Analysis of different production factors’ contribution to mineral deposits discovery in China

Corresponding author: Jinrong Tang, Development and Research Center, China Geological Survey, jinrongt@163.com

Co-authors:
Zongxi Yang, Development and Research Center, China Geological Survey, 77759059@qq.com
Ping Zhou, Development and Research Center, China Geological Survey, k_zh_l@163.com
Junfa Shi, Development and Research Center, China Geological Survey, shijunfa@163.com

Driven by rapid economic growth, China’s mineral exploration expenditure increased sharply in the last 10 years from 3.096 billion Yuan in 2003 to 41.41 billion Yuan in 2012, and the average annual increase rate is 33.4%. But due to global economic sluggish and Chinese economic restructuring, China’s mineral exploration expenditure decreased to 35.379 billion Yuan in 2013, about 9% lower than in 2012. Despite the sharp increase of exploration expenditure, we haven’t achieved a high discovery of mineral deposits as expected, though a number of large deposits, such as Qu-long, Jia-ma and Duo-long super large copper deposits, are discovered in the western region of China. To study the relations between the mineral deposits discovery and the production factors including the exploration expenditure, drilling, R&D investments and experts, we have collected the relevant data produced in the last 30 years, and calculated the contribution of each production factor to the mineral discovery using Cobb-Douglas function. Our study indicates that in the last 30 years, the numbers of mineral discovery had a positive correlation to the drilling work amount. This means that drilling work amount is the most important factor influencing the mineral discovery. Secondly, we find that the dependency of mineral discovery to the exploration expenditure decreased significantly in the last 10 years. This is because that many mineral prospecting works were focused to the buried or deeply buried deposits, so that the exploration cost has increased and it is more difficult to find deposits. Thirdly, the contribution of the R&D investments as well as experts to the mineral discovery tends to increase, implying that the science and technology advantages and experts’ initiatives should be tapped for the discovery of mineral resources. Our conclusion is that besides keeping the exploration expenditure to a proper level, we should attach great importance to science and technology innovation and the role of experts. We should also establish the international mineral exploration regulatory system, and promote the efficient transformation of resources, assets, and capital.