Original Article

Country' Green Human Resource Management, Monetary Markets, and Environmental Connection

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Abstract: Capital markets are crucial for increasing growth in the economy of any nation, but they can additionally have a negative impact on the natural environment if money is invested in environmentally favourable projects. Additionally, green human resource management (GHRM) might contribute to a decrease in emissions of carbon dioxide (CO_2). Throughout the following paper, the effects of GHRM and the Financial Development of Markets (FMD) on Pakistan's environment are examined. Utilising the cointegration on data sets spanning from 1971 to 2022, we investigate the subject. The research's findings support the notion that FMD and economic growth (EG) have a beneficial impact on CO_2 emissions, while GHRM aids in their reduction. We advise financial institutions to offer subsidised loans to initiatives utilising green energy technologies, and we urge GHRM to focus on promoting ecological sustainability.

Keywords: economic growth, Co2 emissions, financial market development, GRHM

1. INTRODUCTION

Green human resource management (GHRM) is a procedure that involves a company's staff in promoting the corporate leadership of an organization's green environmental goals. To further the good environmental effects of the organisations and to boost a business's perception of themselves, organisations can reinforce the incentives, both financial and otherwise, for employees that promote a notion of GHRM. For instance, work descriptions would be created to communicate GHRM and the social obligations that employees have for actions that would help the natural world. To encourage the phenomenon of GHRM, corporations also engage in green management when employing fresh talent by highlighting the particular skills and qualities of a worker who gets hired, concentrating on precise sustainable activities. In order to increase staff comprehension of GHRM, corporations are also involved in educational initiatives that promote GHRM practises in their current workforces. Finally and certainly not least, organisations are keeping track of how well their staff members execute in accordance with GHRM requirements and might even create sustainable incentives for staff members that implement environmentally friendly procedures (Arulrajah et al., 2015). A company could contribute to lowering greenhouse gas emissions by encouraging green consumption of electricity practises or by decreasing overall energy consumption in light of the GHRM practises stated above. Since the "Second Economic Renaissance" of the last decade of the 19th and starting point of the 20th centuries, the role of energy consumption in industrial expansion can't be ignored. Due to widespread production

technological advances, scientists have taken an intense interest in the relationship between energy usage and development. The same supports the fact that usage of energy has had a long-lasting impact on "industrial economies" since the 20th century. In a similar vein, the relationship between energy consumption and financial development (Senen et al., 2018) is becoming a source of concern owing to CO2 emissions since it poses a serious risk to the environment's natural composition through altering the climate. A counterargument to the idea that energy increases output and revenue, which then expands the financial sector and, eventually, results in economic development (EG), is that what if economic activity pollutes social and human capital? Environmental literature continues to debate how that increase has affected the environment both locally and worldwide. With the ongoing acceleration of global growth, modern writing raises this worry for the environment. The Environmental Kuznet Curve (EKC), which elaborates that pollution may increase at very early stages of advancement but may decrease by adoption of environmentally conscious technologies later at later stages of development, is frequently used in ecological writing for clarifying non-stationary associations.

After discussing EKC, it became clear that the financial market would directly impact increased economic activity, which would in turn cause pollution to rise as energy demand rose along with income levels. Second, Financial Market Development (FMD) may lead to growth that results in increased energy consumption and pollution. There are two perspectives on financial growth, according to which it may either promote an upsurge in carbon emissions or limit them. On the other hand, FMD has scale effects and spreads wealth. The growth of FMD would make it possible for customers to take out more loans, which they might then use to buy things that might cause pollution due to energy consumption. This rationale might be referred to as the wealth impact. On the other hand, due to increased funding from financial institutions, scale effects may be creating pollution through the expansion of major economic organisations with large scales of production. According to this viewpoint, no economy is exempt from a cataclysm brought on by environmental degradation.

