

GLIMPSE 2022

An Anthology of BIGM Research - Abstracts



**Bangladesh Institute of
Governance and Management**

Glimpse 2022
An Anthology of BIGM Research Abstracts



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ABBREVIATIONS

ADB I	Asian Development Bank Institute
ARDL	Autoregressive Distributive Lag
AUC	Area Under the Curve
BDHS	Bangladesh Demographic and Health Survey
BLR	Binary Logistic Regression
BMI	Body Mass Index
BRI	Belt and Road Initiative
CC	Community Clinic
CIWB	Carbon Intensity of Wellbeing
CNN	Convolution Neural Network
CCR	Canonical Cointegration Regression
CS-ARDL	Cross-sectionally Augmented Autoregressive Distributed Lag
DARDL	Dynamic ARDL
DOLS	Dynamic Ordinary Least Square
DSE	Dhaka Stock Exchange
DT	Decision Tree
ECD	Early Childhood Development
ECDI	Early Childhood Developmental Index
ESCI	Emerging Sources Citation Index
EKC	Environmental Kuznets Curve
EV	Electric Vehicles
FDA	Foreign Development Assistance
FDI	Foreign Direct Investment
FMOLS	Fully Modified Ordinary Least Squares
GARCH	Generalized Autoregressive Conditionally Heteroscedastic
GHGs	Greenhouse Gases
GLS	Generalized Least Squares
GMM	Generalized Method of Moments
IAA	Innovative Accounting Approach
IRF	Impulse Response Function
ICSS	Iterated Cumulative Sum of Squares
KNN	K-nearest Neighbour
LR	Logistic Regression
MEP	Macroeconomic Policy
ML	Machine Learning
MLP	Multilayer Perceptron
NAHS	National Adolescent Health Strategy
NB	Naïve Bayes
PCEC	Per Capita Electricity Consumption
PCGNI	Per Capita Gross National Income
PPM	Preference Pattern Mining
PSM	Propensity Score Matching
PTS	Political Terror Scale
PV	Photovoltaics (PV)
RF	Random Forest
SARIMA	Seasonal Autoregressive Integrated Moving Average
SGMM	System Generalized Methods of Moments
SMOTE-NC	Synthetic Minority Over-sampling Technique Nominal Continuous
SCI	Scielo Citation Index
SEM	Structural Equation Modelling

SSCI	Social Sciences Citation Index
STIRPAT	Stochastic Impacts by Regression on Population, Affluence and Technology
SVM	Support Vector Machine
TY	Toda -Yamamoto
TFP	Total Factor Productivity
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
VDC	Variance Decomposition

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PREFACE

Bangladesh Institute of Governance and Management (BIGM), is a premium knowledge hub in Dhaka for education, training and research, primarily focused on policy instrumentation. The institute is the brainchild of a few distinguished members of the civil services, retired and active with a vision. The vision of BIGM is to become a premium knowledge hub by adding value in teaching, training and research regarding policy, governance and development to serve the interest of the country and its people. In order to achieving the above vision, the Institute intends to enhance the capacity of the executives of both public and private sectors by strengthening their knowledge, skills, insights and positive attitude; sharpening their professionalism and critical thinking capabilities, and inculcating in them commitment and strategic policy leadership through post-graduation level professional education, cutting-edge research, and higher level training.

The academic and institutional structure of BIGM is reinforced by a culture of research. Initially, the focus of the research activities of BIGM was on macroeconomic issues but at present, the research portfolio of BIGM has evolved into being multidimensional and multi-disciplinary in nature and broadly covers policy, governance and development areas. Since 2019, BIGM researchers have also been conducting primary research on issues such as rural women's empowerment, the impact of remittance on returnee migrants' well-being, and the glass ceiling faced by women in the Civil Service of Bangladesh. These three primary research projects have already been completed and few research papers based on these projects are accepted for publication in various internationally reputed journals. Up till now, 54 (fifty-four) articles of the researchers of BIGM have been published in various international peer-reviewed indexed journals; 10 (ten) scientific papers have already been accepted for publication and 11 (eleven) papers are under review in different journals. The researchers of BIGM present their research papers in various international fora, seminars, and workshops.

At BIGM innovation and reform has been undertaken with the changing needs of time and society. Research focused on macro and micro economic issues to provide policy inputs for achieving the country's SDGs by 2030 and becoming a developed country by 2041. The Institute is expanding its outreach to collaborate and share its expertise, talents, and resources with different academies, institutes, universities, research centers, and think tanks working within the country and abroad. The institution is now working on different fronts with multi-pronged strategies to elevate it to a center of public policy at international level.

This publication, the Research Glimpse 2022 is the abstracts of all the published research articles of BIGM researchers/faculty in various international peer-reviewed indexed journals since 2017. The abstracts are compiled with the journal names, categories, and publication history following the decision taken in the meeting of the Board of Trustees (BoT) and the Governing Body (GB).

September, 2022



Mohammad Tareque, PhD

A. GROWTH

1. External debt and growth: role of stable macroeconomic policies

Sima Rani Dey¹, Mohammad Tareque², PhD

Abstract:

Purpose

This study aims to examine the impact of external debt on economic growth in Bangladesh within a broader macroeconomic scenario.

Design/methodology/approach

In the process of doing so, it assesses the empirical cointegration, long-run and short-run dynamics of the concerned variables for the period of 1980–2017 applying the autoregressive distributed lag (ARDL) bounds testing approach to cointegration. First, debt-gross domestic product linkage explores the impact of external debt impact on economic growth using a set of macro and country risk variables, and then this linkage is also analyzed along with a newly formed macroeconomic policy (MEP) variable using principal component analysis.

Findings

The study results reveal the negative impact of external debt on GDP growth, but the larger positive impact of MEP index indicates that this adverse effect of debt can be mitigated or even nullified by sound MEP and appropriate human resource policy.

Originality/value

The dynamic effects of different shocks (external debt and macro policy variable) on economic growth by vector autoregression impulse response function also confirm our ARDL findings.

Keywords: External debt; Economic growth, Macroeconomic policy; ARDL

JEL Classification: C32; H63; E23; E60

Published in *Journal of Economics Finance and Administrative Science* (Emerald), Vol. 25 No. 50, pp. 185-204 (28 July, 2020)

Journal Category: Scielo citation index, Q2

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2. Endogenous growth model of a labour-abundant and land-scarce economy

Tahmina Sultana¹, Dr. Mohammad Moniruzzaman², Dr. Mrityika Shamsuddin³,
Mohammad Tareque⁴, PhD

Abstract: The study contributes towards modelling and estimating an endogenous growth model of an economy burgeoning with young working population and declining agricultural land. The model explores the long-run impact of physical capital stock, human capital augmented labour and production index augmented agricultural land on Gross Domestic Product of Bangladesh. Theoretically and empirically the model indicates that per capita income will be rising as long as the growth and share of human capital and the growth of agricultural productivity outweigh the dragging effect of the growth of declining agricultural land and the population growth. Vector error correction model (VECM), autoregressive distributive lag (ARDL) and dynamic ordinary least square (DOLS) techniques are employed to observe the robustness of the results. The underlying production relations exhibit constant returns to scale. DOLS estimates are found more robust and significant as compared to the results in ARDL. Agricultural productivity and human capital are found as very crucial determinants of growth. Government should give more focus on creating human capital through higher spending on education and take necessary measures to increase the utilization rate of scarce agricultural land. Formulation of land zoning policy and land reclamation policy may be instrumental for effective use and protection of declining agricultural land and adverse environmental impacts.

