

The impact of Science and Technology Policy on Industrial R&D activities
- Empirical evidence from the large- and medium sized enterprises in Shanghai
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In the economic reforms and the progress of economic development in China, science and technology (S&T) are playing an increasingly important role in the competition- and innovation driven growth strategies. According to the latest edition of the OECD's Science, Technology and Industry Scoreboard published in 2003, R&D expenditure in China has grown rapidly from 0.6% of GDP in 1996 to 1.1% in 2002. It has reached almost USD 60 billion in current purchasing power parity in 2001, and ranked the 3rd in the world, behind only the U.S. and Japan. Internationally, the new growth strategy and policy orientation in China have also received attention and recognition. In 2002, for the first time, China has been invited by OECD to participate as an observer in the Committee for Science and Technological Policy (CSTP).

Behind this promising catch-up pattern, however, there are essential structural differences in the high-tech and R&D intensive sectors in China compared to the developed OECD countries. Due to market and investment uncertainties associated with relatively low contributions of high-tech sectors to growth and lack of intellectual property right protection, the R&D investment and innovation activities conducted by industrial sectors are still very limited. Within this context, the governmental S&T policy becomes an important instrument to leverage and stimulate the innovation activities in the industrial sectors. This paper is an empirical study on the impact of S &T policy on industrial R&D expenditure of large- and medium-sized enterprises in Shanghai, where most FDI and high-tech industries in China are located. The paper is based on a panel consisting of 32 manufacturing sectors for the period of 1993-2002 and the empirical analysis is conducted in a dynamic panel data framework.

Two S&T policy instruments are subjective to our analysis, namely direct subsidy and tax incentive. The general finding is that both direct subsidy and tax deduction, as incentivestimulating policy instruments, have positive effects on industrial R&D expenditures. Consistency and stability of policy further enhance the positive effect. There is also a synergetic effect between these two policy instruments; an increase in the direct subsidy will strengthen the corresponding effect of the tax deduction, and vice versa. Nevertheless, the effect of tax incentives is the most important one.

The results from our empirical analysis also suggest that whereas S&T and R&D are widely believed to be the most important driving forces behind the long-run economic growth, however, the development and application of these resources need to be carefully managed. Furthermore the interactions between S&T policy and FDI- and competition policies are also increasingly essential for the economic growth in China.