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Return to Growth: Does it mean more on Defence Expenditure?

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Abstract. The Greek economy is expected to return to growth paths after a prolonged recession period. Our paper focuses on considering developments on the defence expenditures issue given that the majority of the procurement programmes have either been canceled or postponed following the "Troika" (the International Monetary Fund - IMF, the European Central Bank- ECB and the European Commission-EC) recommendations since the crisis started. The paper employs neural networks to assess the hierarchy ordering of the explanatory variables in the Greek demand for defence expenditures function relying on their explanatory power. It turns out that both property and human resources play a vital role in explaining defence spending developments in Greece. The results derived based on a forecasting investigation lead to a number of conclusions concerning the expected developments on the defence procurement policy to be followed, as well as on the determinants of such developments.

I. Introduction

The discussion regarding defence spending in Greece has grown to becoming a debate in the literature, approached in the light of mainly two perspectives, i. e. the country's questionable economic performance and the escalating demands from the part of Turkey to revise the status-quo in the Aegean and the Eastern Mediterranean. The fact remains, however, that during the recent economic crisis the European Commission (EC), the European Central Bank (ECB) and mainly the International Monetary Fund (IMF) have been insisting that defence procurement cuts must be a top priority[1]. This policy recommendation has been encouraged following the recent NATO summit, during which it has been pointed out that Greece is one of just five member countries that contribute 2% or more of their GDP to defence[2]. Bearing the above in mind and in view of the possibility that the outlook for Greece is

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[1] In fact the IMF has repeatedly in the past expressed its concerns on the issue of "excessive defence spending" (IMF, 2010, 2012 and 2014).

[2] This is a rather naïve approach concerning the issue of NATO members burden sharing, considering that in most cases about 70% of total defence spending reflects expenditure on personnel wages and salaries leaving only about 10 to 15% for equipment procurement.

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a return to a growth path the issue of providing some room for an increase in defence spending has become more than pressing. The urgency of the matter is justified since all procurement programmes of the Hellenic Armed Forces (EMPAE) have been cancelled or postponed during the crisis years thus endangering their effectiveness in a period during which Turkey raises increased claims in the area of the Aegean and Eastern Mediterranean.

In the light of this background we shall attempt to consider the extent to which the forecasted economic recovery of the Greek economy may offer some room for channeling more funds to defence expenditure and the reasons that justify such a defence spending increase. To do so we shall resort to using neural networks (ANNs), an option regarded as being more suitable for the purposes of the present analysis as explained later on in this paper. Thus, after a brief literature review we proceed to presenting and analyzing the input data and the methodology used in the analysis. Sections IV and V present the ANN results and the policy implications derived while the last section of the paper considers the conclusions drawn.

II. A Brief Literature Review

The majority of the papers on the issue use conventional models for a time series or panel analysis employing three main variable categories: Economics and production, technology and geopolitical and security ones. Following a number of early, well-established contributions in the literature like Smith (1980 and 1989), Hartley and Hooper (1990), Jones-Lee (1990), and Hewitt (1992), some focusing on developing countries e. g. (Deger and Smith 1983), Biswas and Ram, 1986), there has been a number of papers concentrating on individual country cases (Murdoch and Sandler 1985, Looney and Mehay 1990, Okamura 1991) or alliances (Murdoch and Sandler, 1982, Knorr,1985). The case of Greece occupies a leading position in the literature as it is involved in an arms race against Turkey (e. g**.** Sezgin, 2000, Andreou and Zombanakis 2000)[3]. Coming to recent contributions, there seems to be a trend which emphasizes on human resources and raises welfare considerations some of them with reference to the Chinese case like Ying Zhang, Rui Wang and Dongqi Yao (2017), Ying Zhang, Xiaoxing Liu, Jiaxin Xu and Rui Wang (2017) and Fumitaka et al. (2016). In fact, human resources variables like population growth and per capita income are considered as significant determinants (Dunne and Perlo-Freeman, 2003). Finally, on the techniques of analysis issue and following the inconclusive results derived on this issue using conventional models (Hartley and Sandler 1995, Taylor 1995, Brauer 2002) the focus has shifted towards artificial intelligence methods and specifically Artificial Neural Networks (ANN) to determine the defense expenditure of Greece (Andreou and Zombanakis 2006).

[3] It has now been established in the literature that the Greek side is compelled to follow the Turkish defence procurement policy regardless its direction of change and refers to earlier work on this issue (Andreou and Zombanakis 2006) in which an arms race between the two sides has been established despite occasional objections (Brauer 2002).The fact is, however, that the defence potential of Turkey has risen despite its recent economic problems, with the government aiming even at purchasing F-35 stealth fighters for $100 million each. By contrast, the ability of Greece to build up a reliable defence industrial base will be eroded in an environment of capital controls that outline an investment-hostile economy.

ANN belongs to a class of data driven approaches, as opposed to model driven approaches most frequently used in the analysis. Some of the advantages of using ANN as these have been analyzed in the literature (Kuo and Reitch, 1995, Hill et al. 1996) are the following: First, they do not require any a - priory specification of the relationship between the variables involved in the relationship under consideration. Thus, in cases of disagreement on the issue of the explanatory variables to be used or in cases in which there is lack of a strong theoretical background the ANN are considered to be preferable[4] Quoting Beck et al. (2004), neural networks "can approximate any functional form suggested by the data, even if not specified by one's theory ex ante". In other words, neural networks are particularly suitable for a large number of Defence-studies cases in which a standard theory cannot conclude as to a specific model structure or when immediate response to environment changes is required. In addition, in cases in which certain variables are correlated or exhibit a non-linear pattern of behaviour the ANN are more applicable. This is due to the fact that ANN, being a data-science model, are not affected by statistical multicollinearity issues while their non-linear nature enables a better data fitting. Furthermore, without requiring the choice of a specific model, the network is designed to perform automatically the so-called estimation of input significance as a result of which the most significant independent variables in the dataset are assigned high synapse (connection) weight values while irrelevant variables are given lower weight values. It goes without saying that the choice and hierarchy of variables on the basis of input significance contributes to the forecasting performance of the network (Andreou and Zombanakis 2006). Finally, the use of ANN does not require any data distribution assumptions for the input data which is a common issue when running a regression (Bahrammizaee, 2010). Finally, there is also evidence that neural networks display a higher forecasting ability when it comes to time series forecasting (T. Hill, et al. 1996, Adya, and Collopy 1998).

III. Theoretical Background and Methodology

IIIa. Theoretical Background

Following Smith (1989) we shall assume that the demand for defence expenditure is represented as follows[5].

$$DEF = f(Y, P, S) \qquad (1)$$

where DEF is a specific country's defence spending depending on income (Y), prices of defence and civilian goods (P) and selected geopolitical variables depending on the country in focus (S). Given the controversial role of prices in the equation as earlier pointed out, (Sandler and Hartley 1995), prices are usually not included as an explanatory variable and the demand for defence expenditure function in its general form reduces to:

[4] In the case of the demand for defence spending function, for example, the use of prices as an explanatory variable is an open issue (Sandler and Hartley 1995).

[5] This model is derived by using a social welfare function which is maximized subject to a number of constraints; both budgetary and geostrategic ones (see Smith, 1980, 1989, for further details).

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$$DEF = f(Y, S) \qquad (1')$$

In the case of Greece, following Andreou at al. (2002), we expand (1') to get the following generalised formulation:

$$EQDEF = f(DLGDP, DRPOP, SPILL, THREAT, Z) \qquad (2)$$

where EQDEF stands for GDP share of defence expenditure on equipment procurement, DLGDP is the country's GDP rate of growth, SPILL stands for the spill over benefits as these are denoted by the defence spending over NATO – GDP figures and DRPOP represents the difference of the population growth rates between Turkey and Greece. The choice of the DRPOP has been based on the emphasis on the human resources variables (Andreou and Zombanakis 2000) in a period in which the Turkish side has explicitly underlined its importance[6]. The four-year lag of the dependent variable is used to represent the follow-up of the Hellenic Armed Forces armaments programme (EMPAE), as this is strongly affected by the political cycle[7]. Concerning Z, this has been reserved for dummies capturing various extraordinary major geopolitical and economic events like the Turkish invasion against Cyprus.

The final variable used in the model is THREAT, representing the Turkish GDP share of expenditure on equipment procurement and approximates the pressure exercised on Greece by Turkey. This pressure has been going on even since the beginning of the 50s, but has been culminating during the last two decades, with the Turkish president during his visit to Athens on December 6, 2017 demanding the revision of the Lausanne Treaty of 1923 and the Paris Treaty 1947 which describe the status quo of the Greek islands in the Aegean.

First we need to determine the forecasting ability of our neural network when it comes to the demand for defence expenditure in Greece and the leading input variables contributing to its forecasting performance.

The dataset used in this study contains the following variables as these are described in Table 1 and is composed of 58 observations covering a period between 1960 and 2018.

[6] In fact during his speech in Eskişehir, in March 2017, the Turkish president urged "his brothers and sisters in Europe" to "have not just three but five children," thus beginning a baby boom in their new countries.

[7] The effect of the political cycle is especially pronounced when it comes to recording transactions on importing defence equipment. Depending on whether the recording system is based on accruals or payments the political cost involved in terms of a "guns versus butter" logic dilemma will burden the ruling party during the period under consideration.

