



Determinants of energy consumption function in SAARC countries: Balancing the odds



Syeda Rabab Mudakkar^{a,*}, Khalid Zaman^b, Huma Shakir^b, Mariam Arif^c,
Imran Naseem^b, Lubna Naz^d

^a Centre for Mathematics & Statistical Sciences, Lahore School of Economics, Lahore, Pakistan

^b Department of Management Sciences, COMSATS Institute of Information Technology, Abbottabad, Pakistan

^c Department of Humanities, COMSATS Institute of Information Technology, Abbottabad, Pakistan

^d Department of Economics, University of Karachi, Karachi, Pakistan

ARTICLE INFO

Article history:

Received 27 May 2013

Received in revised form

25 July 2013

Accepted 11 August 2013

Available online 2 September 2013

Keywords:

Energy

Economic growth

FDI

Financial development

Relative energy prices

SAARC countries

ABSTRACT

The objective of the study is to investigate the multivariate energy consumption function for South Asian Association for Regional Cooperation (SAARC) countries (namely, Bangladesh, India, Nepal, Pakistan and Sri Lanka), particularly, economic growth (GDP), relative prices of energy (REP), foreign direct investment (FDI) and different financial development indicators (i.e., broad money supply, liquid liabilities, domestic credit provided by banking sector and domestic credit to private sector) over a period of 1975–2011. The results reveal that Granger causality running from all other variables to FDI which indicates a strong support for the hypothesis that energy consumption (EC), GDP, REP and FD are important determinants in promoting the FDI both in short- and long-run, in the context of Bangladesh. The results suggest for India indicate that GDP, FDI, REP and FD are useful in explaining the movements of EC in the short-run. Similarly, the Granger causality results indicate that EC, GDP, REP and FD are the important determinants of FDI. In case of Nepal, REP is the only variable whose movements in the short-run determined by movements in the other four variables i.e. GDP, FDI, EC and FD. However, the EC also provide useful information about the variable FD. The results of Pakistan indicate the causal relationship among FDI and EC which supports the “feedback hypothesis” in the short- and long-run. Similarly, both variables i.e., FDI and GDP supports the feedback hypothesis both in the long and short run, where as FD and EC, FD and REP, FDI and REP and finally REP and GDP supports the feedback hypothesis in the short run. In case of Sri Lanka, this study did not find any strong support of the causality among the variables either in the short or long run except unidirectional Granger causality running from FD to EC and EC to FDI.

© 2013 Elsevier Ltd. All rights reserved.

Contents

1. Introduction	567
2. Methodology	568
2.1. Theoretical framework	568
2.2. Measuring Financial Development (FD) indicators	569
2.3. The Granger causality and the Toda-Yamamoto-Dolado-Lutkepohl (TYDL) approach	569
3. Results	570
3.1. Results of principle component analysis	570
3.2. Unit root test results for the integration properties of the data series	570
3.3. Determination of optimal lag order in the VAR system	571
3.4. Estimation of the VAR system and stability tests	571

* Corresponding author. Tel.: +92 334 8982744; fax: +92 992 383441.

E-mail addresses: rabab.mudakar@yahoo.com (S. Rabab Mudakkar),
khalidzaman@ciit.net.pk (K. Zaman), huma@ciit.net.pk (H. Shakir),
mariamarif@ciit.net.pk (M. Arif), drimran@ciit.net.pk (I. Naseem),
lubnanaz.economist@gmail.com (L. Naz).

3.5. Unrestricted level VARL ($k+d_{max}$) and the results of modified WALD test	571
4. Conclusion	572
References	573

1. Introduction

South Asia is ranked as one of the regions with lowest per capita consumption of Energy particularly in form of electricity despite the fact that region is blessed with enormous energy potential for generating enormous amount of electricity. Presently, South Asian countries are producing electricity less than 50% of their available potential [25]. In 2005, recognizing the pivotal role that energy plays in economic and social development, the 13th South Asian Association for Regional Cooperation (SAARC) Summit approved the establishment of the SAARC Energy Centre (SEC) in Islamabad. The SEC is currently mandated to strengthen its member countries' energy capacities by facilitating energy policy coordination through the establishment of common policies. By enhancing regional capabilities, the SEC is also expected to be a catalyst for economic growth. Under the guidance from the SEC, Bangladesh, India, and Pakistan are now working together to address their own as well as the region's energy issues [11].

