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ABSTRACTS

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**THE EFFICIENCY OF THE USE OF RETROSPECTIVE CALCULATION
PRINCIPLE FOR FORECASTING NATURAL GAS PRODUCTION
(EXEMPLIFIED BY GAZPROM'S FIELDS IN TYUMEN REGION)**

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Natural gas production from Gazprom's Tyumen fields will be forecasted on the basis of econometric models of production functions having small retrospective estimates of absolute values of relative forecast errors, i.e. small errors of ex-post forecast. Among the production functions investigated sufficiently small (not exceeding 2.3 %) errors of ex-post forecast per 1 year and further till 12 years ahead (not considering 2009) have power-exponential production functions investigated between 1984 to 1997 and between 2005 to 2008. These functions forecast natural gas production volumes, as of 2011, in amount of 461,3–464,9 bln m³.

Moreover, in the process of economic research we have obtained very seldom both in econometric and in economy of the gas industry result. In other words, we have revealed power-exponential production functions that allow forecasting natural gas production per 1 year and till 18 years ahead (not considering 2009) with a maximum error of ex-post forecast of 3,7 %. These functions investigated between 1985 to 1991, 1994, 1997 and between 2003–2008 forecast natural gas production volumes, as of 2011, in amount of 464,3–474,7 bln m³.

Particularly, the production function

$$\Gamma_t = e^{4,61} (\Phi_{t-1(1990)})^{0,56-5,12 \times 10^{-9} \cdot G_{1963,t-1}}$$

where Γ_t – annual gross production of natural gas, t ,

$\Phi_{t-1(1990)}$ – average annual value of basic industrial-production assets (in comparable prices of 1990) in year $t-1$,

$G_{1963,t-2}$ – accumulated natural gas production from the moment of industrial development of the first in Tyumen region gas field (1963) up to year $t-2$) investigated on the basis of data obtained in the former USSR between 1985-1991 ($R^2 = 0,99$; $DW = 1,52$) has the following errors of ex-post forecast: in 1992 – 0,4 %, in 1993 – 1,1 %, in 1994 – 0,4 %, in 1995 – 0,3 %, in 1996 – 3,0 %, in 1997 – 2,7 %, in 1998 (the year of crisis and defolt) – 1,0 %, in 1999 r. (the post crisis year) – 1,5 %, in 2000 – 1,0 %, in 2001 – 0,1 %, in 2002 – 1,1 %, in 2003 – 0,8 %, in 2004 – 1,6 %, in 2005 – 3,1 %, in 2006 – 2,8 %, in 2007 – 2,7 %, in 2008 – 0,5 %, in 2009 (the year of crisis) – 17,6 %, in 2010 r. (the post crisis year) – 3,7 %. As of 2011, this function forecasts natural gas production in a volume of 474610 mln m³.

Thus, the above results are the evidence of high efficiency of the use of retrospective calculation principle (ex-post forecast) in the process

of econometric forecast of natural gas production. Forecasted by two types of functions the volumes of natural gas production in 2011 from the Gazprom's fields of Tyumen region with a maximum ex-post forecast error of 3.7 % are in interval 461,3–474,7 bln m³.