Table 1: The Data Set

Code	Data Series	Source
EQDEF	Greece: Expenditure on Defence Equipment / GDP	NATO and SIPRI
SPILL	NATO Defence Expenditure / GDP	NATO and SIPRI
DLGDP	Rate of change of Greek GDP	ELSTAT
THREAT	Turkey: Expenditure on Defence Equipment / GDP	NATO and SIPRI
DRPOP	Turkey-Greece: Difference of Population Growth Rate	UN STATISTICS

III. b. Methodology

The neural network model has been estimated through the Keras Python library (Chollet et al., 2015). We used several alternative configuration schemes when it comes to the number of hidden layers and the neurons in each hidden layer. Through this process we were able to achieve performance and to also compare how the different network architectures perform on this dataset. The input and output data series are normalized in the range [0,1], while we used Adam as optimizer since it has been shown to be more efficient and it can have a superior performance compared to other optimization algorithms (Kingma & Ba, 2014). Regarding the activation functions, we use ReLu for the neurons in the hidden layers and Sigmoid for the neuron in the output layer.

Each input variable is associated with one neuron in the input layer. The frequency of the data is annual and the observations are split to 80% in-sample / training and 20% out-of-sample / testing. Determining the number of hidden layers and neurons in each layer is a difficult task and it plays a highly significant role in the performance of the model. If a hidden layer contains too few neurons, a bias will be produced due to the constraint of the function space which will result in poor performance. On the other hand, if too many neurons are used, overfitting might be caused and the amount of time needed by the model to analyze the data will increase significantly, which will not necessarily lead to convergence. We therefore, tested the model performance of various combinations of hidden layers and neurons in each hidden layer, in order to obtain the best forecasting performance.

The number of iterations/epochs that present the data to the model also plays a significant role during the training phase. The training of the model was configured to stop if the error metric of the model, calculated on the test set, did not decrease more than 0.0001 in 10 successive epochs or when a limit of 10,000 epochs was reached, and the model was saved for later use. In Figure 1 we display how the error metric fell and reached the optimal number of epochs. However, it should be mentioned that a large number of epochs might cause overfitting and the model will not be able to generalize.

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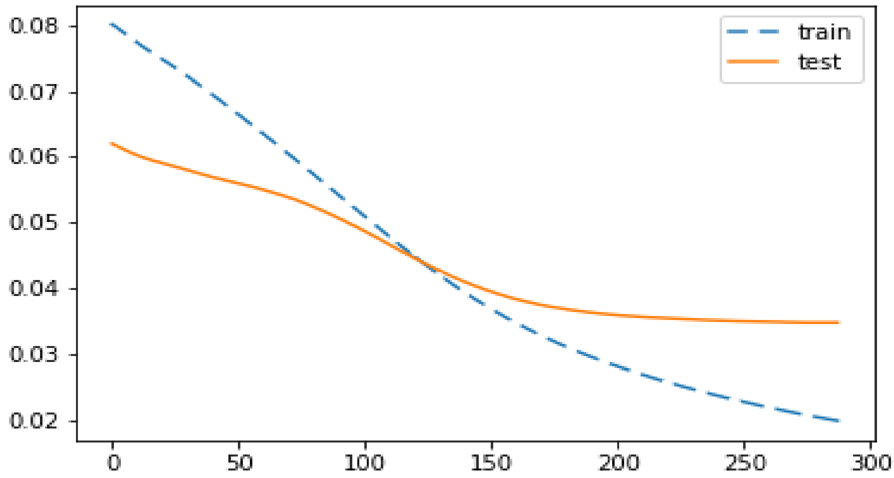
Figure 1: Training and Testing Dataset Error during Model Training



The issue of overfitting can be overcome by evaluating the out-of-sample forecast performance of the model through the usage of a testing set. The testing set contains unseen parameters that were not included in the dataset during the training phase (Azoff, 1994). If the network learned the structure of the input data instead of memorizing it, it performs well during the testing phase. On the other hand, if the model did memorize the data then it will perform poorly on the out-of-sample forecast. Therefore, the optimal network architecture is generally based on the performance of the out-of-sample forecast, assuming that the learning ability was satisfactory.

The out-of-sample forecast performance is evaluated using three different types of forecast evaluation statistics. The evaluation statistics used is the Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and the Theil Inequality Coefficient (Theil's-U). We employ various evaluation statistics since there are certain similarities and differences in each error statistic. To be more specific, all error statistics overcome the cancellation of positive and negative errors during their summation; however, they do not take into consideration the scale of the series that is tested, while Theil's-U does. While in the case of Theil's-U, the series is always bounded between 0 and 1. When comparing the Theil's-U, one looks if the value of the Theil's-U is as low as possible.

$$RMSE = \sqrt{\frac{1}{T}\sum_{t=1}^{T}(x_t^f - x_t)^2}$$

$$MAE = \frac{1}{T}\sum_{t=1}^{T}|x_t^f - x_t|$$

$$Theil's\,U = \frac{\sqrt{\frac{1}{T}\sum_{t=1}^{T}(x_t^f - x_t)^2}}{\sqrt{\frac{1}{T}\sum_{t=1}^{T}(x_t^f)^2} + \sqrt{\frac{1}{T}\sum_{t=1}^{T}(x_t)^2}}$$

where x_t^f is the forecasted value, x_t is the actual value when pattern t is presented and T is the total number of observations.

IV. Results

IV. a. ANN Out- of – Sample Forecasting

Table 2 presents the out-of-sample forecast evaluation statistics of the various neural network architectures. It can be observed that despite the limited number of observations the neural network predicts the movements of the series to a quite significant extent. The best forecast is given by the neural network architecture of 5-40-5, which achieved peak performance after 277 epochs of training. To be more specific, the best forecast has a RMSE of 0.1858, MAE of 0.1215, and a Theil's-U of 0.1866. It is important to note that the Theil's-U value is significantly less than 1. We also present a graph of the best forecast made by the optimal neural network architecture (Figure 2).

Table 2: Neural Network Out-of-Sample Errors

Neural Network Training Output			
Network Architecture	**RMSE**	**MAE**	**Theil's-U**
5-5-5	0.192486	0.141149	0.195553
5-10-5	0.192710	0.129544	0.192350
5-20-5	0.189457	0.122309	0.189630
5-40-5	**0.185800**	**0.121473**	**0.186643**
5-80-5	0.187447	0.122719	0.188300
5-5-5-5	0.204008	0.149236	0.207757
5-10-10-5	0.200814	0.144117	0.205937
5-20-20-5	0.198275	0.127101	0.198514
5-40-40-5	0.193471	0.124721	0.194643
5-80-80-5	0.192268	0.119817	0.191964

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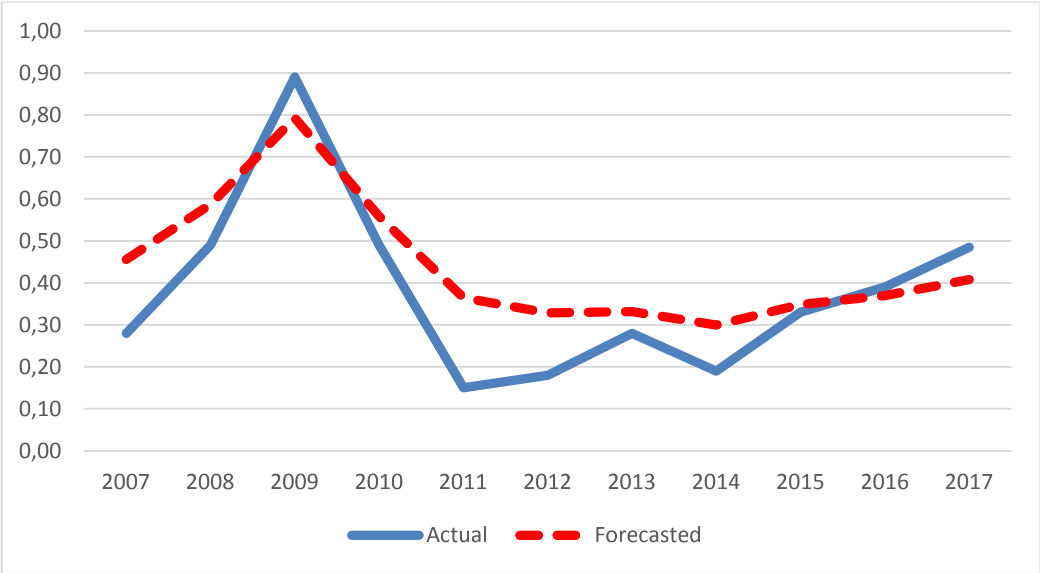
Figure 2: Actual and Forecasted Values of Equipment Defence Spending



IV. b. Determining the Input Significance.

An important aspect of our study is the determination of the significance ordering of the input variables. To be more specific, the input variables that are most significant are those that contribute mostly to the forecasting process. This process is also carried out in Andreou and Zombanakis (2000) study and is explained extensively in Azoff (1994). The significance of the input variables is determined through the sum of the absolute values of the weights fanning from each input variable into all the nodes in the first hidden layer. The input variables that have the highest connection strength are the ones that contribute significantly to the forecasting process. The analytical technical background behind this process is beyond the scope of our study, since the reader may refer to Azoff (1994) for further information.

To train the model, our dataset was split in a training dataset, which consisted of 45 (or 80%) of the observations and a test dataset which consisted of 12 (or 20%) of the observations. The datapoints were assigned to the training and the test dataset randomly, instead of using the first or the last twelve datapoints, because during training the error of the model is calculated on the test dataset and evaluating the performance of the model on a narrow time period is not an accurate predictor of the performance of the model over all the data. Moreover, given that the most recent observations are descriptive of the current situation in Greece, excluding them from the training dataset would negatively impact the forecasting ability of the model. The input significance ordering of the variables used in forecasting the equipment defence of Greece is an important part of our study. The reason is because not only does it show which variable contributes mostly to the forecasting of the variable of interest, but also because inferences can be made on the ordering of the variables that mostly affect the equipment defence spending of Greece.

