Chapter 18
Financial Development and Energy Consumption in Turkey:
Empirical Evidence from Cointegration and Causality Tests

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ABSTRACT
This chapter investigates the cointegration and causal relationship between financial development and energy consumption in the case of Turkey over the period 1960-2011. In doing so, the ARDL bounds testing and Johansen-Juselius approaches to cointegration and Granger causality test based on vector error correction model are employed. The empirical results show that the series are cointegrated. The empirical results also show a positive and statistically significant relationship between financial development and energy consumption in the long run. In addition, a unidirectional causality running from financial development to energy consumption is found in the short and long run. Thus, this chapter provides an empirical evidence that financial development is a determinant of energy consumption in Turkey. This chapter also presents some implications for Turkey’s energy policy.

INTRODUCTION
Investigating the determinants of demand for energy has been a major focus of research topic in developing countries for several reasons. Firstly, since energy is a key factor of the production, its resources may affect economic growth and development of a country (Squalli, 2007; Stern, 2010). Secondly, some developing countries such as Turkey, China and India have been growing...
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rapidly. This increases the demand for energy in those countries. As indicated in Turkey report presented by US Energy Information Administration (2013) Turkey has witnessed the fastest growth in energy demand over the last two years in the OECD. In addition, Turkey which imports majority of its oil, natural gas and hard coal supplies is expected to double energy demand over the next decade. Thus, it is very important issue to deal with the dynamics of energy consumption for Turkish economy.

Turkey has also implemented a macroeconomic strategy regarding cautious structural and fiscal reforms since 2002. Through this strategy, Turkey has been one of the major recipients of foreign direct investment (FDI) and integrated with the globalized world economy accelerated by Turkey’s EU accession process. One of the main aims of these structural and fiscal reforms is to increase the efficiency and resiliency of the financial sector. These reforms have reinforced the macroeconomic structure of the country. Therefore Turkey has experienced rapid economic growth between 2002 and 2012 with an average annual real GDP growth of 5 percent. These significant improvements in the Turkish economy have also enhanced foreign trade. Turkey’s exports reached USD 151.7 billion by the end of 2013, up from USD 36 billion in 2002 (OECD, 2013; Macroeconomic Outlook Report, 2012). Thus, as well as demand for energy, financial development, economic growth and foreign trade appear as important policy dynamics of Turkish economy.

In recent years, the role of financial development as a determinant of energy consumption has been investigated in energy literature (Sadorsky, 2010a; Shahbaz & Lean, 2012; Islam, Shahbaz, Ahmed & Alam, 2013; Mudakkar, Zaman, Shakir, Arif & Naseen, 2013; Coban & Topcu, 2013). However, as seen from Table 1, none of the previous studies examine this relationship in the case of Turkey in spite of the considerable increases both in its financial development and demand for energy in the last decade. Therefore, this study basically investigates the long-run and causal relationship between financial development and energy consumption by adding real income and trade openness as potential determinants to function for energy consumption in Turkey over the period 1960-2011.

In this study, firstly, using the ARDL bounds testing and Johansen-Juselius approaches to co-integration, we have tested the long-run relationship between the variables. Secondly, we have tested the causal relationships by Granger causality test based on vector error-correction model (VECM). The study is a single country analysis. Since there is limited empirical evidence on the link between financial development and energy consumption for Turkish economy, this study is expected to make a contribution to the existing literature and reveal some policy implications. Especially, if financial development is found to affect energy consumption then this relationship can affect energy policies of Turkish economy.

LITERATURE REVIEW

The literature examining the dynamics of energy consumption first focuses on the link between economic growth and energy consumption (Wandji, 2013; Shahbaz, Zeshan & Afza, 2012). Theoretically, growth hypothesis implies that decreasing energy consumption may reduce economic growth, whereas the conservation hypothesis suggests a causality running from economic growth to energy consumption (Squalli, 2007; Stern, 2010). Payne (2010) and Wandji (2013) suggest uni-directional causality running from energy consumption to economic growth, whereas Belloumi (2009); Shahbaz et al. (2012) and Bozoklu & Yilanci (2013) reveal bi-directional causality between the variables. On the other hand, several studies (e.g. Ghani, 2013; Sadorsky, 2012; Shahbaz, Nasreen & Ling, 2013) examine the relationship between foreign trade (trade openness) and energy consumption. Ghani (2013) investigating the impact