2. LITERATURE REVIEW

There are numerous research on the simulation of emissions of carbon dioxide. Additionally, we are talking about a few of these examples to back up our claim. For instance, Keho (2017) uses measure regression techniques to examine the association between revenue and greenhouse gas emissions in five groups of fifty-nine states nations. Subsequently supports the finding that money has a favourable effect on emission levels throughout all percentiles in the majority of screens. This link is ideally established for the remaining panels at lower pollution quantiles. Portugal from 1971 to 2008 is used by Shahbaz et al. (2015) to test this link. They discover that income has a favourable impact on pollutant emissions. They also claim that pollution and urbanisation have a favourable relationship. Al-Mulali et al. (2015) examine the relationship between income and pollution in Vietnam over the years 1981–2011 and discover a favourable correlation. They also note that trade and money have a favourable impact on environmental emissions. However, it has been discovered that labour has been useful in reducing Vietnam's pollution, which might be called a GHRM endeavour. Al-Mulali et al. (2016) use the years 1980 to 2012 to study the EKC hypothesis in Kenya. The findings showed that trade openness, urbanisation, GDP, and the usage of fossil fuels all contribute to an overall long- and short-term increase in air pollution. However, using renewable energy both now and in the future reduces air pollution. Additionally, but only over the long term, financial development also lowers air pollution. The EKC theory does hold true in Kenya, according to the findings. The trade variable, according to Alkhateeb and Mahmood (2017), is in favour of the clean environment thesis. Additionally, income raises pollutant emissions. The creation of jobs in Saudi Arabia, according to Alkhateeb et al. (2017), is positively impacted by the oil industry. Additionally, Maalel and Mahmood (2018) discover that oil dependence on income has a beneficial affect on the economic growth of GCC countries but dependence on oil exports has a negative impact. Salahuddin, et al. (2015) use a panel study to examine the impact of FMD on CO2 emissions in the GCC region over the years 1980 to 2012. In this panel, they discover that FMD is effective in lowering pollutants. Additionally, while energy use and wealth have had a favourable impact on pollutant emissions, FMD has had a detrimental effect. In the causal study, they also discover an unidirectional connection between revenue and emissions of pollutants, indicating that electricity use is inducing pollution. Literature denotes whether FMD has an advantageous, unfavourable or indifferent impact on contamination. It is an analytical query, consequently, for every economy. In order to examine the impact of FMD on Pakistan's contamination levels through a single-country evaluation, this

article is strongly prompted. This study's predicted methodology would demonstrate the precise impact of FMD on Pakistan's pollution emissions. Furthermore, not one investigation has been able to measure how GHRM practises affecting the emission of pollutants.

3. MATERIALS AND METHODS

FMD contributes to increased revenue generation and may adversely impact the environment by increasing pollutant emissions due to increased economic activity. Additionally, EG causes increased economic activity, which, if clean energy is not employed, could speed up the release of pollutants. Conversely, highly educated individuals might contribute to a decrease in pollution. As a result, GHRM may aid in the reduction of emissions of pollutants like carbon dioxide emission levels, which may be influenced by wealth and FMD. It can be difficult to measure GHRM as an indicator in a socioeconomic context. In order to describe the equation that follows in log-linear structure, researchers are using Human Resource Development (HRD) as a stand-in for GHRM:

$$lCO_2t = f(lFMDt, lGHRMt, lYt) \qquad (1)$$

the period of 1971–2022, while l displays the logarithm over CO2 represents carbon dioxide emissions, FMD and GHRM represent FMD and HRD, respectively (an at the macro level surrogate for GHRM), and Y represents an individual's income employing an equivalent for revenue per capita. Loans are available from financial markets to help every nation's production and consumption processes. Any economic activity requires energy, and consuming energy can lead to environmental issues. Therefore, we can speculate that CO2 and FMD are directly related. Additionally, EG may speed up utilization of energy, which could lead to an increase in airborne pollutants. EG is therefore projected to have a positive impact on greenhouse gas emissions. However, as noted above in the opening section, GHRM may contribute to a reduction in contamination through the efforts of people with education. Researchers employ the ADF test to check for stationary patterns difficulties in data analytics. We can move forward with cointegration analysis once the sequence of integration has been established using the ADF test. Equation 1 is being used with auto-regressive distributive lag (ARDL) in the manner described below:

$$\Delta lCO_{2t} = o_0 + o_1 lCO_{2t-1} + o_2 lFMD_{t-1} + o_3 lY_{t-1} + o_4 lGHRM_{t-1}$$

