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Technological Progress, Innovation and Economic Growth; the Case of Turkey

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Abstract

This paper focuses on the influence of technological progress and innovation on the Turkish economy. The economic structure of Turkey has changed dramatically over the last three and a half decades during which technology has become a crucial endogenous variable in aggregate production function. The new technology investments brought with them high productivity rates and rapid, positive economic growth. The inter-relation between technological progress and economic growth is summarized and analyzed using quantitative methods. The Econometric results show a significant effect of technological progress and innovation on economic growth.

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Keywords: Economic Growth; Innovation; Technological Progress

1. Introduction

Turkey has been experiencing very rapid growth rate over the last 3 and half decades. This period can be easily segmented into three decades; 80s, 90s and the turn of the twenty first century. The first election after the army revolution took place in 1983. The liberal party won the election and their administration worked on turning the local sticky economy into an open competitive economy for the following 10 years. The open economy brought new opportunities to Turkey. International trade instantly began to increase. National production was being shaped according to the new foreign trade demand.

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New and modern production systems were imported. Local entrepreneurs began producing cheap spare parts substituting imported products. Universities found new opportunities in new founded industrial zones. The industry's specific labor demand brought new opportunities and targets for Universities.

However, the 90s and beginning of 2000 saw a slowdown in the economic growth rate. During those years, Turkey had a coalition administration. Political stability was not strong like the 80s and the financial market was very fragile. There were two big devaluations which occurred in 1994 and 2001. Economic growth was somewhat sustained but the new technological investments could not find a secure place during those years.

The election in the year 2002 was another critical year in Turkish economic history. A majority party was legislated. The new administration managed new policies in technological development. New ideals included focus on technology exports. A new Research and Development act was legislated in parliament. R&D activities were boosted by the new act. Main cost items in R&D companies such as social insurance payments, cooperate and income taxes, energy and communication costs and depreciations were covered more easily than ever before. These new methods gave their fruits immediately. The productivity and production growth raised rapidly.

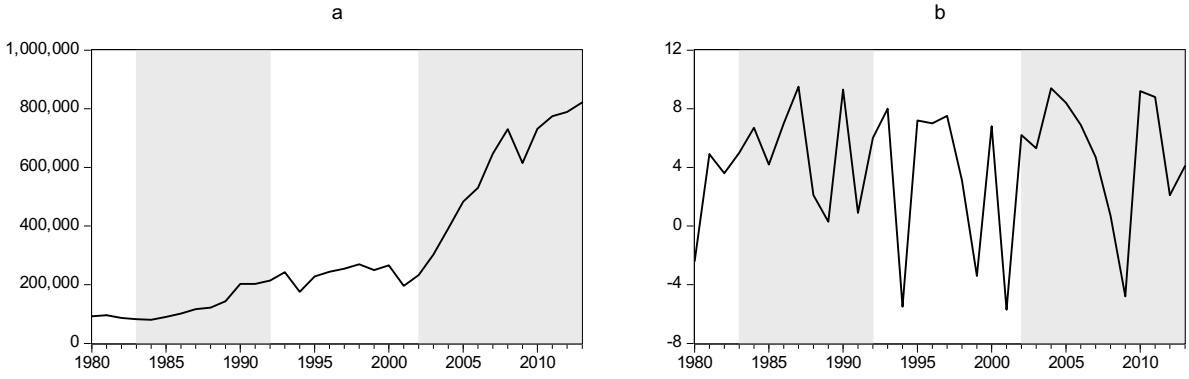

Fig. 1. (a) GDP; (b) GDP growth rate.

Figure 1 gives insight into the GDP in terms of current US Dollars and the GDP growth rate. The 80s embodied the speed up years for the Turkish economy. GDP was 83 million Dollars in 1983, the value increased to 213 million Dollars in 1992 when the new coalition government took up the administration. In the year 2002 the GDP had just reached 232 million US Dollars. After ten years, in 2013 the GDP went up to 822 million US Dollars.The growth rate graphs also summarize the same period with similar conclusions. Three negative growth rates were experienced in the years between 1992 and 2002 due to political and domestic unrest. The negative growth rate in 2009 was caused by a global crisis.

2. Literature

The innovation and research sector relation was first focused upon at the beginning of the 90s (Aghion & Howitt, 1992). They built an endogenous growth model with simulations. Positive effects of investing in technology was defined in literature by Romer (Romer, 1990). Johns claimed that the long run growth could be possible by R&D activities (Jones, 1995). R&D effects on aggregate production functions were tested by national research centers in the early 2000s (Sveikauskas, 2007). R&D activities and productivity growth were most clearly analyzed in literature by Loo and Soete (Loo & Soete, 1999). Small enterprise R&D activities were shown to bring big returns on the national economy by bringing new technologies (Comin, 2004). Recent studies are focusing on patenting and economic growth (Westmore, 2013). Some new approaches explain todays endogenous growth functions with the Shumpeterian model(Aghion, Akcigit, & Howitt, 2013). More recently, entrepreneurship innovation and economic growth relations are researched in today's economic literature(Galindo & Méndez, 2014).