shumëkombëshe në Shqipëri në funksion te mardhënieve të punës. Por a kanë ndikuar investimet e huaja në punësim apo thjesht kanë rritur shkallën e prodhimit të përgjithshëm nëpërmjet përdorimit të kapitalit të huaj, duke shmangur konkurencën dhe përfituar nga sektorët monopol. Ky është sensi i punimit që paraqesim.

FJALËT KYÇ.

Investime të huaj direkte, Kompani ndërkombëtare, Joint venture, kapitali i huaj, IHD.

RRITJA E SIGURISE NË SISTEMET E NDRYSHME TË RAPORTIMIT FINANCIAR

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ABSTRACT:

During financial reporting with various programs like Finance 5, Alpha Accounting, Bilance etc. , is often a need to store this data in strict security systems as they can be attacked or manipulated by competition, different hackers also by the stakeholders themselves who have deposited this data or are handling this data. In this paper are handled methods that can be used to generate secure financial reports both in terms of their interference and their authenticity.
Protocols and systems that can be implemented in the software currently used for these reports are described. There are also treated some cases where different systems, offers different levels of security according to the parameters preselected. Another treatment of the systems is done on the need for security point of view.
Not always the need for security is the same.

KEYWORDS:

financial reporting, information security, protocol, cryptosystem, Finance 5, Alpha Accounting

HYRJE:

Kriptografia mbi vijat eliptike (ECC), ka qenë një fushë shumë e studiuar prej mjaft studiuesve dhe përbën gjithmonë e më shumë interes. Njëlloj si edhe me kriptosistemet RSA dhe Diffie – Hellman, vitet e para të studimit dhanë disa rezultate të dështuara lidhur me parametrat e vijave eliptike të cilat duhen shmangur.

Megjithatë, ndryshe nga kriptosistemet RSA dhe Diffie – Hellman të cilët ngadalë janë dorëzuar gjithmonë e më shumë kundrejt sulmeve të forta algoritmike, Kriptografia mbi vijat eliptike, që prej zbulimit të saj e deri tani i ka rezistuar sulmeve.

Pavarësisht avantazheve të shumta të vijave eliptike dhe pavarësisht nga përshtatja e tyre nga shumë përdorues, pjesa më e madhe e ekonomisteve dhe akademikëve e shohin ambientin e vështirë të karakteristikave shkencore të këtyre vijave si pengesën më të madhe për implementimin dhe përdorimin e tyre.

SKEMA BAZË

Alice dhe Bob duan të bien dakord për një çelës të përbashkët të cilin mund ta përdorin për të shkëmbyer të dhëna nëpërmjet një sistemi simetrik të tillë si DES ose AES. Për shembull, Alice dhe Bob mund të jenë banka të cilat duan të transferojnë të dhëna financiare tek njëra tjetra. Nuk është fare praktike, dhe harxhon shumë kohë dërgimi i një korrieri për shkëmbimin e çelësit. Aq më tepër duke marrë parasysh mundësinë që vet korrieri mund të zbulojë çelësin gjatë dorëzimit. Supozojmë gjithashtu se Alice dhe Bob nuk kanë pasur kontakte të mëparshme dhe të gjitha komunikimet e mundshme ndërmjet tyre janë publike.

Një mënyrë për të vendosur një çelës të përbashkët është ajo e Diffie – Hellman (në të vërtetë ata përdorën grupet multiplikativ të fushave të fundme).

Për të përdorur ECC të gjitha palët duhet të bien dakord për elementet që përcaktojnë vijën eliptike.Ato janë parametrat e fushës mbi të cilën është ndërtuar skema. Fusha F është përcaktuar nga karakteristika e saj q në rastin e numrave të.

Vija eliptike është përcaktuar nga konstantet e përdorura në përcaktimin e ekuacionit të saj. Së fundi, nëngrupi ciklik G është përcaktuar prej gjeneratorit të tij. Për zbatimin e sistemit kriptografik, rendi i nëngrupit G , që është më i vogli numër jo negativ n i tillë që nG=0, duhet të jetë i thjeshtë.

Alice dhe Bob bien dakord të përdorin një vijë eliptike $\mathcal{E}\mathcal{E}$ mbi një fushë të fundme $F_a F_a$ të tillë që problemi i logaritmit diskret të jetë i vështirë në $\mathrm{E}(\mathrm{F_q})\mathrm{E}(\mathrm{F_q})\ \mathcal{E}\ (\mathrm{F_q})\ \mathcal{E}\ (\mathrm{F_q})\mathrm{P} \in \mathrm{E}(\mathrm{F_q})\mathrm{P} \in \mathrm{E}(\mathrm{F_q})$. Ata ranë gjithashtu dakord të përdorin një pikë $P \in \mathcal{E}\ (F_q)P \in \mathcal{E}\ (F_q)\mathrm{P} \in \mathrm{E}(\mathrm{F_q})\mathrm{P} \in \mathrm{E}(\mathrm{F_q})$ të tillë që nëngrupi i gjeneruar nga P të ketë rend të madh (zakonisht vija eliptike dhe pika mbi të, zgjidhen në mënyrë të tillë që rendi të jetë një numër i thjeshtë i madh).

Alice zgjedh një numër të plotë a të cilin e mban sekret, llogarit $P_a = aP$ $P_a = aP$ dhe i dërgon Benit tekstin e shifruar $P_a\ P_a$.

Bob gjithashtu zgjedh një numër të plotë $\mathrm{bb}b$ të cilin e mban sekret, llogarit

$P_b = bP\ P_b = bP$ dhe i dërgon Anës tekstin e shifruar $P_b\ P_b$.

Alice llogarit $aP_b = abP\ \ aP_b = abP\ \ aP_b = abP\ aP_b = abP$.
Bob llogarit $bP_a = baP\ bP_a = baP\ bP_a = baP\ bP_a = baP$.
Alice dhe Bob bëjnë disa marrëveshje publike mbi mënyrën e përftimit të çelësit nga $abPabP$.

Për shembull ata mund të përdorin si çelës, 256 bitët e fundit të koordinatës x të pikës $abPabP$. Ose mund të llogarisin funksionin hash të koordinatës x të pikës $abPabP$. [11]

EVIDENTIMI I GABIMEVE TE MUNDSHME GJATE SHKEMBIMIT TE CELËSAVE SIPAS DIFFIE – HELLMAN

Shohim tani disa prej kushteve të këtij protokolli me qëllim ndërtimin e shembujve, e sistemeve të fortë e diagnostik. Gjatë zbatimit të tij duhet pasur parasysh se:

- Algoritmi i shkëmbimit të celësave zbatohet mbi një grup te fundëm me rend q relativisht të madh (për të krijuar shembuj provë ky rend është marrë shumë i vogël krahasuar me përmasat reale që duhet të ketë)
  Si çelësa privat-publik duhen zgjedhur :
- a≠1. Nëse çelësi privat do merrte vlerën 1 atëherë gjatë procesit të shifrimit do transmetohej vet pika P e cila i referohet vleres fillestare duke bër kështu lehtësisht të zbulueshëm ~elësin privat të Alice
- a≠n-1 nëse marrim a=n-1 do kishim

$$P_a = aP\ mod\ q = (n-1)P\ mod\ q = nP - Pmod\ q = 0 - P\ mod\ q = -P\ mod\ q$$
$$P_a = aP\ mod\ q = (n-1)P\ mod\ q = nP - Pmod\ q = 0 - P\ mod\ q = -P\ mod\ q$$

sepse n është rendi i nëngrupit mbi të cilin është ndërtuar vija eliptike e zgjedhur në shkëmin e celësave. Në këtë mënyrë rritet ndjeshëm rreziku ndaj sulmeve të mundshme për të gjetur vlerën fillestare të pikës P.

- a ≠ gNëse marrim a=g atëherë mesazhet të cilat i adresohen Alice mund ti lexoj edhe Bob sepse parametrin g e kanë të dyja palët. Nga Alice tjetër, gjatë veprimeve për deshifrim, studentit mund ti krijohet ideja se ky parametër është i pa nevojshëm, duke cënuar kështu kushtet e kriptosistemit. Për ta shmangur këtë gabim, mjafton që në algoritmin Maple të shtojmë kushtin a ≠ g

Për sa i përket gabimeve në algoritëm duhet patur parasyn përzgjedhja e saktë e çelësave

- a≠1 sepse për ndryshe do kishim M +1·k ·P-k·P mod p =M mod p
- a≠p-1. Nëse çelësi privat zgjidhet a=p-1 atëherë Y2= M + (p-1)·k ·P mod q prandaj në këtë rast M + (p-1)·k ·P+k·P mod q = M+p·k ·P mod q = M mod q. Kështu pra është lehtësisht i deshifrueshëm mesazhi. [20]
- a ≠ P në këtë rast ky kusht bie menjëherë sepse P është pikë e vijës eliptike E(Zq) ndërsa a është skalar nga Zq.

- k ≠ a nëse edhe çelësat privat të dy palëve do ishin të njëjtë atëherë Bob mund të lexojë të gjithë mesazhet e Alice. Gjithashtu studentit mund ti krijohet ideja që njëri prej dy çelësave është i pa nevojshëm.
- kP ≠ a edhe ky kusht anulohet për të njëjtën arsye
- P ≠ B sepse për ndryshe çelësi publik i do ishte i njëjtë me çelësin e gjeneruar nga Alice e për rrjedhojë mund të krijohet ideja se është i pa nevojshëm gjenerimi i Y_1=kP
- Y2-aY1mod p ≠ Y1-aY2mod q që të mos ngatërrohet rendi i veprimeve për llogaritjen e tekstit të hapur kur kemi tekstin e shifruar.

Veprimet për gjenerimin dhe krahasimin e çelësave kryhen sipas modulit q (ku p është numri i pikave të vijës eliptike të zgjedhur) dhe jo sipas modulit q (ku q është karakteristika e fushës mbi të cilën është ndërtuar vija eliptike).

Edhe në këtë rast, njëlloj si kriptosistemi Massey – Omura, rezultati i njëjtë në rastin kur pikat e vijës shumëzohen me çelësat përkatës si prodhim me skalar u(x-,y)=(ux,uy) ose (x,y)u=(xu,yu) me atë të saktin ku pikat mblidhen sipas algoritmit përkatës në vija eliptike çon në një tjetër gabim për tu evituar pasi studenti në këtë rast nuk përdor fare veprimet mbi vijat eliptike.

HAPAT E NDËRTIMIT TË ALGORITMIT I CILI I SHMANG KËTO GABIME PËR RASTIN E PROTOKOLLIT TË SHKËMBIMIT TË ~ELËSACE DIFFIE - HELLMAN MBI VIJAT ELIPTIKE.

- Zgjidhet një fushë e fundme.
- Zgjidhet një vijë eliptike mbi atë fushë.
- Konvertohet teksti në pikë të vijës eliptike me anë të një funksioni shifrimi ose të një hash funksioni.
- Zgjidhen çelësat a,b që plotësojnë kushtet e trajtuara më sipër.
- Vendosen kushtet për protokollin dhe çelësat si edhe komentet përkatëse për secilin rast të gabimeve në mënyrë që të gjenerohen shembuj ose ushtrime diagnostikë.
- Çelësat konvertohen në sistem binar për të zbatuar më pas algoritmin mbledhje dyfishim lidhur me shumëfishimin e pikave të vijës eliptike.
- Vendosen kushtet për pikat e vijës eliptike ndër të cilat kërkohet edhe që vlerat e shumëfishimit si vektor të jenë të ndryshme nga vlerat e shumëfishimit si pika të vijës përkatëse.

KONKLUZIONE:

Referuar përpjekjeve të vazhdueshme për të shmangur informalitetin, kryerja e transaksioneve të ndryshme dhe deklarimeve, nese do bëhej në rrugë të sigurta (informacion i enkriptuar), do kishte nje impakt të lartë në ekonomi.

Një ndër protokollet e përshkruara më sipër mundëson krijimin e çelësave të

përbashkët të komunikimit sipas vijave eliptike të cilat për momentin janë ndër më të sigurtat por gjithashtu edhe me kompleksitet te lartë veprimesh.

Deklarimet sistematike të enkriptuara apo te nenshkruara në mënyrë dixhitale, do ishin kosto e reduktuar si në kohë edhe në vlerë monetare për ekonominë në tërësi.

Gjithashtu përdorimi i kriptografisë do ndihmonte në rritjen e sigurisë në deklarimet reale duke bër verifikimin në disa hapa si edhe moslejimin e rikthimit të të njëjtit dokumentacion pa lën gjurmë në sistem.

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TECHNOLOGICAL DEVELOPMENT AND THE "THREAT" TO THE FUTURE!

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ABSTRACT

One of the most advanced areas with direct and inevitable impact on our lifestyle is digitalisation. Over the years, it has changed the way we act, think, it has dictated the form and means of communicating with each other, the manner and duration of business operations, but at the same time it raised great uncertainties and has sparked fears for the future.

The new technological era, the functions and services ongoing automation are running with galloping steps towards perfection in exchange for the growth of the unknown for the future of human capital.

In various industries, mechanical and routine work automation has given its effects long ago. Numerous researches and technicians have expressed and raised hypotheses about the new computer era, its impact on jobs, and the effects on the respective countries economy.

In addition to reviewing and analyzing studies on the technological development effects, a survey focusing on current employees will also be implemented, their conception and prediction of their future profession and how threatened they are by technology.

Based on previous studies, lower and middle level jobs have a higher percentage risk for automation in the future compared to other more advanced jobs.

Replacing certain jobs levels through artificial intelligence is believed to bring transformation and reduction of workforce, changes in the banking system, increase income inequality, distortions in international competition, changes in fiscal packages, etc.

Ahead of the 'dark' future as a result of incessant technological development, it is very important and vital to move forward with time toward personal development to be prepared and resistant to the negative effects which can accompany. The future belongs to mankind and it will be ours as long as we invest in education, professional development, in order to increase our capabilities to update new technological methods in service of mankind and enhance the quality of life facing any "automated" challenge.

KEYWORDS:

digitalization, artificial intelligence, automation

INTRODUCTION

Artificial Intelligence is one of the most developed and sensitive phenomena in our life system today, although it must be admitted that not all of us really know its meaning as a concept. It often happens that when we hear about artificial intelligence, our minds go straight to robotic devices, but on the contrary it is even more broad and complex. Artificial intelligence has been an existing discipline for over sixty years and concludes in a range of sciences, theories, and techniques that aim to recognize, judge, and perceive the cognitive abilities of a human being.[1] More precisely, artificial intelligence is about imitating or copying the human mind through various computer systems and machinery.

Going back to 1950, Minsky and McCarthy field representatives described artificial intelligence as any task performed by a program or machine that, if a man performed the same activity, we would say that man had to apply intelligence to accomplish that task. This is undoubtedly a pretty broad definition, which is why we sometimes need arguments to prove whether it is AI or not.

AI systems will typically demonstrate at least some of the following behaviors related to human intelligence: planning, learning, reasoning, problem solving, knowledge representation, perception, movement and manipulation and, to a lesser extent, social intelligence and creativity.

THE METHODOLOGY USED IN THIS STUDY.

Technological advancement, mainly the development of artificial intelligence, has brought a major change in our lifestyle. Endless studies have been made in the framework of the changes and advantages brought by technological developments in the environment in which we live, from which many conclusions and data will be taken into consideration for the analysis of this paper. The data of this paper are divided into primary and secondary. The latter are the analysis and review of the previous AI-related literature, while the primary ones are the data collected from the questionnaire focusing on young people and current employees in Albania. The questionnaire aims to identify their conception of technology development as well as their anticipation of the future in terms of employment, how protected or threatened they feel by this phenomenon. The focus of the questionnaire will be mostly young people, because they are the main actors that will make this possible for the future, but they are also more informed than the older age groups. They are able to adapt to any new technological changes, and with our help to strengthen their knowledge of the field, and keep them informed of new changes that are foreseeable for the future, will make them more prepared and not risking on not being inappropriate in the work and social environment.

The object of the study in this paper is the impact that technological advancement has had on artificial intelligence in various industries of the economy. It will also analyze the different types of artificial intelligence in operation and what are anticipated to emerge in the market, its applications in various industries and fields, its positive and negative effects, and mainly the focus of the study will be the analysis of the impact of the technological era in employment and economics.

ARTIFICIAL INTELIGENCE AND ITS APPLICATIONS[19]

The development of informatics as a combination science with logic and mathematical algorithms has made it easy to automate many complex tasks that only a few years ago could be manually accomplished. The impact of AI may not be linear, but it can build at an accelerating pace over time. The artificial intelligence services offered are numerous and in various sectors, but their main purpose is to perform working procedures in a much shorter time than manual and of a higher quality. We can mention the machinery of production of various products which are generally designed in such a way as to transform the product from a raw material to its final wrapping and packaging, positioning the employee only in the role of process controller and no longer in its realization step by step, but this is the simplest form of artificial intelligence.

Although technological systems mainly enable people to imitate many different processes, the extent to which they can be copied serves as an indicator to determine the types of artificial intelligence. Thus, there are types of AI that are built based on their resemblance to humans in the way they think and act.

HERE, WE CAN LIST FOUR TYPES OF AI[20]:

Reactive AI, This is the oldest form of AI and have more disabilities. They try to copy the human mind to respond to different types of stimuli. They fail to perceive or judge but simply respond automatically and programmatically.