Keywords: GDP growth; Augmented labour; Augmented agricultural land; Caved model

JEL Classification: J24; Q15; O47

Published in *Journal of Social and Economic Development*, (Springer), Vol. 21, Issue 2, (28 October, 2019)

Journal Category: Emerging Sources Citation Index (ESCI), C

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3. Twin deficits hypothesis in Bangladesh: An empirical investigation

Sima Rani Dey¹, Mohammad Tareque², PhD

Abstract:

Purpose

This study attempts to examine the twin deficits hypothesis for Bangladesh. Along with the traditional twin deficits hypothesis associated with the current account and fiscal deficit, the paper also explores the causal relationship between the trade deficit and fiscal deficit.

Design/methodology/approach

We start with the investigation of the conventional twin deficit hypothesis employing autoregressive distributed lag (ARDL) bounds testing approach in a multivariate framework. Due to the absence of cointegration between the budget deficit and trade deficit, the study adopts a multivariate vector autoregressive (VAR) model to analyze the nexus.

Findings

The study supports the presence of the twin deficits hypothesis in Bangladesh, both in the short run and long run. Unidirectional causation running from the budget deficit to the current account deficit in the long run. The trade model also supports the twin deficit hypothesis, like the aforementioned current account model.

Practical implications

Therefore, the sustainable fiscal deficit is the key to maintain a stable current account deficit and trade deficit in Bangladesh.

Originality/value

The study incorporates the country risk indicators to address the governance issue while analyzing the models' deficit scenarios because good governance is an integral part of explaining the development outcome and failure of a country like Bangladesh.

Keywords: Current account deficit; Trade deficit; Twin deficits; VAR; Granger Causality

JEL classification: C32; E62; F32; H62; O53

Published in *International Journal of Emerging Markets* (Emerald) 02 March, 2021

Journal Category: Social Sciences Citation Index (SSCI), Q2

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4. Aggregate consumption expenditure and economic growth: Evidence from Bangladesh

Sima Rani Dey¹, Mohammad Tareque², PhD

Abstract: This paper attempts to investigate the relationship between aggregate consumption expenditure and economic growth of Bangladesh using the ARDL Bounds Test approach. The study reveals that consumption expenditure and GDP have a significant impact on each other. Granger non-causality test also has been carried out, and the test reveals that unidirectional causal relationship is running from aggregate consumption expenditure to GDP. Bilateral causality exists between GDP and capital investment. The findings suggest that consumption enhancing fiscal and monetary policies can also boost the economic growth in the context of Bangladesh. That's because Bangladesh is still operating on the relatively flatter part of its long run supply curve.

JEL Classification: F43

Published in *Global Journal of Management and Business Research: B Economics and Commerce*, Vol. 18, Issue 5 (July, 2018)

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5. The relationship between income, consumption and GDP of Asian countries: A panel analysis

Sima Rani Dey¹

Abstract: This paper attempts to scrutinize the co-integration relationship between consumption, income and GDP per capita in panel data series. We have applied unit root test, co-integration test and FMOLS estimation technique to analyze the data. Data covers 11 Asian countries of three income categories– lower middle income, upper middle income and high income. The study contemplated the annual observations of 35 years from 1980 to 2014. Study revealed that the association between consumption and income is stronger in lower and upper middle income countries. The low level of income determines its maximum use predominantly for consumption. The relation between consumption, income and GDP per capita is stronger for lower middle income countries; thereby the countries with higher income generally tend to make big investments.

Keywords: Income; Consumption; GDP; Panel unit roots; Panel cointegration

JEL Classification: C23; D31; E21

Published in *Managing Global Transitions, University of Primorska, (Slovenia)*, Vol. 17, No. 2 (July, 2019)

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6. Investigating the roles of physical infrastructure, financial development and human capital on economic growth in Bangladesh

Faroque Ahmed¹, Jamal Hossain², Mohammad Tareque³, PhD

Abstract: This article investigates the dynamic relationship among physical infrastructure, financial development, human capital and economic growth in Bangladesh, employing Autoregressive Distributed Lag (ARDL) bound co-integration and Granger causality test for the period 1985–2019. The study finds a significantly positive long-term impact of physical infrastructure and human capital on economic growth. However, the effect of financial development on growth is found to be negative, and the result suggests that financial development will take place with economic growth. From the policy perspective, this study emphasises increasing investment in physical infrastructure and human capital for Bangladesh to foster long-term economic growth.

Keywords: Physical infrastructure index, financial development index, human capital index, economic growth, ARDL

JEL Classification: H40; C43; O40; C32

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7. Promoting sustainable development through realizing the demographic dividend opportunity in the digital economy: A case study of Nepal

Tapan Sarker¹, Shristi Tandukar², Sima Rani Dey³

Abstract: This paper reports the links between demographic dividend, digital economy, and sustainable development in the context of Nepal. Nepal is one of the countries that has been undergoing a remarkable demographic transition in South Asia in the last few decades, which provides it with the “window of opportunity” for sustainable development. In this regard, an appropriate study in this sector is indispensable to capture the optimum advantage of demographic dividend with the emerging techno-economic paradigm administering the dimensions of sustainability. By using multiple regressions, we analyze the economic variables of demographic dividend as the dependent variable, with the indicators of the digital economy being telecommunication and internet access as independent variables, and for the environment-related issues, greenhouse gas emissions and urbanization as explanatory variables, to understand the convoluted relationship of the influence of demographic dividend on the digital economy. The study provides a decisive rationale for the prospective policy implications necessary to grasp the advantage of demographic dividend by examining the potentials of the digital economy, exploring the environmental dimension that is currently regarded as one of the global issues in the economy. Policy implications and the impact of COVID-19 have also been discussed. The outcome of the research provides a road map for attaining the Sustainable Development Goals for Nepal. The findings and lessons learned will also assist policymakers and future researchers with similar scopes that can strengthen the economy of countries, but not limited to the least developed countries.

Keywords: demographic dividend, digitalization, environment sustainability, economy, Nepal

JEL Classification: J11, O32, Q56

Published in *Asian Development Bank Institute (ADBI)* (March, 2021)

Journal Category: ADBI Working Paper 1225. Tokyo: Asian Development Bank Institute

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B. INVESTMENT

1. Impact of public and private investment on GDP growth in Bangladesh: Crowding-in or out?

Md. Monirul Islam¹, Asif Hossain², Mohammad Tareque³, PhD

Abstract: This study investigates the impact of public and private investment on GDP growth in Bangladesh over the period 1980-2016 within ARDL framework. It also enquires the causal relationship between investment (public and private) and GDP growth using Block Exogeneity Wald Test technique. The study primarily finds that there exists a significant impact of both public and private investment on GDP growth in the long run. In the short run, public investment does not affect, but private investment has a positive impact on GDP growth. The study also explores a bidirectional association between public investment and GDP growth whereas unidirectional relationships from private investment to GDP growth and from public investment to private investment. Consequently, public investment crowds-in private investment. Therefore, increase in public investment is critical to moving to the next level of the country's growth.