In South Asia, progress in regional economic integration has been weak and slow, and investment issues have not yet been included in the process. As a result, the region has not realized its potential to attract FDI inflows associated with regional integration, especially intraregional ones. Since the mid-2000s, strong economic growth in major economies in the sub-region has created momentum for regional integration, and South Asian countries have increasingly realized that regional integration can help them improve the climate for investment and business. The inclusion of an investment agenda in the regional integration process and in particular the creation of a regional investment area can play an important role in this improvement [48].

The key question in energy economics is whether growth factors lead to energy consumption (EC) or whether EC leads to growth factors. Although the causal relationship between EC and growth factors has been widely studied over the last three decades, the empirical evidence is not without controversy [23]. According to Zachariadis [52], p. 1233,

"There is a rapidly growing literature on the interaction between energy use and economic development, with many analysts drawing policy conclusions on the basis of Granger causality tests that involve only energy and an economic variable".

Çoban and Topcu [13] investigate the relationship between financial development and energy consumption in the EU over the period 1990–2011 by using system-GMM model. No significant relationship is found in the EU27. The empirical results, however, provide strong evidence of the impact of the financial development on energy consumption in the old members. Lee [29] investigates the contributions of foreign direct investment (FDI) net inflows to clean energy use, carbon emissions, and economic growth by using panel data of 19 nations of the G20 from 1971 to 2009. The results indicate that FDI has played an important role in economic growth for the G20 whereas it limits its impact on an increase in CO₂ emissions in the economies. Song et al. [42] figure out China's indicators of economic growth and changes in energy consumption brought by technological progress since 1986. Empirical results show that China's high-speed economic growth is still largely dependent on massive energy consumption. China's rapid economic growth should have to maintain reduce energy

consumption. China has faced the very problem which should needs to address. Chu and Chang [12] applies bootstrap panel Granger causality to test whether energy consumption promotes economic growth using data from G-6 countries over the period of 1971–2010. The result reveals that nuclear consumption Granger causes economic growth in Japan, the UK, and the US; economic growth Granger causes nuclear consumption in the US; nuclear consumption and economic growth show no causal relation in Canada, France and Germany. Regarding oil consumption-economic growth nexus, there is one-way causality from economic growth to oil consumption only in the US, and that oil consumption does not Granger cause economic growth in G-6 countries except Germany and Japan. Wu et al. [50] adopted data envelopment analysis (DEA) for measuring congestion with undesirable outputs to analyzing congestion of the industry in 31 administrative regions of China. The results show that five regions have congestion in their industry in 2010. Besides, the regions located in the east of the country perform the best in ecological efficiency, followed by regions in central and west China.

Ekholm et al. [15] discuss the implications of financing constraints for future energy and climate scenarios for Sub-Saharan Africa. The results portray the effect of capital cost on technology selection in electricity generation, specifically how limited capital supply decreases investments to capital-intensive zero-emission technologies. As a direct consequence, the emission price required to meet given emission targets is considerably increased when compared to case that disregards the capital constraints. Tang and Shahbaz [43] assess the causal relationship between electricity consumption and real output at the aggregate and sectoral levels in Pakistan by using annual data from 1972 to 2010. The results reveal that at the aggregate level, there is unidirectional Granger causality running from electricity consumption to real output in Pakistan while at the sectoral level, electricity consumption Granger-causes real output in the manufacturing and services sectors. However, there is no causal relationship between electricity consumption and real output in the agricultural sector. Solarin and Shahbaz [41] investigate the causal relationship between economic growth, urbanization and electricity consumption in the case of Angola, over the period of 1971–2009. The results in favor of bidirectional causality between electricity consumption and economic growth; and between urbanization and economic growth.

Akhmat and Zaman [2] investigate the causal relationship among nuclear energy consumption, commercial energy consumption and economic growth in selected South Asian countries, over the period of 1975 to 2010. The results reveal that nuclear energy consumption Granger causes economic growth in Nepal and Pakistan; while, oil consumption Granger causes economic growth in Bangladesh, Bhutan, Maldives, Nepal and Sri Lanka; gas consumption Granger causes economic growth in Bangladesh, Bhutan, India and Maldives; electricity consumption Granger causes economic growth in India and Sri Lanka, finally, coal consumption Granger causes economic growth in Bangladesh, Bhutan, Nepal and Sri Lanka. Alam [3] find causality relationships between electric power consumption, foreign direct investment and economic growth for India and Pakistan covering a period of 1975–2008. The results indicate for India shows the long run causalities for electric power consumption and foreign direct investment boosting economic growth, electric power consumption and economic

Download English Version:

<https://daneshyari.com/en/article/8121174>

Download Persian Version:

<https://daneshyari.com/article/8121174>

[Daneshyari.com](https://daneshyari.com)