

$$\Delta Y2(t) = -0.11 + 1.46 * \Delta X2(t) - 0.75 * ecm(t-1) + u(t) \quad (8)$$

Note: $X2 = \text{Log}(K_t P_t / L_t)$, $Y2 = \text{Log}(\dot{P}_t / L_t)$,

$$ecm(t-1) = Y2(t-1) + 2.91 - 0.51 * X2(t-1)$$

Known by (8), model could force unbalance status back to balance status by potency of 0.75. Though the potency is rather strong, but there is still influence from some other factors.

D. Prediction of Model

In order to verify the veracity of models, with given number of scientists and engineers in S&T activity and investment in S&T capital asserts in 2008, Forecast of numbers of certificated patents and scientific papers in 2008 are done with weighted average B and average B respectively. The results listed in Table IV, which indicate strong prediction capability of these two models.

TABLE IV Result of output prediction of 2008 by models

Growth model	Number of S&T person in 2008	S&T capital asserts in 2008 (billion Yuan) (constant price)	Real Output in 2008 (item)	Prediction value of 2008 (weighted average B) (item)	Prediction error	Prediction value of 2008 (average B)(item)	Prediction error
Patent	4967480	549.017	411982	408460	-0.85%	399870	-2.94%
Paper			270878	265040	-2.16%	264450	-2.37%

Note: Absolute values of forecast error are all in acceptable scope of 5%.

4. Conclusion and Suggestion

First, capital-promotion endogenous growth model could explain input and output relation of China's S&T activity best, and single-direction Granger causality, strong balance mechanism of error correction model and strong prediction capability of growth models also support it. Second, judged by econometric result, S&T capital asserts, number of scientists and engineers in S&T activity and accumulated knowledge could explain S&T output effectively, and input shows significant positive influence on output. Finally, two models have some different explanation on input-output relation: capital input elasticity of patent output is less than labor input elasticity of patent output, while labor input elasticity of paper output is less than capital input elasticity of paper output.

Based on above conclusion, here are three suggestions. First, because the scientific advance is more to be capital-promotion, investment in S&T research apparatus should be reinforced to raise integrated science and technology level. Second, in order to improve output efficiency of S&T activity, we should not only increase investment on cultivation of talented persons and R&D apparatus, but also reinforce accumulation and share of knowledge. Finally, input factors should be allocated reasonably according to types of S&T activities to raise output efficiency. For example, enterprises who care mainly about economic benefit should emphasize more on introduce and cultivation of talented persons, but high schools that care more on academic research should

emphasize more on investment of laboratory apparatus and establishment.

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