Keywords: public investment, private investment; GDP growth; crowding-in and -out effects; ARDL bounds test.

Published in *Global Journal of Human-Social Science: E Economics*, Vol.8, Issue 6 (August, 2018)

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2. Does infrastructural development allure foreign direct investment? The role of Belt and Road Initiatives

Faheem Ur Rehman¹, Md. Monirul Islam², Kazi Sohag³

Abstract:

Purpose

China's Belt and Road Initiative (BRI) is the most ambitious investment strategy for infrastructural development belonging to the significant potential for stimulating regional economic growth in Asia, Europe and Africa. This study aims to investigate the impact of infrastructure on spurring inward foreign direct investment (FDI) within the purview of human capital, GDP per capita, foreign aid, trade, domestic investment, population and institutional quality in BRI countries.

Design/methodology/approach

In doing so, the authors analyze panel data from 2000 to 2019 within the framework of the system generalized method of movement (GMM) approach for 66 BRI countries from Europe, Asia, Africa and the Middle East.

Findings

The investigated results demonstrate that aggregate and disaggregate infrastructure indices, e.g. transport, telecommunications, financial and energy infrastructures, are the driving forces in attracting foreign direct investment (FDI) in the BRI countries. In addition, control variables (i.e. institutional quality, human capital, trade, domestic investment, foreign aid and GDP per capita) play an essential role in spurring FDI inflows.

Originality/value

The authors' study uniquely investigates both the pre- (2000–2012) and post- (2013–2019) BRI scenarios using the aggregate and disaggregate infrastructural components from the perspectives of full and clustered sample regions, such as Asia, Europe, Africa and the Middle East. The study provides several policy implications.

Keywords: Infrastructure; FDI; GMM; Belt and Road initiative countries

JEL Classification: C23; F12; F14; F36; O24; O47

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Journal Category: Social Sciences Citation Index (SSCI), Q2

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3. Financial infrastructure—total factor productivity (TFP) nexus within the purview of FDI outflow, trade openness, innovation, human capital and institutional quality: Evidence from BRICS economies

Faheem Ur Rehman¹, Md Monirul Islam²

Abstract: BRICS countries' contribution to the global economy has received wider attention. The critical factor behind their role is financial market reform that stimulates these economies' productivity growth. This research contributes to constructing a comprehensive index of financial infrastructure and measuring its relationship with BRICS economies' total factor productivity (TFP) within the purview of outward FDI, trade openness, human capital, innovation and institutional quality during 1990–2019 using the CS-ARDL technique. The findings divulge a significant and positive role of financial infrastructure in TFP both in the long and short runs, while outward FDI, trade openness, human capital, and innovation walk on the same footing in BRICS countries. Moreover, the CS-ARDL-based investigated findings remain the same across the two-way fixed effect with Driscoll and Kraay Standard Error technique. Therefore, BRICS countries' more promotion of financial dynamics and other ancillary economic, demographic, and technological factors is critical to stepping towards the spectacular growth trajectory.

Keywords: Financial infrastructure financial stability, Total factor productivity CS-ARDL, BRICS

JEL Classification: G3; G10; G15; G18; G24; C23

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Journal Category: Social Sciences Citation Index, Q2

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C. HUMAN CAPITAL

1. Exploring the linkage between human capital and economic growth: A look at 141 developing and developed countries

Tanzila Sultana¹, Sima Rani Dey², Mohammad Tareque³, PhD

Abstract: As a factor of production, human capital is defined both in its health and educational dimensions, incorporating qualitative and quantitative aspects. Using a panel of 141 countries (93 developing and 48 developed), we attempt to explore and compare the impact of human capital on economic growth at different development stages. For our estimation, we employ the System Generalized Methods of Moments (SGMM) for the period 1980–2008. Our findings reveal that all aspects of human capital positively influence growth in developing countries, especially life expectancy gain, which may be explained by the demographic transition these countries are going through. However, the scenario is different for developed countries, where increased life expectancy posits a drag on economic growth, probably because of the increasingly aging population and dependency ratio. Only when life expectancy is omitted does health expenditure, along with other educational measures of human capital, help sustain growth in developed countries.

Keywords: Human capital; Qualitative; Quantitative; Economic growth; Developing; Developed

JEL classification: C54; I15; I25; J24; O40; O57

Published in *Economic Systems* (Elsevier) (August 04, 2022)

Journal Category: Social Sciences Citation Index (SSCI), B, Q2

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D. ENERGY

1. Renewable and non-renewable energy consumption in Bangladesh: The relative influencing profiles of economic factors, urbanization, physical infrastructure and institutional quality

Md. Monirul Islam¹, Muhammad Irfan², Muhammad Shahbaz³, Xuan Vinh Vo⁴

Abstract: Many researchers investigate the socio-demographic and economic factors-induced energy consumption, particularly fossil fuel-based non-renewable energy consumption, but there exists a scarcity to study on the same factors-driven renewable energy consumption along with institutional quality factor. Given this, our research strives to analyse the relative influence of income growth, foreign direct investment, domestic investment, urbanization, physical infrastructure, and institutional quality on renewable and non-renewable energy consumption in Bangladesh for the period of 1990–2019 using the dynamic ARDL (DARDL) simulations method. The empirical findings divulge that income growth shows positive and negative effect on renewable and non-renewable energy consumption, respectively. Domestic investment has positive effect for renewable and non-renewable energy consumption. Foreign direct investment is found to have positive influencing factor for renewable energy consumption. Urbanization negatively impacts renewable energy consumption but urbanization affects non-renewable energy consumption positively. Physical infrastructure is a negative and positive determinant of renewable and non-renewable energy consumption, respectively. Institutional quality positively affects renewable energy consumption. The robustness of the results is comparatively exhibited using the DARDL simulations area plots where 20% positive and negative shocks to the predictors on the predicted variables are presented.

Keywords: Renewable and non-renewable energy consumption; Income; growth; FDI; Urbanization; Infrastructure; Institutional quality

JEL classification: Q2; Q3; Q4; C53

Published in *Renewable Energy* (Elsevier) (December 2021)

Journal Category: SCIE, Q1

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2. Electricity consumption and GDP nexus in Bangladesh: A time Series investigation

Sima Rani Dey¹, Mohammad Tareque², PhD

Abstract: The purpose of this paper is to assess the empirical cointegration, long-run and short-run dynamics as well as causal relationship between electricity consumption and real GDP in Bangladesh for the period of 1971–2014. Autoregressive Distributed lag (ARDL) “Bound Test” approach is employed for the investigation in this study. Both short-run and long-run coefficients are providing strong evidence of having positive significant association between electricity consumption and GDP. Our long-run results remain robust to different measurements and estimators as well. The study reveals the unidirectional causal flow running from per capita electricity consumption to per capita real GDP in the short run. The study result also yields strong evidence of bidirectional causal relationship between per capita electricity consumption and per capita real GDP in the long run with feedback. It is suggested that both electricity generation and conservation policy will be effective for Bangladesh economy. In prior studies, lack of causality between electricity consumption and GDP is due to the omitted variables. Combined effects of public spending and trade openness on GDP and electricity consumption are also considerable.