4. RESULTS AND DISCUSSION

Unit root analysis is necessary for the cointegration to occur. According to Table 1, lCO_2t and $lFMDt$ exhibit unit root at levels but become stagnant after the initial variation. Additionally, lYt and $lGHRMt$ are level and stationary. We are moving towards cointegration analysis employing ARDL after the ADF test revealed a mixed order of integration. Table 1's F-value from the bound test is 5.9769, which is large enough for us to reject the null hypothesis that o = o = o = 0. Therefore, we can assert that our carbon dioxide emissions algorithm's cointegration exists. Diagnostic procedures also demonstrate the interpretability of our approach. According to long-term studies, the $lFMDt$ has an elasticity of 0.6068 and is favorably impacting the lCO_2t. Therefore, a 1% rise in FMD may cause a 0.6068% increase in CO2 emissions. Financial markets are wonderful for funding economic activity, but if loans are granted without considering how money might be used for ecologically destructive eating, the ecosystem could suffer. Our findings support the notion that FMD contributes to ecological deterioration by raising CO2 emissions. Additionally, the modulus of the relationship between lYt and lCO_2t is 0.2409. This indicates that EG is damaging the ecosystem by emitting increasing CO2 over time. Thankfully, the $lGHRMt$ has a detrimental effect on CO2 emissions. This outcome supports the theoretical hypotheses that informed individuals support environmentally friendly products. Therefore, in our approach, GHRM is effective in lowering pollution.

Variable	C	C and T
lCO_{2t}	1.5847 (2)	−2.1645 (1)
$lFMD_t$	−0.3145 (0)	−2.5478 (0)
lY_t	−3.2547 (1)**	−3.5418 (1)***
$lGHRM_t$	−4.2514 (1)***	−5.2145 (0)***
ΔlCO_{2t}	−4.5874 (2)***	−5.1547 (1)***
$\Delta lFMD_t$	−6.5417 (0)***	−5.6541 (0)***

*,** and *** for stationarity at 10%, 5% and 1%

Table 01: ADF test

Table 2 also includes short-run findings, and the correlation coefficient of t1 there is significantly negative. So, we can say that our model has a short-run relationship. The average rate of integration, as indicated by the coefficient t1, is 33.59% in a year. With an extremely modest flexibility of 0.2039 in comparison to long-run pliability, FMD positively influences CO2 emissions in the immediate future additionally. This supports the statistical projections of poor elasticity in the short term relative to the long term. The CO2 emissions increase by 0.2039% for every one percentage point rise in FMD. Additionally, income has an elasticity of 0.3068 in the short term, which contributes to increasing pollution. Both independent factors have a favourable effect on pollution as a whole. This outcome might be a result of the fact that GHRM takes a while to develop among employees into one that is ecologically conscious, it might only be beneficial in the long run.

Predictors	Effects	S.E.	t-Stat	P
Long-run estimates				
$lFMD_t$	0.6068	0.0775	7.8307	0.0000
lY_t	0.2409	0.0963	2.5009	0.0166
$lGHRM_t$	−0.1457	0.0244	−5.9713	0.0000
C	3.7004	0.3543	10.4441	0.0000
Short-run estimates				
$\Delta lFMD_t$	0.2039	0.0700	2.9111	0.0059
ΔlY_t	0.3068	0.1089	2.8177	0.0075
$\Delta lGHRM_t$	−0.0746	0.0641	−1.1638	0.4521
Ψ_{t-1}	−0.3359	0.1094	−3.0713	0.0038
Diagnostic tests	F-value		P-value	
Heteroscedasticity	1.4539		0.2343	
Serial correlation	0.3947		0.6766	
Normality	1.4205		0.4915	
Functional form	1.5330		0.1333	
Bound test	Estimated F-value=5.9769			
Critical bound F-value	Lower		Upper	
5%	3.23		4.35	
1%	4.29		5.61	

Table 02: CO_2 Emission Model

5. CONCLUSIONS

Although monetary markets are thought to have a favourable impact on economic growth, FMD and EG may have detrimental consequences on the environment. The presence of more experienced, well-educated and informed individuals in organisations may also have a positive impact on contamination. This study examines how income, GHRM, and FMD affect emissions of carbon dioxide (CO2). Under this hypothesised approach, we discovered cointegration and the short-run relationship. Additionally, FMD is helping to reduce emissions of carbon dioxide. FMD is predicted to increase income levels in this economy, but it also has an opportunity to negatively impact the natural world by emitting CO2. Additionally, EG contributes directly to CO2 emissions, although GHRM is proven to play a positive influence in lowering emissions of carbon dioxide. According to the findings, we advise the banking industry to offer loans while assuring responsible borrowing. For instance, if financial resources are used to fund green or renewable energy initiatives, reduced rates ought to be offered.