19 Council of Europe, Article about AI (https://www.coe.int/en/web/artificial-intelligence/history-of-ai)

20 Forbes Article about AI (https://www.forbes.com/sites/cognitiveëorld/2019/06/19/7-types-of-artificial-intelligence/#23a081d233ee)

- AI with limited memory, These machines are more advanced than reactive machines and have the ability to learn from their history of making more concise decisions. (Chatbots, virtual assistants, self-driving vehicles, etc.)
- Theories of mind. If the first two types of AI already exist in the market, the other two types are still in development. Systems at this level will be able to better understand the units with which they collaborate by identifying their needs and opinions. This system consists in the perception of people and the way their mind is built, but it is still evolving and difficult to achieve fully.
- Conscious AI. This is the last phase of AI that currently exists only hypothetically but underdeveloped. Creating this type will also be the finalization of the AI research process, as it is thought that the human copy will truly be realized not only to understand and recognize the emotions of the units with which it collaborates but also to experience its own emotions and desires. If this were to succeed, unfortunately human resources would have to be replaced by robotics, and that could be the end of humanity.
- Artificial intelligence designed as the intelligence displayed by computer systems, has many applications nowadays. To be realistic, today we can easily be called the "age of artificial intelligence" that we are living in, as in every field and industry there are endless technological applications in which programs are designed to perform specific tasks. Some of the major areas that artificial intelligence is present are:
- Marketing. Marketing is aimed at advertising and selling the product to the end consumer, and to date the human being has been very capable in this promotion and distribution process. But technology has made it possible to create unique algorithms with the sole purpose of promoting the company and its products to customers, which makes the distribution process easier and increases the level of information to customers. Thanks to these developments, new professions have emerged in the field of marketing such as social network marketing or websites.
- The banking system. It is one of the sectors that utilizes technological systems that enable customer support, various service delivery and mainly credit card fraud detection. (Example HDFC Bank has invested in an EVA [3] chatbot - a virtual electronic assistant, enabling customer-response queries), although in Albania we do not have a high level of investment in AI, the banking sector is an exception because it applies the same technology as the subsidiaries located in developed countries.
- Finance. Financial operations depend largely on accurate forecasts for the future. Various technology programs have been adapted in this area for the purpose of assisting business investors by providing specific information and data models analyzed. We can mention the Nomura stock market in Japan, which has created a program that makes it possible to analyze various data on stocks of previous periods and adjust them to the current conditions. In this way, it manages to predict how the value of a stock can move and influence on investor's good decision making.
- Medicine. One of the most vital areas for us, has invested and seeks to invest continuously in artificial intelligence as it sees it as a positive thing in improving patient service. Currently there are computer systems that make it possible to return questions and answers to the medical field, but there are robots that allow for a basic intervention with the realization of the whole process.
- Other areas may be: agriculture, space, chatbots, social media, laws, education etc.

THE POSITIVE AND NEGATIVE EFFECTS OF ARTIFICIAL INTELLIGENCE.

Many researchers consider artificial intelligence at a baby's age. It exists, can be learned, can be developed, and continually improved, but it can never be on par with human beings in terms of its conception. AI does not have the proper intelligence and emotional intelligence to justify its decisions or the reactions it may have. Our goal should be to successfully use AI so that it can facilitate different services but not become a leader in service delivery without the need for human resources. In this way, its positive effects become more apparent because they facilitate different work processes and only help people, businesses and the government. On the other hand, if used unconditionally and not with positive intentions, it can emphasize its negativity to people, businesses and society as a whole.

The positive effects of AI include: opening new jobs for people because AI will not serve as a risk to employment but will simply facilitate different task processes, increase work productivity, improve our livelihoods and businesses will be more efficient, we will have energy savings, better security, more targeted marketing and better healthcare.

Another advantage would be the redemption or employment of those who truly deserve it, reducing the gender and race gap. And surveillance by this intelligence can be seen as an Orwellian concept, since it is considered an intrusion on individual privacy. The conclusion is that the rapid spread of artificial intelligence must be guided by the principle of balance between privacy and performance. The use of this intelligence should be transparent and have benefits for both employers and employees. A fairer and more productive workforce is valuable as long as it does not disrupt or unhumans the employees.

The negative effects of AI consist of: market transformation into the automation of various jobs, cohabiting or hostile to humans over the changes that will occur, natural human competition can lead to the creation of borderless AI, create unpredictable consequences, high cost startups for AI investment. Etc. It is worth noting that artificial intelligence algorithms cannot be completely detached from the bias of their programmers, which can unduly harm or favor employees in an unfair way.

If productivity is all that artificial intelligence requires, an older employee is at risk of losing his or her job. It is very important to note that depending on how this intelligence is used, the work for the human being can be more fair or inspiring.

The business is absorbing AI in the function of demand forecasting, employment and customer service. McKinsey's Global Research Institute even estimates that applying this intelligence to marketing, sales and supply chains could create an economic value of $ 2.7 trillion in the next 20 years. Driven by such anticipations that arouse hope and panic at the same time, AI can affect the alienation of our jobs.

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE ECONOMY AND EMPLOYMENT[21].

Economic growth is usually measured by capital stock and employment growth, especially when used efficiently. But capital growth and employment will no longer be regarded as the main indicators of the level of economic growth in the world. Fortunately, financially, and not only, the storytelling leader for economic growth and prosperity, it is thought to be the tech industry that is promising to move fast the economy of every country. The greatest danger to us from all this technological development and galloping progress is thought to be the automation of jobs and the replacement of human intelligence with artificial intelligence. Various studies argue about the future of technology as the technology evolves and its impact on jobs and the economy. AI may bring a boost to economic activity, but the distribution of benefits is likely to be uneven. Many researchers are negative about our future as human resources, as they predict that 60% of the work being done today by our management can be automated and accomplished only with the presence of computer systems and machinery. Other researchers are more optimistic about the presence of this technology, arguing that it will not necessarily lower the employment rate because it is people who will be trained to control these systems. Different machinery and technology programs will help to make work easier, add quality and at the same time reduce overall costs. Also, these scholars predict an increase in the economy with really high figures. Our desire to treat this paper with the utmost positivity has led to the consideration of the most recent "positive" studies of AI in economics.

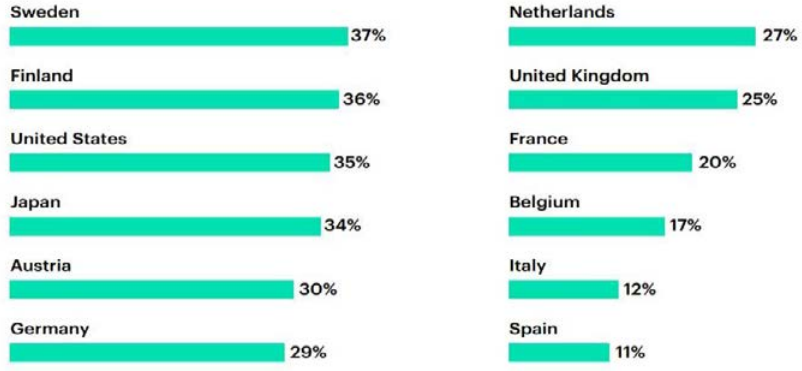
For exmaple, Accenture[22] from the analysis of the **12** most developed countries in the world, it was concluded that artificial intelligence would have a higher probability of **doubling** their annual economic growth by **2035**. To reach this figure, it recommends policy makers and the private sector of businesses, prepare to welcome this new future and invest in it with the primary aim of increasing productivity. The figure below shows how much artificial intelligence is thought to increase labor productivity in the 12 countries surveyed.

21 Enterprise Voice Assistant(EVA)

22 Accenture plc(www.accenture.com.), Irish Company that provides services in strategy, consulting, digital, technology and operations

FIGURE 1: INCREASE IN LABOR PRODUCTIVITY IN AN AI WORLD

Artificial intelligence promises to significantly boost the productivity of labor in developed economies.



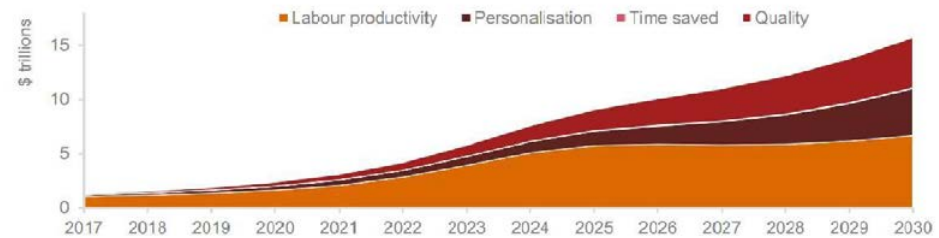
Percentage difference between baseline in 2035 and AI steady state in 2035

Source: Accenture and Frontier Economics

Increasing labor productivity does not consist of prolonging working hours, but of effectively using time at work and delivering higher quality work in support of technological systems. This data largely results from the ability of each state to adapt artificial intelligence to the infrastructure of its economy. In general, artificial intelligence is claimed to bring tremendous profit to each country, fighting the recent economic downturn and the establishment of a new era of high productivity and economic sustainability.

On the other hand, based on a study done by the company PwC[5], we note again a claim for increased productivity at work by 2030 but also of other factors as illustrated below:

Figure 1.2 – Global GDP impact by effect of AI in main scenario

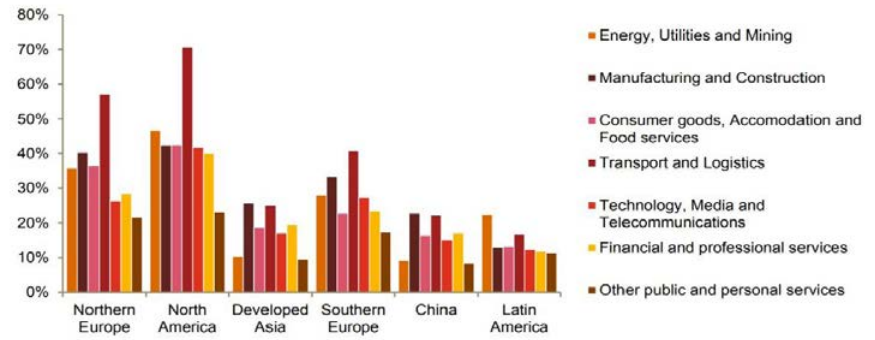


Source: PwC Analysis

According to the study by PwC, global GDP is projected to grow by 14% by 2030, to about $ 15.7trillion, as a result of the presence of artificial technology in the economy. The economy is claimed to be measured by (a) the profits of businesses resulting from the automation of business processes and the transfer of existing employees to the management and maintenance of artificial intelligence; and (b) increasing consumer demand for marketed products that reflect a higher quality with the impact of AI.

One of the disadvantages of artificial intelligence is the automation of jobs and the replacement of human resources with computer systems. But what are the types of jobs that may have the highest risk for automation? Based on the Pwc study, and also the experience so far, has shown that the most potential jobs to be automated are: routine tasks, manual tasks and very simple tasks compared to management or any other area, specific sectors of the economy that contain manual tasks, such as transportation, logistics, manufacturing, construction, banking and financial services due to deep learning and computer systems development, services provided to citizens. Etc.

Figure 5.1 – Percentage of jobs at high risk of automation by 2030, by geographic region and industry sector (adjusted using the Global Innovation Index – see Section 7.7 for more details)



Source: PwC Analysis

ance, tax, and consulting services for your business.

IV. MARKET RESEARCH ON EMPLOYEES

Rapid and powerful technological development has made people feel paranoid about the knowledge-acquisition abilities needed for AI and the changes it can bring to society. Albania is a small country compared to the developed countries that we analyzed above and we think that AI will evolve at a slower pace for our society, but we have nevertheless thought about studying what really concerns the younger generation and not only in connection with this phenomenon.

The market study was conducted through a questionnaire in which the questions were constructed in such a way as to measure how much were informed or worried the employees about the technological changes and innovations they are bringing to the economy. Out of 242 respondents, about 60% were female and predominantly in the age group of 16-25.

Regarding the level of education, it should be noted that there were participants with different levels, those with primary and higher education who mainly did simple jobs where we can mention fasons, and there were those that had graduted, where there was a range of professions. They worked as a bartender, waiter, financier, politologist, lawyer, filmmaker, nurse, lecturer, architect, physician, mechanic, IT specialist, etc. Thanks to the education, the profession that they had chosen and their current job position, about 70% of the surveyed indicated that they felt it necessary to be updated with technological changes in the country, especially those directly related to their chosen field.

Given the types of AI mentioned above, we can easily say that the job positions that surveyors held may have the greatest chance of being automated and replacing human resources with technological systems. But studies showed the future of technology based on developed countries and having the possibility to invest in technology and innovation. Given this fact, the employees did not necessarily feel threatened by AI as they considered the time when automation of jobs in Albania could be reached, to have a long path, not only of the capital needed for investment but also of its adaptive infrastructure.

However, with the right technological advancements, they thought that the positive impacts would be on saving time on job performance, increasing work productivity, and economic growth. On the other hand, they were coherent with the changes and technological innovations at every moment, because they wanted to always be a valuable asset for the work they did. So if jobs were to be automated, it had to be partial and behind the work processes to be the ones running each process through AI.

CONCLUSIONS AND RECCOMENDATIONS

The proliferation of applications through AI development is thought to be the biggest technological change of recent times. Their general purpose implementation allows this new technology to be applied to a wider range of sectors and occupations, regardless of the level of skill of the employees, creating a panic about job automation, income inequality and control over people's lives.

According to numerous studies on AI and market research conducted in Albania, there are positive and negative views regarding the impact of AI that is claimed to have on employment and the economy. So far, we have seen major changes in employment but also in our lifestyle in what technology has brought about by the application of reactive AI (1), AI with limited memory (2) and AI with theory of mind (3) according to their respective forms. It remains to be seen how much free space for implementation the fourth form of AI will have. This form is discussed to be as positive in facilitating work processes as well as highly problematic in adversely affecting human life. AI may indeed be an algorithmic solution but it will be an "ethical" dilemma on what should be automated and what not. Every human resource along with its database must be truly protected and secure for the privacy of its information.

Also, a great deal of attention should be paid to the policymakers of developed and developing countries, on the attention they give to investment in technological innovation. They should be on the principle that any technological innovation that is

implemented improves and facilitates human life rather than making it difficult by excluding it from any decision-making in the economy and, at worst, "putting it out of the game" with the replacement of a robot. At the same time, policymakers should control and restrict private entities from investing without control in technological systems and prevent market switching to a monopoly on the services provided by them.

Every AI implementation requires in-depth knowledge of technology, capabilities and limits in advance. If our goal is impossible, adopting AI would be a failure. It is vital for a person to know and manage it's own tendencies, to understand the objective to be achieved, to know the possibilities of AI and how it can be used in function of improving the business and not only, by having sufficient knowledge in the control and maintenance of technology. Technology innovations through AI are inevitable and human resources need to be updated with new technological changes and qualified by leveraging AI's capabilities to optimize performance and financial outcome, establishing the ultimate "human-machine" collaboration.

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THE BEST METHOD FOR VALUATION OF BIOLOGICAL ASSETS

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ABSTRACT

The purpose of this paper is to understand the way followed to compose and improve the international accounting standard for biological assets and also which are the practices for its application. Various theories related to the need of harmonizing accounting practices will be brought up, as well as theories on the use of fair value in improving the quality of financial reporting.The greatest advantage that developing countries like Albania have, is that they can choose between the techniques and opportunities that most developed countries offer. Studies found out that figures presented at fair value are even more realistic in some cases than historical cost estimates. This was related to the type and longevity of biological assets.
Studies have also analyzed in-depth the ways in which standard makers influence policy choices. However perfect the standard may be, the level of decision-making, still has a significant impact on the quality of reporting. This means that the transmission mechanism causes transformation in the purpose of the standard. The standard is amended and improved for one purpose, and it is used for another one.The following studies are also presented according to the evolution of thinking in both schools, in the schools of east, based in rules, and in that of the west, based in principles, highlighting the advantages and disadvantages of choosing the valuation method and reporting the values of biological assets in the financial statements.

KEYWORDS M40:

Biological assets, international accounting standard, fair value.

MEASUREMENT OF BIOLOGICAL ASSETS

Much debate is on whether to use the fair value model or not, as a way to replace the cost model for measuring and evaluating biological assets. Some scholars hold a critical view of using fair value to evaluate biological assets and presenting fair value changes in the statement of results. While a good deal of researchers value fair value as a very appropriate way of fair valuation of biological assets. It is no coincidence that such debates also confront accounting schools, the rule-based birth justifies the historical cost, while the principle-based western school strongly advocates fair value as a very positive innovation and opportunity for a real and fair assessment. The determination of the fair value of biological assets, as provided for in the standard, was carried out by several methods. The standard method permitted was using the latest market transaction prices for biological assets, otherwise known as the market method, as a marker. This method is easily applicable and fully identifies fair value when there is an active market. But how should the entity act to properly evaluate the asset in the event that such a market is missing? The standard presents ways that are to some extent assumptions of a similar reality. If the current market is missing, the reference is made to the latest transaction in that market. If the asset is missing, it has not been traded before, the reference becomes an asset, similar to the adjustment. If both are missing, the reference is made to the standard indicators to consider, which are standard sectors related to the biological assets for which value is needed. It is understandable that each of these modes of evaluation yields different results.