Keywords: Electricity consumption; GDP; ARDL bounds test; Causality test

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Journal Category: Emerging Sources Citation Index (ESCI)

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3. Electricity consumption and income nexus: Evidence from Bangladesh

Sima Rani Dey¹

Abstract: The purpose of this study is to examine the causal relationship between per capita electricity consumption (PCEC) and per capita gross national income (GNI) (PCGNI) in Bangladesh for the period of 1971-2014. By using Vector error correction modeling approach. The study reveals that positive short-run unidirectional causal flow running between PCEC to PCGNI without feedback which implies that an increase in electricity consumption promptly affects economic activity. The results of both long-run and joint causality yield strong evidence of bidirectional causal relationship between PCEC and per capita real GNI with feedback. Therefore, both electricity generation and conservation policy will be effective for Bangladesh economy. So, smooth supply of electricity is necessary to meet the growing electricity demand for consumption; consequently, it will lead to sustain of growth and take it even higher level.

Keywords: Cointegration; Energy sector; Error correction models, Electricity

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Journal Category: Emerging Sources Citation Index (ESCI), C, Q3

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4. Minerals import demands and clean energy transitions: A disaggregated analysis

Md. Monirul Islam¹, Kazi Sohag², Shawkat Hammoudeh³, Oleg Mariev⁴, Nahla Samargandi⁵

Abstract: Global energy transitions entangled with a paradigm shift from fossil fuel to renewable energy consumption elevates the demand for clean energy technologies, such as solar photovoltaics (PV), wind turbines, electric vehicles (EV) and power storage systems etc., which require significant volumes of minerals as raw materials. We measure the import-demand function of minerals by incorporating the role of renewable energy production capacity for selected OECD countries. We apply the cross-sectional autoregressive distributed lag (CS-ARDL) approach to analyse the panel time-series data due to common correlation, country heterogeneity, non-stationarity and potential endogeneity over the period 1990–2020. Our findings confirm that the overall renewable energy production, including installed solar and wind capacities, fosters the import demands for both the aggregate and disaggregate minerals (copper and nickel) in the long run. We also observe that the copper price elasticity of demand holds the Marshallian demand hypothesis, while the nickel price violates it in the long run. Besides, we find a heterogeneous effect of the income factor on the mineral import demand. Therefore, our findings recommend optimizing mineral resources to reinforce the global agenda of energy transitions toward a decarbonized or a net-zero emissions trajectory by the 21st century.

Keywords: Mineral imports; Clean energy transitions; Wind and solar capacities; Renewable electricity; CS-ARDL approach; OECD countries

JEL classifications: B27; C23; L61; P18; P28; Q2

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Journal Category: Social Sciences Citation Index, Q1

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5. Mineral import demand and clean energy transitions in the top mineral-importing countries

Md. Monirul Islam¹, Kazi Sohag², Md. Mahmudul Alam³

Abstract: The clean energy transitions require a large volume of minerals to handle its diverse technologies, such as solar photovoltaics (PV), wind turbines etc. Therefore, mineral importing countries concentrated on cleaner energy production confront an uprising trend in critical mineral prices due to thriving demands. We quest for the response of the top mineral importing countries' import demand for minerals to the clean energy transitions from 1996 to 2019 within the import-demand function analysis. Using the cross-sectional autoregressive distributed lag (CS-ARDL) method, our findings divulge a significantly positive response of mineral import demand to solar and wind energy productions in the long run. We also find that mineral price elasticity holds the Marshallian demand hypothesis in the mineral-laden solar energy generation while contradicting it in wind energy production. In addition, the oil price substitution effect does not sustain, whereas exchange rate depreciates mineral import demands in the long run. Therefore, our policy implications encompass optimizing the mineral resources for clean energy transitions to materialize the 21st century's global agenda of a decarbonized or net-zero emissions trajectory.

Keywords: Minerals import, Clean energy transitions, Installed solar capacity, Installed wind capacity, CS-ARDL approach, Mineral-importing countries

JEL classification: B27; C23; L61; P18; P28; Q2

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Journal Category: Social Sciences Citation Index, Q1

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6. Energy consumption–economic growth nexus within the purview of exogenous and endogenous dynamics: evidence from Bangladesh

Md. Monirul Islam¹, Md. Saiful Islam²

Abstract: This paper investigates the nexus between energy consumption and economic growth in Bangladesh over the period 1971–2018 using the autoregressive distributed lag (ARDL) approach to cointegration. The main contribution of this study is the inclusion of exogenous dynamic (globalisation) and endogenous factor (political risk indicator measured by political terror scale (PTS)) to the energy consumption–economic growth nexus. The study explores an energy consumption–economic growth nexus where globalisation and PTS have both positive and negative influences on this relationship in the short run and long run. The Toda–Yamamoto Granger causality test confirms the feedback hypothesis, that is bidirectional causal relationship between energy consumption and economic growth, and the result is further verified by the impulse response function. Therefore, policymakers should enhance the availability of energy for people and industries to continue the existing momentum of economic growth. Besides, the government should cautiously deal with both the globalisation and political risk issues about energy consumption–economic growth nexus in Bangladesh.

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Journal Category: ESCI, Q4

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E. ENVIRONMENT

1. Assessment of nexus between energy consumption and sustainable development in Russian Federation: A disaggregate analysis

Md. Monirul Islam¹, Kazi Sohag², Muhammad Shahbaz³

Abstract: Russia's competitiveness and productivity encounter the intense environmental challenges due to the reckless fossil fuel consumption, putting this country's long-run sustainability at risk. Despite this, this country intends to achieve the sustainable development goal by cutting greenhouse gas (GHG) emissions to 70% of its 1990 level as pledged in the Paris Agreement in 2016. This research assesses the relationship between disaggregate (renewable and non-renewable) energy consumption and sustainable development within the purview of financial, demographic and country risk indicators using annual time-series data from 1990 to 2020. This paper utilizes an augmented ARDL approach to co-integration and a dynamic ARDL simulation model to detect counterfactual forecasting shocks to the predictor variables and their effects on the predicted indicator. The study's findings divulge that renewable energy consumption escalates the sustainable development in the long run, whereas non-renewable energy consumption declines. Then again, urbanization and political terror scale (PTS) have a long-term adverse effect on sustainable development. On the other hand, financial openness substantially exerts a favorable long-term influence on sustainable development. Therefore, this study suggests shifting to generous renewable energy usage to ease the adverse effect of non-renewable energy consumption on the sustainable development in Russia.