As earlier stated, the input significance ordering is obtained through the summation of the absolute values of the weights of each input to the neurons of the first hidden layer. Once this process is complete, we rank the variables in a descending order to obtain a clear picture of the most significant variables. The results are presented in Table 3 with W denoting the weight of each variable that appears as a subscript.

Table 3: Ordering of Neural Network Weights

Estimation of Input Significance
$W_{spill}>W_{threat}>W_{drpop}>W_{dlgdp}$

According to the optimal forecast generated by the neural network architecture of 5-40-5, the input significance ordering is $W_{spill} > W_{threat} > W_{drpop} > W_{dlgdp}$. It is interesting to see that the Greek GDP growth rate ranks last in this input significance ordering scheme, pointing to its secondary importance as a determinant of defence equipment purchases. By contrast, the Turkish threat as approximated by the specific country's military spending on equipment, as well as the population rate differential between Turkey and Greece are clearly more important in determining decisions on Greek defence equipment purchases. The performance of spill - over benefits accrued due to the country's NATO membership ranks at the top position, maybe due to the fact that both Greece and Turkey are NATO members[8].

Table 4: Input Significance Ordering

VARIABLES RANKING	ANN
1	SPILL
2	THREAT
3	DRPOP
4	DLGDP

[8] The fact remains, however, that the role of NATO and its spillover benefits for Greece has been questioned since 1974 and the Turkish invasion to Cyprus, following which Greece withdrew from the NATO military structure for a period of six years.

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V. Policy Implications and Forecasting

V. a. Policy Implications

Table 4 sums up the results of the input-significance ordering procedure using ANN. It is evident that THREAT which is approximated by the Turkish defence spending on equipment features at a leading position of our hierarchy ordering preceded only by the NATO spillover benefits. On the human resources side, another variable related to Turkey, namely DRPOP which stands for the difference in population growth between Turkey and Greece is at the third position of the hierarchy ordering[9].

Contrary to expectations the last determinant in the stepwise input-significance ordering concerning Greek defence equipment procurement is the country's GDP growth. The poor performance of the GDP growth in this input-significance ordering can be attributed to two reasons: First, the percentage of GDP channeled to defence equipment procurement has been fluctuating between 0.15 and 0.39 during the past few years, figures too small to underline a high input significance rank between defence expenditure and economic growth. Second, the contribution of the domestic defence industrial base to the EMPAE[10] leaves a lot to be desired, represented by a one-digit percentage figure. Had the presence of the domestic defence industry in the procurement programmes of the Hellenic Armed Forces been more pronounced the link between defence spending on equipment and the GDP growth would have been stronger as the output of the domestic defence industry contributes to the performance of the entire economy (Andreou et al. 2013)**.** By contrast, the link between military spending and domestic defence industrial base in Turkey is much stronger, given that more than 50% of their armed forces requirements are met by the Turkish industry[11].

Focusing on the Turkish defence expenditure represented by THREAT, its predominance in the ordering of input significance deserves special attention as it is supported by the increasing pressure exercised from the part of Turkey regarding the status quo of both the Aegean and the Eastern Mediterranean (see Table A. II. 1 in Appendix II and Figure 3 below), with the Turkish defence minister Hulusi Akar raising claims on what he called "Blue Homeland" in December 2018. Figure 3, in particular, shows how the Turkish Airforce (THK) hostile activity expressed as ICAO and FIR violations, armed aircraft and engagements (dogfights) in the Hellenic airspace reached an overall maximum during the recent past[12.]

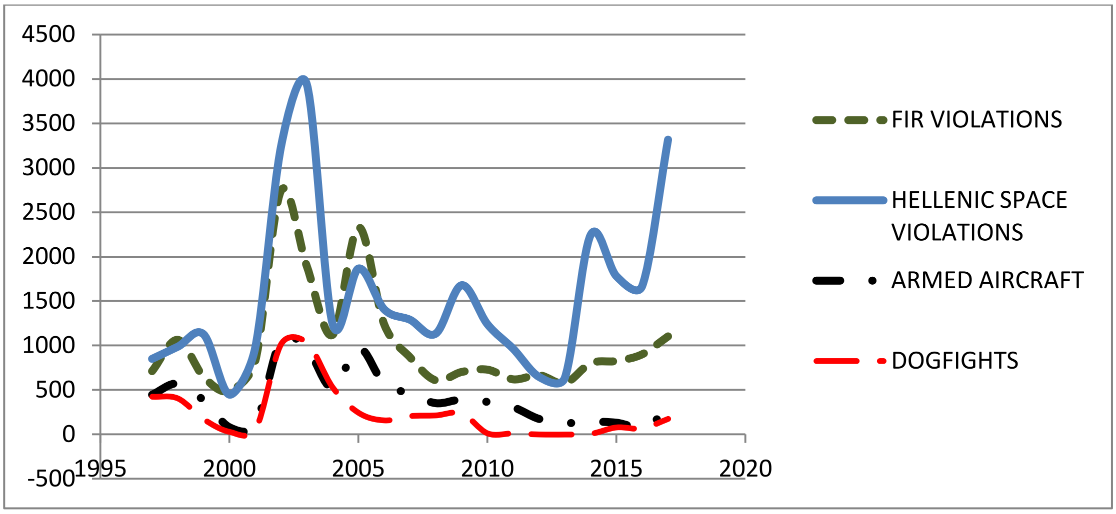
[9] As a latest update the Turkish population increased to 82.8 mill. In 2017, an increase of 3.6% compared to 2016. By contrast, the tendency of the corresponding Greek figures is slowly but steadily declining.

[10] Medium Term Developments and Modernisation Programme of the Hellenic Armed Forces.

[11] In fact, during a recent speech in Ankara (October 2018), Erdoğan pointed out that the development of a sound defence industrial base is a prerequisite for a peripheral military power in the S.E. Mediterranean.

[12] The emphasis given to FIR and ICAO violations at the expense of engagements during the last few years may be due to the fact that a large number of experienced pilots have left the THK following the July 2016 coup attempt. In addition recent experience indicates a shift to alternative forms of aggression

Figure 3: THK Activity in the Hellenic Airspace



Source: HAF, NATO

V. b. A Forecasting Exercise

The dataset for the training of the model consists of a set of inputs, and their corresponding labels, or expected output. Our dataset uses as inputs the values of the five variables for each year n while the values of the variables of the next year $n+1$ were used as the corresponding expected output. This way, each model was trained to accept as input values for the five variables and forecast the values of the five variables for the following year. The models were assessed using error metrics and the best performing model was selected to perform a forecast of the Greek defence spending on equipment for the years 2019-2022.

For the purpose of this study we adopted two forecasting scenarios, the first one involving a conservative Turkish defence equipment procurement strategy and a second one regarding an aggressive defence equipment purchases strategy. The former is introduced by assigning a purchases value corresponding to 0.3% of GDP which represents one of the lowest values during the last few years. By contrast the aggressive defence procurement strategy

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involving mainly naval tactics. Thus, on February 12, 2017 a Turkish coast guard vessel rammed a Greek one while performing what the Greek coast guard called “dangerous manoeuvres inconsistent with international collision avoidance practices.” The fact that the incident took place near Imia, a pair of Greek islets the ownership of which Turkey has disputed for 20 years, points to a territorial power play. The threat mix involves, in addition certain rather unorthodox methods like the arrest of two Hellenic Army officers during a border patrol in the north on February 28 and their imprisonment since then without pressing any charges.

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increases this figure to 0.8% of GDP[13]. To achieve this, the 2018 data were used as inputs to obtain the forecasted values for 2019 which were in turn used as inputs, after setting the threat value to 0.3 or 0.8 depending on the forecasting exercise, to obtain the values for 2020 and this process was repeated for the years 2021 and 2022. The results of the EQDEF forecasting exercises are presented in Table 5 and Figure 4.

The forecasted values of the Greek defence expenditure in the context of the arms race in which the country has been entangled against Turkey do not reveal any pronounced sensitivity to the scale of the Turkish procurement programmes. By contrast, they reflect almost accurately, the provisions of the 2019 defence budget for the Defence Ministry (Ministry of Finance 2017) which offer little room, if in fact any at all, for major defence equipment purchases[14].

Table 5: Greek Defence Spending on Equipment (%GDP)

Forecasts under Alternative Scenarios

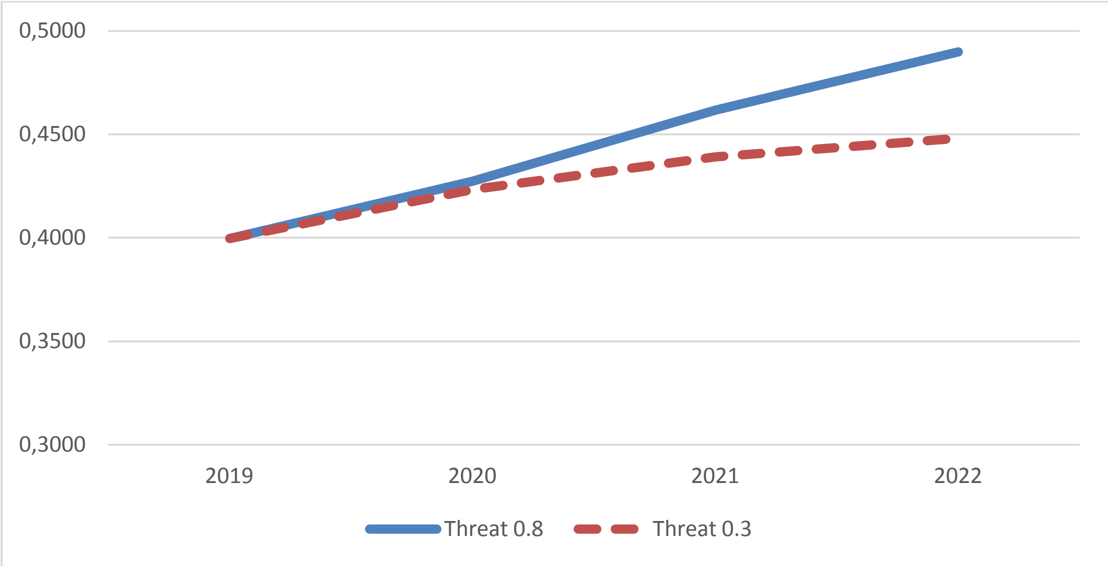
YEAR	EQDEF : ESCALATING TURKISH POLICY	EQDEF : CONSERVATIVE TURKISH POLICY	DIFFERENCE
2019	0.3996	0.3996	0.0000
2020	0.4273	0.4234	0.0039
2021	0.4617	0.4391	0.0225
2022	0.4897	0.4480	0.0417

[13] This figure means that until the conclusion of the % 150 - billion Turkish procurement programme there will be about $40 billion left to spend. This figure barely covers the cost of a helicopter carrier ($2 bill), the S-400 missiles ($2.5 bill.), 145 attach helicopters ($4 bill.), 1,000 battle tanks ($6 bill.), 100 F-35 fighters ($1.5 bill.), 6 t-214 submarines ($4 bill.) and a number of other programmes involving the TF-X domestically produced aircraft, the modernization of the f-16 fleet and the MILGEM corvettes.