The alternative method suggested by the standard was using the flux discount model. This method doubles the possibilities for hypotheses. First, there are assumed flows, not real but predicted to occur in the future, and second, how the discount rate could be determined to justify the risk assumed. Only when both methods could not lead to a reliable estimate of the fair value of the asset did it move to the historical cost model. Even this model itself has its own questions because it does not fully fit the conditions at the reporting date. Historical cost begins with the entity's history of the asset and adjusts for changes from one accounting period to another by depreciation and amortization. It may be that the value of the biological asset increases rather than decreases. The prudential principle really protects an entity because it reports its asset and performance at the lowest possible value but does not reliably and truthfully represent reality. By the cost model the unit cannot present its potential, or the possibility for more in the future.

SUBSEQUENT AMENDMENTS TO IAS 41

International Accounting and Financial Reporting Standards are in the process of being constantly amended by their drafters and publishers. Specifically, IAS 41 has been amended since its publication in 2001, with the aim of avoiding irregularities in regulations and publishing in a clear language. In 2007, the IASB received feedback from auditors, drafters and other field specialists on IAS 41. This response aroused much debate as circumstances arose where a decision was made to improve IFRSs

by regulation. The process for annual improvements began in January 2007.

The International Financial Reporting Standards Interpretation Committee (IFRIC) asked IASB staff to recommend to the Board some amendments to IAS 41. The proposed changes were part of the annual improvements in February 2007. The Committee noted that the standard ambiguity had created divergences for the accounting practice itself. This in turn could prevent readers of financial statements from reading and interpreting the statements properly (IASB, 2007).

The major difficulties were brought by paragraph 21 of IAS 41. In its original publication, it stated, "The reason for this calculation of the present value of expected cash flows is to determine the fair value of a biological asset in its current location and conditions. An entity should consider this reasoning in using an appropriate discount rate as well as in estimating the expected net flows. Current conditions of a biological asset exclude any increase in value as a result of the entity's additional biological transformation and future activities, such as those associated with increasing biological transformation, harvesting / harvesting and sales in future periods. " The Interpretation Committee argued that the last sentence could be interpreted such that changes in the fair value of biological assets, due to the increase, would not be allowed to be taken into account if a discounted flow model were used to estimate . According to this committee, the compilers of the financial statements could read this paragraph as a prohibition to include in the discounting model the amounts generated by the increase in the unmeasured assets in order to determine fair value. The proposed changes were for paragraph 21 and for the definition of biological transformation. It was agreed by the members present at the meeting that the prohibition of including potential future growth of the biological asset in the discounted model of expected flows excluded much of the fair value of the biological asset. In order to avoid misinterpretation and to fully disclose the fair value assessment, paragraph 21 of IAS 41 was removed. These amendments were published in May 2008, effective January 2009 and their prospective application. The changes that were made included not only the content, the way of knowing, measuring and presenting, but also the form, the necessary reformulation of some paragraphs. In this way, the alternative method of estimating the fair value of biological assets that was measured by discounting flows was removed.

CONTINUING STUDIES FOLLOWING THE AMENDMENT OF IAS 41

After the first amendment following the publication of IAS 41, more intensive studies and analyzes on the use of the fair value or cost model for the valuation of biological assets continued. A very massive study is the one undertaken by the Institute of Certified Accountants in Scotland with authors Elad and Herbohn (2011) where the implementation of IAS 41 in Austria, France, and the United Kingdom was evaluated.What is generally emphasized in the study is that the adoption of IAS 41 and disclosures about the fair value of biological assets for entities in different countries foster comparability of the performance and financial position of biological assets in different countries.

The main concern in recent studies relates precisely to strengthening the mechanism in order to achieve greater compliance and comparability between countries that have adopted IFRSs.

From the studies of a group of authors: B. Robin (2003); D. Burgstahler L. Hail (2006); Th. Jeanjean and H. Stolowy (2008) A. Haller and P. Walton (2006) I. Tsalavoutas (2011) it is argued that focusing solely on standards is incomplete when it comes to creating a common language in accounting. It is emphasized that those influencing the choice of accounting methods are executives and auditors. Whereas those who orient the financial reporting of a country are the market and the policy-making factor. Meanwhile, it is argued that the factors that play the most important role in choosing the characteristics of the financial reporting framework are national management and institutions, perhaps even more important than the standards themselves.

Another group of researchers analyzed the theoretical effect of IAS 41, but this time before implementation, as Herbohn and Herbohn (2006) did. These tireless researchers of biological assets have had the Australian Standard as object of study, which is very similar to IAS 41, applied in 2001. The authors draw conclusions from the study based on accounting practices in Australia and its expected consequences of IAS 41 in the EU forestry industry. Experience in Australian practice indicated that the main concern of IAS 41 proponents of measuring fair value assets was the inclusion of unrealized gains and losses on the outcome of the reporting period. The fear that precedes the application of this standard is that the fair value assessment of biological assets will change the outcome. According to studies conducted in Australia, net profit, after applying IAS 41 varied by approximately 27% after applying the fair value model compared to profit before applying this standard. And the next question that was added to the study was whether this standard manages to truly reflect the value of investing in forests.

Another group of researchers focused on the benefits and challenges immediately after the implementation of IFRSs, from the historical cost model to the fair value model. The conclusions highlighted the fact that the successful implementation of IAS 41 also requires other instruments. Following the application of IAS 41, another type of income will be reported, not only turnover income but also income from changes in fair value. In this way biological assets become not only the subject of valuation but also a source of profit or loss for the period.

Nobes and Schwenke (2006) have compared the situation before and after the application of IFRSs and concluded that their implementation enhances the comparability of financial information.

Following, are the most important arguments seen from a more general perspective analyzing the recognition and measurement of biological assets. Increasing volatility in the statement of comprehensive income, as well as recognizing unrealized gains and losses due to changes in fair value, are perceived as a downside to the cost model. While in recent works the concern remains with the quality of reporting of profits in the agricultural sector, their variability due to the use of different methods to estimate fair value. According to Rute Gonçalves and Patrícia Lopes (2012) the variables that were found to be positively correlated with fair value were firm size, legal adjustment, registration status, and the sector to which it belongs. The first conclusion of the study was that developed countries are more inclined to use the fair value model.

HISTORICAL COST OR FAIR VALUE

As stated above, historical costs need modification to an actual value, while fair value relies on assumptions, removing objectivity and somewhat compromising reliability. Referring to Mary Barth and Wayne Landsman (2010, How Does Financial Reporting Affect the Financial Crisis?), The dilemma of most research to date lies in whether using fair value provides third parties with more reliable decision-making information. compared to the cost, how reliable the fair value information itself is. But when it comes to the fair value of biological assets, it should be noted that they have an unusual character because they are self-generated or regenerated without the need for additional inputs, such as water, air and sun so that next year they are no longer the same. According to a study conducted by ICAE - The Institute of Chartered Accountants of England and Wales, in 2012, 144,000 Worldwide Certified Accountants were asked which valuation method they would use to evaluate biological assets, when both methods are possible, most have preferred historical cost over fair value.

A study conducted in 2014 by the accounting department, University of Barcelona, contradicts the use of the fair value model with reference to IAS 41. The empirical data study showed that the use of fair value for biological assets, compared to historical cost, changes the value of assets and income, but does not result in significant changes in profit, volatility or accounting manipulation.

Referring to the two studies above, the importance of their conclusions is noted, both in terms of level of studies, professionals and academics, as well as in terms of mass. These conclusions more than contradict each other. It seems as though professionals prefer not to change the valuation method and continue to use the historical cost, even though its disadvantages have been pointed out for more than two decades. Whereas, if IAS 41 were applied regularly, the changes would include both a statement of position and performance, but not at a statistically significant level. Studying academics in this case assures professionals that they are not afraid of change.

CONCLUSION

The increasing importance of biological activity as a way to avoid poverty in developing countries and to benefit more from biotechnology in developed countries has made the new century more and more demanding and innovative and also better ways of using them. An international standard has been developed for this activity only. The purpose of improving and facilitating implementation has led to improvements to the reporting standard itself. It is currently a clear standard and most likely to be implemented. So tolerant are these opportunities that they have even sparked debate and studies have been undertaken to analyze whether this freedom brings benefits or costs.

Studies and practices to date have the same conclusion, that it is difficult to enforce this, not because of the standard rather than the very nature of biological assets. An even greater relief is the recent amendment to the standard whereby biological asset holders have been singled out as in the case of plantations;

Studies up to now, are a very good orientation to show how thought has evolved, how ideas have been beaten and achieved at their best, theoretically and practically. Given that historical cost was considered a static, outdated, not very active way of valuing to represent reality in perpetual change, the transition to fair value was required.

It is concluded that, before and after implementation, the fair value valuation method also has disadvantages. The golden middle would be a fair value if not much in the future. There continues to be doubts about the quality of financial reporting using the fair value method, especially in dealing with biological assets with more than one use cycle. At other asset levels this valuation approach is very positive for more liquid, marketable, market-related assets.

In addition to the factors that affect compliance with the standards, it should be noted that for a much better quality financial reporting and to disobey the standard, professionals play an essential role.

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PREMISES FOR INDUSTRY 4.0 DEVELOPMENT IN THE ALBANIAN MARKET

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ABSTRACT

The integration of the Albanian economy into the European and global markets cannot be achieved outside the process of the latest technological developments, including Industry 4.0. This study intends to remark the branches of Albanian economy that largely fulfill the prerequisites for adapting and implementing particular technologies of Industry 4.0.

There is a question brought in: How much economic actors in Albania are ready to develop elements of Industry 4.0 in some of the important branches such as: construction, logistics, trade, agriculture, etc? In order to answer this question, the paper check over the key factors that stimulate and impede the development of Industry 4.0 elements mostly in mentioned branches. The analysis of such factors is the premise for building an economic, social and political vision of the I4.0 development process in the Albanian economy. The economic environment is viewed in terms of the level of entrepreneurship development and in terms of public economic policies.

The transformation of the general education system, in particular the higher education in short and medium terms, is considered as a key factor for implementing the elements of industry 4.0. This need relates to the new skills and roles of the labor force that must be prepared to implement I4.0 elements. At the same time, it relates to the re-qualification of the existing labor force that will have to work in an advanced technological environment. Despite the fact that the stimulus comes from technology, the focus of our analysis is the overall organization and management.

The opportunities for implementation of Industry 4.0 in Albania are analyzed by regarding:

- as an internal need for the development of the Albanian market,
- as a tool for enhancing competitiveness and
- as an element that stimulates the integration of the Albanian economy into the European and world economy.

KEY WORDS:

Industry 4.0, Digital economy, innovation, life-long education, customization.

1. INTRODUCTION

Concepts like 4-th Industrial revolution and terms like Industry 4.0, Factory 4.0, Agriculture 4.0, Entrepreneurship 4.0 and up to Marketing 4.0 are becoming common words in the economic literature nowadays in Albania. So far they are mostly recognized words. De facto, there is a lack of broad understanding for them and of the approach for Albanian businessess to adopt the enabling technologies of Industry 4.0. The reason is not the missing interest of researchers and managerial teams, but mostly the market size, its limited envolvement in the international supply chains, as well as the economic level of the country. Our work intends to draw the attention to the opportunities for an advancement of Albanian companies towards Industry 4.0, in terms of technology, management, education.

We have raised several questions:

Are economic actors in Albania ready to develop and/or implement elements of Industry 4.0?

What are the branches of economy most close to the new technologies?

What are the key factors that stimulate or hinder the development of Industry 4.0 in these branches?

There are efforts done to modestly analize the situation in country and bring some insights as regards to the future of Industry 4.0 in the Albanian market.

2. HOW INDUSTRIAL REVOLUTION CAME TO ALBANIA

Talking about the future, Klaus Schwab, one of the most known authors of fourth industrial revolution, makes a short description of the background. He points out that over the past 250 years, three industrial revolutions have transformed the way human beings create value and have changed the world. In each, technologies, political systems and social institutions all co-evolved, changing not just industries, but how people saw themselves, related to one another and interacted with the natural world (Schwab, 2018).

The first Industrial Revolution started in Britain's textile industry in the mid-

18th century and was spread in most of European countries by the end of the 1800s (Encyclopedia Britannica). The beginning of 20-th century did mark the second industrial revolution, with the massive production and changes in the economic models of development.

However, none of these waves could arrive in Albania in due time. The industrial development of the country has followed a different course. As prof. Banja, 2017, describes it, Albania bounced from feudalism to the country's industrialization in the mid of the 20-th century. In around five decades the country could advance to provide 45% of its GDP from the mining and industrial production, under a centralized and planned economy. After the '90-s, it jumped to a market economy, unfortunately renouncing for several years from the production and the further advancement of the industry. It happened almost at the same time with the third Industrial Revolution, which was pushing the world in a higher stage of development, hopefully reaching Albanian market without too much delay. In few decades the fourth industrial revolution got the international attention and interest, but not yet that of Albanian business.

This distinct course of Albanian industrial development has affected the outcomes expected in each stage. The missing growth and opportunities have brought to a slow-down of country advancement. Consequently, our study regarding the level of Industry 4.0 in country has faced some difficulties and limitations:

- to figure out the relevant branches for the survey;
- to use methods of evaluation and analysis like those from countries already experienced in embracing the innovative technologies and digitization process;
- to adopt indicators and enable measuring of Industry 4.0 level of penetration in country. (GTAI, 2019)

However, the fourth industrial revolution promises huge economical potential as well as provides outstanding ecological and social opportunities, making worthwhile the efforts to approach it in the Albanian context.

Every stage of industrial development has been followed by an essential change in the relation between human and machine. The technical progress goes along with new economic models and theories. The researches reveal the differences between waves and the expected outcomes. The study from PwC, 2016, describe them as follows: "While Industry 3.0 focused on the automation of single machines and processes, Industry 4.0 focuses on the end-to-end digitisation of all physical assets and integration into digital ecosystems with value chain partners. Generating, analysing and communicating data seamlessly underpins the gains promised by Industry 4.0, which networks a wide range of new technologies to create value".

Companies and countries adopting the elements of Industry 4.0 are expecting quantitative benefits in four areas: higher productivity, revenue growth, increased employment and investment. Industry 4.0 will have a direct effect on producers and their labor force as well as on companies that supply manufacturing systems (Gerbert et al., 2015).

There are nine technology trends that are the building blocks of Industry 4.0 and mostly bear the potential technical and economic benefits for manufacturers and

production equipment suppliers. Our study goes beyond the technological details and is mainly focused on the actors and factors driving the wave of development towards Albanian economy, although its actual weak position.

This has been inspired by the statement that every country and everybody should benefit, phrased by Schwab, 2018, "Appreciating the importance of the Fourth Industrial Revolution and shaping it for the benefit of all, rather than just those privileged enough to be wealthy or skilled, requires a new way of thinking and a broad understanding of the different technologies that will impact individuals, communities, organizations and governments."

3. DRIVERS OF INNOVATION AND TECHNOLOGICAL ADVANCEMENT IN ALBANIAN COMPANIES

It is hard to detect any clear development of Albanian industry that can be nowadays categorized as part of Industry 4.0 trend. However, the envolvement of Albanian economy in the international one, the participation of companies in the international business activities and the ICT expansion in country is directing companies towards the implementation of Industry 4.0 enabling technologies. For the purposes of this work, the process of recognition, acceptance and implementation of Industry 4.0 elements in the Albanian companies is perceived in close relation with the concepts of innovation and digitization. These last concepts are more obvious and known for many of managers that lead Albanian big companies, while Industry 4.0 is still an unfamiliar notion.

Fourth Industrial Revolution technologies are truly disruptive, they upend existing ways of sensing, calculating, organizing, acting and delivering (Schwab, 2018). The changing technologies are accompanied by new economic models, new managerial approaches, human -machine relations and other changes. The resistance to change might be part of the process, the same as the tendency to adopt the most innovative ways of producing, servicing, doing business, learning and so on.

We have considered six main factors that affect the process of innovation, digitisation and implementation of Industry 4.0 enabling technologies amongst the Albanian companies. The survey is realized through interviews done with top managers of big companies carrying out activity in several branches: construction, industry (food & drinks), wholesale trade. The choice corresponds to main economic activities in Albania, in terms of GDP structure (A2, A3, A4), according to INSTAT publications (INSTAT, 2018). They are asked to assess the influence of these main factors on their companies' decision making.

Two of the factors, respectively: company budgets for investment, research & development, and grants & other project funds from outside the company, imply the relation between innovation and financing opportunities.

Suppliers and customers are two groups of actors that highly influence the company' activities, being part of the value chain and representing the level of market development and integration.

The two last factors relate to the transmission and transfer of knowledge, as an intrinsic part of the whole development process. The universities and consultancy organizations are playing a crucial role in the analysis, assessment and stimulation of Industry 4.0 paradigm itself, as evidenced by the vast literature recently provided (PwC, 2016), (WEF, 2016), (OECD, 2018 and 2019), etc. Mergers, acquisitions, joint-ventures, from the other side, are becoming a strong instrument to disseminate innovative technologies, management approaches, learning methods, amid companies, markets, countries as well.