Keywords: Energy consumption, Renewable energy, Non-renewable energy, Sustainable development, Augmented ARDL model, Dynamic ARDL simulations, Russia

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2. Economic growth and environmental pollution nexus in Bangladesh: revisiting the environmental Kuznets curve hypothesis

Md. Monirul Islam¹, Md. Mahmudul Alam², Faroque Ahmed³, Abul Quasem Al-Amin⁴

Abstract: The paper reports a re-examination of the environmental Kuznets curve (EKC) hypothesis for Bangladesh; considering economic growth and greenhouse gas (GHG) emissions (such as CO₂, CH₄, and N₂O). The autoregressive distributive lag (ARDL) model and VAR-based innovative accounting approach (IAA) with the combination of Variance Decomposition and Impulse Response Function are used to check cointegration among the variables using data from 1976 to 2014. This approach is specifically employed for variance analysis in order to measure causal association and regressors' shock to dependent variables. The EKC hypothesis is not supported because there is a positive association between economic growth and pollutants (CO₂ and CH₄ emissions) over time. However, the EKC is valid for N₂O emissions. IAA causal analysis reveals a bilateral causative relationship between GDP and CO₂ emissions, as well as a unilateral causal relationship between CH₄ emissions and GDP. Trade liberalisation, urbanisation, and financial liberalisation do not necessarily improve or save the natural environment. Bangladesh needs to use renewable energies and cut GHG emissions by abandoning fossil fuels.

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Journal Category: (Wos) Biological Abstracts, Q3

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3. Econometric analysis of the effect of economic globalization, energy intensity, urbanization, industrialization and growth on CO₂ emissions of Bangladesh

Mowshumi Sharmin¹, Mohammad Tareque², PhD

Abstract: This paper examines the effect of economic globalization, energy intensity, urbanization, industrialization and growth on per capita CO₂ emissions of Bangladesh employing techniques of Johansen co-integration, Vector Error-Correction Models (VECM) and Vec Granger Causality Tests. To analyse the impacts of innovations in all variables on CO₂ emissions, this study additionally employs variance decomposition (VDC) for robust findings. The result of long run and causality test postulates that growth stimulates energy consumption and consequently causes CO₂ emissions. VDC result posits that in the long run, energy intensity, urbanization, industrialization and growth contribute more than 60% of the CO₂ emission in Bangladesh. On the other hand, effect of economic globalization becomes stronger in the long run but in explaining fluctuations in CO₂ emissions it contributes only 9%. To avoid adverse effect of growth implementations of energy conservation policies are needed.

Keywords: Johansen co-integration; globalization; CO₂ emissions; urbanization; industrialization

JEL Classification: O44; Q20; Q43

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4. Sustainable Growth-Environment Nexus in the Context of Four Developing Asian Economies: A Panel Analysis

Mowshumi Sharmin¹, Mohammad Tareque²

Abstract: This paper has used a stirpat model to investigate the synergistic effect of CO₂ emission, energy consumption, energy intensity, economic growth, population, urbanization and trade openness to demonstrate growth environment nexus in four selected developing Asian economies. Taking a panel data set from Bangladesh, China, India and Indonesia this study applies Autoregressive Distributed Lag (ardl) model and vec Granger Causality/Block Exogeneity Wald Tests. The empirical results show that energy intensity, urbanization, population, and per capita gdp growth are the *raison d'être* of CO₂ emissions whereas trade openness is found to be negatively related to CO₂ emissions. Conversely, energy consumption, urbanization, population and trade openness are positively related to per capita gdp. In addition, it also investigates the Environmental Kuznets Curve (ekc) hypothesis and the findings substantiate an inverted Ushaped relationship. Cross-section short-run coefficients of country-level data are inquired into to check the robustness of the panel outcomes.

Key Words: EKC hypothesis, STIRPAT model, CO₂ emission, urbanization, energy consumption

JEL Classification: c33, o44, q43

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5. An analysis of energy, environment and economic growth (EEE) nexus: a 2SLS approach

Mowshumi Sharmin¹, Sima Rani Dey², Faroque Ahmed³, Mohammad Tareque⁴, PhD

Abstract: The growing apprehension of global warming, greenhouse gas emissions and increasing use of fossil fuel due to emergent economic activity signifies that for the sustainability of the environment cleaner energy use is important. In the same pursuit, this study aims to examine the energy, environment and economic growth nexus of Bangladesh, incorporating both renewable and non-renewable energy consumption with forest depletion. We have employed the Two-Stage Least Square approach to avoid likely simultaneity bias and possible endogeneity of the variables arising from the ordinary least squares. Result postulates non-renewable energy consumption and forest depletion have a significant impact on CO₂ emission, whereas renewable energy shows no significant consequence. The issue which arises in this regard is that renewable energy consumption has not yet reached a stage from where it could play a substantial role in emission reduction of the country. Therefore, countries should adopt policies that would provide a conducive environment for affordable energy use.

Keywords: 2SLS; Renewable Energy; Non-renewable Energy, Forest Depletion; CO₂ emission

JEL classification: C2; C52, Q4; Q5; Q43

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6. Predicting Air Quality of Dhaka and Sylhet Divisions in Bangladesh: A Time Series Modeling Approach

Md. Mazharul Islam¹, Mowshumi Sharmin², Faroque Ahmed³

Abstract: Air pollution has emerged as one of the major public health threats. In recent years, Bangladesh has ranked among top air polluted countries around the globe. Air quality in Bangladesh is measured on daily basis using national standards of five pollutants – NO₂, CO, Ozone (O₃), SO₂ and particulate matter (PM_{2.5} and PM₁₀) and presented as indexed value ranged from 0 to 500 which is further classified from good to extremely unhealthy. In this study we have applied Seasonal Autoregressive Integrated Moving Average (SARIMA) model to forecast weekly air quality of Dhaka and Sylhet divisions in Bangladesh. Our study reveals the existence of seasonal pattern of the air quality and suggests extremely unhealthy and very unhealthy air in January-March 2020. Therefore, policymaker should address this period as the air quality directly influences public health.

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Journal Category: ESCI, Q1

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7. Synergy between sectoral output, energy and CO₂ emission: a panel cointegration analysis of South Asia

Mowshumi Sharmin¹

Abstract:

Purpose

The purpose of this study is to investigate the synergy between sectoral output, energy use and CO₂ emission with other factors for a panel of South Asian economies including Afghanistan, Bangladesh, Bhutan, India, Pakistan, Maldives, Nepal and Sri Lanka.

Design/methodology/approach

The analysis is done using annual panel data from 1980–2019 using dynamic ordinary least squares (DOLS), fully modified OLS (FMOLS) and Toda-Yamamoto techniques.

Findings

Empirical findings reveal the existence of a statistically significant long-run cointegrating relationship between energy use, sectoral output such as agricultural, industry and service gross domestic product (GDP), globalization, urbanization and CO₂ emission. DOLS and FMOLS result posits that in the case of the South Asian region agriculture GDP does not contribute to increasing CO₂ emission while service and industrial GDP is responsible for increasing CO₂ emission along with urban population, energy use and to some extent globalization. More remarkably, the contribution of the service GDP is greater than the other two sectoral outputs in increasing CO₂ emission with a feedback hypothesis.

