Chapter 92
The Relationship Between Economic Growth and Innovation:
Panel Data Analysis on Chosen OECD Countries

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ABSTRACT

This chapter studies innovation and economic growth and emphasizes their relationship. In this context; innovation and economic growth outputs of 16 OECD countries between 2005 and 2015 are analyzed. GDP is considered as economic growth variable, R&D investments in GDP (%), and patent applications are considered as innovation variables. In light of these variables, panel data analyze is used. Unit root, Pedroni co-integration and FMOLS tests were applied with the order. As a result, the increase in patent applications and R&D investments was found to have a positive effect on economic growth.

INTRODUCTION

Innovation is an activity that helps the companies gain and earn more. In the globalizing world, innovation is very important for catching the age and competing the markets with other firms. Firms competed only with other firms in the domestic market in the past, but now they compete with all the world's companies in the same sector. On the other hand, when the effects of innovation are considered as macro-based, the economic benefits provided to countries are also very crucial. According to Global Innovation Index 2017 report, 14 of the top 20 countries in Innovation Score List are also in the top

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Gross Domestic Product (GDP) list. Accordingly, it is obvious that the favorable relationship between economic growth and innovation investments. In this study, this essential relationship between economic growth and innovation is studied.

The purpose of this study is to present the importance of the innovation in order to achieve sustainable economic growth. In this context, this study consist of three main parts. In the first part of study, the concept of innovation is defined. Innovation sources, innovation types and models are described in this part. Innovation is a dynamic structure which is continuous, developing and constantly changing. Therefore, the measurement of this process is not possible with a simple single technique and different parameters and data are used in this measurement process. For this reason, significant innovations indicators are also explained in this part.

In the second part of study, the concept of economic growth is explained. Different definition of economic growth is given and then, the basic resources of economy which is consisting of human, nature, fund, technological change and innovation are studied. Achieving economic growth and improving the quality of life is desirable by all countries and peoples. Therefore, the policies and measures to be prepared for this purpose are very important. In this context, economic models focusing on innovation are examined.

In the third and last the part of study, literature review, relationship between innovation and economic growth is examined with the help with panel data analysis. The number of patent applications and the share of R&D Investments in GDP are considered as innovation data and national income as economic growth data. The activities of 16 OECD countries which is selected according to GDP between the year of 2005 and 2015 are analyzed by the mentioned innovation and economic growth data. Panel data analysis is chosen as the method and unit root, Pedroni co-integration and FMOLS tests are performed. E-views program is used to perform all these tests. In the conclusion part, all the results obtained are interpreted and the relationship between economic growth and innovation is stated in a concrete way.

CONCEPT AND DEVELOPMENT OF INNOVATION

Definition of Innovation

Innovation word is based on the Latin term "innovatus". The word innovates is derived from the verb "innovare" which has the meaning of change, metamorphosis and renewal. (Akalın, 2007). According to Oslo Guidelines which is co-published by Eurostat (European Statistical Office) and OECD, (Organization for Economic Co-Operation and Development) innovation means a new or significantly improved product, service or process, new marketing or an organizational method. Besides, the minimum requirement for an innovation to occur is that the method to be used is new or significantly improved. (Lowe and Marriot, 2006).

According to Lundvall, innovation is a system in which all the sub-parts of economic system and institutional structure should be evaluated in a single framework. Competitors and subcontractors, suppliers can help to shape the innovation capacity of the company as a source of knowledge, experience and technological solutions.

According to European Union Commission, innovation is the successful discovery and exploitation of renewal in social as well as economic environments (European Commission, 2014).

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