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Financial stability, energy consumption and environmental quality: Evidence from South Asian economies

Samia Nasreen [a,*], Sofia Anwar [a], Ilhan Ozturk [b]

[a] Department of Economics, Government College University Faisalabad, Faisalabad, Punjab, Pakistan
[b] Faculty of Economics and Administrative Sciences, Cag University, 33800 Mersin, Turkey

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ABSTRACT

A few studies are found on the relationship between financial instability, energy consumption and environmental quality in energy economics literature. The current study is an endeavor to fill this gap by investigating the relationship between financial stability, economic growth, energy consumption and carbon dioxide (CO_2) emissions in South Asian countries over the period 1980–2012 using a multivariate framework. Bounds test for cointegration and Granger causality approach are employed for the empirical analysis. Estimated results suggest that all variables are non-stationary and cointegrated. The results show that financial stability improves environmental quality; while the increase in economic growth, energy consumption and population density are detrimental for environment quality in the long-run. The results also support the environmental Kuznets curve (EKC) hypothesis which assumes an inverted U-shaped path between income and environmental quality. Moreover, the study found the evidence of unidirectional causality running from financial stability to CO_2 emissions in two countries i.e. Pakistan and Sri Lanka. The findings of this study open up new insight for policy makers to design a comprehensive financial, economic and energy supply policies to minimize the detrimental impact of environmental pollution.

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* Corresponding author.
E-mail addresses: sami_lcu@yahoo.com (S. Nasreen), sofia_eco@gcuf.edu.pk, sofia_ageconomist@yahoo.com (S. Anwar), ilhanozturk@cag.edu.tr (I. Ozturk).

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1. Introduction

Financial sector is playing a significant role in the mobilization and utilization of savings, facilitation of transactions and monitoring of resources towards productive activities in developing countries. An efficient financial sector is expected to increase economic efficiency in general and growth process in particular. It can increase investment activities by issuing loans at cheaper rates, allocating resources toward productive channels, facilitating trade activities, managing risks, monitor the functioning of firms and informing the firms to use environment friendly techniques in their production process to stimulate the level of economic growth [24,72]. Schumpeter [101] was the first that explored the finance-growth relationship by analyzing the importance of finance in economic activities. The role of the financial sector in economic growth has received a great deal of attention with the advent of endogenous growth theory. However, the expansion in empirical literature started after the seminal paper of King and Levine [67] which stimulated the interest in this area.

Dasgupta et al. [30] noted that countries with efficient financial markets are more likely to enjoy a clean environment than countries with less developed financial markets. Economic literature suggests that sound and efficient financial sector attracts foreign direct investment in a country and encourages the economic growth. Foreign firms are more energy efficient and use environment friendly techniques than domestic firms of less developed countries [36]. Developed financial structure encourages firms to adopt modern technologies in the energy sector that result in lower emission of energy pollutants [68] and stable financial system helps to improve environmental conditions by encouraging investment on environmental friendly techniques. Under the rejunctive remedies financial system also punishes the firms on the releasing more wastage in water and air through restricting their access to easy credit [97,19,48]. This act of financial markets not only increases the market value of the firms and productivity but also reduces environmental pollution. In contrast, Tamazian et al. [115] pointed out that financial sector development may over all enhance economic growth which may result in more industrial pollution and environmental degradation.

Banks dominate the financial sector in South Asian region while capital markets are relatively underdeveloped [120]. The size of banking sector is three times more than the stock market in all South Asian economies. Government bonds are leading indicator in region's bond markets as compared to corporate bonds. In some South Asian countries like India and Sri Lanka, public sector banks control more than 50% of commercial banking assets while in Bangladesh and Pakistan, the role of private sector banks is more prominent [113]. The banking sector of South Asian economies is relatively more stable as compared to other developing economies of the world. Capital adequacy ratio is found to be greater than statutory requirements in all countries except Nepal. The amount of gross nonperforming loans, although rising, has not reached the alarming situation and most countries have displayed satisfactory levels of provisions. The performance of banks is also satisfactory, with higher interest margins and cost efficiencies [120].

