

## **THE FORECAST OF GDP IN ECONOMY OF SLOVAK REPUBLIC BY THE YEAR 2002**

### **1. Introduction**

At beginning try to answer a question "Why is forecasting so unavoidable for market economies?" The one consideration is that flourishing and efficiency of instruments of the economic policy depend on the correct forecast of economic development in the future. These instruments of economic policy do not work immediately and influence the economic process after a period of time. Therefore is necessary to forecast the development of national economy and also use it in making macroeconomic decisions for the continuous development and economy growth in advance.

The reliability of forecast depends on information accessible for prognostic authors and on a prognostic model which they used. Generally the forecasts are supported by statistics information covered in a system of national account. In Slovakia the process of creating a complete system of national account continues and it causes an information barrier. This barrier is complicating the process of making macroeconomics prognosis. Also there is a minimum one year time delay in publishing official macroeconomic data.

The second assumption to arrange macroeconomic forecast is using a prognostic model. Usually there are used the econometric models which are based on a system of equations describing the fundamental relations in national economy. In practice there are often combined with other methods of forecasting like reflexive methods, intuitive methods or forecasts based on a long-time experiences of specialists in due area – expertness methods. The following forecast of gross domestic product and its components in Slovakia is made by extrapolation method.

### **2. Forecast of Gross Domestic Product (GDP) and it's components in economy of Slovak Republic by to year 2002 – case study**

In prognosis of quarterly values of indicator GDP there is particularly used one method of extrapolation of time series. The application of this method is based on the analysis of time series, where the forecasted values are generated on the past values of the indicator. Time series mean a chronological arrangement of indicator's values. By extrapolation approach the most important is to define the trend as a fundamental tendency of development the exact figure. This trend is defined as one of mathematical functions where the one of the factors is a time. Parameters of these functions have to be statistically

estimated by past values of indicator and then the forecasting estimated aggregates are regarded as the function of time.

In the following prognosis the time series are featured by quarterly values of indicator GDP in current prices 1995 for 28 periods – from first quarter 1993 where  $t = 0$  ( $t = \text{time}$ ) to fourth quarter 1999 where  $t = 27$ . The data were officially published by Statistical Office of Slovak Republic. The next step is to define the trend as a one of mathematic equations. In this prognosis three trends are being used: linear, exponential and polynomial trend for the estimate of development of GDP and its components for twelve periods – first quarter 2000 where  $t = 28$  to fourth quarter 2002 where  $t = 39$ . For each function there is counted the value of standard divergence “ $R^2$ ” which express the reliability of equation of the relevant function. If the value of this coefficient is approaching to number one, then the prognostic values are more exact.

The mathematic equations and values of standard divergence for each function in this model of forecasting development of GDP are the following:

A/ for linear trend  $y = 1,8816t + 116,84$   
 $R^2 = 0,91$

B/ for exponential trend  $y = 118,25 e^{0,0132t}$   
 $R^2 = 0,9087$

C/ for polynomial trend  $y = -0,0196t^2 + 2,4497t + 114$   
 $R^2 = 0,9152$

The model shows parameters for forecasting of GDP. For each component of GDP the parameters of functions and values of standard divergence are different. Now there is a question, which trend is more exact and more reliable. From the values of standard divergence is evident that quadratic trend has a highest value of coefficient  $R^2$ . It means that the forecasting values of GDP by quadratic trend are explained by the time series on 92 %. The differences of the coefficient  $R^2$  between the trends are minimal.

In the Figures 1-3 below are illustrated the three trend's curve. The model where is used the linear and exponential trend is forecasting a faster increase of GDP, comparing to the third polynomial trend model.