The interviews with top managers have enabled us to analyze the data collected and provide the following results and discussion (Figure 1).

The factor considered as the most influencing in the process of innovation and adaptation of new technologies and elements of Industry 4.0 in general, is the role of customers. Demand from the customers is pushing companies to provide new and/ or improved products and services in a competitive environment. Albanian companies tend to fulfill the market demand by providing customized products and services while lowering the cost. A new level of mass customization is expected by companies due to innovation and digitization of their processes, contributing to a faster response to customer needs. And it lays the foundation for the adoption of new business models, production processes, and other innovation, as evidenced by other researches in the European economies (Gerbert et al., 2015).

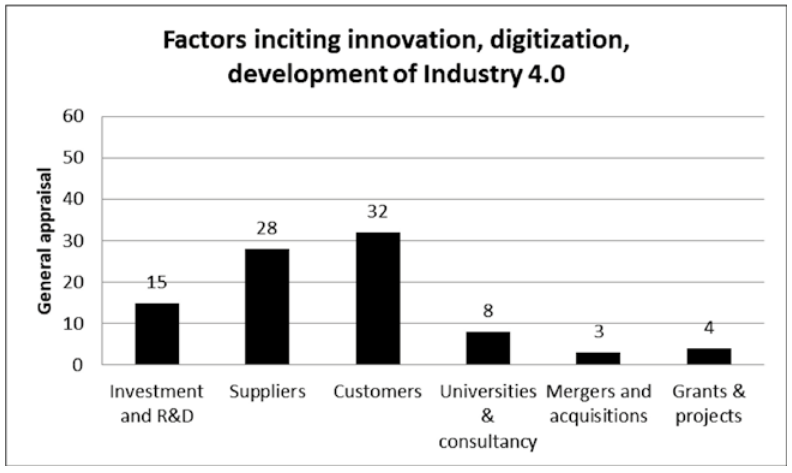


Fig. 1. Results of the interviews (source: the authors).

The next promoter highly orienting companies from the most innovative solutions and technolgies is the group of suppliers. We should mention the fact that many of the companies under survey are depending on products imported (the case of trade companies), or on machineries, production lines, technologies imported (the case of manufacturing companies, either local ones, or subsidiaries of foreign firms working in Albania). This explains the great importance of the suppliers role in providing the recent technological trend together with the goods and machineries.

Both demand and supply – key factors that determine the progress of a market - obviously play the crucial role to encourage implementation of elements of Industry 4.0 in Albanian economy. However, the demand seems to be the dominant factor, which is justified by the fact that Albanian market is still eager to import goods more than capital. With more investment and a stronger local production the entry of innovative tchnologies and implementation of I4.0 elements would be faster.

Investment of companies for technolgy, innovation and R&D are the third factor, according to the opinion and assessment of their top managers. We have associated it with the other factor, grants and projects, which is ranked the last but one from this survey. The reason is that they both condition the financing opportunities, but come from different sources for the companies. The first one comes from internal sources (profits) and capabilities of the companies (financing institutions), and they are limited. Grants and projects are becoming an important source of "feeding" companies from outside with funds for development and innovation, especially in regional and global level. There is an opportunity generally utilized in European countries (EU-SE, 2017), which is open to Albanian companies as well. However, the companies have difficulties to get use of these grants and projects offered, which could contribute to accelerate the process of innovation and digitization. This is an issue that requires the intervention and support of other stakeholders but companies, adequate for a separate study. As the GE Global Innovation barometer 2018 shows, the private sector has been taking the lead on innovation, but now people around the world want government to drive more innovation, to play a stronger role in encouraging entrepreneurship and fostering a business-friendly climate (GE-GBI, 2018).

We were expecting a higher influence from the institutions of science and research, like universities and consultancy organizations, on the innovation and technological development in Albanian companies. It did not result so. The role of universities was very limited, only in the construction sector, while companies from other sectors did report some support from consultancy institutions or freelancers. This component of survey did motivate us to watch the relationship of innovation and education in country, as described shortly in the following section.

The above factors are not the only drivers of innovation and implementation of I4.0. There are other factors, defined in different researches, which have a minor or a hardly measurable influence in our country conditions. We are only mentioning a few of them. The young age of population, the development of digital infrastructure and the country aspirations for European integration are amongst the stimulating factors. Otherwise, the factors preventing the advancement include the lack of industrial tradition, the market size and isolation, as well as the effectiveness of education reform.

4. INDUSTRY 4.0 AND EDUCATION

The recognition of new technologies alone is not sufficient for their implementation today and in the future. As Marr, 2019, appoints it "For our children to be prepared to engage in a world alongside smart machines, they will need to be educated differently

than in the past". It intends that education in general would face challenges in coming years, in order to respond to the changes the Industry 4.0 is bringing. Some of them are related to the structure of education, while others touch the content.

We do start with the redifinition of the education purpose, which should adapt to needs of the society for the future years, as considered by reserachers and international organizations (OECD, 2018), (WEF, 2016). Especially universities should think differently about how new educational futures can be constructed. Then, the development of human potential becomes a necessity, in order that people "are equipped to partner with machines in the future rather than compete with them" (Marr, 2019).

Improve STEM education for several years has been an issue of discussion. The need for technical skills in the age of technology is obvious and improving science, technology, engineering and math skills is expected to contribute to the shaping of individuals and the society (Fisk, 2017). There is actually a big demand for people with STEM skills in different countries (Schneider, 2018).

At this point, we ask the question: How does Albanian higher education correspond to industrial development?

Engineering (with its subdivisons) and computing (with its subdivisions) are the main branches directly related to the education for the industrial development, making respectively the hardware and the software. The Albanian higher education, both in public and private institutions is actually providing these diplomas, in undergraduate, graduate and doctoral levels. Assessing the adequacy of higher education to support the implementation of Industry 4.0 in country would require the analysis of the quantity and quality provided by engineering and computing studies. An empiric quantitative analysis shows a relatively limited number of graduated students in these branches, in last four consecutive years. They represent respectively less than 10% (for engineering, manufacturing, construction) and less than 7% (for ICT programs) of the total students graduated each year (referring to a total of 34.331 graduates for 2018), as figure 2 displays.

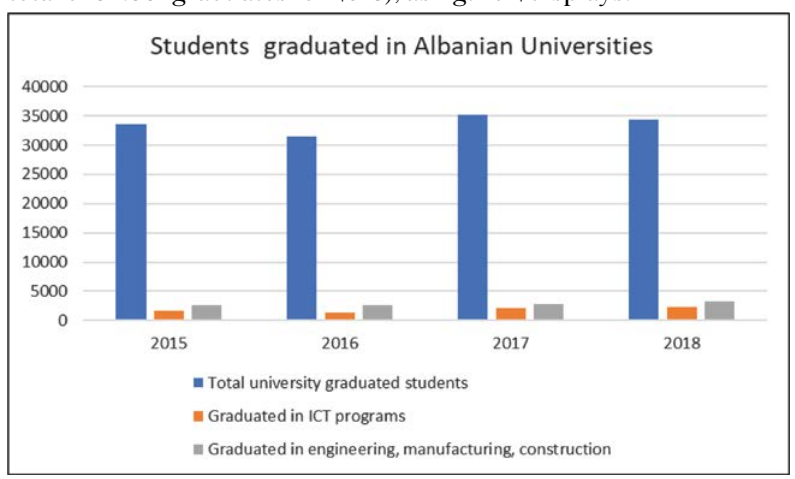


Fig. 2. Industry related education in Albania (source: INSTAT, processed by authors).

Even without a qualitative analysis of the education provided, the small available number of those that have to drive the industrial development of the country and enable the Industry 4.0 implementation in the near future does not seem very encouraging.

Another challenge for the education is to adapt to lifelong learning models. Changes in jobs, new skills required and longer life of people incite the education to become a lifelong endeavor, and sources for education need to evolve to provide those opportunities. Preparing the new generation and re-qualifying the existing workforce for the coming years of industrial development and digitization is a challenge, as well as an obligation of Albanian education system.

5. CONCLUSIONS

The enabling technologies of Industry 4.0 will ultimately enter in the Albanian economy. Our efforts to survey and analyze the situation in country regarding the readiness for such development have permitted to draw several conclusions.

Firstly, it was evidenced that economic actors in Albania are not yet quite ready to develop and implement elements of Industry 4.0. The sooner top managers of companies and other stakeholders realize this and invest to accelerate the process, the better they will increase their capabilities and face the competition in a digital single market, either local or global one. Further on, this is valid for all companies in economic activities like construction, manufacturing, engineering and ICT related services, that seem closer to the new technologies since now. However, other branches can be added to the list in short or medium-term, as the experience of developed countries has shown.

After discussing the driving forces for the Industry 4.0 in Albanian environment, as described in section 3, we did pay some more attention to the academia, with a few reccommendations.

As the future work will become more flexible, diverse and requiring, the education system need to prepare the generations for this type of work. Industry 4.0 relies on STEM, on the creative, communicative, cooperative human skills and on the critical thinking. Albanian education system, especially the higher education, should contribute to provision of such skills for the younger generation that will make the workforce of tomorrow.

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USING THE NATURAL LANGUAGE PROCESSING ALGORITHM TO ANALYZE THE SENTIMENT OF USER BEHAVIORS IN SOCIAL MEDIA

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ABSTRAKT

In recent years, the online social network has revolutionized interpersonal communication. Recent research on language analysis on social media is increasingly focusing on the latter's impact on our daily lives, both on a personal and professional level. Natural language processing (NLP) is one of the most promising avenues for processing social media data. It is a challenge to develop robust methods and algorithms which extract relevant information from a large volume of data coming from multiple sources and languages in various forms or in free form.

KEYWORDS:

Natural language processing, social network, language analysis, algorithms

INTRODUCTION

Natural Language Processing (NLP) is a tract of Artificial Intelligence and Linguistics, devoted to make computers understand the statements or words written in human languages. Natural language processing came into existence to ease the user's work and to satisfy the wish to communicate with the computer in natural language. Since all the users may not be well-versed in machine specific language, NLP caters those users who do not have enough time to learn new languages or get perfection in it.

The goal of Natural Language Processing is to accommodate one or more specialities of an algorithm or system. The metric of NLP assess on an algorithmic system allows for the integration of language understanding and language generation. It is even used in multilingual event detection purposed a novel modular system for crosslingual event extraction for English, Dutch and Italian texts by using different pipelines for different languages. The system incorporates a modular set of foremost multilingual Natural Language Processing (NLP) tools. The pipeline integrates modules for basic NLP processing as well as more advanced tasks such as cross-lingual named entity linking, semantic role labelling and time normalization. Thus, the cross-lingual framework allows for the interpretation of events, participants, locations and time, as well as the relations between them. Output of these individual pipelines is intended to be used as input for a system that obtains event centric knowledge graphs. All modules behave like UNIX pipes: they all take standard input, to do some annotation, and produce standard output which in turn is the input for the next module pipelines are built as a data centric architecture so that modules can be adapted and replaced. Furthermore, modular architecture allows for different configurations and for dynamic distribution.

APPROACHES TO NATURAL LANGUAGE PROCESSING

Natural language processing approaches fall roughly into four categories: symbolic, statistical, connectionist, and hybrid. Symbolic and statistical approaches have coexisted since the early days of this field. Connectionist NLP work first appeared in the 1960's. For a long time, symbolic approaches dominated the field. In the 1980's, statistical approaches regained popularity as a result of the availability of critical computational resources and the need to deal with broad, real-world contexts. Connectionist approaches also recovered from earlier criticism by demonstrating the utility of neural networks in NLP. This section examines each of these approaches in terms of their foundations, typical techniques, differences in processing and system aspects, and their robustness, flexibility, and suitability for various tasks.

SYMBOLIC APPROACH

Symbolic approaches perform deep analysis of linguistic phenomena and are based on explicit representation of facts about language through well-understood knowledge representation schemes and associated algorithms (21). In fact, the description of the levels of language analysis in the preceding section is given from a symbolic perspective. The primary source of evidence in symbolic systems comes from human-developed rules and lexicons.

STATISTICAL APPROACH

Statistical approaches employ various mathematical techniques and often use large text corpora to develop approximate generalized models of linguistic phenomena based on actual examples of these phenomena provided by the text corpora without adding significant linguistic or world knowledge. In contrast to symbolic approaches, statistical approaches use observable data as the primary source of evidence. A frequently used statistical model is the Hidden Markov Model (HMM) inherited from the speech community. HMM is a finite state automaton that has a set of states with probabilities attached to transitions between states . Although outputs are visible, states themselves are not directly observable, thus "hidden" from external observations. Each state produces one of the observable outputs with a certain probability.

COMPARISON AMONG APPROACHES

From the above section, we have seen that similarities and differences exist between approaches in terms of their assumptions, philosophical foundations, and source of evidence. In addition to that, the similarities and differences can also be reflected in the processes each approach follows, as well as in system aspects, robustness, flexibility, and suitable task

To summarize, symbolic, statistical, and connectionist approaches have exhibited different characteristics, thus some problems may be better tackled with one approach while other problems by another. In some cases, for some specific tasks, one approach may prove adequate, while in other cases, the tasks can get so complex that it might not be possible to choose a single best approach. In addition, as Klavans and Resnik (6) pointed out, there is no such thing as a "purely statistical" method. Every use of statistics is based upon a symbolic model and statistics alone is not adequate for NLP. Toward this end, statistical approaches are not at odds with symbolic approaches. In fact, they are rather complementary. As a result, researchers have begun developing hybrid techniques that utilize the strengths of each approach in an attempt to address NLP problems more effectively and in a more flexible manner.

SENTIMENT ANALYSIS

Sentiment analysis is the process of using natural language processing, text analysis, and statistics to analyze customer sentiment. The best businesses understand the sentiment of their customers—what people are saying, how they're saying it, and what they mean. Customer sentiment can be found in tweets, comments, reviews, or other places where people mention your brand. Sentiment Analysis is the domain of understanding these emotions with software, and it's a must-understand for developers and business leaders in a modern workplace.

As with many other fields, advances in deep learning have brought sentiment analysis into the foreground of cutting-edge algorithms. Today we use natural language processing, statistics, and text analysis to extract, and identify the sentiment of words into positive, negative, or neutral categories.

Sentiment analysis is done using algorithms that use text analysis and natural language processing to classify words as either positive, negative, or neutral. This allows us to know how people reaction on social media are.

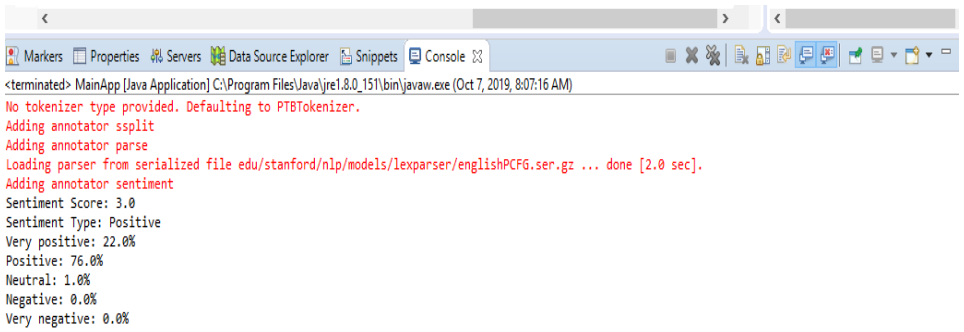
Algorithmia provides several powerful sentiment analysis algorithms to developers. Implementing sentiment analysis in your apps is as simple as calling our REST API. There are no servers to setup, or settings to configure. Sentiment analysis can be used to quickly analyze the text of research papers, news articles, social media posts like tweets and more.

Social Sentiment Analysis is an algorithm that is tuned to analyze the sentiment of social media content, like tweets and status updates. The algorithm takes a string, and returns the sentiment rating for the "positive," "negative," and "neutral." In addition, this algorithm provides a compound result, which is the general overall sentiment of the string.

Input Example:

Love is a really scary thing, and you never know what's going to happen. It's one of the most beautiful things in life, but it's one of the most terrifying. It's worth the fear because you have more knowledge, experience, you learn from people, and you have memories

We have choose a confusing example .



This algorithm is based on the Stanford CoreNLP toolkit.

The algorithm takes an input string and returns a rating from 0 to 4 ,the type that sentence is classified , which corresponds to the sentiment being very negative, negative, neutral, positive, or very positive. This can be implemented also with big datas from social media and at the end we can learn about many peoples opinion.

CONCLUSIONS

It is very important to analyze how people think in different contexts about different things. This is all the more important when it comes to the business world, because every business is dependent on its customers and they try to make their products or services meet the customer requirements. So knowing what they want, what they think and talk about existing products, services and brands is more useful for businesses to make decisions, such as identifying competitors and analyzing trends. Because people express their opinions on social networks and this data can be used, it has made it possible for some of the aforementioned things to be done using this data. The project, Opinion Analysis for Social Networks has done this.