In order to promote the preservation of the planet, financial institutions ought to make investments in companies that use energy-efficient technologies in manufacturing. In order to mitigate contamination at the micro and assemble levels, we conclude by recommending that educational endeavours and GHRM practises be promoted in organisations in the manner described below:

- Economic and non-financial advantages may be implemented to encourage employees to promote GHRM initiatives within the organisations.

- The job description for the hiring process should clearly state the necessity for GHRM procedures that might inform the staff about the GHRM activities for a support of a healthy work environment.

- Green planning should be started in order to carry out corporate operations with the least amount of energy resources and to save the environment.

- An organisation ought to initiate educational programmes for its current personnel in GHRM procedures.

- Employees should be compensated monetarily for adhering to the finest GHRM practises, and performance reviews should be based on GHRM standards.

REFERENCES

Akpan, G.E., Akpan, U.F. (2012), Electricity consumption, carbon emissions and economic growth in Nigeria. International Journal of Energy Economics and Policy, 2(4), 292-306.

Alkhateeb, T.T.Y., Mahmood, H. (2017), Trade and environment nexus in Saudi Arabia: An environmental kuznets curve hypothesis. International Journal of Energy Economics and Policy, 7(5), 291-295. Alkhateeb, T.T.Y., Mahmood, H., Sultan, Z.A., Ahmad, N. (2017a), Oil price and employment nexus in Saudi Arabia. International Journal of Energy Economics and Policy, 7(3), 277-281.

Alkhateeb, T.T.Y., Sultan, Z.A., Mahmood, H. (2017b), Oil revenue, public spending, gross domestic product and employment in Saudi Arabia. International Journal of Energy Economics and Policy, 7(6), 27-31.

Al-Mulali, U., Ozturk, I. (2015), The effect of energy consumption. urbanization, trade openness, industrial output, and the political stability on the environmental degradation in the MENA Region. Energy, 84, 382-389.

Al-Mulali, U., Saboori, B., Ozturk, I. (2015), Investigating the environment Kuznets curve hypothesis in Vietnam. Energy Policy, 76, 123-131.

Al-Mulali, U., Solarin, S.A., Ozturk, I. (2016), Investigating the presence of the environmental Kuznets curve (EKC) hypothesis in Kenya: An autoregressive distributed lag (ARDL) approach. Natural Hazards, 80(3), 1729-1747.

Arulrajah, A.A., Opatha, H.H.D., Nawaratne, N.N.J. (2015), Green human resource practices: A review. Sri Lankan Journal of Human Resource Management, 5(1), 1-16.

Keho, Y. (2017), Revisiting the income, energy consumption and carbon emissions nexus: New evidence from quantile regression for different country groups. International Journal of Energy Economics and Policy, 7(3), 356-363.

Maalel, N.F., Mahmood, H. (2018), Oil-abundance and macroeconomic performance in the GCC countries. International Journal of Energy Economics and Policy, 8(2), 182-187.

Ozturk, I., Acaravci, A. (2013), The long-run and causal analysis of energy, growth, openness and financial development on carbon emissions in Turkey. Energy Economics, 36, 262-267.

Salahuddin, M., Gow, J., Ozturk, I. (2015), Is the long-run relationship between economic growth, electricity consumption, carbon dioxide emissions and financial development in gulf cooperation council countries robust? Renewable and Sustainable Energy Review, 51, 317-326.

Senen, N.A.M., Mahmood, H., Liaquat, S. (2018), Financial markets and electricity consumption nexus in Saudi Arabia. International Journal of Energy Economics and Policy, 8(1), 12-16.

Shahbaz, M., Dube, S., Ozturk, I., Jalil, A. (2015), Testing the environmental Kuznets curve hypothesis in Portugal. International Journal of Energy Economics and Policy, 5(2), 475-481.