Practical implications

As CO₂ emission is a global phenomenon with a cross-boundary effect, these empirical findings might contribute to formulating implementable energy and environmental policies to sustain growth, as well as to protect the environment in the regional context.

Originality/value

The study contributes to the literature by providing an empirical investigation of South Asia incorporating the contribution of sectoral output to understand the potential contribution of each sector on energy and emission. This is the first study on the South Asian context from the perspective of sectoral output, energy and emission.

Keywords: Energy Use; Sectoral Output; CO₂ emission; Urbanization; FMOLS; DOLS; Co-integration; Dynamic regression

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Journal Category: SSCI, C, Q3

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8. Relationship of Renewable and Non-Renewable Energy Utilization with CO₂ Emission of Bangladesh

Mowshumi Sharmin¹

Abstract: This paper attempts to find out the relationship of renewable and non-renewable energy utilization with CO₂ emission in Bangladesh. The analysis is done using the Autoregressive Distributed Lag (ARDL), Dynamic Ordinary Least Squares (DOLS), Fully Modified OLS (FMOLS) and Canonical Cointegrating Regression (CCR) techniques to observe the robustness of the findings. Results postulate that non-renewable energy and GDP has statistically significant positive association with CO₂ emission whereas, renewable energy is negatively associated. From all estimation techniques, it is found that 1% augment in non-renewable energy utilization will boost CO₂ emission by on an average more than 0.75%. Moreover, Toda -Yamamoto (TY) and vector autoregression impulse response procedure have been employed and the findings confirm that non-renewable energy is causing CO₂ emission but renewable energy is not causing CO₂ emission. The paper adds value to the present energy-emission study in a way that in Bangladesh context there are paucity of studies that concentrate on the effect of both renewable and non-renewable energy utilization on CO₂ emission and there exists no study with multiple estimation techniques with a view to get robust findings. Another contribution is the dynamic effects of impulse response function also complement the ARDL, DOLS, FMOLS and CCR findings. As findings are responsive to the methodology used, therefore, for robust results, multiple techniques are employed. This study recommends increasing the share of renewable energy will play a critical role to reduce CO₂ emission consequently global warming.

Keywords: Economic growth; CO₂emission; Bangladesh; Renewable energy utilization; Non-renewable energy utilization; Panel Cointegration.

JEL Classification: C2; C5; Q4; Q5; Q43

Published in *Energy Economics Letters*, Asian Economic and Social Society, Asian Economic and Social Society-(AESS) vol. 8(1) (February 04, 2021)

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9. Impact of globalization, foreign direct investment, and energy consumption on CO₂ emissions in Bangladesh: Does institutional quality matter?

Md. Monirul Islam¹, Muhammad Kamran Khan², Mohammad Tareque³, PhD, Noor Jehan⁴, Vishal Dagar⁵

Abstract: Bangladesh's recent doorway to the spectacular growth trajectory is largely associated with the shared contributions of globalization, FDI, trade, economic growth, urbanization, energy consumption, innovation, and institutional quality that affect its natural environment. Earlier studies hardly incorporated these dynamics together especially innovation and institutional quality to examine their impacts on environmental degradation in Bangladesh. This study attempts to scrutinize the effect of globalization, foreign direct investment, economic growth, trade, innovation, urbanization, and energy consumption on CO₂ emissions in the presence of institutional quality in Bangladesh over the period 1972–2016 by utilizing dynamic ARDL simulations' model by Jordan and Philips (2018). The investigated results depict that globalization; foreign direct investment, and innovation have a negative effect on CO₂ emissions in improving environmental quality while economic growth, trade, energy consumption, and urbanization positively impact CO₂ emissions and hence stimulate environmental degradation both in the long and short run. Besides, institutional quality measured by the political terror scale (PTS) affects CO₂ emissions positively and thereby degrades the quality of the environment in both the long and short run. Therefore, policy implication should go toward encouraging globalization, foreign direct investment and innovation; and the sensible utilization of income growth, trade potentials, energy consumption, urbanization and institution is required for the sake of environmental quality in Bangladesh.

Keywords: Globalization; Economic factors; CO₂ emissions; Environmental degradation; Dynamic ARDL simulations model; Bangladesh

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Journal Category: ESCI, ESI, Q1

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10. Globalization and Politico-administrative factor-driven energy-growth nexus: A Case of South Asian Economies

Md. Monirul Islam¹, Dr. Md. Saiful Islam²

Abstract: In modern days, economic growth is energy-dependent and vice versa. Earlier studies concentrated a bit to analyze the influence of globalization and politico-administrative factors on the energy consumption-economic growth nexus in developing economies. The motivation for the current research is to scrutinize the energy consumption-economic growth nexus while accounting for the influence of globalization and country risk indicators—the politico-administrative factors in a panel of 4 South Asian countries (Bangladesh, India, Pakistan, and Sri Lanka) during 1980–2018. To check the issues of heterogeneity and cross-sectional independence, the study employs the pooled mean group estimation method. The investigated results provide a nexus between energy consumption and economic growth where globalization - a long-run force positively affects this nexus in the long run and negatively in the short run. Besides, the politico-administrative factors have an adverse impact in the long run and an insignificant effect on this nexus in the short run. The Dumitrescu–Hurlin non-causality test establishes the feedback hypothesis concerning energy consumption-economic growth nexus in South Asian economies. The study results remain robust across the dynamic ordinary least square estimator. Therefore, this study suggests sustaining the energy-growth nexus to properly handle globalization and politico-administrative and the Covid-19 pandemic issues through institutional quality. Moreover, the objective-oriented policies are critical to strengthening the energy-growth nexus without decaying environmental quality in South Asian countries.

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11. Measuring Economic, Social and Environmental Wellbeing of Asian Economies

Mowshumi Sharmin¹, Sima Rani Dey², Md Tariqul Islam³

Abstract: This study aims to address the economic, social, and environmental wellbeing issues simultaneously by measuring the carbon intensity of wellbeing (CIWB) of Asian economies employing Prais-Winsten and pooled OLS estimator. The measure of CIWB is made taking into account a ratio of the two indicators—CO₂ emissions per capita and life expectancy at birth. There is a paucity of studies that concentrate on human and social wellbeing indicators (i.e., water, sanitation, life expectancy) together applying the Environmental Kuznets Curve (EKC) hypothesis. Therefore, we have also investigated the EKC hypothesis as this theory hypothesizes the link involving human and environmental wellbeing and development. The findings utilizing the two econometric techniques indicate that in both the estimation models urban population access to an improved water source and total population access to improved water source has consistently negative and significant effects on CIWB. The fertility rate and prevalence of HIV pose no threat to CIWB. These findings demonstrate that social and human wellbeing indicators of the Asian economies are sustainable to this moment as they are lowering CIWB which is desirable. Contrary, GDP per capita, exports as a percent of GDP, and urban population have a significant and positive impact on CIWB which poses a challenge for the sustainability issue. We also have found the existence of the EKC hypothesis indicating environmental quality will increase past a turning point. The findings of the paper are well matched with the view of the “Economic and ecological modernization” theory and “human ecology” theory.