From the top-level view of the project, we take data from social media sites to extract sensations from them and keep track of those sensations along with user information that experienced those sensations in order to be used more later. As a final step, the data are processed with the extracted sensations so that they can be used in product profiling, trend analysis and forecasting. After developing the 'crawler', the main challenge to be addressed is how to decide whether a particular sentence is positive or negative, or neutral. The first thing found to address this challenge was a lexical source of data called SentiWordNet, given that there are positive and negative results for each word. Although it has positive and negative results for almost all English words, when it comes to sentences, this lexical source changes the overall polarity of a sentence by context. This solution cannot parse words in short terms, which reduce accuracy and sometimes render the result incorrect. Moreover, it sometimes does not give correct polarity values for sentences that include terms like "not good", "not bad"

When implementing the sentiment module, several issues should be considered, such as:

- The comment from the user of a product or brand can be not only in English but also in other languages, with emotional symbols etc.
- The comment may not fully match what the user should exactly say about the product or brand
- Identifying the entity
- Identify the link of a particular comment to previous comments
- Uncertainty of comment words
- Communication or writing in jargon

Despite these difficulties, with machine learning techniques, more accurate results can be achieved after constructing classifiers based on large labeled datasets.

By using a punctuation system for feelings about the particular product or

service with user information, we can successfully profile products, analyze trends and forecast. So the system is capable of saying how a group of people of a certain age or a particular area with a particular profession think of a particular product or service and how that approach may change in the future, which is the most useful information when it comes to the business world.

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INDUSTRY 4.0 IN SHIPBILDING PRINCIPLES OF INDUSTRY

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ABSTRACT

Manufacturing companies and industries are being guided by industry 4.0 principles which are directing them to be computerized and automated so as to produce advanced ships and also vehicles. More and improved processes have been advanced in the construction of the ships. It has led to more efficient ships and an improvement in their performance. New technology has been used and therefore better ships have been manufactured. The manufactured ships are strong, durable, efficient and economical and they are easy to keep their maintenance. Some of the advancements and improvements are as discussed below:
Significant changes have been noted on the physical appearance of ships which have been manufactured using the latest technologies. Industrial 4.0 revolutions have used physical systems from cyber and internet which include support designs and newest trends in manufacturing. They have helped increase creativity, the cost has reduced and the needs of the customers have been satisfied. The demand has increased so much since better ships with good designs have been manufactured. Computer-Aided Design (CAD), has helped so much in ensuring beautiful designs are created (Awang et.al 2010). A lot of innovations and advancements have been made to ensure optimal solutions are met. The availability of evaluation tools helps in making the design process automatic.

KEYWORDS:

industry 4.0, construction, shipping, innovation, efficiency.

INTRODUCTION OF SENSORS IN SHIPBUILDING

Ship industry manufacturing has experienced a lot of competition from different manufacturing companies. To beat that competition, companies have manufactured ships which are cheaper and of good quality. Prototyping has been used as the only option to ensure maximum output, lower costs of ships and reduced weight of the vessels. Advanced software is been used to ensure good designs are created. This has enabled easy marketing and the products are of high quality, have good performance and it is reliable. Customized designs are also available where customers can give designs they want for the manufacturing of ships (Kim et.al 2006). This makes the customers be satisfied because they are involved in the making of designs. The costs of the designs are low such that the customers are able to afford it.

These are devices that have been used to detect the environment and place where a vessel is operating in, it also used to know the state and features of a vessel. It is also used to detect the mental and psychological well being of the ship crew operating the ships. Sensors technology has helped so much where information and data can easily be got. Through the internet, actual monitoring of the vessels has been made easier where a person can be able to know the environment of the ocean and therefore measures are taken when there is a possible danger that is about to happen. In case of an emergency, the ship crew is notified by the sensor which sent a signal to them. it has helped so much in ensuring that risks have been reduced. Possible measures are taken and therefore in recent times, sea accidents have been reduced.

SHIPBUILDING ROBOTICS

Robots have been made which are helpful in the process of constructing ships and maintaining them. they are capable of performing tasks that are dangerous when done by human beings. Robots have therefore been introduced to perform such tasks which include welding (Kim et.al 2005). There is also a shortage of skilled labor in welding and therefore robots are used as an alternative. Robots play the following roles in shipbuilding: lifting heavy machines, welding, painting and other jobs in shipyards. Since they perform tasks faster, they are capable of performing a lot of tasks in a short period. This leads to increased outputs. Initially, the robots were designed to do welding tasks in shipyards. Lately, other robots have been manufactured which are able to clean pipes and do some inspections in ships. Spider Robot is an example of a modern robot that crawls on the surface of ships. It helps in preparing the vessel surface for painting. It cleans and blasts away rust and other materials which make it easy for the process of painting. Advanced robots are being constructed and in the near future, the process of shipbuilding will be easy. More smart and digital vessels have been constructed.

Introduction of Liquefied Natural Gas (LNG) fueled engines. There has been a significant improvement in the use of LNG fuels whereby it is friendly to the environment. It does not harm the environment and thus good for the ships. The market for LNG fuel has increased so much in recent times. Carbon dioxide emission has been reduced by twenty-five percent through the use of LNG engines. Modern ships have been fitted with those engines and there has been a lot of benefits to the surrounding environment. Human and aquatic life is now safe and diseases that come as a result of emissions from the vessels have reduced. The majority of engine designers for ships which include Rolls-Royce, Wartsila, Turbo and Mitsubishi are making advancements in fitting ships with LNG engines which will use LNG fuel (Laugsand,2017). Countries are advocating for this engine because they keep the environment clean. Furthermore, LNG fuels are slightly cheaper and economical than diesel fuels. Ship-owners are able to save a lot from purchases of these fuels from time to time. LNG engines are easier and cheaper to maintain compared to diesel engines.

ADVANCED MATERIALS

Shipbuilding 4.0 has led to the use of Bucky paper which is a thin sheet from carbon nanotubes in the manufacturing of ships. It's lightly in weight compared to steel but stronger than it. It is stronger than diamond and hence favorable for making ships. Vessels that have been built from this material use less fuel and therefore it will increase the efficiency of the energy. The ships are so strong that they can be able to carry a lot of materials. Transportation becomes easier since they can cruise well on the water. The speed is so high and therefore they can be able to move for longer distances at a short time carrying a lot of luggage. The material is also resistant to corrosion, this makes it last longer without being damaged. It is also retardant to the flame. It does not catch fire easily and hence a reduction in ship accidents. This advancement in shipbuilding has been of great help since better ships have been constructed which last longer and have minimized sea accidents. Airplane manufacturers have been advised to use this material in their manufacturing companies.

Advancement of technology in building and repair of ships, availability of finance has enabled manufacturing bigger and sophisticated ships (Kowalczyk, 2018). They have the capacity to carry a lot of things; can cruise long distances within a short period. They have made countries and people to invest in the logistics sector, ports. Infrastructure has improved so much so as to enable the business to go on well. People have secured jobs in ship manufacturing companies and also others have trained as captains for those ships. The ships are fitted with comfortable chairs where people can feel comfortable. Their transport charges are little and people are able to travel for longer distances. The maintenance costs for the ships are so low because their materials are so strong and therefore, they can last for a longer period of time without getting rust. Ships are being constructed in ballast-free designs. It helps in balancing seawater and ensures a constant flow of water in and outside of the ship.

CONCLUSION

In conclusion, industry 4.0 has helped so much in the building and construction of ships worldwide. Improved ships have been manufactured in recent times. Large capacity ships that are able to carry a lot of luggage have been constructed. They are long-lasting, faster and they use less fuel. They can be used to cruise for longer distances in a short duration of time. They are fitted with sensitive devices that can detect any emergency which might happen unrecognized hence sea accidents have reduced so much. This technology is also being used in the manufacturing of vehicles and airplanes. The cost of the ships is friendly to the customers and many people have been able to purchase them.

Their maintenance costs are too low such that people can afford to maintain the ships. LPG engines have ensured that the environment is well maintained and free of contamination. Aquatic and human life is at peace.

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INNOVATION TECHNOLOGY IN EDUCATION

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ABSTRACT

There are many different ways of looking technology influence in Education there are advancements and disadvantage.

Technology promotes independent learning in students the internet is a treasure trove of information. Preparation of students for the future from the way technological advancements are ongoing, it is obvious that the future will be digital and technology-focused.

Has the potential to lower textbook and tuition prices with resources more accessible and in great abundance, the cost of textbooks is likely to decrease. Allows teachers to create an exciting way to educate students when the only tools for teaching are limitation to books, a blackboard or whiteboard, and a chalk or markers, innovation in technology encourages development of new teaching methods. Some of the disadvantage of technology in education is the lack of interests in study because everything is now accessible online or through data saved in a computer or mobile devices. Makes students vulnerable to potential pitfalls while computers prove to be an invaluable educational tool.

A negative view on technology consumerism has taught us that technologies, from computers to mobile devices, are widely viewed as tools to entertain rather than educate. Raise instructional challenges for professors and teachers to stay abreast with technology, they may need to be retrained. Can diminish overall value of in-person education although research on online learning did not establish a direct link to how personal interaction affects a student's performance

KEYWORDS:

technology, education, students, methods, innovation, learning

INTRODUCTION

Several new technologies for communication have arisen in the recent past, which have been primarily intended for both recreation and personal use. However, these technologies have made them viable options for knowledge-based and education learning applications. The technologies that are given discussed in this paper include podcasts, blogs, instant messaging, live video chats, wikis, student portals, and simulation applications. A discussion of different technologies as well as their usages, the underlying cognitive psychology and educational theories, and also education application, as well as knowledge management, are scrutinized.

For a long period, the medium applied in education has remained constant as well as traditional: the tested and true techniques like flipcharts, chalk, whiteboards, overhead projectors, and blackboards. The application of different computing technologies has led to the usage of web portals, emails, and PowerPoint. There have been many research papers done concerning the usage of the technology within a class, coupled with work on correlated parts of online learning as well as e-learning. The application of the technologies in education has been studied in many types of research, and there is enormous work on both online and web learning. Particularly, some of these technologies are very useful within class work and they have been applied in a very innovative style.

These technologies of certain interest are those who are regarded as conversation technologies that make it possible to create as well as share a wide range of information. The other term which is applied for describing these technologies is constructivist learning tools that are focused on end-users when developing or creating their content. The urge to use these technologies originates from the distinct pedagogical advantages gained. Also, they stem from the need to stay up to date with the strength of modern students. The modern students are different from what the old education systems were intended to teach, and today's students can be referred to as the digital natives. On the other hand, numerous educators can be termed as immigrants to the digital world. The other way to perceive this is to look at the past educational methods as print-based, while the modern platform can be termed as digitally-based (Collins & Halverson, 2018).

The main objective is to examine these technologies as well as explore the evolution of the usage from personal utilization to the educational tools as well as examine the critical educational applications for which these are utilized. Necessary research is analyzed and examined. The future of various technologies for both professional and educational use, coupled with some viable research fields, is examined.

CONSTRUCTIVIST LEARNING TOOLS AND CONVERSATIONAL TECHNOLOGIES

The idea of the conversational technologies is not quite new, as entails numerous systems which have been largely utilized for quite some time, including video conferencing, discussion forums as well as emails. Among the critical concepts of the conversation technology and is that the markets are conversations and knowledge is usually developed and shared using a dialogue of questions and answers (Tondeur et al., 2017). Some studies which are related to this kind of conversational knowledge management advocate abstraction and aggregation of the information usually helps in creating information. Other features on the conversation knowledge management comprise the fact that it is fairly fast, stored numerous locations, and does not require complex technologies to be achieved.

The conversation technologies entail numerous software and systems, the majority of which are quite familiar like, web pages, audio streaming, video streaming, emails, wikis, weblogs, and instant messaging. While there are particular aspects that are of great interest in terms of mature technologies, those that will be accorded the attention in this paper are applications, impacts, and issues relating to these podcasts, blogs, IM, and wikis. These technologies are a bit new and have grown many users and are beginning to be recognized as viable education tools.

INSTANT MESSAGING (IM)

It is not likely that there would be numerous college learners who are not familiar with the utilization of IM. Enabling real-time and interactive communications with some instant responses, the instant messenger is conversational in that; it makes it possible for communication and chats among groups and individuals. The most popular instant messaging platforms include Yahoo message and MSN messenger. With IM, people can communicate or chat in real-time. IM has been accepted as a way of communication in the business environment and today (Marzilli et al., 2014). It has been tested and studied as a tool for education. The key characteristics of IM include its capability and synchronous nature for supporting phone-like and chats interaction. Where real-time interactions facilitate rapid communications to happen.

BLOGS

The blogs were created as a way for expressive people to post some online records of themselves. Complete with photos and posts, these blogs were an online diary or narrative of an individual with opinions, events, and stories. While its initial usage was purely for personal use, recently, their efficiency as an educational tool has been discovered together with its utilization as an extension of learning logs that are developed online. The aspect of learning logs has been using before the arrival of the weblog. The concept of this is to allow people to document their learning and

also to perform some key reflection as well as self-analysis (Papadakis, 2016). The utilization of a learning journal and a log is correlated to action research learning methods as well as the attempts to relate the past knowledge and the newly learned information. The blogs are an extension of learning journals and logs because they are electronic and can easily be made available. The utilization of weblogs as tools for education provides the advantages of increased sharing of information, enhanced instructors review and monitoring as well as simplified information publication. The utilization of blogs has been expanding, and the number is always increasing. The growth in this field is predicted to increase in the future.

WIKIS

Wiki technology has emerged. This technology allows for enhanced partnership compared to the Weblogs. Whereas the main emphasis of weblogs is creating a number of pages as well as documents mainly be one person, the wiki's strength is the capability for various interested users and readers to express their ideas online, modify the work published by other people, send or receive concepts as well as post different links to related websites and resources. Due to this, Wikis took an extra step to allow greater interactivity and collaboration. Wikis have a value for educational goals, and their usage has begun to be incorporated into several higher learning institutions courses (Fidalgo-Blanco, Sein-Echaluce & García-Peñalvo, 2014).

PODCASTS

A podcast is usually iPod and broadcast combined, but it does not necessarily need an iPod and broadcasts information to the end-users. The podcasts are digital files that are downloadable to the user as per their subscription. An instructor can create a podcast for the students. On the other hand, the students can create an assignment as a podcast file. Education is a field where the podcast's power has been greatly utilized. As some higher learning institutions, the various courses are being provided in podcasts.

CONCLUSION

The education's face, whether classroom, hybrid, or online, is shifting, and it is essential for instructors to stay up-to-date with many possibilities as well as opportunities that are in the market. In this paper, some technologies are dubbed as conversational technologies because of their collaborative and interactive characteristic, were discoursed in details, coupled with their educational applications, advantages as well as their abilities. The relevant case studies and researches related to educational and classroom applications also discoursed. Generally, the tools discoursed here belong to a class popularly known to as the conversational technologies. The technologies emphasize group learning, student interaction, as well as collaboration compared to traditional classroom methods. These technologies are more fit towards the educational environments or courses where the major prominence is usually on the communication of the student, where the learners access the best technology and creativity and output is highly encouraged. In cases where coursework is based on the lectures or is more inclined to the factual information delivery, these technological tools might have limited usability. The application which might be accommodating in this scenario might be for the communication which is to be stretched outside the classroom, via the utilization of instant messaging or for additional resources that are to be disseminated as podcasts. Due to the fact, every tool has its features and right usages; it is the responsibility of the educator to choose the ones which are most suitable to a certain task and course. The IM, which learners use for personal communication, has penetrated to the business environment and in education, as well, due to its strength in informational communications, which are performed in real-time. There are different results concerning the usage of IM within the sector of education; some people claim that it beneficial to them, but there are numerous limitations too.

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ISSUES IN CYBERNETICS AND CYBER SECURITY

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ABSTRACT

Criminality is a very complex phenomenon, so it is also a theoretical category, because it integrates a large number of different components. All those dimensions can be mirrored by the analytical approach. They are important for understanding criminality itself, but also for the complex approach to criminality that follows from the analysis. It is primarily a social phenomenon that underpins the sociological aspect of understanding its essence

Criminality as a social phenomenon has existed in all socio-economic systems. As such he has accompanied the development of mankind thus becoming figuratively a partner of his. In recent years as a result of the development of science, large-scale use of computers in all socio-economic fields has begun to increase, thus increasing economic indicators, rapid communication and access to the administration and resolution of many practical issues. The multifaceted interest of the computer has aroused the curiosity of the criminal elements, and especially of the criminal organizations, to use it in the pursuit of illicit profits, abuses and other criminal purposes. Computer technology today is considered one of the most sophisticated and fastest means of committing a simple or organized crime with extremely serious consequences.

Cybercrime refers to crimes involving computers and computer networks. The term "cybercrime" consists of an illegal activity taking place in the virtual world. Cybercrime is a crime created by the creation of technology, or can be considered a traditional crime transformed into cybercrime. The development, growth and use of ICTs has always been associated with a significant increase in criminal activities.

The internet is increasingly being used as a tool in the hands of organized crime and terrorism. Cybercrime is already a prominent form of international crime, influenced by a worldwide evolution of ICT.

Unlike other known crimes, cybercrime is distinguished as it can be appropriated and can be easily committed by a significant number of people, requiring very few resources, but whose operation can cause severe and serious damage. be committed in a particular jurisdiction without being physically there and often their illegality is not very understandable and creates confusion.

Society has always been and is concerned about the dangers of crime. Therefore, she has made every effort to prevent it. In the context of the development of human rights, economic, commercial, financial, cultural, and information exchange, the world society with its national, regional, global level institutions and bodies is investing more every year for prevent crime in general and organized crime in particular.