South Asian countries have introduced financial sector reforms in early 1980s. Early reform programs included initiatives to privatize and restructure public sector, banks and develop capital markets. These were followed by reforms to liberalize the financial sector, strengthen prudential norms, revamp laws, build regulatory capacity, improve corporate governance, and develop market infrastructure and payment systems. While countries have undertaken varying degrees of reforms, in most cases the reform programs have strengthened their financial systems and especially their banking sectors [113]. Banks have become dominant players in the region's financial sectors and strong contributors to economic growth. The main motive of initial reforms was to increase competition in financial sector, particularly banking sector and improve prudential regulations [113]. Not only financial development contributed to growth through enhancing the benefits of FDI in South Asia rather improvement in political rights and civil liberties also enhanced the benefits of financial development [10]. In recent years, countries have taken steps to bring their local auditing and accounting standards in line with international accounting standards, improve technological infrastructure, modernize payment systems and introduce corporate governance guidelines. These reforms increase the stability of financial system [120] and in turn economic growth. Table 1 shows key financial sector indicates of South Asian economies for the year 2012.

South Asian economies have tremendous potential for economic growth. For nearly two decades, until the onset of the global financial crisis in 2008, South Asian economies enjoyed rapid economic growth. Growth rate was greater than 9% in India; 7% in Pakistan; 6% in Bangladesh; 4% in Nepal and 6% in Sri Lanka in the past decade. Due to high economic growth and reduction in poverty, GDP per capita increased sharply in all South Asian countries from 2000 onward (see Table 2).

Energy consumption reflects the life style trends of a country. Economic prosperity is usually accompanied by a higher energy demand; especially the demand for renewable energy sources and their consumption (see e.g. [25,27]). This can be seen in the case of India, Pakistan and Sri Lanka. Energy consumption was lower in the year 1990, but increase in per capita income in the following years, increased energy consumption in all three countries. Nepal which is a small country with medium low development has high energy consumption. The energy consumption figures of Nepal are comparable to Pakistan and India, both of which are relatively bigger and more populous than Nepal (see Table 2). The enormous economic growth and demand for energy consumption has been accompanied with the problem of environmental pollution. India accounts for about 75% of total regional emissions, though per capita emissions remain low; there is considerable potential for further increase with economic growth. The average annual CO_2 emissions per capita has been estimated at 1.91 metric tons in India, 0.94 metric tons in Pakistan, 0.39 metric tons in Bangladesh, 0.14 metric tons in Nepal and 0.63 metric tons in Sri Lanka in the year 2012 (see Table 2).

The objective of the study is to investigate the relationship between financial stability, energy consumption and CO_2

Table 1
Key financial sector indicators of South Asian economies in 2012.

Indicator	Pakistan	India	Bangladesh	Nepal	Sri Lanka
Domestic credit provided by financial sector (% of GDP)	45.8	75.9	69.0	67.9	48.4
Bank deposits to GDP (%)	28.79	61.98	50.48	58.68	31.60
Stock Market Capitalization (% of GDP)	19.4	68.0	15.0	21.9	28.7
Bank return on assets (%)	2.10	1.00	1.3	1.77	1.56
Bank Z-score (%)	13.57	36.02	9.67	8.02	14.23
Capital adequacy ratio (%)	15.4	14.6	10.5	11.5	12.3
Central bank assets (% of GDP)	8.85	4.61	5.14	2.73	2.72
Deposit interest rate (%)	8.0	8.25	11.7	4.0	8.7
Lending interest rate (%)	13.5	10.6	13.0	8.0	13.3
Exchange rate/US$	93.40	53.44	81.86	85.20	127.60
Commercial banks	36	82	43	31	24
Specialized banks	4	7	5	58	14
Non-bank financial institutions	43	346	30	78	56

Source: World Bank, World Development Indicators database.