Figure 1

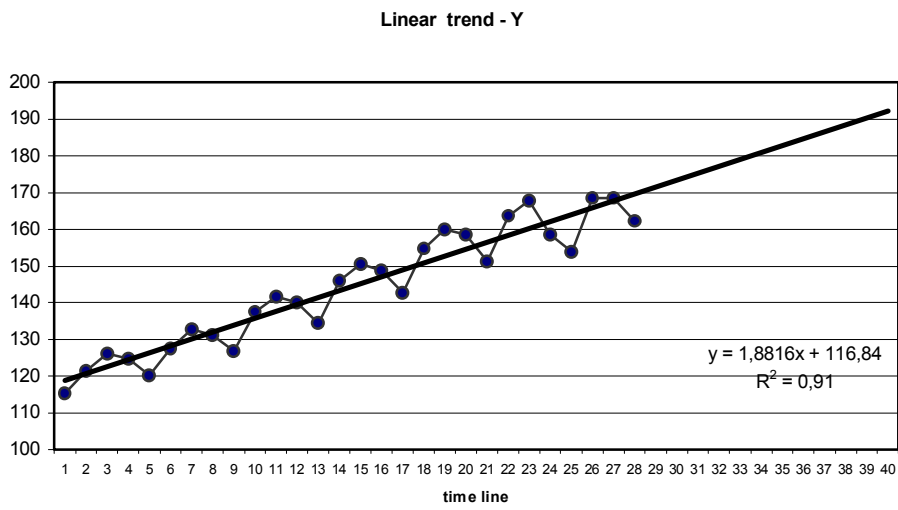


Figure 2

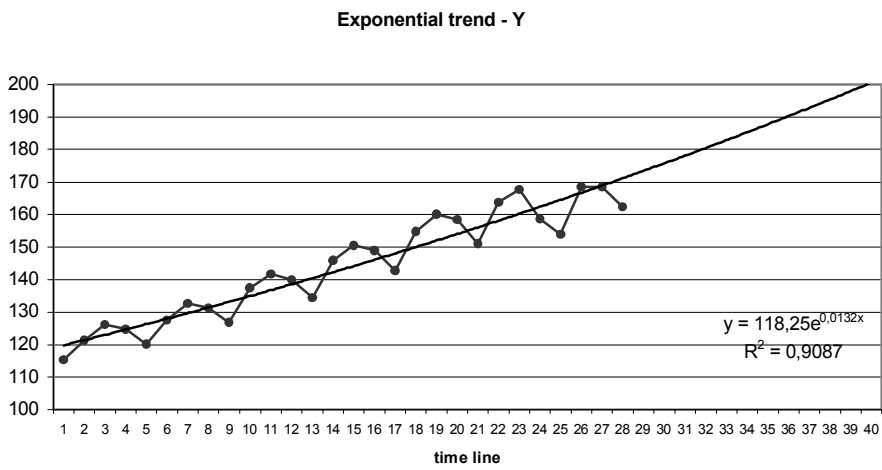
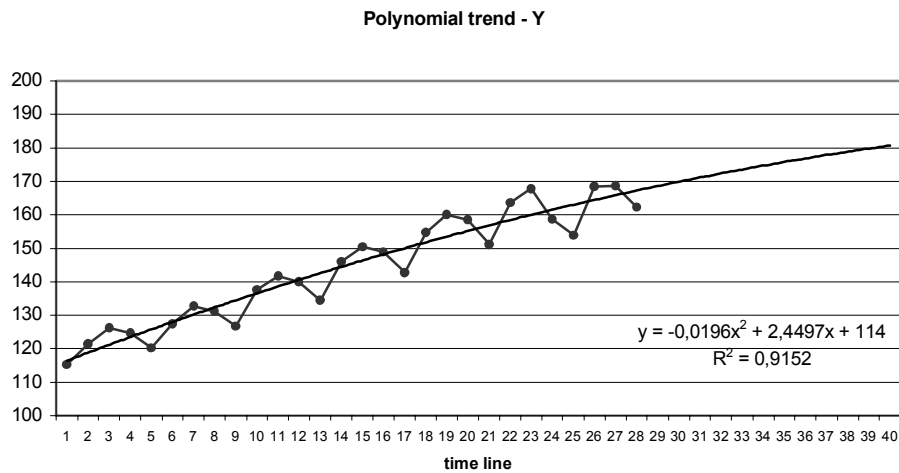


Figure 3



The following Figure 4 is presenting a forecast of development of GDP and its components by linear trend. From the year 1999 to 2002 the all prognostic indicators moderately rise especially in a case of gross capital formation where the increase is greater.