KEYWORDS:

Criminality, cybercrime, communication and information technology.

HYRJE

Në një kohë kur përdorimi i teknologjisë dhe internetit është bërë i pashmangshëm, krimi kibernetik është një nga fenomenet më shqetësuese anembanë botës, mes të cilëve edhe Shqipëria.[23] Shqipëria është vulnerabël ndaj sulmeve të mundshme të kësaj natyre, që mund të shkojnë deri aty sa të cënojnë edhe sigurinë kombëtare. Dhe një ndër këto sulme, mund të vijë edhe nga akte terroriste. Jo vetëm mungesa e pajisjeve teknologjike të institucioneve ligjzbatuese, por edhe mosinformimi i shqiptarëve, bën që siguria e gjithësecilit prej nesh, të jetë lehtësisht e aksesueshme.

Kriminaliteti si dukuri e dëmshme dhe e rrezikshme për njerëzimin, që nga kohërat më të lashta ka shfaqur tek njerëzit mendime dhe ide të ndryshme për mënyrën e parandalimit të tij në shoqëri. Zhvillimi i shoqërisë ka kaluar në etapa të ndryshme, të cilat kanë sjellë dhe konstatime të ndryshme për kriminalitetin. Me nocionin kriminalitet‘ kuptohet tërësia e të gjitha krimeve të kryera në një kohë, hapësirë dhe periudhë të caktuar. Ndryshimi i shoqërisë së sotme filloi me revolucionin agrar, u pasua nga revolucioni industrial dhe arriti deri në periudhën e sotme në epokën e revolucionit informatik[24].

Ndryshimi që solli revolucioni informatik ishte automatizimi i çdo proçesi duke e shnëdrruar çdo informacion në një kod binar, duke e përpunuar atë dhe duke gjeneruar informacion të ri. Revolucioni informatik solli sofistikimin e mëtejshëm të sjelljes kriminale, integrimin e sistemeve kompjuterike në veprat ekzistuese, ku çdo individi në saj të kësaj teknologjie mund t‘i shkaktohet dëm masiv. Bazuar në format e ndryshme të kriminalitetit në shoqëritë e zhvilluara bashkohore evidentohet një formë e re krimi, ajo në fushën e kibernetikës[25].

23 https://www.balkanweb.com/eksperti-si-funksionon-krimi-kibernetik-ne-shqiperi/

24 DomenicoV.(2007), —La nuova criminalita informatica. Evoluzione del fenomeno e strategie di contrastoll, Rivista di Criminologia, Vittimologia e Sicurezza: 46–54

25 Halili R. (2008), Kriminologjia, Prishtinë, fq. 69

Me arritjet e mëdha tekniko-teknologjike që ballafaqohet sot njerëzimi dallohet një lehtësim në automatizimet e proceseve të ndryshme nga njëra anë, ndërsa në anën tjetër një keqpërdorim i këtyre arritjeve që ka shfaqur një sërë problemesh dhe rreziqesh. Pra, revolucioni informatik përveç anëve të mira ka dhe anët e tij negative, që u kanë krijuar hapësira sjelljeve kriminale. Statistikat e para mbi krimin kibernetik janë mbajtur që prej vitit 1985, të dhëna këto që kanë ecur në rritje dhe zgjerim në shumë sfera të cilat nuk kanë ekzistuar më parë. Përdorimi i kompjuterit ka mundësuar kryerjen e shumë detyrave dhe funksioneve në fushën ekonomike, juridike, mjekësore, shkencore dhe fusha të tjera. Këto zhvillime kanë bërë që të shfaqen shumë sjellje anti shoqërore dhe kriminale për shkeljen e ligjit. Deri më tani nuk ekziston ndonjë përkufizim i pranueshëm botërisht për krimet kibernetike.

Studimet e para lidhur me krimin kibernetik filluan në vitet 1960. Në këtë periudhë ky krim përfshinte abuzimin kompjuterik, sabotazhin kompjuterik, spiunazhin kompjuterik dhe përdorimin ilegal të sistemit kompjuterik. Në vitet 70 kostot e pajisjeve informatike u ulën në mënyrë dramatike, gjithashtu edhe programet kompjuterike ishin me çmime të lira, pikërisht në këtë periudhë ishte shfaqja e fillimit të tregut për pavarësinë e programeve dhe furnizuesve të tyre[26].

MËNYRAT E SHFRYTËZIMIT TË INTERNETIT SI MJET PËR KRYERJEN E KRIMIT KIBERNETIK.

Në vitet e fundit shoqëritë në të gjithë botën, kanë bërë përparime të mëdha drejt kalimit në shoqërinë e informacionit. Fakti që shoqëria po mbështetet gjithmonë e më shumë dhe si rrjedhojë po varet gjithmonë e më shumë nga teknologjia e informacionit dhe komunikimit, e bën atë të ekspozuar ndaj kërcënimeve të tilla si krimi kibernetik.

Zhvillimi i teknologjisë kompjuterike ka përcaktuar rolin që kanë kompjuterat në zhvillimin dhe funksionimin e shoqërisë si dhe varësinë që individët kanë ndaj përparësive që ofron ky zhvillim teknologjik. Nëpërmjet aksesit në të dhënat e depozituara në sistemet kompjuterike, individë të ndryshëm për interesa dhe motive të ndryshme kanë shfrytëzuar kompjuterin si mjet për kryerjen e veprave penale kibernetike.

Një veprimtari e caktuar kriminale nuk mund të kryhet pa ndihmën e kompjuterit. Përdorimi i kompjuterit si mjet për realizimin e veprimeve kriminale në fusha të caktuara, duke përdorur mekanizma të automatizuar, siç janë programet kompjuterike dhe të dhëna të tjera, i ka ndihmuar këta individë të realizojnë veprimin e tyre kriminal.

Përdorimi i kompjuterit si mjet për kryerjen e krimit mund të bëhet kryesisht për këto forma të krimeve kibernetike si: keqpërdorimet financiare, krijimin dhe përhapjen e viruseve, vjedhjen e informatave nga sistemet kompjuterike, etj[27].

26 www.oecd.org/dataoecd/3/42/46894657.

27 Gordon S., Ford R. (2006). —On the definition and classification of cybercrimell, in Journal in Computer Virology, n. 2, pp.13-20.

Duke marrë në konsideratë mundësitë e mëdha që ofron kompjuteri, ai mund të shfrytëzohet gjithashtu si mjet efikas për planifikimin, organizimin dhe udhëheqjen e veprimeve kriminale si nga ana e individit ashtu dhe nga organizatat kriminale. Në këtë këndvështrim, sot po luan rol gjithnjë e më të madh interneti me shërbimet e postës elektronike, që ofron mundësi të shpejtë komunikimi në çdo cep të botës. Kjo gjë lehtëson udhëheqjen dhe kontrollin e shpejtë të veprimeve të paligjshme të autorëve të veprave penale në kibernetikë[28].

Përdorimi i kompjuterit ndeshet tepër edhe tek mashtrimet apo manipulimet e ndryshme për regjistrimin e gabuar të të dhënave, apo futjen e pasaktë të tyre në mënyrë të qëllimshme për përfitime pasurore ose dobi të tjera. Mashtrimet kompjuterike mund të bëhen në çdo sistem ekonomik apo në çdo sistem tjetër ku shrytëzohet sistemi informatik kompjuterik. Si rast praktik mjaft i ndeshur është ai i tregtisë elektronike E-bay që kryhet nëpërmjet internetit.

Duhet të përmëndet se ky modernizim gjithnjë e më i madh i teknologjisë së informacionit ka bërë të mundur që kompjuteri me përparësitë e veta teknike që ka, të shfrytëzohet edhe si mjet i fortë për parandalimin, zbulimin, gjurmimin dhe provimin e veprave penale. Për këtë arsye organet e zbatimit të ligjit dhe agjencitë në mbarë botën janë të orientuara në ndërtimin dhe zhvillimin e sistemeve të automatizuara informatike. Rol të madh në këtë aspekt luan interneti, format i cili mundëson shkëmbim të informatave mes strukturave policore dhe agjencive të shteteve të ndryshme me qëllim identifikimin dhe ndalimin e autorëve të veprave penale kibernetike.

VËSHTRIM MBI HISTORIKUN E PIRATERISË KOMPJUTERIKE.

Emërtimi krimi kompjuterik ne jetën e përditshme tashmë është një term i zakonshëm i cili e ka prejardhjen nga përdorimi i mjetit (kompjuterit) për të kryer një veprimtari të caktuar e cila është në kundërshtim me ligjin. Pra emërtimi i këtij lloj kriminaliteti e ka origjinën nga mjeti dhe format e metodat e përdorura në kryerjen e veprimeve të kundraligjshme. Ndryshe nga sa thame me lart termi "krimi kibernilik" ka kuptim e shtirjes me të gjerë duke u bazuar në shkenën dhe teknologjinë e kibernitikës. Termi kibernitik është përdorur për herë të parë nga shkrimtari William Gibson në novelën e tij "Nuromaneer" të publikuar, për të përshkruar ambientin në të cilin piratët *e* informatikës operojnë.

Pirateria kompjuterike ose "hacking" ka ekzistuar për më shumë se nje shekull. Vitet 1870, disa adoleshentë e titulluan ate duke nderhyrë ne sistemin e teleknmunikacionit telefonik, duke bërë kështu telefonata të gjatë ndërkombëtare. Në fillim të viteve 1960 shërbimet e universiteteve amerikane të cilat ofronin përdorimin e kompjuterit fillestar laboratori i inteligjences artificiale, u bënë bazat e themelimit të piratëve kompjuterike të mëvonshem. Në fillim fjala ''hacker" ishte një term pozitiv që përdorej për të treguar një person i cili ishte mjeshtër i kompjuterave dhe mund ti

28 Gercke M. (2009). —Understanding Cybercrime. A Guide for Developing Countries

përdorte programet përtej destinacionit për të cilin ata ishin krijuar.

Më vonë në Amerikë në fillim të viteve 1970 rastet me teknologjine e komunikimit u botuan. Kjo u frymëzua me shumë nga rasti ku John Draper beri një thirje të largët telefonike pa paguar, duke fërshëllyer me anë të një bilbili me nje ton preciz drejt aparatit telefonik i cili e ngaterronte dhe bënte që ai të hapte linjen telefonike. Po ne vitet 1970 dy te rinj nga Kalifornia krijuan një aparaturë që quhej "blue box' (kutia blu) e cila përdorej për të ndërhyrë në sistemet telefonike. Këta dy të rinj në kohët e sotmë janë themeluesit e kompjuterit "Apple'".

Edhe pse bota e kompjuterit mund të ekzistojë vetëm në një formë të pakapshme, ajo ndikon dhe në shumë raste kontrollon sjelljen tonë fizike dhe jetën në një shkallë shumë kuptimplotë. Aeroplani psh e ka pjesën më të madhë të aparaturave të tij të kontrolluara nga kompjuteri. Kështu që jeta e pasagjerëve varet nga ky kompjuter.

Bota financiare është gjithashtu shumë e varur nga kompjuterat. Kështu bllokimi luhatur i sistemit kompjuterik tek banka kryesore e shtetit Shqipëtar do të ndikonte në ekonominë e shtetit brënda disa ditësh duke sjellë për të pasoja tepër te rënda

Termi virus kompjuteri ka hyrë tashmë në terminologjinë e përditshme. Esenca e nje virusi komniuterik është që ashtu si ekuivalenti *i* tij njerëzor ai mund të transmetohet nga një kompjuter tek nje tjetër. Kjo mund të ndodhi kur një disk i infektuar transferohet ndëmjet kompjuterave. Gjithashtu virusi mund të transmetohet edhe në menyrë elektronike përmes lidhjeve të ndryshme kompjuterike me stadi modem rreze infra të kuqe etj. Rritja e rrezikut per krimet ndaj kompjuterave, ose kunder informacionit ne kompjutera ka filluar te terheqi vemendjen e vendeve te zhvilluara.

Vet mbrojtja, megjithese thelbesore nuk është e mjaftueshme për ta bërë hapsirën kibernetike një vend të sigurtë. Sundimi i ligjit duhet gjithashtu të forcohet. Vendi ku mbrojtjet ligjore bëhen gjithnjë e më pak të afta të konkurojnë në ekonominë e re. Qeveritë duhet të shqyrtojnë legjislacionet e tyre aktuale për të parë nëse këto janë të mjaftueshme apo të përshtatshme për të luftuar gamën e gjërë të krimeve në fushën e kibernitikës.

Nga një studim i zhvilluar në legjislacionct e 52 vendeve rezultoi se dhjetë prej ketyre shteteve kanë ndryshuar ligjet e tyre duke mbuluar me shumë se gjysmën e llojeve të krimeve kompjuterike që janë në realitet.

Në një kohë që shumë shtete kanë filluar të ndërmarin hapa progresiv në fillimin e legjislacioneve të tyre në këtë fushë është e qartë se duhet akoma shumë punë për të arritur në atë pikë kur organizata ose individe të ndryshëm të jenë te sigurtë. Kriminelët kibemitik do të mendohen dy herë përpara se të sulmojnë sistemet dhe informacionet e tyre.

Vëndet që paraqiten legjislacione, nese legiislacionet e tyre penale kanë qenë të zgjeruara në fushën e kibernitikës për të mbuluar dhjetë lloje të ndryshme të krimit kibernetik në katër kategori:

krime të kryera ndaj të dhënave (data) duke përfshirë ndërprerjen, moditikimin, dhe vjedhjen:

- krime në lidhje me rrjetin, ku përfshihet ndërhyrja dhe sabotazhi:
- krime e *hyrje* duke përfshirë këtu piraterinë dhe shpërndarjen e viruseve: dhe

- krime të tjera që lidhen me kompjuterat duke përfshirë këtu ndihmën dhe mbshtëtjen e kriminelëve të kibernitikës, mashtrimet kompjuterike, falsifikimet kompjuterike.

Krahas të mirave të padiskutueshme që sjell interneti dhe teknologjia në pergjithesi, fenomeni shoqërohet dhe me një sërë problematikash që kanë të bëjnë me cënimin e të drejtave themelore të njeriut. Është detyrë e shtetit, të ruaje dhe garantojë të drejtat e individit. Dimensioni i ketyre krimeve shtrihet jo vetem në cënimin e sigurisë dhe privatësisë, por edhe në dëmtime të tjera materiale apo psikologjike që mund të shkaktojnë tek individi.

Në kategorine e krimeve kiberentike përfshihen: infrastruktura e teknologjisë së informacionit, aksesi i paligjshëm, përgjimi i paligjshëm, ndërhyrja e të dhënave, falsifikimi dhe mashtrimin elektronik. Pra, duke parë që ky krim po mer dimension kaq të gjërë, edhe lufta ndaj tij duhet të rritet në përputhje me këto dimensione.

Duhet të ngrihen struktura të posacme dhe të specializuara në shkallë kombëtare dhe duhet të rritet bashkëpunimi ndërkombëtar në këtë fushë, madje për këtë është e rëndesishme të konceptojmë nje arkitekturë globale të sigurisë së informacionit, që të marrë brenda saj dimensionin teknik dhe operacional, dimensionin juridik dhe rregullator, dimensionin organizativ dhe ekonomik duke mos harruar dimensionin human.

KONCEPTI I KRIMIT KOMJUTERIK.

Krimi kompjuterik i referohet krimeve, në të cilat përfshihen kompjuterat dhe rrjetet kompjuterike. Termi "***krim kibernetik***" konsiston në një aktivitet ilegal që ndodh në botën virtuale. ***Krimi kompjuterik është vepër penale, që është krijuar me krijimin e teknologjisë, apo mund të konsiderohet një krim tradicional i transformuar në krim kompjuterik.*** Zhvillimi, rritja dhe përdorimi i teknologjive të komunikimit dhe informacionit, është shoqëruar gjithmonë me një rritje të ndjeshme të aktiviteteve kriminale. Interneti gjithnjë e më shumë, po përdoret si mjet në duart e krimit të organizuar dhe terrorizmit.

Krimi kompjuterik tashmë është një formë e dukshme e krimit ndërkombetar, influencuar nga një evolucion botëror i teknologjisë së komunikimit dhe informacionit. Në dallim nga krimet e tjera të njohura, krimet kompjuterike, dallojnë pasi ato mund të përvetësohen dhe mund të kryhen lehtësisht nga një numër i konsiderueshëm njerëzish, kërkojnë fare pak burime, por nga veprimi i të cilave shkaktohen dëme të rënda dhe të mëdha, mund të kryhen në një juridiksion të caktuar, pa qenë aty fizikisht dhe shpesh paligjshmeria e tyre është jo shumë e kuptueshme dhe krijon konfuzion.

TRAJTIME TEORIKE MBI MËNYRAT E SHFRYTËZIMIT TË KOMPJUTERIT SI MJET PËR KRYERJEN E KRIMIT.