[14] The 2019 budget provides €3.3 bill. to the Ministry of Defence with the funds allocated to equipment procurement not exceeding €1 bill, amounting roughly to 0.5% of GDP. Needless to point out therefore that any comparison between the Greek and the Turkish side as regards defence procurement spending figures is pointless.

Figure 4: Greek Defence Spending on Equipment (%GDP)

Forecasts under Alternative Scenarios



VI. Conclusions

The aim of this paper has been to investigate the possibility of increased defence expenditure from the part of Greece once the country's economy recovers from the prolonged crisis, an increase which has been against the Troika policy recommendations. The results derived point to a number of interesting conclusions:

First, the forecast shows that there will be an increase of defence expenditure on equipment procurement in the next few years.

Second, a return to positive growth rates is expected to bring about rather low, if any at all, increases as regards defence spending on equipment. This is due to both the restricted funding of the Defence Ministry requirements as well as the limited contribution of the domestic defence industrial base to the EMPAE programmes and consequently to the country's economic growth.

Third, the main source of defence spending increases in the future is the corresponding expenditure from the part of Turkey, in the logic of an arms race environment which has been threatening the NATO cohesion ever since 1974 when Greece had withdrawn from the alliance military structure for a period of six years. Such an environment accentuates the already existing frictions between Turkey and a number of the remaining NATO members for a wide selection of reasons. The increasing population differential growth rate between Turkey and Greece simply adds to the threat, ranking third in the input significance ordering.

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Fourth, the pressure exercised in such an environment from the part of Turkey has increased since the beginning of last decade making the follow-up cost considerably heavy for Greece to sustain as the resource availability is constrained by the tight annual budgets.

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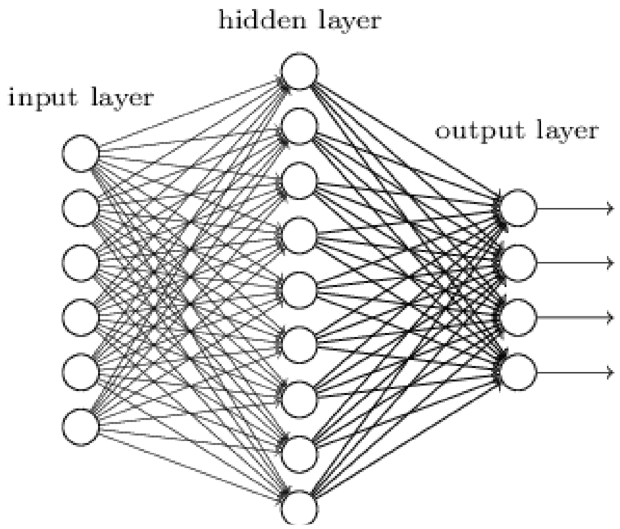
Appendix I. NN Briefing

Artificial Neural Networks, which belong to the data science approach and not on the model driven approach, are one of the widely used models for data science applications. They are loosely based on the biological nervous system and brain functions, meaning that they employ certain general purpose algorithms to analyze the input data provided. The structure of an Artificial Neural Network contains the input layer, the hidden layers and the output layer. Each layer contains several nodes or neurons. Each neuron connection is assigned a weight that is based on its relative importance compared to the other inputs. The calculation of the weights that creates the input-output mapping are what solve the high dimensional, non-linear system identification problem. However, the model adjusts its weights in order to minimize the errors in the results. A commonly used process for the training is back-propagation, which is technically the derivative of the errors with respect to the weights $\frac{\mathrm{dError}}{\mathrm{dWeights}}$. An example of an m-d-q neural network architecture is displayed in Figure 5 where m are the inputs, d are the number of neurons in the hidden layer, and q are the output neurons. In our study we estimate an m-d-5 network architecture to forecast the behaviour of our time series.

Figure A. I. 1: Example of a Neural Network Diagramme



The input data is analyzed by the neurons inside the hidden layers through the utilization of activation functions such as Sigmoid and ReLu (Hahnloser et al. 2000) The mathematical form of the Artificial Neural Network is presented below:

$$y_t = w_o + \sum_{j=1}^{q} w_j \times g\left(w_{0j} + \sum_{i=1}^{p} w_{ij} \times y_{t-1}\right) + \epsilon_t$$

where $w_{ij}(i = 0,1,2,..,p, j = 1,2,..,q)$ and w_j $(j = 0,1,2,\dots,q)$ are the connection weights/biases, p is the number of input neurons and q is the number of the hidden nodes. The output of the model is y_t and the input variables which are the previous values are y_{t-1}. The error term is ϵ_t which is the difference in the forecasted and actual values of the output and g is the activation function of the model. It should be mentioned that a commonly used parameter by artificial neural networks is the bias factor that has a fixed input value of 1 and it feeds into all neurons in the hidden and output layers with adjustable weights. Its significance is that it shifts the activation function which results in an increase in the accuracy of the data.

I. 1. System Design

The input data, $x = \{x(t): 1 \leq t \leq N\}$ is split into a training set $x = \{x(t): 1 \leq t \leq T\}$ and a testing set $x = \{x(t): T < t \leq N\}$, where N is the length of the series. The training set is used to train the network at a certain level to achieve convergence based on some error criterion. This is achieved by presenting the input and output data L-times to the model and have the

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learning algorithm adjust its weights. The number of times that the data is presented is called epochs and the output neuron is basically the predicted values that the model predicts. The process of back-propagation is carried out by an optimizer such as Adam. The range of predicted values is between [0,1] by the implementation tool used. Therefore, the values x_t of both the training and testing set is normalized by taking the ratio $\frac{x_t - x_{min}}{x_{max} - x_{min}}$, in order to avoid negative values. The predicted values x_t can be restored by taking the inverse transformation $x_t^f * (x_{max} - x_{min}) + x_{min}$.

Appendix II. The Greek / Turkish Conflict in Figures

Table A. II. 1: Turkish Air Force Activity in the Hellenic FIR

YEAR	FIR VIOLATIONS	HELLENIC SPACE VIOLATIONS	ARMED AIRCRAFT	DOGFIGHTS
1997	712	849	448	425
1998	1064	986	574	405
1999	648	1125	384	171
2000	487	446	82	30
2001	826	976	105	53
2002	2742	3240	1062	1017
2003	1891	3938	970	1032
2004	1121	1241	521	528
2005	2330	1866	977	244
2006	1237	1406	567	159
2007	868	1289	464	207
2008	608	1134	353	215
2009	703	1678	395	237
2010	729	1239	367	13
2011	620	962	307	13
2012	667	646	176	1
2013	577	636	129	0
2014	801	2244	145	8
2015	826	1779	133	80
2016	902	1671	86	68
2017	1103	3317	257	176

Source: Hellenic General Staff

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The Justification of Colonial Policy through Violence, the Concept of Tyranny, the Various Forms of the Colonized People's Death, and its Mark in Literature

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Abstract. In this paper, the justification of the colonial violent practices which led to the indigenous people's physical death, social marginalization and cultural extermination is presented. The concept of death is indispensable in understanding the distance between the colonized and the colonizer, the stereotypically caused identity loss of the former, the reasoning of violence committed upon the disorganized, to-be-colonized world, which, resembling nature, abides solely by the natural law of power. Moreover, the role of colonial literature in justifying the indigenous people's objectification, dehumanization and subsequent death, as well as in supporting the imposition of colonial rule, is presented. Postcolonial literature is mainly approached with regard to native writers' perception of the fatal physical and cultural consequences of colonization upon the indigenous populations.

Keywords: Colonialism, Death, Colonial, Postcolonial, Colonizer, Colonized People, Sovereignty, Tyranny, Epistemic Murk, Civilization, Otherness, Subjugation, Inferiority, Dehumanization, Objectification, Invisibility

DEFINITION OF COLONIALISM

Colonialism is "the control of individuals and groups over the territory and/or behavior of other individuals or groups" [10]. It refers to group sovereignty; it differs from imperialism in that settlers migrate from the colonizing power to the colony in significant numbers. The distinction between the two, however, is not entirely consistent in literature. "Some scholars distinguish between colonies for settlement and colonies for economic exploitation. Others use the term colonialism to describe dependencies that are directly governed by a foreign nation and contrast this with imperialism, which involves indirect forms of domination" [17].

