

## Chapter 6

# The Burdens of Abundance: R&D, Technological Change, Resource Allocation, and Productivity

This chapter attempts to reveal the extent of the ample supply of natural and human resources at the disposal of Soviet planners. Upon reviewing the evidence, it becomes plausible to visualize that these immense reserves of inputs together with the stranglehold of the central planning system (CPS) on the economy have influenced the technological requirements determined by Communist policy to achieve economic growth. The management of R&D was influenced in the same process, as it was intrinsic to the level of technology demanded from above.

However, only minor improvements in the efficiency of resource utilization could turn the entire situation around and secure enormous advances in techno-economic growth and development in the former Soviet Union. Developed market economies have been saturated with much higher levels of *technologization* and growth has slowed as gains from increases in efficiency have become more difficult to realize. Significantly smaller efforts toward advance could bring the regions in the former Soviet Union incrementally much greater rewards than the same efforts would in the West. The potential is there.

The issues discussed in this chapter are not solely relevant to the R&D issue, though the purpose is to determine linkages and relationships. The reader interested only in R&D may wish to skip this chapter. It addresses the bearing of the central planning system and the bargaining, which was

characteristic of the Soviet-style system, on R&D. The exposition also concentrates on how the organization influenced the management of R&D, the incentives, motivation, and consequent productivity of researchers and scientists. Basically, the chapter attempts to reveal the extent of the ample supply of natural and human resources at the disposal of Soviet planners and how these may actually have been *burdens of abundance* to a more productive R&D sector.

Understanding the nature and logic of the policies characteristic of Soviet-style central planning that governed the R&D sector of the USSR, requires a perception of one of the greatest man-made paradoxes of this century and perhaps beyond: namely, the *crisis amid plenty* in the Soviet Union. In spite of being bequeathed with an abundant supply of mineral and human resources, Communist Party politics successfully cultivated an economic system in which shortages of outputs were common, and those products produced were typically of low quality. Yet, probably, it was precisely the abundance that was the actual origin of the dilemma. Therefore, the Soviet Union's good fortune may, in fact, have been the nation's major misfortune, at least in the past. With today's experience, knowledge, and rapidly democratizing political environment, measures could be introduced to promote socioeconomic growth and development beyond that in the saturating economies of the West.

Extensive-style economic growth in the USSR was frequently identified as a natural product of the great size and endowments of the Soviet nation. A typical postwar five-year plan prescribed basic application of funds and capital investment to increase 1.5 times, fuel and raw materials extraction to expand by 25% to 30%, and an additional 10 million to 11 million persons to be recruited into the national economy (Aganbegyan, 1988, p. 7). Therefore, the generous availability of relatively educated labor and valuable mineral and energy resources largely determined the manner of economic growth and development under the long years of Communist rule, particularly with respect to industrial policy. Due to the thorough use of the supply-driven planning mechanism, this policy subsequently influenced the policies and plans for the upstream and downstream sectors of the economy.

The entire central planning system determined everything in the economy from the priorities of and the resources for research and development of innovations, the needs for and objectives of scientific activities, and the technologies used for production, to the prices and quantity of output of all products produced and how and to whom these would be distributed. Theoretically, Soviet-style central planning was really an incredible system. The coordination and planning by a single central agency, GOSPLAN in the USSR, could have facilitated the optimal allocation of resources and the