Lidhur me mënyrën e shfrytëzimit të komjuterit si mjet krimi, ka teori të ndryshme, nga një sërë autorë është shumë Me rëndësi të përcaktohet vendi, roli dhe mënyrat

e shfrytëzimit të kompjuterit në këtë fushë. Lidhur me këtë, autori A. Bequaj[29], thekson se shfrytëzimi i kompjuterit në fushën kriminale bëhet në pesë mënyra themelore*:*

Kompjuteri si objekt sulmi. Individë dhe grupe të ndryshëm, duke zgjedhur kompjuterin, me mjete edhe metoda të larmishme, përpiqen që në cdo mënyrë të shkatërrojnë "të mirat shoqërore". Dhe për këto shkaqe, sistemet informative dhe kompjuterike, bëhen pikënisje e këtyre sulmeve me qëllim të ndryshimit të të dhënave apo asgjësimit të tyre. ***Po ashtu, edhe vlerat e hardwerit dhe softwerit si dhe të webet e të dhëna të cilat gjenden në sistemet kompjuterike, të cilat përfaqesojnë vlerat e caktuara të shoqërisë, paraqesin ngacmim për shumë individë dhe grupe të organizuara kriminale, për të arritur qëllimet e tyre në mënyre ilegale.***

KOMPJUTERI SI MJET I KRYERJES SË SULMIT.

Një sërë veprimtarisht kriminale tashmë nuk mund të kryhet pa ndihmën e kompjuterave. Perdorimi i tyre si mjet për realizimin e veprimeve kriminale në fusha të caktuara, duke përdorur mekanizma të automatizuar, për modifikim dhe manipulim të formave elektronike të të dhënave, sic janë programet kompjuterike dhe të dhënat të cilat prezantojne mallin, paratë ose informatat. Në rastin konkret, kompjuteri mundëson ose lehtëson punën e autorit në realizimin e veprimeve të caktuara kriminale. Në këte kategori proceset kompjuterike konsiderohen si elemente kyc dhe ato shërbejnë për të mundësuar, lehtësuar dhe shpejtuar realizimin e veprave të caktuara kriminale dhe në këtë kontest, kompjuteri e krijon dhe ndihmon këtë ambient.

Kompjuteri si mjet për organizimin, planifikim, fshehje ose lidhje me kriminalitetin**.** Në këtë rast komjuteri mund të shfrytëzohet si mjet shumë i fortë në planifikimin, organizimin dhe udhëheqjen e veprimeve kriminale, qoftë nga ana e individit apo edhe e organizatave kriminale. Në këtë drejtim, kompjuteri gjithnjë e më shumë shfrytëzohet në fushën e kriminalitetit të organizuar, vecanërisht në fazën e përgatitjes dhe të planifikimit të veprimtarisë kriminale si dhe në procesin e kontrollit dhe të mbikëqyrjes së realizimit të procesit të fundit e vecanërisht në realizimin e efekteve financiare[30].

KRIMI KIBERNETIK NË LEGJISLACIONIN E VENDIT TONË.

Ndryshimet e reja në Kodin Penal, erdhën si domosdoshmëri e përshtatjes së legjislacionit shqiptar me atë evropian dhe mbi të gjitha me realitetin bashkëkohor, për sa i takon krimit kibernetik. Mbrojtja e shoqërisë shqiptare nga krimi kibernetik, adaptimi i legjislacionit dhe nxitja e bashkepunimit ndërkombetar në luftën kundër krimit në fushën e kibernetikës, janë 3 arsyet kryesore që kanë shtyrë Ministrinë e

29 August Bequaj "How to Prevent Computer Crime", John Walleye & Sons, Inc., 1983

30 Dr.Vesel Latifi: Kriminalistika, Prishtine, 2004, fq. 288.

Drejtesisë, t'i propozoje qeverisë dhe më pas Kuvendit këto ndryshime.

Perdoruesit e internetit në vendin tonë si dhe numri i shkeljeve të sigurisë së rrjeteve dhe sigurisë së informacionit, është duke u rritur me shpejtësi. Kjo shkakton humbje të konsiderueshme financiare dhe krijon rreziqe dhe kërcenime të reja, për zhvillimin e shoqërisë së informacionit. Në këtë kuadër është e domosdoshme, që të ndërmerren hapa për zhvillim të sigurtë të shoqerise së informacionit. Rëndësi të vecantë merr implementimi i ndryshimeve ligjore për t`iu përshtatur marrëdhënieve ekzistuese mes publikut dhe institucioneve shtetërore, në menyrë që të ofrohet një mbrojtje sa më e përshtatshme.

Vlerësohet si tejet e rëndësishme, marrja e masave specifike, për të ndërgjegjesuar shoqërinë lidhur me rreziqet potenciale në fushen e sigurisë së rrjeteve dhe sistemeve online, për eliminimin e tyre, përfshire mbrojtjen e fëmijeve nga përmbajtjet e paligjshme në hapësirën kibernetike. Incidentet e sigurisë që ndikojnë në funksionimin e duhur të rrjeteve, sistemeve dhe shërbimeve, që nderhyjnë në privatësinë e komunikimit, kërkohet të menaxhohen, duke u mbeshtetur në praktikat me të mira botërore për menaxhimin e incidenteve te tilla.

Sulmet ne infrastrukturat kritike te informacionit ne rang vendi, mund te kene pasoja te renda ne funksionimin e tyre, duke shkaktuar edhe humbje te medha financiare, per kete duhet qe, se pari ato te identifikohen e se dyti te merren masa te forta sigurie, per ta mbajtur ne nivel me te larte sigurine e ketyre infrastrukturave te konsideruara tashme jetike per funksionimin e mire te shoqerise.

MASAT PËR PARANDALIMIN DHE LUFTIMIN E KRIMIT KIBERNETIK.

Krimi kibernetik, për shkak të karakterit të tij specifik, rrezikshmërisë së madhe shoqërore dhe shkallës së lartë të rritjes në masë të madhe, po bëhet problem i vërtetë shoqëror, madje jo vetëm në përmasa kombëtare, por edhe në përmasa ndërkombëtare. Kjo formë e kriminalitetit po zhvillohet me një shpejtësi aq të madhe, saqë praktikisht nuk ka precedent. Për këtë arsye vlen të përmendet konstatimi se kjo dukuri është një «industri», e cila p.sh disa vende siç është SHBA zhvillohet me ritme të shpejta. Vetëm në SHBA ka me miliona sisteme informatike e kompjuterike, të cilat janë të lidhura në rrjetin kompjuterik. Vetëm transaksionet financiare, që barten nëpërmjet katër sistemeve kryesore të rrjetit të bankave elektronike, si: Fedëire, Bankëire, Chips dhe SËIFT, së bashku përbëjnë afërsisht 300 miliardë dollarë qarkullim ditor brenda shtetit dhe afërsisht 600 miliardë dollarë qarkullim ditor në trafikun ndërkombëtar. Këto shuma dollarësh, duke i llogaritur edhe ato të shteteve të tjera në botë, të cilat janë në qarkullim monetar ditor nëpërmjet rrjeteve të ndryshme të sistemeve kompjuterike, me siguri që paraqesin një provokim të madh, të cilit shumica e krimineleve nuk mund t'i bëjnë ballë.

Për këto dhe shkaqe të tjera, është e pakontestueshme nevoja për një aksion adeguat, me qëllim parandalimin dhe luftimin e suksesshëm të këtij fenomeni të ri në shoqërinë bashkëkohore. Duke pasur parasysh vështirësitë e parandalimit, zbulimit, sqarimit dhe provimit të veprave të kriminalitetit kompjuterik, në luftën kundër

këtij fenomeni shikuar në përgjithësi, në dispozicion janë tre lloje mekanizmsh, të cilët mund t'u përgjigjen me sukses këtyre provokimeve, dhe këto janë: pajisjet për mbrojtje, etika dhe ligjet. Këto mekanizma kanë karakter parandalues dhe represiv. Para së gjithash, në aplikimin e tyre përparësi duhet t'u jepet masave parandaluese në krahasim me ato represive[31].

Mbrojtja e suksesshme e sistemeve kompjuterike në aspektin global duhet shikuar si problem në tre nivele: ndërkombëtar, kombëtar dhe lokal. Sistemet globale kompjuterike dhe rjedhja transnacionale e të dhënave dhe e informatave, praktikisht kanë «hequr» kufinjtë shtetërorë në kuptimin klasik, kështu që kriminelëve kompjuterike u mundësohet që veprat penale t'i kryejnë në një shtet, ndërsa pasojat t'i bartë shteti tjetër, edhe me mijëra kilometra larg atij shteti. Në këtë mënyrë, krimi kibernetik, praktikisht, bëhet problem ndërkombëtar, që imponon nevojën e mbrojtjes së sistemeve informatike jo vetëm të vendit, por në të njëjtën kohë edhe atyre të vendeve të huaja. Me këtë rast hapet edhe çështja e hetimeve ndërkombëtare, e ekstradimeve dhe ndëshkimit të kryerësve të kësaj kategorie të kriminalitetit[32].

STATEGJIA KOMBETARE NE KETE FUSHE[33].

Me vendimin Nr. 973, datë 02.12.2015 është hartuar "Dokumenti i Politikave për Sigurinë Kibernetike 2015 – 2017". Kjo është strategjia aktuale, e cila synon arritjen e një sërë objektivash për këtë periudhë. Krahas saj, ekziston dhe "Strategjia e Sigurisë Kombëtare (SSK), 2014 – 2020", një strategji më afatgjatë, e cila synon aritjen e objektivave, të cilat kërkojnë një shtrirje në kohë.

Sipas strategjisë aktuale, duke qenë se aksesi në hapësirën kibernetike, së bashku me elementët pozitivë të tij, rrit rrezikun potencial nga dëmtimi apo keqpërdorimi i të dhënave dhe sistemeve kompjuterike.

Si pasojë e rreziqeve kibernetike në rritje, sigurimi i integritetit të të dhënave dhe konfidencialitetit, si dhe një akses i sigurtë në hapësirën kibernetike, janë kthyer në një nga sfidat më të mëdha, me të cilat përballet shoqëria në ditët e sotme, duke e kthyer atë në një çështje të sigurisë kombëtare.

Qëllimi i kësaj strategjie është të rishikojë e të koordinojë, detyrimet që lindin nga angazhimet e marra, për një hapësirë kibernetike të sigurt me qëllim që, të sigurohet përmbushja e përgjegjësive nga të gjithë aktorët në mënyrë të koordinuar. Në këtë mënyrë mund të garantohet zhvillimi i mëtejshëm i shoqërisë së informacionit, si një ambient i sigurt, i besueshëm dhe i hapur si dhe promovimin e vlerave dhe mundësive të ofruara nga përdorimi i hapësirës kibernetike.

Persa i perket vizionit qe kjo strategji synon, shkurtimisht e parashtrojme si me poshte vijon:

31 Bakewell,E. J., Koldaro, M.,& Tija, J. M. (2001) Computer crimell. The American\ Criminal Law Review, 38, (3), 481-524

32 Me gjeresisht, shih: Vula V. vep. e. cit, fq. 150.

33 http://www.cirt.gov.al/images/dokumenta/Dokumenti%20i%20Politikave%20per%20Sigurine%20Kibernetike%202015-2017.pdf

- Mbrojtja e të drejtave themelore të njeriut, lirinë e shprehjes, të dhënat personale dhe privatësinë
- Akses për të gjithë
- Përgjegjësi e përbashkët
- Forcimi i bashkëpunimit dhe koordinimit:
- Bashkëpunimi ndërkombëtar
- Administrimi i rrezikut

Objektivat strategjike, që do të ndiqen për përmbushjen e këtij vizioni dhe respektimin e parimeve të mësipërme janë:

- Plotësimi i kuadrit ligjor në fushën e sigurisë kibernetike
- Forcimi i kuadrit institucional
- Rritja e ndërgjegjësimit për sigurinë kibernetike
- Identifikimi dhe mbrojtja e Infrastrukturave Kritike të Informacionit
- Krijimi dhe implementimi i kërkesave minimale të sigurisë kibernetike
- Dokumenti i Politikave për Sigurinë Kibernetike 2015 - 2017 21
- Forcimi i partneritetit me struktura të tjera përgjegjëse të fushës, brenda dhe jashtë vendit
- Rritja e nivelit të njohurive, aftësive dhe kapaciteteve për ekspertizë në fushën e sigurisë kibernetike
- Respektimi i vlerave

NDRYSHIMET LEGJISLATIVE TË REFLEKTUARA NË KODIN PENAL.

Në vitin 2008, është miratuar Ligji nr.10023 "Për disa shtesa dhe ndryshime në Kodin Penal të R.SH", me anë të të cilit, në kodin tonë penal u përfshinë një sërë dispozitash të reja, që ndëshkonin forma të ndryshme të shfaqjes së krimit kibernetik. Zgjidhja normative që ka dhënë ligjvënësi shqiptar në këtë drejtim, ka qenë ajo e përfshirjes së dispozitave të reja në tekstin e kodit penal në lidhje me veprat penale, në fushën kompjuterike. Këto dispozita janë të inkorporuara në kapituj të ndryshëm të tij, sipas objektit që ato prekin apo cënojnë.

Në mënyrë të përmbledhur ato paraqiten si më poshte vijon:

Hyrja e paautorizuar kompjuterike:[34]

Termi i referohet hyrjes në një sistem kompjuterik, i cili është i lidhur me një rrjet telekomunikimi publik, ose në një sistem kompjuterik brenda të njëjtit rrjet, ose nëpërmjet Internetit. Dispozita mbi hyrjen e paautorizuar kompjuterike gjen zbatim në këto raste, kur realizohet një hyrje e paautorizuar në distancë në një sistem kompjuterik,në sajë të cënimit të masave të sigurisë,kur një person, i cili ka qenë i autorizuar për të hyrë dhe përdorur sistemin, ka tejkaluar këtë autorizim, duke kryer veprime të cilat shkojnë jashtë kufijve të lejuar të përdorimit të sistemit nga ana e tij, etj.

34 Neni 192/b I Kodit Penal

Keqpërdorimi i paisjeve:

Në nenin 293/ç, cilësohet se kjo vepër penale mund të kryhet nëpërmjet prodhimit, mbajtjes, shitjes, dhënies në përdorim, shpërndarjes apo çdo veprimi tjetër, për vënien në dispozicion të një pajisjeje, ku përfshihen edhe një program kompjuterik, një fjalëkalim kompjuterik, një kod hyrjeje apo një e dhënë e tillë e ngjashme, të cilat janë krijuar ose përshtatur për hyrjen në një sistem kompjuterik ose në një pjesë të tij, me qëllim kryerjen e veprave penale kundër integritetit të të dhënave apo sistemeve kompjuterike. Ky nen gjen zbatim në ato raste, kur kryhen veprime për sigurimin e pajisjeve apo kodeve, që shërbejnë për të kapërcyer masat e sigurisë me të cilat është i pajsur një sistem kompjuterik.

Përgjimi i paligjshëm i komunikimeve elektronike:[35]

Me përfshirjen në kodin tonë penal të veprës penale të përgjimit të paligjshëm, të të dhënave kompjuterike, ligjvënësi ka synuar të shtrijë mbrojtjen e siguruar tashmë, ndaj komunikimeve telegrafike dhe telefonike edhe ndaj komunikimeve elektronike. Kjo dispozitë synon të mbrojë të drejtën për respektimin e privatësisë së komunikimit të informacioneve. Vepra penale në fjalë, përfaqëson të njëjtën shkelje, që përbën edhe përgjimi dhe rregjistrimi i bisedave telefonike, përgjimit të paligjshëm të të dhënave kompjuterike, i referohet çdo akti të përgjimit të paligjshëm të të dhënave të transmetuara në rrugë elektronike, nëpërmjet telefonit, faksit, e-mailit apo transferimit te dosjeve.

Ndërhyrja në të dhënat kompjuterike:[36]

Kjo veper perfshin veprime si dëmtimi, shtrembërimi, ndryshimi, fshirja apo suprimimi i paautorizuar i të dhënave kompjuterike. Fshirja e të dhënave kompjuterike është ekuivalente me shkatërrimin, që mund të kryhet ndaj objekteve që kanë një ekzistencë materiale. Suprimimi, nënkupton çdo veprim që ndalon ose i jep fund disponueshmërisë ndaj të dhënave për subjektin, i cili ka të drejtë aksesi në kompjuterin ose mbajtësin e të dhënave, në të cilin ato janë ruajtur, ndersa me ndryshim, do të kuptohet modifikimi i të dhënave ekzistuese. Instalimi i programeve të dëmshme sic mundte jene viruset,do të cilësohet sipas kësaj forme të ndërhyrjes, në të dhënat kompjuterike duke qenë se çon në një modifikim të të dhënave.

Ndërhyrja në sistemet kompjuterike:[37]

Dispozita në fjalë, merr në mbrojtje interesin e ligjshëm të operatorëve dhe përdoruesve të sistemeve kompjuterike dhe të telekomunikacionit për të mundësuar funksionimin e tyre në mënyrën e duhur. Për efekt cilësimi juridik të veprës, kërkohet që pengesat e krijuara të jenë serioze.Persa i perket objektit material, me sistem kompjuterik do të kuptohet kombinimi i një tërësie aparaturash që bën të mundur transmetimin në distancë të të dhënave dhe informacioneve, nëpërmjet përdorimit të teknologjive të komunikimi.

