Chapter 2
A Strategic Approach to Reduce Energy Imports of E7 Countries: Use of Renewable Energy

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ABSTRACT

Higher technological developments, product diversity, international trade, and population growth have greatly increased the energy demand of countries. It is very significant that this growing demand should be satisfied with a safe and accessible energy source. Because of this issue, it is thought that countries should be directed towards renewable energy sources so that these countries can meet their rising energy demand without increasing their energy imports. This chapter aims to identify the causal relationship between the use of renewable energy and energy imports. Within this framework, the data between 1990 and 2015 of E7 countries (Brazil, China, Indonesia, India, Mexico, Russia, and Turkey) is taken into the consideration by using the Pedroni panel cointegration method and the Dumitrescu Hurlin panel causality analysis. Results show that there is a long-term relationship between energy imports and renewable energy usage, but there is no causal relationship between energy imports and renewable energy usage. This situation gives information that the use of renewable energy is important and effective in order to reduce imports, but using only this method is not sufficient to remove the import problem for these countries.

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INTRODUCTION

Energy is a major component of economic activity in the global world. Therefore, it is accepted as a major force playing a role in competition and growth for countries. In addition to this situation, it is also thought that there is a significant relationship between energy and the development of the countries (Huang et al., 2008). In other words, when energy is abundant, it has a significant influence on the welfare of the countries. On the other side, in case of scarce energy, economic expansion is limited. Moreover, this situation has also negative effects on the consumption amount in the countries. In summary, it can be said that the presence of energy thus determines the path of development of a society (Dinçer et al., 2018b; Blum & Legey, 2012).

The scarcity problem in the energy caused significant financial crisis in the past, such as oil crisis in 1973 and 1979 (Dinçer, Yüksel & Şenel, 2018; Yüksel, 2017a,c). In these crisis period, it is seen that there is an important increase in the inflation rates (Dinçer, Hacıoğlu & Yüksel, 2017; Yüksel, Canöz & Özsarı, 2017). Additionally, the production levels in these countries went down at a significant level. This situation led to great recession in the world economy (Kettell, 2016; Yüksel, Dinçer & Emir, 2017). The governments of different countries aimed to take necessary actions in order to minimize the negative effects of these crisis (Yüksel et al., 2018 a, b; Dinçer & Yüksel, 2018a,c). After these issues, energy supply and security has become a crucial concept that is emphasized in national and international energy policies. It is thought that so as to achieve this objective, the gap between energy demand and supply should be reduced. Hence, it can be possible to provide efficiency regarding energy usage (Yüksel & Zengin, 2017).

Alternative energy sources also play a significant role with respect to the aim of energy efficiency. Within this framework, renewable energy is an outstanding concept that refers to the energy which is provided from renewable resources, such as solar energy, wind energy, geothermal energy, hydraulic energy. Additionally, renewable energy usage has many different benefits. For instance, the usage of solar and wind energy does not have any harmful effects on the environment. Furthermore, it can be said that renewable energy usage has also economic advantages. As an example, because it is provided from renewable sources, it has a positive effect on the efficiency (Dinçer et al., 2019d). Moreover, it is believed that this situation makes a contribution to the sustainable development of the countries (Chontanawat et al., 2006).

Renewable energy also plays a very significant role for emerging economies. Because these economies have not been developed yet, they try to take different actions in order to be developed economies (Dinçer, Yüksel & Çetiner, 2019). Within this context, they mainly focus on the way of increasing economic growth. Nonetheless, high amount of import has a negative influence on economic growth for these countries (Yüksel, 2016a,b). Thus, if they have to make energy import, it means that this situation becomes a barrier to reach economic growth. Owing to this issue, the governments of these countries aim to develop a policy in order to prevent this problem. Therefore, it can be understood that renewable energy is an appropriate policy for these countries so ass to minimize the amount of energy import.

Parallel to the issues emphasized above, the aim of this study is to identify the causal relationship between the use of renewable energy and energy imports. Within this framework, the data between 1990 and 2015 of E7 countries (Brazil, China, Indonesia, India, Mexico, Russia and Turkey) is taken into the consideration. In addition to this situation, Pedroni panel cointegration method and the Dumitrescu Hurlin panel causality analysis are used in order to reach this objective. As a result of this analysis, it can be