Keywords: CO₂ emission; Urbanization; Environmental wellbeing; Life expectancy; EKC hypothesis

JEL classification: Q54; Q56; R11

Published in *Environmental Science and Pollution Research* (Springer Nature), October 25, 2021

Journal Category: ESCI, ESI, Q1

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12. Renewable and non-renewable energy consumption driven sustainable development in ASEAN countries: do financial development and institutional quality matter?

Md. Monirul Islam¹, Md. Idris Ali², Brian Ceh³, Sanjeet Singh⁴, Muhammad Kamran Khan⁵, Vishal Dagar⁶

Abstract: Energy consumption for sustainable development has become a crucial issue in recent years. The anthropogenic effects of traditional energy sources (non-renewables) underscore the need for renewable energy and efforts to promote its adoption have comprised policy makers' strategies to achieve sustainable development. At the same time, institutional stability is a necessary element needed to meet the goal of sustainable development via improved management of resources and technology diffusion. The literature shows some contradictory findings on this matter and this study aims to clarify. Thus, this research scrutinizes the contribution of renewable and non-renewable energies in sustainable development while also taking into account financial development and institutional quality in ASEAN countries from 1980 to 2018. To assess for co-integration, a pooled mean group (PMG) regression technique is employed and the findings from this technique are verified by using fully modified ordinary least square (FMOLS), dynamic ordinary least square (DOLS), and canonical cointegration regression (CCR) techniques in conjunction with other panel-based econometric procedures to evaluate the robustness of the model. The findings reveal a significantly positive influence for renewable energy and a significantly adverse impact for non-renewable energy with respect to sustainable development in ASEAN countries. In addition, the results indicate that institutional quality and financial development have adverse effects on sustainable development. Therefore, this research recommends sustainable management of non-renewables and greater promotion of renewables by strengthening institutional quality in ASEAN countries.

Keywords: Sustainable development; Energy consumption; Institutional quality; Renewable energy; Non-renewable energy; Financial development

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F. HEALTH & GOVERNANCE

1. Bangladesh National Adolescent Health Strategy, a Step to Achieve Sustainable Development Goals by 2030: A Policy Analysis and Legal Basis

Tahmina Sultana¹, Mohammad Tareque², PhD

Abstract: This paper aims to critically assess the adolescent focused policies and plans of Bangladesh of the last two decades. Another aim of this article is to check how the latest National Adolescent Health Strategy (NAHS) is compatible with the global strategy and to suggest some ways to achieve Sustainable Development Goals by 2030 using policy analysis triangle framework. Authors reviewed all relevant policy documents introduced by the Government of Bangladesh during 1998-2017. This framework allows the analysis of the contextual factors that influenced the policy, the process and the entities involved in the decision making. Findings suggest Bangladesh strategy is comprehensive and aligned with global strategies but only regarding the key strategies. Thus identifying key activities including implementation and monitoring plan with a specific timeline is the urgently required. A tentative Plan of Action has been proposed and it is expected that the policy community will be benefitted to take their future actions to implement the strategy successfully.

Keywords: Adolescent health; health policy; mental health; policy triangle framework; policy analysis; sustainable development goals

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2. An Assessment of Anemia Status of Child-Mother Pairs in Bangladesh

Jahidur Rahman Khan¹, Md. Mazharul Islam², Raaj Kishore Biswas³, Amena Sultana⁴

Abstract: Anemia (e.g. iron deficiency anemia) is a serious public health concern that often coexists within the same household, particularly threatening child-mother pairs. Despite the high prevalence, there is a paucity of research to understand the anemia status of child-mother pairs in Bangladesh. This study aimed to explore the anemia status of child-mother pairs and associated factors using data from the 2011 Bangladesh Demographic and Health Survey (BDHS). Multinomial logistic regression was used to estimate the association between factors and different pairs. Among the child-mother pairs, about 26% was both anemic, followed by child anemic-mother nonanemic (25%) and child nonanemic-mother anemic (17%). Several factors were significantly associated with anemia status of child-mother pairs. Current breastfeeding status was associated with greater odds of different anemia status pairs. Mothers' undernutrition was related to greater odds of child-mother anemic pairs (adjusted odds ratio [AOR] 1.775, 95% confidence interval [CI] 1.216–2.593, $p = 0.0030$). Living in wealthier households was associated with lower odds of child-mother anemic pairs (AOR 0.519, 95% CI 0.320–0.842, $p = 0.0080$). Overall, the findings from this study show the importance of simultaneous consideration of children and mothers for anemia-related health programs as well as cohort-specific tailored interventions to reduce anemia burden.

Keywords: Children and mother; Anemia; Co-occurrence; Factors; Bangladesh

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Journal Category: SSCI, Q1

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3. Healthcare capacity, health expenditure and civil society as predictors of COVID-19 case fatalities: a global analysis

Jahidur Rahman Khan¹, Nabil Awan², Md. Mazharul Islam³, Olav Muurlink⁴

Abstract:

Background: The rapid growth in cases of COVID-19 has challenged national healthcare capacity, testing systems at an advanced ICU, and public health infrastructure level. This global study evaluates the association between multi-factorial healthcare capacity and case fatality of COVID-19 patients by adjusting for demographic, health expenditure, population density, and prior burden of non-communicable disease. It also explores the impact of government relationships with civil society as a predictor of infection and mortality rates.

Methods: Data were extracted from the Johns Hopkins University database, World Bank records and the National Civic Space Ratings 2020 database. This study used data from 86 countries which had at least 1,000 confirmed cases on 30th April 2020. Negative binomial regression model was used to assess the association between case fatality (a ratio of total number of confirmed deaths to total number of confirmed cases) and healthcare capacity index adjusting for other covariates.

Findings: Regression analysis shows that greater healthcare capacity was related to lesser case-fatality [incidence rate ratio (IRR) 0.5811; 95% confidence interval (CI) 0.4727–0.7184; $p < 0.001$] with every additional unit increase in the healthcare capacity index associated with a 42% decrease in the case fatality. Health expenditure and civil society variables did not reach statistical significance but were positively associated with case fatalities.

Interpretation: Based on preliminary data, this research suggests that building effective multidimensional healthcare capacity is the most promising means to mitigate future case fatalities. The data also suggests that government's ability to implement public health measures to a degree determines mortality outcomes.