Colonization assumes three different forms. Firstly, there is colonization in which the dominant relationship between the colonizers and the colonized is the extermination of the latter. Secondly, there is colonization in which the relationship between the colonizers and the colonized is one of assimilation. There is also an intermediate relationship, in which the

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colonizers and the colonized live adjacently or apart, but neither total acculturation nor total eradication occurs [10].

VARIOUS FORMS OF THE INDIGENOUS PEOPLE'S DEATH CAUSED BY COLONIALISM

In any form of colonization and in different percentages, deaths, mostly of the colonized, take place. They assume the forms of physical, cultural or social death. Whether the realm of death is literal or a metaphorical societal construct designed for oppressing the colonized, it is created through power dynamics.

In the case of extermination, physical death simultaneously extinguishes the indigenous people's culture and, thus, causes cultural death. Additionally, extermination marginalizes the few indigenous survivors through slavery, geographically or socially.

In the case of assimilation, physical death upon the colonized occurs on a smaller scale. There is a percentage of the colonized people's social assimilation by the colonizers, and there is partial cultural death of the indigenous culture through its absorption by the dominant culture. With regard to the imposition of the colonizers' culture, "the colonizers acted as a donor culture and the colonized people constituted a host culture, with a vast amount of cultural transfer……..from donor to host" [10]. This social or cultural death of the colonized occurs because the colonizers reject the existence of constructs such as pre-existent society and culture among the indigenous populations. Thus, cultural dominion upon the natives is a paternalistic practice which exports civilization in order to offer to the indigenous peoples an imposed cultural identity and to "humanize" them.

The colonized conclude that because their native culture is so diverse from the new dominant population, they are intrinsically inferior: "The native constantly compares and analyzes his ability to speak like the colonizer and dominant culture. Upon comparison, the native is in a state of high proclivity to develop an inferiority complex" [9].

In the case of adjacent living between the colonizers and the colonized, there is social marginalization of the latter by the former. Such marginalization, as well as the subsequent chaotic differentiation between the colonizers' and the natives' living conditions is described also through reference to diverse spatial worlds: "Between the European town and the native town, there is an interstellar distance of colonialism" [5]. This social death may lead to death of the indigenous culture as an imposed prerequisite for the colonized to be assimilated into the dominant system and earn financial rights through taxed labor. For instance, "the native Martiniquan individual learns at an early age to assume the language of the oppressor, for it is his only course to freedom and prosperity" [9].

However, language carries culture, and "culture carries, through orature and literature, the entire body of values" by which the natives of Kenya, for instance, "perceive themselves and their place in the world" [15]. Due to colonialism, indigenous languages are associated with humiliation, punishment and generally experiences offensive to human dignity, as colonialist education and relevant practices commit a linguistic, and thus cultural death, upon the natives.

SOVEREIGNTY AND TYRANNY

The concept of sovereignty is complex in political science and has had diverse definitions. The following two definitions are the most common: "The first definition applies to supreme public power, which has the right and, in theory, the capacity to impose its authority in the last instance. The second definition refers to the holder of legitimate power, who is recognized to have authority. When national sovereignty is discussed, the first definition applies, and it refers in particular to independence, understood as the freedom of a collective entity to act. Sovereignty is the full right and power of a governing body over itself, without any interference from outside sources" [6]. In political theory, sovereignty designates supreme authority over some polity. Sovereignty, as understood "in terms of governing competence, is tied to the prescription, application, and enforcement of law" [14]. Bodin claims that law is the source of power, and that "the power to legislate and to rule are identical" and "belongs only to the sovereign" [6]. In short, the sovereign is not subject to any authority. The conclusion drawn is that since the prince is not subject to his own decisions or decrees, he is superior to law.

Apparently, theological roots of sovereignty exist in that the governor is excluded from the power of law. "By granting himself the power to decree and annul laws, he acts like God. He forms a distinct entity, ruling the social body in the same way that God governs the cosmos" [6]. Thus, "on the one hand, political power is secularized; on the other, the sovereign, now identified with the state, becomes a person granted quasi-divine political power" [6].

However, in organized societies, superiority and power are agreed upon, according to various theorists. For instance, Hobbes invoked "a social contract based on the rationality of individuals", who "place themselves under the authority of a prince in order to end the war of all against all," which is characteristic of the "state of nature." [6].

Both Bodin and Hobbes draw a distinction between sovereignty and tyranny, as the first is defined by the sovereign's duty to abide by laws of nature or religion, by power and criteria directed towards the common good for the legitimate exercise of power ("law" or "individual consent" for Bodin and Hobbes respectively). For Althusius, "the sovereign cannot act willfully without being held accountable" [6].

Apparently, sovereignty involves conditioning the natural law through parameters like "people's consent". However, "sovereignty doctrine is understood as a stable and comprehensive set of ideas that was formulated in Europe and that extended inexorably and imperiously with empire into darkest Africa, the inscrutable Orient, and the far reaches of the Pacific, acquiring control over these territories and peoples and transforming them into European possessions" [2]. Consequently, sovereignty becomes tyranny when the colonized are deliberately presented in literature as members of unorganized, communal systems resembling nature and not considered citizens, thus deprived of the right to consent to a social contract; they are considered to be savages and nature is regarded as their ultimate master. In such societies, the natural law of power imposes divine or human sovereignty not through mutual consent, but by the proven manifestation of greater force upon the natives. Subsequently, in colonies, the sovereign, not subjected to law, have the justifiable natural jurisdiction to eliminate life at will and colonialist violence, even in its uttermost brutality, is

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perfectly justifiable. Colonizers' governance of natives (who are deliberately regarded and presented as savages) is outside and above the law, thanks to colonizing power legitimized by self-granted superiority. The latter is granted by the guises of religion, war technology, acculturation to justify and forgive the mercilessness of natives' life elimination, cultural eradication or social marginalization.

Postcolonial Views on Sovereignty and Tyranny

Theorists from once-colonized countries assign to their analysis of literal death and colonialism a perspective burdened with the objective truth of the natives' historical pain and perceive sovereignty as "the power" "to dictate who may live and who must die" [13]. The dynamics of brutality of power, or else, of tyranny baptized as sovereignty, define the right to life or non-life as the space where power is manifested [13].

Regarding the linguistic and cultural death of native cultures, examples in postcolonial literature portray local authors' realization of the imposed attempt of extermination of their cultural identity by the colonizers. For instance, when the eradication of indigenous Kenyan languages and cultures was ventured by the colonizers, "one of the most humiliating experiences" was "to be caught speaking Gĭkũyũ in the vicinity of school" [15]. "The culprit was given corporal punishment" or "was made to carry a metal plate around the neck" [15]. This cultural tyranny of sovereign colonialism brought about "an active (or passive) distancing of oneself from the reality around; and an active (or passive) identification of what is most external to one's environment" [15]. Obviously, indigenous languages are described in postcolonial literature as relevant to the negativity of lack of progress and punishment.

In postcolonial literature, the politics of language play a vital role in manifesting the interaction between the upper class, native in origin but culturally representative of the colonizers, and the lower class, which is addressed pejoratively by their masters as "cripples" [1] or "rats"[1]. The lower-class natives' will for education is "a craze" [1], while for the upper class natives who embody colonialist values and status quo education is an expected normality. Lack of access to colonialist education leads to the lower-class natives' inert and unmanageable imprisonment in a system which perpetuates their marginalization due to lack of education and, subsequently, of social mobility. They may constitute a majority in terms of population percentages, but are objectified and, thus, expendable.

EPISTEMIC MURK

Colonizers' terrorism towards the colonized in cases is by far more bloodthirsty than could be explained by rational, economic motives and opposed to business interests, because of causing the destruction of indigenous labor power. This terror is viewed as an abreaction against the Wild Man, the anti-self of the colonist, "which necessitated violence as savage as the "savage" it was directed against" [18]. This not well-defined anti-self is presented in what Taussig calls "epistemic murk" [18]. The colonizers inspire terror through projecting to the colonized an uncertain nightmarish reality and death as a likelihood for the disobedient.

This epistemic murk is the sequel of ways of disseminating information fabricated to cause uncertainty and is founded on the interplay of illusion and truth as both to the colonizers' powers and to the consequences of the natives' resistance. The stereotypical natives' characterization as "primitive" instead of civilized human beings justifies the colonizers' unscrupulous violence and the affliction of unprecedented chaos to indigenous societies as a normality. In turn, the colonized are subjugated to stereotypes justifiable of their death [18].

COLONIZERS' VIOLENCE; DEHUMANIZED BUT "HUMANIZING"

Death in the uncertain atmosphere of the colony is accompanied by a mystical element of violent and fatal forces existing in both opposing sides. Due to this element the colonized are identified with the stereotypical image of a savage and the colonizer substitutes this image for actual indigenous human beings.

The distance between colonization and civilization is great, despite acculturation through colonialism. Aimé Césaire explicates the colonialist mental processes which justify the imposition of brutality upon the colonized. A civilization justifying colonization and force, "is already a sick civilization" [4]. Colonization brutalizes the colonizer, awakens "buried instincts," "violence, race hatred and moral relativism" [4]. The colonizer sees the colonized as an animal in order to ease his conscience, gets habituated to treating him like an animal and "tends objectively to transform him into an animal." [4]. All the above are legitimized by widening inequalities between the colonizers and the colonized "and making them into a law" [4]. Indicative of the above is President Roosevelt's speech when referring to the Native Americans: "justice is on the side of the pioneers ……..this great continent could not have been kept as nothing but a game reserve for squalid savages" [11].

Colonialism yields space for the verbal liberation of Westerners' craze for power through torture. Death is not a punishment, it is a vice, as, for instance, it enforces upon De Montagnac forgetfulness through the imposing power of visual atrocity. Quoting the right to brutality and the power to verbally express it, De Montagnac states that "In order to banish the thoughts that sometimes besiege me, I have some heads cut off, not the heads of artichokes but the heads of men." and Count d'Herisson states that "we are bringing back a whole barrelful of ears collected, pair by pair, from prisoners" [4].