35 Neni 293/a i Kodit Penal
36 Neni 293/b i Kodit Penal
37 Neni 293/c I Kodit Penal

Shpërndarja kompjuterike e materialeve pro gjenocidit ose krimeve kundër njerëzimit:[38]

Në përbërje në kësaj figure përfshihen, ofrimi në publik ose shpërndarja e qëllimshme publikut, nëpërmjet sistemeve kompjuterike, e materialeve që mohojnë, minimizojnë, në mënyrë të ndjeshme, miratojnë ose justifikojnë akte, që përbëjnë gjenocid ose krim kundër njerëzimit. Pra objekti i saj, janë mardhëniet juridike të vendosura, për të mbrojtur jetën dhe shëndetin e shoqërise nga vepra penale, me pasoja të rënda, duke përdorur sistemet kompjuterike.

Pjese e kësaj kategori e veprash jane dhe: "*Kanosja me motive racizimi dhe ksenofobie nëpërmjet sistemit kompjuterik*".[39]"*Shpërndarja e materialeve raciste ose ksenofobike, nëpërmjet sistemit kompjuterik*"[40] dhe "*Fyerja me motive racizmi ose ksenofobie nëpërmjet sistemit kompjuterik*"[41], vepra te cilat, mbrojne nderin dhe dinjitetin e individit nga veprimet raciste dhe ksenofobe, duke perdorur elementin e sistemi kopjuterik.

LLOJET E AUTORËVE TË VEPRAVE PENALE NË FUSHËN E KIBERNETIKËS.

Sikurse çdo formë tjetër e kriminalitetit dhe krimet në fushën e kibernetikës po shkaktojnë pasoja të rënda për individët dhe institucionet shtetërore. Nga të dhënat e statistikave vërehet se në kryerjen e këtyre veprave të krimeve kibernetike, marrin pjesë persona me aftësi të lartë intelektuale dhe profesionale.

Autori i këtyre krimeve mund të karakterizohet kryesisht si një person i ri, inteligjent, shumë i motivuar, punëtor i besueshëm, si një njeri që ka logjikë të fortë, i cili njeh mirë sistemin kompjuterik, mundësitë dhe mënyrën e shfrytëzimit të tij. Nisur nga motivet të cilat i nxisin dhe qëllimet të cilat dëshirojne të arrijnë me veprimet e tyre, autorët e veprave penale në fushën. e krimeve kibernetike, ndahen në amatore dhe kriminelë profesionistë[42].

Në grupin e parë hyjnë personat të cilët ushtrojnë aftësi profesionale të ndryshme si juristë, ekonomistë, punëtorë administrate etj, që për shkaqe të ndryshme hyjnë në veprimtari ilegale. Kriminelët profesionistë janë persona të cilët kanë përvojë dhe njohuri të shumta,të cilët paraqesin rrezikshmëri të lartë shoqërore. Karakteristika themelore e tyre është se adaptohen në situata të reja, si rezultat i zhvillimit të teknologjisë. Grupi i tretë janë ata persona të magjepsur me teknologjinë e re informatike deri në atë masë sa çdo aspekt i jetës së tyre është i lidhur me kompjuterat. Ata posedojnë njohuri teknike të tilla që i çojnë në veprime kriminale dhe zgjedhin të sulmojnë sisteme të caktuara[43].

38 Neni 74/a i Kodit Penal
39 Neni 84/a i Kodit Penal
40 Neni 119/a i Kodit Penal
41 Neni 119/b i Kodit Penal
42 GORDON/FORD. (2006), "On the Definition and Classification of Cybercrime", Journal in Computer Virology, Vol. 2, No. 1, pp. 13-20.
43 M. CHAWKI. (2005), A Critical Look at the Regulation of Cybercrime: A Comparative Analysis with Suggestions for

FORMAT E KRYERJES SË KRIMEVE KIBERNETIKE.

Krimet kibernetike janë zhvilluar që kur teknologjia informatike ka filluar të zhvillohet në përmasa të gjëra dhe shumë mënyra të kryerjes së veprave penale janë ndryshuar dhe po vazhdojnë të ndryshohen. Në funksionimin eçdo sistemi kompjuterik ekzistojnë pesë faza të cilat paraqesin pika kritike për mbrojtje nga kriminaliteti kompjuterik të cilat janë:

- **Hyrja;**,faza kur futen të dhënat në kompjuter është çasti i kryerjes ku kryhen më shumë krime me një manipulim të njohur me emrin —përzjerje e të dhënave. Këto manipulime mund të kryhen në shumë mënyra si: Plotësimi i të dhënave; Ndryshimi i të dhënave; Ndërrimi i të dhënave ekzistuese; Fshirja e të dhënave ekzistuese.
- **Dalja;** Faza tjetër e veprimit kriminal është dalja. Kjo fazë ka formën e vjedhjes të të dhënave. Teknika që përdoret më së shumti është kopjimi i të dhënave të softëerit ose programeve. Këto vjedhje kryhen nga punëtorët e pandershëm, në bashkëpunim me një apo më shumë persona nga jashtë[44].
- **Programimi;** Veprat e kriminalitetit kompjuterik në fazën e programimit kanë të bëjnë me njërën nga këto forma: Ndërrimi i programeve; Fshirja e instruksioneve të rëndësishme; Modifikimi i programeve; Sabotazhi i programeve.

Nëse do ta krahasonim këtë fazë me atë të manipulimeve në hyrje del qartë se nevojiten më tepër njohuri specifike dhe profesionalitet më i lartë në aftësitë informatike dhe teknikat e përdorura.

- Përdorimi ka të bëjë me një numër të vogël të qëndrave kompjuterike të cilat kanë marrë masa mbrojtëse, me qëllim të pengimit të shfrytëzimit të paautorizuar të sistemit komjuterik nga ana e punonjësve në mënyrë të paautorizuar.
- Bartja është një prej niveleve më të ndjeshme të sistemit informatik për shkak se është shumë e vështirë të sigurohet mbrojtja fizike e lidhjeve të komunikimit[45].

LLOJET E SULMUESVE KIBERNITIKË.

Amatorë - Këta njerëz nganjëherë quhen Fëmijënor. Ata zakonisht janë sulmues me pak ose aspak aftësi, shpesh duke përdorur mjete ekzistuese ose udhëzime të gjetura në internet për të nisur sulme. Disa prej tyre janë vetëm kurioz, ndërsa të tjerët po përpiqen të demonstrojnë aftësitë e tyre dhe të shkaktojnë dëme. Ata mund të përdorin mjete themelore, por rezultatet ende mund të jenë shkatërruese.

Hakerat - Ky grup sulmuesish ndërhynë në kompjuterat ose rrjetet për të fituar akses. Në varësi të qëllimit të ndërhyrjes, këta sulmues klasifikohen si kapele të bardha,

Legal Policy, DROIT-TIC.

44 Schjolberg S. (2004), Computer Related Offences. A presentation at the Octopus Interface, Strasbourg2004, available at www.coe.int.

45 Gordon/Hosmer/Siedsma/Rebovich. (2003), —Assessing Technology, Methods, and Information for Committing and Combating Cyber Crime", available at: www.ncjrs. gov/ pdffiles 1/nij /grants /198421 .pdf. Regarding the number of the cases in early cybercrime investigations, see: Schjolberg. (1983), —Computers and Penal Legislation, A study of the legal politics and a new technology", pp 6, available at: www.cybercrimelaw.net /documents/ Strasbourg.pdf

gri ose të zeza. Njihen gjithashtu edhe kapelet e kuqe. Kapelet e bardha sulmojnë rrjetet ose sistemet kompjuterike për të testuar dhe zbuluar dobësi në mënyrë që siguria e këtyre sistemeve të përmirësohet. Këto ndërprerje bëhen me leje paraprake dhe çdo rezultat raportohet tek pronari. Nga ana tjetër, kapelet e zeza shfrytëzojnë çdo dobësi për përfitime të paligjshme personale, financiare ose politike. Sulmuesit e kapeleve gri janë diku në mes të sulmuesve të bardhë dhe të zezë. Sulmuesit e kapelave gri mund të gjejnë një dobësi në një sistem. Hakerët gri mund të raportojnë dobësinë tek pronarët e sistemit nëse ky veprim përkon me axhendën e tyre. Kapelet e kuqe janë ata që gjurmojnë kapelet gri dhe të zeza për të shmangur sulmet e mundshme prej tyre.

Grupet e organizuara - Këto hakera përfshijnë organizata të kriminelëve kibernetikë, terroristë dhe hakerat e sponsorizuar nga shteti. Kriminelët kibernetikë zakonisht janë grupe kriminelësh profesionistë të fokusuar në kontrollin, fuqinë dhe pasurinë. Kriminelët janë shumë të sofistikuar dhe të organizuar, dhe madje mund të ofrojnë krimin kibernetik si shërbim ndaj kriminelëve të tjerë. Sulmuesit e sponsorizuar nga shteti mbledhin inteligjencë ose kryejnë sabotime në emër të qeverisë së tyre. Këta sulmues zakonisht janë të trajnuar dhe të mirëfinancuar, dhe sulmet e tyre janë të përqendruara në qëllime specifike që janë të dobishme për qeverinë e tyre.

TERRORIZMI KIBERNETIK

Terrorizmi kibernetik nuk ka të bëjë vetëm me kërcenimin me anë të e-mailit nga grupe të ndryshme terroriste por edhe me veprime të tjera konkrete të cilat mund të kenë një efekt me permasa po aq të dëmshme sa edhe përplasja e avionëve në kullat binjake. Kështu p.sh një grup terrorist mund të ndërhyje në sistemet kompjuterike apo në rrjetet e shume prej bankave të rëndesishme boterore, në institute financiare apo në tregje të ndryshme kompjuterike në bursë etj, duke i prishur ato komplet apo pjeserisht dhe duke sjellë kështu për një "Black out ekonomik" total.

Duke përdorur një teknologji të njëjte me atë të kompanive të ndryshme farmaceutike, grupet terroriste mund të ndryshojnë formulat e një sërë medikamenteve duke i kthyer ato në substance helmuese apo që perhapin epidemi të ndryshme. Substanca alergjikeose edhe mbidoza të ingredienteve të ndryshëm në formulat e ilaceve.

Dallimi i qartë duhet të bëhet midis terroristeve tradicional të cilët përdorin teknologjine e kompjuterike dhe "terroristit të pastër kibernitik" e thënë ndryshe black hackers

Terroristët tradicional mund të zëvendësojnë arsenalin e tyre të zakonshëm si armëve me metoda më bashkëkohore sic janë për shembull viruse kompjuterike. Në ndryshim nga këta terroristet e pastër kibernitik (black hacker) perdorin mjete kompjuterieke për realizimin e qëllimeve të tyre kriminale duke patur edhe një favor ndaj terroristeve të zakonshern pasi ata me ane të veprimeve të tyrë terroriste nuk e vene jetën e tyre në rrezik.

Shumica e organizatave të fuqishme terroriste janë perpjekur që të tërheqin vëmendjen e shtypit, njerezve dhe të qeverisë për të realizuar kërkesat e tyre duke kryer akte terroriste të ndryshme. Kështu pra mund të themi që terrorizmi kiberne-

tik përbën një kërcenim serioz si për vendet më të zhvilluara ashtu edhe për ato me pak të zhvilluara.

Në gjithë progresin në shumë vende të botës përforcimin e legjislacionit në fushën e krimit kompjuterik ende shumë shtete mbeshteten vetëm në legjislacionin e tyre për të ndjekur penalisht kriminelët e kibernetikës. Sistemi legjislativ prapambetur në këtë fushë në mbarë botën nuk prodhon sigurine e dëshiruar dhe nuk realizon konsens midis shteteve për percaktimin ligjor të krimit kompjuterik e bashkëpunimin për parandalimin e tij. Në Shqipëri legjislacioni për krimin kompjuterik është ende ipakompletuar sa duhet sipas rekomandimeve të Konventes.

Gjatë periudhës së tranzicionit perveç përdorimit të kompjuterit si mjet për të realizuar fabrikime të ndryshme, nuk është raportuar ndonjë forme e veprës penale të nderhyrjes në transmetimet kompjuterike. Ky fakt nuk do te thotë se perjashtohet mundesia për të ndodhur krime të tilla në të ardhmen. Zhvillimi i teknologjisenë kibernetike edhe i tendencave të kriminalitetit në këtë fushë shtrojnë nevojën për të aplikuar një model referimi në legjislacion, masat parandaluese si dhe procedural e dokumentimit të krimit kompjuterik.

Vendet në zhvillim po e kërkojnë një model të tille për t'a ndjekur gjë që duhet pasuar edhe nga vende te tjera të pazhvilluara ku perfshihet edhe vendi yne me qëllim që të parandalohet krimi në fushën e kibernetikes. Krahas masave të karakterit legjislativ të cilat kanë të bëjnë me persosjen e ligjit penal dhe atij procedurial është mëse e nevojshme marrja e masave të karakterit organizative ekzekutiv nga organet e institucionet shtetërore si dhe bashkëpunimi i ketyre me sektorin privat për të marrë masa të vetëmbrojtjes ndaj krimit kompjuterik.

PËRFUNDIME DHE REKOMANDIME

Krimi kompjuterik, është një e keqe e vazhdueshme ndërkombëtare që kapërcen kufijtë kombëtarë, në një mënyrë që e bën këtë formë të krimit të organizuar një shqetësim global. Cybercrime mund të shfaqet në forma të ndryshme, përfshi mashtrimin online, vjedhjen dhe terrorizmin kompjuterik.

Tashmë një nga arsyet kryesore që lehtësojnë kryerjen e këtij krimi të tillë është globalizimi i teknologjisë dhe përparimet revolucionare të Teknologjisë së Komunikimit dhe Informacionit dhe (TKI), duke ndikuar kështu mbi aktivitetin kriminal. Mjetet dhe paisjet elektronike dhe kompjuterike po përdoren gjithnjë e më shumë për kryerjen e krimeve.

Përhapja e shpejtë dhe në rritje e përdorimit të teknologjisë si ndihmë në kryerjen e aktivitetit kriminal dhe krimit kompjuterik. meritojnë më tepër vëmendje duke i dhënë prioritet miratimit dhe marrjes së masave të përshtatshme ligjore dhe implementimit të mjeteve efektive teknologjike dhe shtrënguese, që reduktojnë aktivitetin kriminal kompjuterik. Tendencat aktuale tregojnë se në të ardhmen, krimi kompjuterik do të zërë vend si objekt kryesor në zbatimin e politikave globale për luftimin dhe parandalimin e kësaj forme të organizuar krimi, përmes shkëmbimit të informacionit, rritjes së shkallës së intelektit human, koordinimit të përpjekjeve ligjore në nivele kombëtare, rajonale dhe ndërkombëtare, si dhe krijimit të një rrjeti botëror në nivel të lartë të bashkëpunimit mes agjensive dhe institucioneve të zbatimit të ligjit.

Në gjithë progresin në shumë vende të botës përforcimin e legjislacionit në fushën e krimit kompjuterik ende shumë shtete mbeshteten vetëm në legjislacionin e tyre për të ndjekur penalisht kriminelët e kibernetikës. Sistemi legjislativ i prapambetur në këtë fushë në mbarë botën nuk prodhon sigurinë e dëshiruar dhe nuk realizon konsens midis shteteve për percaktimin ligjor të krimit kompjuterik e bashkëpunimin për parandalimin e tij. Në Shqipëri legjislacioni për krimin kompjuterik është ende ipakompletuar sa duhet sipas rekomandimeve të Konventes.

Gjatë periudhës së tranzicionit përveç përdorimit të kompjuterit si mjet për të realizuar fabrikime të ndryshme, nuk është raportuar ndonjë forme e veprës penale të ndërhyrjes në transmetimet kompjuterike. Ky fakt nuk do te thotë se perjashtohet mundesia për të ndodhur krime të tilla në të ardhmen. Zhvillimi i teknologjise në kibernetike edhe i tendencave të kriminalitetit në këtë fushë shtrojnë nevojën për të aplikuar një model referimi në legjislacion, masat parandaluese si dhe procedural e dokumentimit të krimit kompjuterik. Vendet në zhvillim po e kërkojnë një model të tille për t'a ndjekur gjë që duhet pasuar edhe nga vende të tjera të pazhvilluara ku përfshihet edhe vendi ynë me qëllim që të parandalohet krimi në fushën e kibernetikes. Krahas masave të karakterit legjislativ të cilat kanë të bëjnë me përsosjen e ligjit penal dhe atij procedurial është mëse e nevojshme marrja e masave të karakterit organizative ekzekutiv nga organet e institucionet shtetërore si dhe bashkëpunimi i këtyre me sektorin privat për të marrë masa të vetëmbrojtjes ndaj krimit kompjuterik. Tjetër qasje emergjente është edhe ndërgjegjësimi i individëve lidhur me pasojat që mund të ketë krimi kibernetik dhe sulmet e mundshme si ndaj individit të thjeshtë ashtu edhe ndaj kompanisë, biznesit apo institucionit në të cilin ai punon.

E fundit por jo më pak e rëndësishmja, ndërgjegjësimi i fëmijëve dhe të rinjve lidhur me rreziqet dhe pasojat e krimit kibernetik dhe sulmeve të tilla është emergjente pasi janë ata të parët të cilët bien pre e këtyre sulmeve apo e grupev të ndryshme të cilat merren me hacker – im, për kureshtje, për të provuar veten apo qoft edhe nga mungesa e informacionit mbi rrezikshmërinë e lartë që paraqet kjo fushë.

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