Figure 4

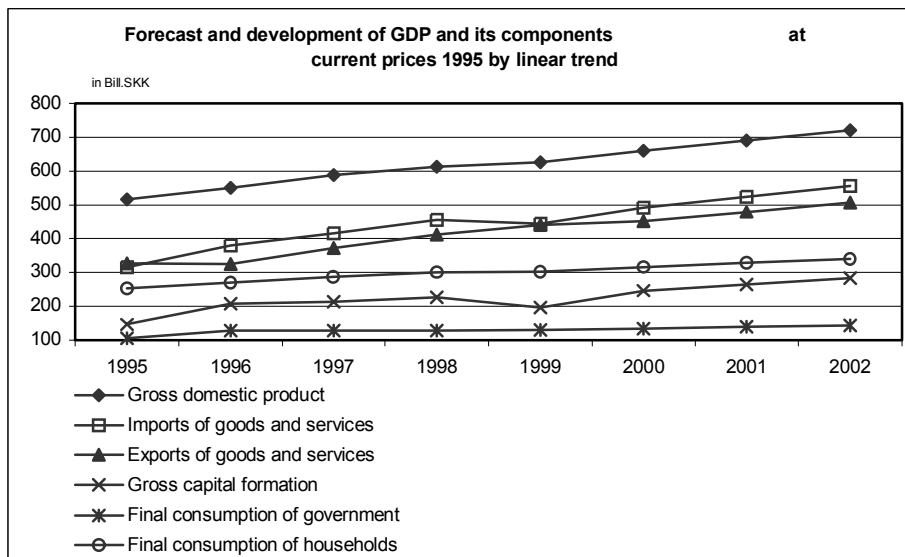
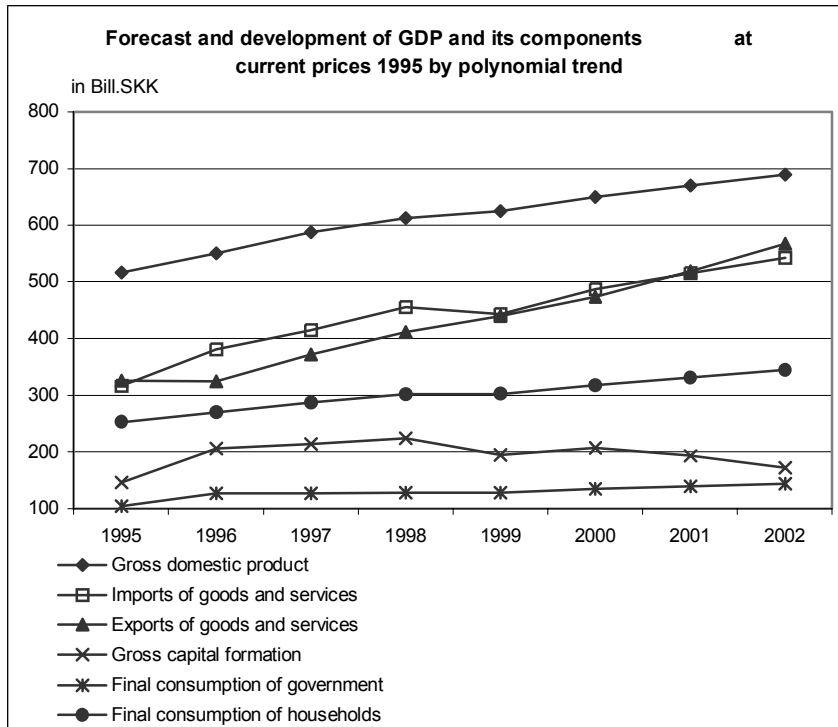