Contrastively and simultaneously, the colonized are considered savages who do not have the capacity for self-government because of their excessive love of freedom and need to be governed for their moral improvement, regardless of the way this governance is imposed. "Only commercial society produces the material and cultural conditions that enable individuals to realize their potential for freedom and self-government. According to this logic, civilized societies are acting in the interest of less-developed peoples by governing them" [17]. History has proven the prevalence of violence as a practice for the colonized people's subjugation or the alleged "moral improvement".

ANOTHER DEATH; PURPOSEFUL DEHUMANIZATION, OBJECTIFICATION, INVISIBILITY

All kinds of "deaths" of the colonized are facilitated through the process of their purposeful dehumanization, objectification and invisibility.

In general, the colonized are objectified by the colonizers. This justifies the fact that they are expendable like any other natural resource of the colony, as parts of a background to the "human" presence of the colonizers. Consequently, from a colonizer's viewpoint, they are expected to succumb to the destiny of used resources with a passivity similar to any other inanimate or animal resource used, commercialized or even wasted. Moreover, "the Western world developed an elaborate vocabulary for denigrating" the colonized, "presenting them as suitable objects for conquest, and legitimizing the most extreme violence against them, all in the furtherance of the civilizing mission"[2]. The colonizers are agents performing invasion and acculturation, and "objectified" natives are passive to the point of being inanimate and soulless individuals, not real ones.

In other cases, the colonized appear to be devoid of human qualities of civilization and social identity. Colonial occupation pertains to defining borders and asserting control over a formerly uncivilized geographical area, the fauna of which could, among the species comprising its natural landscape and its local ecosystem, also be described as "non-civilized human". The colonizer reduces the colonized subject to an absolute evil, a savage being in need of structure and aid from the foreign occupants; this mentality therefore justifies the colonizer's actions……..the colonized subject is dehumanized, or reduced to a level not equal to that of the colonizer, but rather that of an animal, and referred to using purely zoological terms" [9].

There are also cases in colonial literature where the natives are presented as invisible. The indigenous people, reduced to servitude or inertia, rather constitute a part of a domestic or natural background, recipient of the colonizers' actions, which, in colonial literature, are aggressive, atrociously heroic. Fanon asserts that "The Algerians", "the palm trees, and the camels make up the natural background to the human presence of the French" [8]. The purposeful invisibility of the natives is characteristic of the creation of the topography of colonial dominion and death.

On the other hand, when natives are active, they may be so because of an important mission of servitude to the colonial regime. In *The Overland Mail*, even when the dedicated native adheres to a colonialist mission, there are hints of his potential inertia and he remains unnamed [12]. The native is reduced to a subservient, mysterious figure delivering mails to the important, colonized topography of an otherwise dark, uninhabited, uncivilized landscape [12].

TOPOGRAPHY OF (LITERAL) DEATH

The most imposing form of death is physical death. In the bloodshed history of colonialism it often happens through killing. The process of physical killing, be it instantaneous or a prolonged torture, endures less in time in comparison to social and cultural death, but more in memory to impose exemplification or, conversely, spark hatred, rebellion or revenge. Physical killing may carry epic martyrdom and inspire the attacked colonized people through its evocative imagery. Contrastively, natives' social and cultural deaths carry no immediate epic martyrdom, but, instead, the inability to fight against the colonizers' machinations and ruthlessness and yield strategic and collective freedoms. Thus, the space physical death creates is more visible, because, unlike social and cultural deaths, real death is not directly relevant to the status quo machinations and latent policies of everyday conscious, gradual and often indirect elimination of native cultures.

In colonial literature, physical death confines are often defined by silence before and after killing. Skillfully, the reader of colonial literature more often encounters auditory war imagery (silences, sounds of battle), and less often visual descriptions of, heroic through resistance, indigenous warriors. For example, in *Fantasia* "the silence of this majestic morning is……..the prelude to the cavalcade of screams"[7]. Also, when imprisoning and forcing the Algerians to die in the caves, silence and sound are used to describe the topography of death; "The gunshots are followed by silence; a ripple of sound, then a distant hammering that eats into the heart of the mountain."[7].

The skillful approach behind this dominion of sounds over images is that, by definition, images are visually represented in the human brain, and the occidental readership of colonial literature should grant to the colonized no heroic qualities of resistance till death or visualize the atrocities committed by the states whose they were citizens.

Elements of geography separate the colonizers and the colonized and serve not only as geographical confines, but also as symbolic gaps caused by the difference between them. In *The Stranger*, streets are used to create space between Meursault and the Arab[3]. There is a geographical distance between the colonizers and the colonized, which perpetuates fear and stereotypes from both sides. The colonizers' forcefulness is enhanced by their fear of the unknown and distant colonized, especially when stories of natives' atrocity, brutality (even cannibalism) were heard and distorted through retelling. The space of death is defined as a place "crucial to the creation of meaning and consciousness" especially "in societies where torture is endemic and where the culture of terror flourishes"[19]. Violence of death becomes a solution which clarifies the dynamics of power and establishes order.

CONCLUSIONS

For the imposition of colonial dominion, physical, social or cultural death of the colonized has served as an effective tool. Every form of the indigenous people's death has been achieved thanks to the reasoned practice of violence and under the colonialist objective of the colonized people's dehumanization, invisibility or objectification. It has also been justified; the colonized are considered expendable savages, who, as such and unlike citizens,

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do not consent to a social contract accepting sovereignty, but succumb to the tyrannical imposition of a greater power upon their existence and constructs. Colonial literature often justifies literal death, imposition of colonialist societal constructs and the colonizers' culture by the objectification of the natives, by suppressing visual imagery of colonizing brutality and by the presentation of colonized areas as formerly savage areas, initially dominated upon by the only understandable law in nature, the law of power. Postcolonial literature frequently sheds light upon the colonizers' atrocities and on the purposeful death of indigenous cultural identity features (such as suppression of indigenous languages in education) and on the marginalization of the natives' identity at large, for the establishment and the perpetuation of the colonial regime. The colonial policy of violence through the diverse forms of the colonized people's death is reasonable owing to the justification of the means and the ends of the colonial rule in colonial literature; in postcolonial literature the concept of death is of great significance mainly as a means of addressing or exposing the mechanisms, apparent or latent, due to which native people died literally or socioculturally, along with their indigenous societies and cultures, which lost either part of or the totality of their identity.

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Foreign Languages And Military Terminology At The Hellenic Army Military Academy

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Abstract. Teaching English and French and English and French Military Terminology at the Hellenic Army Military Academy aims at aiding cadets in understanding military books, irrespective of the difficulty of the texts, reproducing military texts in spoken language or in written form, and working on projects concerning military issues. It also helps cadets to acquire the necessary oral and written language skills that help them to cooperate with foreign cadets and officers; attend the annual Military Erasmus Program; participate in military conferences about NATO or the United Nations High Commissioner for Refugees (UNHCR). The courses comprise the writing of dissertations concerning geopolitical and geostrategic issues and the study of presentations at international military science conferences. The courses also succeed in helping cadets to learn how to use the electronic means of communication; the mechanisms of translation; and the evolution of language through time.

Keywords: English courses, French courses, military terminology, language skills, course books, international organizations, military translation, military neologisms, dissertations, and electronic communication.

INTRODUCTION

At the Hellenic Army Military Academy (HAMA) cadets are taught two foreign languages, namely English and French, at B2 level. The aim: to help them to attend the annual Military Erasmus Program; communicate with their fellow cadets abroad; and sit examinations at military schools.

Cadets at HAMA are also taught military terminology at B2 level, i.e. they study military texts and memorize military terms and orders, in English and French, in order to acquire the skills that will help them to read and understand military articles and books; develop their oral, listening and writing skills in order to be able to exchange information, convey thought, understand foreign lecturers and have access to military information on the Net.

The present study will not attempt to deal with the method of teaching English or French at the HAMA but to introduce the method of teaching military terminology both in English and French in order to help cadets to succeed in participating in military conferences, attending military colleges abroad and accomplishing NATO missions.

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PART ONE
THE AIM OF TEACHING MILITARY TERMINOLOGY AT THE HAMA

The aims of teaching military terminology at the Hellenic Army Military Academy are the following:

- To help cadets to understand different types of military books, irrespective of the difficulty of the texts;
- To reproduce military texts in spoken language or in written form;
- To produce well-written essays and projects concerning military issues.

The courses on military terminology are based on the cadets' knowledge of the two foreign languages, namely the already acquired skills, like the skills of reading and comprehending, discussing issues and completing language assignments according to the *Common European Framework of Reference for Languages: Learning, teaching, assessment* (CEFR). Strasbourg: Political unity and linguistic diversity in Europe, 2000.

The acquired knowledge of English and French helps cadets to accomplish the military demands of the Hellenic Army Military Academy and the Hellenic Ministry of Defence provided they attend the courses on military terminology and study the military course books that include the most common military terms used in the English and French speaking armies of the world. This is the way to help cadets to become able to read and understand English and French military books and acquire the necessary language skills that will help them to cooperate with foreign cadets and officers.

PART TWO
THE METHODOLOGY OF MILITARY TERMINOLOGY AT THE HELLENIC ARMY MILITARY ACADEMY

Teaching English or French military terminology at the Hellenic Army Military Academy includes comprehensive examinations that check the cadet's understanding of military texts, military terms and orders; strengthening test taking skills; memorizing military terms with the help of the Net; using military e-encyclopaedias concerning military treatises that will become the basis of his/her military literature, military strategy and tactics texts, as well as completing projects or assignments.

