

OUTPUT GAP MODEL

Output gap is a difference between actual and potential level of real gross domestic product (GDP). Potential GDP is defined as the level of output that an economy can produce at a constant inflation rate that can be sustained over the long term. Therefore, potential output generally is perceived as a long-run level (called trend) of production.

Although an economy can temporarily produce more than its potential level of output, that comes at the cost of rising inflation. Conversely, if the economy produces less than its potential level, it might (or will) trigger deflationary pressure on the prices. Many Central Banks include output gap to their monetary policy rules.

Due to abstract definition of potential level of output, Statistical Offices usually do not publish official statistics on potential output series. Generally, some econometric and statistical methods are employed to estimate potential level of GDP. In this research study we applied structural and non-structural econometric techniques to extract total and non-oil output gap and potential level of total and non-oil GDP. Structural models include estimation of production function by means of cointegration method and identifying nature of structural shocks by means of Structural Vector Autoregression models (SVAR). In the second part of the study we compared our results with the ones those obtained from non-structural models, such as Hodrick-Prescott, univariate and multivariate Kalman filters.

In generic terms, multivariate filter system can be summarized in following equations:

$$\pi_t = \pi_t^e + \alpha(y_t - y_t^*) + \varepsilon_t^\pi$$

$$y_t = y_t^* + g_t$$

$$y_t^* = y_{t-1}^* + \mu_t + \varepsilon_t^y$$

$$g_t = \beta_1 g_{t-1} + \beta_2 g_{t-2} + \varepsilon_t^g$$

$$\mu_t = \delta \mu_t + \varepsilon_t^\mu$$

where:

π_t – inflation;

π_t^e – expected inflation;

y_t – actual real output;

y_t^* - potential level of real output;

g_t – difference between actual and potential level of output (gap);

μ_t – drift parameter;

$\varepsilon_t^\pi, \varepsilon_t^y, \varepsilon_t^\mu$ - shocks.

(1) Equation depicts standard Phillips curve, i.e. relationship between inflation and output gap. In this generic model inflation expectations are perceived as an adaptive, and therefore it was expressed as a weighted average of past two preceding months.

(2) Identity defines output as a composition of potential (stochastic trend component) and temporary output (transitory component). For simplicity, transitory components itself (3) is modelled as a stationary second order autoregressive process.

Study results indicate that while different methods do not affect the direction of gap, methods may alter the magnitude of output gap fluctuations, i.e. variance. Particularly results differ substantially for the total output gap, most probably due to complex nature of oil sector in Azerbaijan.