


Chapter 10

Innovation Policies and Technological Progress: Theoretical Approach and a Cross-Country Analysis

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ABSTRACT

This chapter examines how innovation policy and technological progress foster industrial transformation and economic development especially under the streams of neoclassical and evolutionary schools. Furthermore, a cross-country analysis of the relationship between innovation inputs and outputs, using data from the WIPO Global Innovation Index, is employed to investigate the relationship between institutional quality and innovation outcomes. This analysis is conducted for a panel of 129 countries using Ordinary Least Squares (OLS), Fixed Effects (FE), Random Effects (RE) and quantile regression methods. The empirical results show that low innovative capacity countries benefit more from infrastructure and human capital and R&D investment. In countries with moderate and advanced innovation capacity, the impact of business sophistication and market sophistication is increasing, and the deepening of R&D is becoming more important. The results also suggest that the impact of institutional quality is unclear and requires further study.

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INTRODUCTION

Historically and today, science, technology and innovation (STI) policies and technological development have played an important role in promoting industrial transformation and economic development. These policies guide manufacturing and other services and agricultural activities that share the effects of technological progress and technological diffusion. From this perspective, STI policies are a channel of technological progress and focus on technological learning and the development of innovation capabilities. At the same time, exports and international technological learning have a strategic role. Moreover, the adaptive nature of STI policies and variations in their implementation lead to differences and inequalities in outcomes.

Pioneering work on industrial policy goes back to the theory of infant industry protection theory, the early capitalist development of Britain in the 18th and 19th centuries, and the economic catch-up of continental Europe, America and Japan (Hamilton, 1934, List, 1856). Industrial policy was practiced by both frontiers and followers on the path of capitalist development.

Industrial transformation and economic development are closely linked to technological progress. Governments and firms use innovation policies and technology transfer mechanisms to enhance competitiveness, raise productivity and drive structural change. Therefore, it is useful to first recall the theoretical background that provides the main framework for science, technology and innovation policies. Neoclassical and evolutionary schools of economics offer contrasting but complementary explanations of how these mechanisms work. While the neoclassical perspective emphasizes market efficiency, technology diffusion, and externalities, the evolutionary school emphasizes dynamic capabilities, path dependency, and institutional evolution. By examining industrial and innovation policies influenced by these schools, it becomes clear how strategic interventions can facilitate sustainable development.

In the literature, identifying the optimal conditions for innovation has become a key issue for policymakers. Consequently, there has been a significant increase in academic research on the relationship between institutions, innovation policies and innovation outcomes.

In this chapter, the theoretical approach to STI policies and the experiences of various economies at different stages of innovation will be discussed comparatively. Basically, the background section introduces the concepts related to technology and STI policies. This section examines the contributions of STI policies and technological development within the frameworks of neoclassical and evolutionary schools of thought. Main focus of the chapter is on the relationship between institutional quality and innovation outcomes. The section provides a cross-country analysis of the relationship between innovation inputs and outputs using data for a panel of

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