The books that provide the knowledge of military terminology are four (4): two (2) English military terminology course books and two (2) French military terminology course books:

1. *A Workbook for Learners of Military English* Volume I (2014) by Elizabeth Hatziolou and Stavroula Romoudi that comprises 135 pages and includes seven units involving the following military texts: Fundamentals of Combat Operations, The Principles of War, Retrograde Operations, Army Aviation, Field Artillery, Engineering and Logistics.
   The texts are accompanied by activities that require cadets to achieve the following:

- Comprehend the texts with the help of multiple choice quizzes;
- Memorize the definitions of the military terms in the passages;
- Match military words or terms with their definitions (word or definition matching);
- Elaborate, orally or in writing, on the titles of military articles and essays concerning military operations, campaigns, strategies and plans (title elaboration);
- Complete open sentences by using an appropriate military phrase or term (fill in the gaps);

- Form military collocations by using a military e-dictionary;
- Use prefixes or suffixes to enrich their vocabulary (word building formation).

In addition, the course book includes the following: *tables that* list all the standard army *ranks* and insignia; a glossary of army general orders; a military time chart; the NATO phonetic alphabet; exercises on listening to dialogues about military issues and taking quizzes on military English audio-visual CD-ROMs .

2. *A Workbook for Learners of Military English* Volume II (2014) by Elizabeth Hatziolou and Basil Chaldoupis that comprises 160 pages and includes seven units involving the following NATO texts: Defence Matters, Operational Priorities, Kosovo, Counter-Piracy, Support to Turkey, The Future of NATO and NATO Forces 2020.

The course book also includes the following exercises:

- Comprehension and composition;
- True or False;
- Preposition and prepositional phrases;
- Word building or Word formation, i.e. use a root and create an appropriate word to fill the gap in a text.
- Graph analysis and pie or bar understanding;
- Use of military terms;
- Subject-verb inversion and the theory and practice of the subjunctive.

A special glossary of military terms is also included in the course book; as well as tables of military collocations, listening and audio-visual CD-ROMs dialogues about adjusting to military life and war, etc.

The French military terminology course books are the following:

1. *Français sur Objectifs Spécifiques* (2014) by Stamatia Sofiou that comprises 182 pages and is divided into two sections. The first section includes nine units that involve the following texts about NATO:

- Les pays membres,
- La charte des Nations Unies,
- Qu'est-ce que l'OTAN ?
- La réforme des structures militaires de l'OTAN,
- Opérations et missions de l'OTAN,
- Coopération civilo-militaire,
- Les principales fonctions de l'Etat-major militaire international,
- Evolution du partenariat euro-atlantique,
- L'organisation pour l'interdiction des armes chimiques.

The texts are accompanied by the following activities:

- Comprehension (compréhension écrite) and military vocabulary (vocabulaire militaire);
- True or False (Vrai ou faux);
- Matching verbs with nouns; and nouns with adjectives by using an e-dictionary;
- Finding the synonyms and antonyms of the vocabulary in the text;
- Matching Greek and French military terms;
- Translating Greek into French and vice versa;
- Memorizing the army ranks and units; reading military charts, maps and geographical terms;
- Understanding words with multiple meaning: for example, the word *το σύνταγμα* = *la constitution* and the phrase *το σύνταγμα των στρατιωτών* = *le regiment*;

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- Discovering the role of NATO.

The second part of the book includes passages for translation purposes involving L'Ecole spéciale militaire de Saint-Cyr in France and L'Académie militaire de West Point in the USA; as well as an analysis of the Army Services, i.e. Infantry, Artillery, Engineering, Armour, Signals and Army Air Corps.

2. *Textes Militaires* (2014) by Stamatia Sofiou that comprises 182 pages and includes the following six (6) military texts distributed in six (6) units:

- La Guerre de Corée
- La Guerre du Viêt Nam
- La Guerre des Six Jours
- Les Guerres d'Afghanistan
- Les Guerres du Golfe
- La Guerre de Yougoslavie

The units include the following activities:

- Compréhension écrite exercices;
- Preposition and article exercises, i.e. *en* in *être en campagne* and *être à la campagne*;
- Adjective and participle activities, i.e. the word *poste* can have several meanings: *la poste* (the post), *le poste* (the position), *un poste de combat* (a combat post), *un poste de commandement* (the administration office), *être nommé à un nouveau poste* (be appointed to a new job), etc.
- Imperative and subjunctive exercises related to the verbs in the text;
- Active and passive voice exercises; indirect speech activities; subordinate clauses, i.e. time, relative pronouns, causative, deductive and conditional exercises;
- Translation exercises that help cadets to recognize grammar differences between the two languages.

The course book also includes a glossary that refers to the following military terms:

- La Préparation à l'attaque;
- L'Offensive;
- La Patrouille de nuit;
- L'Entrainement militaire;
- La Guerre nucléaire;
- Le Combat de rue;
- Le Maniement des armes;
- L 'Espionnage;
- Réfugiés et Guérilla;
- Sigles matched with Greek acronyms.

The course of English military terminology is complete with a. the study of neologisms; b. the writing of dissertations concerning contemporary geopolitics or the relationship of geography to politics and the existence of international antagonism; contemporary geostrategic, a subfield of geopolitics or the study of strategy to the political situation of a country or region; military power or strength; the history of international organizations, like the United Nations and NATO, which deal with conflict; and the study of presentations of international military science conferences.

Concerning the study of neologisms, cadets can visit the following website <https://www.researchgate.net/profile/Elizabeth_Hatziolou> and learn about the new words or expressions in contemporary military technology and army jargon. On the website, the article "Neolexia: How helpful can it be in class?" aims at explaining the nature of the new words/phrases through different types of neologisms, like *nonce words*, *blends*, *portmanteau* and *buzzwords*; giving examples; and revealing the educational value of neologism and how it can be used in class.

In order to keep cadets informed on the evolution of the French language, there is the Hellenic Army Military publication entitled *Scientific Publications 2014-2016* in which the essay "Détection et utilisation des néologismes dans l'enseignement du Français Langue Etrangère" by S. Sofiou is divided into two parts.

1. The theoretical part that includes a historical study of neologisms that s their evolution and underlines their diachronic influence on society and culture; and a list of neologisms that record their complicated nature and creativity that can help cadets to consolidate the French language.
2. The part on the application of neologisms and the role that they have played in contemporary army terminology satisfies institutional targets and responds to educational needs by involving cadets in the effective and reactive procedure and keeping their interest in the language while contributing to their work progress.

International presentations on neologism, like the one by S. Sofiou entitled "L'étude des néologismes dans l'enseignement du FOS à l' Ecole militaire de Grèce," delivered at the 3rd International Conference of the University of Belgrade in September 2014, also help cadets immerse themselves in the study of military terminology.

As far as the dissertations of senior cadets are concerned, the ones written in English pertain to contemporary topics, like the following:

1. "UN Peacekeeping and Diplomacy" or the history of the United Nations, an intergovernmental organization tasked to promote international co-operation and to create and maintain international order; and the art and practice of conducting negotiations between representatives of states.
2. "Operation Desert Storm," involving authentic newspaper articles about the War in Iraq and Afghanistan, the Syrian Civil War and the Guerilla War of the Islamic State of Iraq and Syria (ISIS).
3. "The Breakup of Yugoslavia" about the collapse of Yugoslavia in the Nineties and the formation of smaller states, like Croatia, Slovenia, Serbia, Bosnia-Herzegovina, Montenegro and Skopje.
4. "The Arab Spring 2010-2014" that involves the riots in the Middle East from 2010 to 2014 to liberate the people from the oppression of dictatorship.
5. "The Crisis in North Africa: Egypt, Libya, Tunisia, Algeria and Morocco" about the mass protests of the peoples of North Africa, from 2010 to 2014, against authoritarianism or the form of government characterized by strong central power and limited political fredom.

Besides the texts, the dissertations include comprehension questions, vocabulary activities graph analyses, listening and video activities, with regard to military issues, which cadets download from the Net.

The dissertations of the French speaking cadets concern the following topics:

1. «La personnalité du Général de Gaulle » or the contribution of the French general to the defeat of the Nazis in World War II.
2. «Les Forces de Défense et la Protection de l'environnement», a study on the protection of the environment during military drills and joint and combined military operations.

3. «Une étude générale des ponts et une étude détaillée du pont Bailey» or a project on the construction of bridges for communication purposes and the construction of the Bailey bridge to facilitate the transport of men and weapons in rocky and steep terrain.
4. «La Première Guerre Mondiale et les Ecrivains Français ». The language of the «poilus» used in the French war fiction and the emergence of dystopia in the novels about the Great War.

Through dissertations cadets make good use of their knowledge in relation to military terminology and world war history.

CONCLUSION

By using the above methods, the courses on military terminology succeed in accomplishing three targets, i.e. using English and French terminology in speech and writing; consolidating foreign linguistic information; and enriching cultural knowledge.

What is more, cadets have the opportunity

- ✓ To learn how to use the electronic means of communication with the help of the inductive approach /méthode inductive.
- ✓ To learn the mechanisms of translation and understand the interdependence between the structures of the two languages, because as Ferdinand de Saussure (1857-1913), the Swiss linguist, said, "la langue est instrument pour la parole et en même temps le produit de la parole».
- ✓ To understand how language functions and evolves through time.

Lastly, as General Dmitri Skarvelis, Former Chief of Staff at the Hellenic Ministry of Defence once said, "Competence in foreign languages is a necessity in the army, a necessity that is increasing gradually".