Figure 5

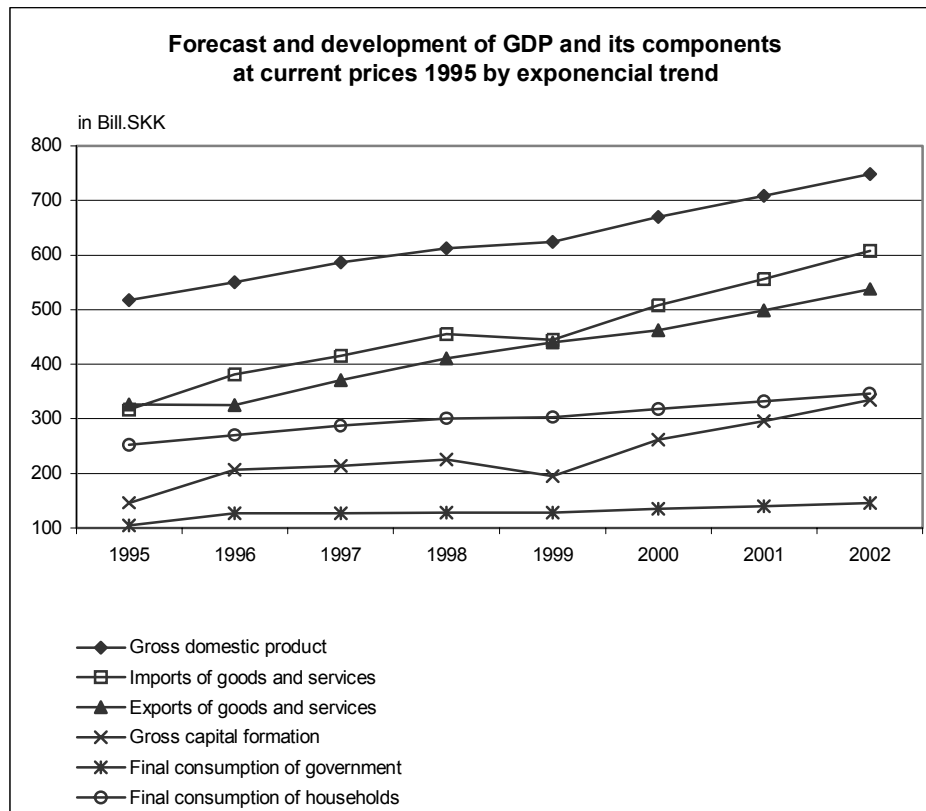


The prognosis of GDP and its components by polynomial trend is showed in Figure 5. Besides the one component – gross capital formation – all forecasted indicators are shooting up. But this increase is slighter than in Figure 4. The gross capital formation has a tendency to decline.

The development of GDP and its components by exponential trend are illustrated in Figure 6. The increase of prognostic components of GDP is more greater than the forecasted components by trends before. The highest rise is in gross capital formation. But this trend of development is showed up least exact.

How will be the economic growth rate in years 2000 – 2002? Based on the prognostic data of GDP it is able to forecast the economic growth rates and also the influence of weight of GDP’s components on the economic growth rate.

Figure 6



From the following Table 1 it is possible to find out future economic growth rates and the weight of GDP's components on it. As it follows from the prognostic model the most exact data of the GDP's growth rate are forecasted by polynomial trend. According to this trend the GDP will growth in years 2000 – 2002 approximately 3 % per year. The greatest influence on this growth will have particularly the export (5 – 7 %) and import (4 – 6%). The next important component generating growth will be the final consumption of households with the weight of 2 %.

Table 1. Influence of weight of GDP components on the economic growth rate (in %)

Period	GDP	Final consumption of households	Final consumption of NPISH's	Final consumption of government	Gross capital formation	Exports of goods and services	Imports of goods and services	
<b>Linear trend</b>								
year	2000	<b>5,65</b>	2,05	0,02	1,01	8,12	1,99	7,53
	2001	<b>4,52</b>	1,76	0,05	0,61	2,91	4,05	4,85
	2002	<b>4,34</b>	1,70	-0,01	0,58	2,80	3,87	4,60
<b>Polynomial trend</b>								
year	2000	<b>3,94</b>	2,39	0,02	1,09	1,92	5,41	6,89
	2001	<b>3,20</b>	2,06	0,00	0,72	-2,11	6,90	4,38
	2002	<b>2,79</b>	2,05	-0,04	0,72	-3,16	7,33	4,09
<b>Exponential trend</b>								
year	2000	<b>7,27</b>	2,39	-0,21	1,07	10,78	3,60	10,36
	2001	<b>5,67</b>	2,06	-0,55	0,72	5,06	5,43	7,05
	2002	<b>5,68</b>	2,05	-0,78	0,72	5,40	5,58	7,29

Source: Own counts.

### 3. Conclusion

Based on the mentioned prognosis of development of GDP, which was designed by extrapolation by time series and comparing of linear, exponential and quadratic trend, it is expected that the size of GDP will grow until the year 2002 but with a slow economic growth rate in the interval from 2 to 5 percent. The expected dynamics of economic growth will be generated by domestic demand and influence of development of export performance. Until the year of 2002 there is expected a slow growth of domestic demand which will be influenced by the growth of final consumption of households and later also by slow growth of gross capital formation. Development of export and import will be also important due to its influence on the future economic growth rate of GDP. The share of import on the economic growth of GDP will grow more fast than the share of export, which means, that outside imbalance will deepen – trade deficit and current account of balance-of-payments will grow. With the growing share of import and export the rate of openness of Slovak economy will also grow and there will be created conditions for bigger influence from the outside environment, which may be not only positive but also negative.