GIVING ECONOMICAL FORECASTS USING AN ELEMENTARY INFORMATICAL SYSTEM

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Abstract: In the given study natural population growth is calculated, based on information provided by the National Institute of Statistics. Also economic predictions are made for these quantities and for the total population development. The objective of this research is to present a practical method for achieving economic forecast. This is a learning tool using the computer. Using this method, students can achieve other economic predictions. Data processing is performed with Mathlab program.
Key words: forecasting, modelling, simulation operations, software

1. INTRODUCTION

The aim of this study is to present a practical method for achieving economic forecasts using the computer.

With the help of this method students from Economics faculty, sociology and other schools are able to give economic forecasts for a series of economical indicatives. These types of social impact, economic forecasts show interest for government institutions and economic society.

It is a practical application very useful in the learning process.

Using this method does not require advanced programming knowledge, only computer operating skills. The advantage is that users develop computer operating skills. The computer system used in the future may be developed by adding new features.

2. DESCRIPTION

In the business of forecasting we use modelling and simulation operations.

In the computer simulation process computer is used to evaluate a model from numerical point of view , over a specified time period and to obtain data to estimate the true features of the model (Law & Kelton, 2000).

Using computer model to achieve simulations is common, especially in education. This has been driven by several factors:

- increasing the number of software tools for simulation;
- there are packages to simulate specific problems;
- affordable prices that can be purchased at most of the software packages available;
- simulation software packages do not usually require a special technical expertise to be used;
- current informatios systems can provide large amounts of data needed for the simulation experiments.

3. DESCRIPTION METHOD OF WORK

The proposed method has 4 stages.
1. Organization of input, which will be processed;
2. Define mathematical relationships, achieving calculations;
3. Making economic forecasts using the MathLab;
4. Analysis and interpretation of results.

4. CASE STUDY

In the following lines, economic forecasts will be made.

Steps taken to achieve economic forecast are the following.

4.1 Organization of input, which will be processed

Information available is: total population (P), birth and deaths. The birth rate is the number of babies - live a year compared to average population in that year and in numbers - births per 1,000 inhabitants live.

The mortality rate is the number of dead people in a year reported the average population in that year and is expressed as deaths per 1000 inhabitants.

Manipulate date is merged in Table 1.

Year	2000	2001	2002	2003	2004	2005	2006
Total population (P_t)	22435205	22408393	21794793	21733556	21673328	21623849	21584365
Birth (N_0)	108254	102432	98190	100915	111348	117780	119477
nationality (n_t)	4.83	4.57	4.51	4.64	5.14	5.45	5.54
Deaths (D_t)	108455	110063	113225	112283	114316	116809	116384
Death rate (m_t)	4.83	4.91	5.20	5.17	5.27	5.40	5.39

Tab. 1. Statistics of the Romanian population
Source: www.insse.ro

4.2 Define mathematical relationships, achieving calculations

Data are processed by software MathLab.

MathLab is a development background for numerical and statistical analysis, it allows manipulation of matrices, viewing functions, implementation of algorithms.

Absolute natural growth of population:

$$\Delta_n = N_t \times D_t \tag{1}$$

Δn – absolute natural growth of population

where:

$$N_t = P_t \times n_t \tag{2}$$

N_t- number of births

$$D_t = P_t \times m_t \tag{3}$$

D_t– deaths

$t := 0..6$

Period considered is between 2000÷2006, t=0 corresponding to year 2000, t=1 for. 2001, etc.

Notes: Δn - absolute natural growth of population

$$D_n = \Delta_t \tag{4}$$

$$\Delta_t := N_t - D_t \tag{5}$$

Actual values are:

$$N := \begin{bmatrix} 108254 \\ 102432 \\ 98190 \\ 100915 \\ 111348 \\ 117780 \\ 119477 \end{bmatrix} \quad D := \begin{bmatrix} 108455 \\ 110063 \\ 113225 \\ 112283 \\ 114316 \\ 116809 \\ 116384 \end{bmatrix}$$

4.3 Making economic forecasts using the MathLab

Achieve economic forecast for Δn in time 2007 - 2010. Expected values are denoted by pi (p_0 pt. 2006, p_1 for. 2007, etc.).

Extrapolation method is used. Function used is *predict(v,m,n)*, where:

v – vector whose values are input data, the real values
m, n – integers, positive

$$0 < m < length(v) - 1 \tag{6}$$

Function determines vector containing the estimated values based on previous values of vector v.

Function *predict* use calculation method Burg of coeficients for the last m points v vector.
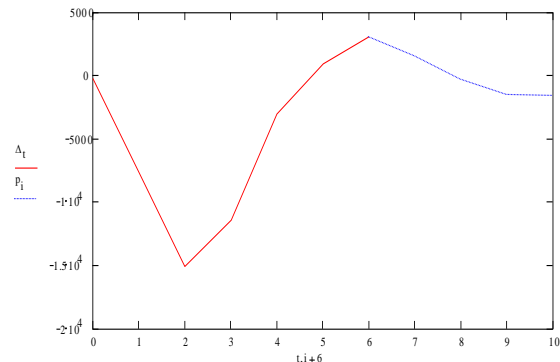
$i := 0,1,..4$

$$p := predict(\Delta, 3, 6) \tag{7}$$

Fig. 1. Natural increase of population

4.4 Interpretation of results

Group actual data and the estimated data in tabular form:

Δn - Absolute natural growth of population	2007	2008	2009
Predicted values	$1.502*10^3$	-368.207	$-1.55*10^3$
Actual values	$-1.70*10^3$	$-1.40*10^3$	$-1.40*10^3$

Tab. 2. Comparison of estimated values with actual

Predicted values are relatively close to the real ones. For two of the three intervals, the projected data are close.

5. CONCLUSION

Thus we believe that the proposed method can be used in giving economic forecasts.

The given method includes the use of a computer system. This method can be used as an exercise in the learning process.

The results of this foercasting study are comparable with the real ones, as follows.

Using the computer in this situation is easy and effective.

6. REFERENCES

Burtică, M., (2004), *Introduction to forecasting and business planning*, Mirton, Timisoara

Caracota, D., Caracota, R., (2001), *Development strategies. Economic forecasting*, Sylvi, ISBN 9738258200, Bucureşti

Nicolae, V., Caracota, D., (2000), *Macroeconomic Forecasting - Application works*, ASE, Bucuresti

Nicolae, V., Caracota, D., (2000), *Macroeconomic Forecasting - Application works*, ASE, Bucuresti

Onete, B., (2003), *Fundamental information systems*, ASE, ISBN 9735942984, Bucureşti