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Thessaloniki International Fair and the East – West conflict

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Abstract. This study aims to highlight the economic and industrial fairs as a medium in the East – West conflict. In addition of the commercial importance of a trade fair, the study will focus on its political significance. Specifically, the article has the goal of judging the cultural – political intentions of the German Democratic Republic towards Greece, but also the German – Germanic system competition in the context of its exhibition diplomacy. Point of reference is the Thessaloniki International Fair. Analyzing this issue, the study will provide information about the ideological – political importance of the East Berlin trade fair policy, specifically as part of a global strategy which had to promote East Germany and its interests in order to achieve a primary goal, that of international recognition.
Keywords: Thessaloniki International Fair, East – West conflict, German Democratic Republic, Federal Republic of Germany

INTRODUCTION

Trade fairs from the first years of their organization were markets with importance beyond their borders. Since the mid-19th century, they have evolved in exhibitions that did not only serve the promotion of any products, from agricultural to industrial, to the market, but also the promotion of political culture and the confrontation of ideological systems.

Thus, during the Cold War the fairs played a double role: on the one hand they served economic interests through the promotion of companies and products and also had a political dimension and contributed to the competition of the two opposite Systems. [1]

The International Fair of Thessaloniki (TIF) was founded in 1925/26 with high expectations. The number of participating States grew by the mid-30's to 18 and continued in the coming years. Among these participations were the great Powers Germany (from 1936), Italy, Soviet Union, Japan. From 1951 – after a ten-year break due to the war and civil war – the TIF reflects the Cold War, in which the leading forces of the USA and USSR (as well as their own Federal Republic of Germany and German Democratic Republic) competed strongly with each other. At this point the specificity of the Eastern market, which was also an advantage, should be emphasized since it had a limited resonance in the West, while in Greece it found fertile ground because Greece also promoted the poor quality products of the East-German market that could not be promoted in the Western market. Under these circumstances the delegation of the GDR was more successful in the TIF than that of the Federal Republic of Germany. [2]

For the GDR, a state without diplomatic recognition (until 1973) by the Western coalition States, participation in international fairs and even with propagandistic success was a kind of alternative diplomacy. [3] In addition, East Berlin concentrated during the Cold War, on "capitalist" (non-communist) states, including Greece – despite their more general rejection. Thus, in the context of this policy and in the case of Greece, this reciprocal trade relationship functioned as a non-ideological lever, which resulted in reciprocal participations in the TIF and the Leipzig Trade Fair respectively. Obviously, and as will be shown in this study, the leadership of the GDR attempted to use these contacts through the TIF in the direction of international recognition. [4]

TIF and the policy of the GDR

It should be emphasized that the Cold War could ultimately be won at the social level and not by military means. Thus, the exploitation of policy, the political presence abroad, the policy of creating image, cultural penetration, public image, representation at foreign policy level and, in quite simple terms, those procedures which promote abroad the ideal image of a state and its political and ideological system, were factors that during the East-West competition were at the heart of the interest. [5]

This concerned both rival German states. Thus, West Germany tried, against the backdrop of the Cold War and the German-Germanic competition, to have a strong presence at PR level regarding exhibitions abroad and especially in the sense of promoting a flawless image of the state abroad. [6]

In regards to the central question of this study, whether factors such as these could contribute to the promotion of the political messages of a state, I will concentrate and present the East German policy towards Greece but also towards the other German state, West Germany, in relation to the International Fair of Thessaloniki.

For East Germany the TIF was one of the largest exhibitions among Western countries and a model of its kind. [7] The reasons imposed on Germans for their participation in TIF were economic-commercial, but above all political. The TIF offered the opportunity to view the East German products in the strategic very important Greek space in the best possible way, as well as the economic and political power of the state with the aim of highlighting it as the 5th industrial Power, with parallel expansion of the customer network. [8] It also gave the opportunity to develop relations with personalities of the country's public life and to exercise propaganda in the most legitimate way. This could awaken the interest of the Greeks and approach the goal of obtaining a stable partner in Greece, who might be interested in developing formal relations. [9]

In addition to the aforementioned, participation in the exhibition could enhance the participation in the Film festival -during the international periods- as both events were held at the same time in the same city and the combination was not only able to launch the promotion of the GDR to new heights [10] but, in fact, overshadow the parallel presence of West Germany. [11] For this reason, GDR tried -successfully according to Greek publications- to organize its own kiosks well and to present its exhibits in the best possible way. [12]

On the other hand, the opportunity was given of taking pictures during the exhibition, an activity that the GDR wished to extend to other areas of the country in order to strengthen bilateral cultural relations. [13] Particularly propagandistic was the use of commercials, which primary promoted all areas of life in the GDR and also functioned as proof of technological progress. [14] In addition, it was extremely important for the GDR to send representatives of the Association "*Liga für Völkerfreundschaft*". However, the Association was not an official participant and served the purposes of public information at the exhibition. Its pavilion was the core distributor of printed propaganda material for the GDR, such as ' DDR-Revue '. [15] It should be noted that the shipment to Greece of 100 issues of ' DDR-Revue ' on the occasion of the 10th anniversary of the GDR in 1959 was characterized by the commercial delegation of the GDR as semi-legal propaganda. [16]

Consequently, the participation of the GDR in the TIF was connected with the participation of Greece in the Leipzig Trade Fair -for the first time after the war, in 1956. [17]

Of particular interest are the preparations before the start of the event, which were not limited to the organization of the exhibits, but were, also, of a political nature. The Association "*Gesellschaft für kulturelle Verbindungen mit dem Ausland*" gave instructions for shaping the contacts the delegates ought to make during their visit to Greece, [18] meetings were organized by the East German Chamber of Commerce, which focused on Greek political issues [19] and a person was sent to Greece in order to make the first contacts and organize the overall work. [20] Meanwhile, the team's program, which included contacts with journalists and a major press conference, was defined by the participation of around 40 journalists aiming at the best possible promotion. [21]

However, the activities of the GDR in all sectors were often interrupted by interventions of West Germany. Participation in the TIF was no exception. A perfect example is the press conference regarding participation in the exhibition in 1964. The GDR was scheduled to give the interview at 12:00 and West Germany at 19:00. At the last minute the latter changed the time to 12:00 for the presentation, which led to the journalists being initially shared between both events. [22]

The first participation of the GDR in the TIF dates back to 1954 and continued during the subsequent years as well. Since then there were participations in 1958, 1960, from 1964 to 1966, 1969 and 1970 and during the 80's in 1987 and 1989. [23]

In 1957 the Soviet Union also abstained from the event, although in the previous year it was the focus of the exhibition along with Eastern Germany. [24] In 1959 the abstinence of East Germany was the result of the case of the Greek ship "Martha", [25] while for 1961 and 1962 they were scheduled to participate, but they eventually withdrew their participation. The reasons of abstinence in 1961 are not known, in 1962, however, abstinence was due to reasons of "discrimination" from the Greek side. The management of the exhibition did not accept the analytical name ' Deutsche Demokratische Republik ' and its translation in Greek, English and French, but intended to name the mission of the GDR as the ' East German Chamber of Commerce ' (in Greek and French), using in German only the abbreviation DDR. The people responsible for the mission considered that this treatment was contrary to their basic principles and suggested that their country abstains from the event. It should be noted here that the hardening of the Greek attitude was the result of West German pressures, which were particularly pronounced during the period in question, due to Greece's connection with the EEC. At that time, the trade delegation undertook the obligation to inform the directors of the Fair, as well as the other socialist countries, which were expected to take part, namely Czechoslovakia, Hungary, Poland, Romania, Bulgaria and the Soviet Union. The decision for the abstinence was taken in defiance of the risk of Greek ' retaliation ', that is to say, by defying the possibility that Athens would withdraw its participation from the Leipzig Fair for 1963,

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which, although expected, was not at all desired by the German side. [26] However nowadays, this decision is not a surprise. Already during the preparation period, since February 1962, the authorities in the GDR analyzed in a particularly extensive report the most important issues concerning the participation in the TIF. Among them was the importance of participation in the commercial, social and political level, the role of the promotion, the companies and the types of products that would be promoted, but particular importance was given to the objectives, one of which was clear and very common. It was necessary to clarify the separation from the other German state. The full name of the state and the use of the flag were extremely important, However, the Greek authorities did not want to allow them as well. [27]

This uncompromising stance of the GDR kept the state away from the event the following year, although the work schedule towards Greece for 1963 included the issue of the TIF, for which, in fact, the mission of a representative was planned, in order to make efforts to reach people of the Greek scientific and cultural life. [28] However, in 1964 and 1965 the GDR successfully participated in the TIF, since, despite the new ban on the use of its flag, adopted a compromising stance. [29] This development was halted by the imposition of the junta in 1967, when the GDR withdrew its participation after the request of the Communist Party of Greece. [30] However, during the dictatorship two more participations were made, while after the diplomatic recognition of 1973, the importance of the fair for the GDR was reduced, since the political reasons, which had imposed it, ceased to exist.

Therefore, the next participation was set for 1987. It is clear, however, that the objectives and the orientation of the GDR had changed radically. Both the participation in 1987 and the following one in 1989 aimed at the development of bilateral trade and economic relations and the achievement of the financial interests of the GDR. [31]

Conclusions

The purpose of this study was to highlight the importance of a state's participation in international exhibitions with the aim not only of promoting trade and economic relations but of its respective political and cultural policies. The example used was that of the East German policy towards the Thessaloniki International Fair.

It is clear from what has been analyzed that the Thessaloniki International Fair served as a means for German-Germanic competition, which, at the same time, was a competition between the ideological systems of the East and the West. Through the analysis of the stance of the GDR regarding its participation in the TIF over time the relevant policy of East Germany was outlined and its objectives were identified, while its competition against West Germany became evident.

The confrontation between the two German states, which represent the two opposite ideological systems, is widely known and in recent years many scientific studies have appeared. Of particular importance, however, is the description of the policy of the two German states with regard to the fairs, a policy that enabled them through a kind of disguised propaganda to serve the ideological competition of the systems which they represented. [32]

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