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Journal Category: Science Citation Index Expanded, Social Sciences Citation Index, Q2

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4. Associations of Socio-Demographic and Environmental Factors with the Early Development of Young Children in Bangladesh

Md. Mazharul Islam¹, Jahidur Rahman Khan², Antara Kabir³, Muhammad Zillur Rahman Khan⁴, Md. Monirul Islam⁵

Abstract: This study analyzed data on the early developmental status of 7352 children, aged from 36 to 59 months, using the Early Childhood Developmental Index (ECDI) to assess literacy-numeracy, physical, social-emotional, and learning domains. The study explored correlates of developmental status with a range of socio-demographic and environmental factors that may impact children's development. The analyses use data from the Bangladesh Multiple Indicator Cluster Survey, 2012—2013. Overall, about 65% of children had potential for healthy development, with highest rate of being on track being in the physical domain (~94%) and the lowest rate in the literacy domain (~23%). Older children, who had been breastfed, whose mothers had higher education, and who lived in urban areas were more likely to be developmentally on track. Children, whose family members engaged with them in four or more stimulating activities and read books, were more likely to be on a consistent and positive developmental trajectory. Children who were male, malnourished and experienced physical punishment were less likely to be on a positive developmental track. Policymakers need to invest in early childhood development including the funding of interventions so that children in Bangladesh can achieve their developmental potential.

Keywords: Bangladesh; Early childhood; Developmental risk; Socio-demographic factors; Family environment

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Journal Category: ESCI, Q2

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5. An inquiry into the achievements in health outcomes of Bangladesh: role of health expenditure, income, governance and female education

Tahmina Sultana¹, Faroque Ahmed², Mohammad Tareque³, PhD

Abstract:

Purpose

Bangladesh is applauded for its achievement in various health and social outcomes though criticized for its failure in properly dealing with governance issues. The purpose of this paper is intends to see how the health outcomes (in case of life expectancy, under-five mortality and adolescent fertility) are impacted by health expenditure (both public and private), per capita income in presence of overall governance and female education. This paper assumes that rapid progress in female education reflects the Bangladeshis' social responsiveness to change.

Design/methodology/approach

This paper uses autoregressive distributed lag technique to estimate the models with data ranges from 1990 to 2016 under two different scenarios.

Findings

This study has found that all the explanatory variables exert significant impact on health outcomes. Furthermore, public health expenditure is augmented with a composite governance issue, and this enhances robustness as well as statistical significance of the models. These suggest that the governance issues play a very crucial role to achieve the expected health outcomes. Female secondary enrolment ratio appears with improved coefficients in terms of sign and magnitude for all the health indicators.

Originality/value

This paper contributes to the existing literature showing econometric evidence that highlights the importance of governance and female education in improving health outcomes of Bangladesh apart from health expenditure and per capita gross domestic product.

Keywords: Public health expenditure; health outcome; Composite governance; Female education; ARDL, Social care; Gender

Published in *International Journal of Human Rights in Health Care* (Emerald) (July 26, 2021)

Journal Category: Emerging Sources Citation Index (ESCI), Q2

JEL Classification: I10; H51; O40; C3

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6. Policy Options for Increasing Utilization of Community Clinic services: A Study in Rural Bangladesh

Tahmina Sultana¹

Abstract: This paper aims to identify the problems of Community Clinic (CC) services in rural Bangladesh and to provide some policy options to increase the utilization. Here qualitative methods have been used, including document review, observation, fact check and key informant interviews with policyelites. Among those, the option relating to the absenteeism of health care providers at CC, scored the highest total value of 2.7 in multi criteria analysis as well as viable in PESTLE analysis. Therefore, the recommended option is introduction of biometric system at the CCs. This system is necessary in the CCs to ensure timely presence of the service providers to promote quality and safety in health care towards healthy communities. This system will also assist in implementing the plan of Digital Bangladesh by directly connecting the CCs with the main server of Management Information System of Directorate General of Health Services.

Keywords: e-monitoring, multi criteria analysis, health workers, biometric system

Published in *International Journal of New Economics and Social Sciences* (IJONESS) (June 30, 2021)

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7. A negative association between prevalence of diabetes and urban residential area greenness detected in nationwide assessment of urban Bangladesh

Jahidur Rahman Khan¹, Amena Sultana², Md. Mazharul Islam³, Raaj Kishore Biswas⁴

Abstract: Residential area greenness may influence diabetes, but limited studies have explored this relationship in developing countries. This study assessed the association between residential area greenness and diabetes among urban adults in Bangladesh. The mediation effect of the body mass index (BMI) was also assessed. A total of 2367 adults aged ≥ 35 years were extracted from a nationally representative survey. Diabetes was characterized as fasting plasma glucose level ≥ 7.0 mmol/L or taking prescribed medications to reduce blood sugar level. Residential area greenness was estimated by enhanced vegetation index. Binary logistic regression models were employed to estimate the association between residential area greenness and diabetes adjusting for sociodemographic factors. Mediation analysis was performed to assess whether BMI mediated the association between greenness and diabetes. Greater area greenness was associated with lower odds of diabetes (adjusted odds ratio 0.805, 95% confidence interval 0.693–0.935, $p = 0.0052$). BMI significantly mediated 36.4% of the estimated association between greenness and diabetes. Presence of areas of greenness adjacent to living area tends to be associated with lower diabetes prevalence. Findings emphasized the importance of preserving the local environment to tackle the growing diabetes prevalence in Bangladesh.

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Journal Category: Science Citation Index Expanded, Q1

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8. On Prevention of Diarrheal Disease: Assessing the Factors of Effective Handwashing Facilities in Bangladesh

Sorif Hossain¹, Md. Mazharul Islam², Md. Asraful Islam Khokon³, Md. Monirul Islam⁴

Abstract: People in Bangladesh usually do not utilize handwashing facilities properly, which makes it challenging to implement hygiene practices of handwashing to reduce diarrhea and other health risks. Against this backdrop, this research attempts to assess the factors associated with Effective Handwashing Facilities (EHFs) in Bangladesh utilizing the Multiple Indicator Cluster Survey 2019. This study utilizes descriptive statistics techniques and also bivariate and multivariable logistic regression methods by representing odd ratios to identify the relationship between associated factors and EHF in Bangladesh. The descriptive statistics show that about 74.22% of the households in Bangladesh have EHF. Gender, education, ethnicity, male-head households, household wealth status, source of water, sanitation status, sharing toilet facility are identified as the potential determinants of EHF. As a result, we recommend that all levels of society in Bangladesh have continuous access to handwashing equipment and facilities to reduce hygiene-related illnesses especially diarrheal disease.

Keywords: Bangladesh; diarrheal diseases; effective handwashing facility (EHF); handwashing

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Journal Category: Q3

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9. Relationship between blood pressure and BMI in young adult population: a national-level assessment in Bangladesh

Jahidur Rahman Khan¹, Raaj Kishore Biswas², Md. Mazharul Islam³

Abstract: Young adulthood is a crucial period for major physiological transitions. Environmental changes associated with these transitions can influence health behaviour and health (e.g. poor diet, high body weight and elevated blood pressure (EBP)). Excess body weight can lead to EBP; however, little is known about this relationship among young adults in developing countries. Focusing on Bangladesh, this study assessed the association between BMI and blood pressure (BP) metrics (systolic BP (SBP), diastolic BP (DBP) and BP class (optimal, normal/high normal and elevated)). Sex-specific analyses of these relationships were performed to assess any difference across sexes. Furthermore, associations of overweight/obesity with BP metrics were investigated. Young adults aged 18–24 years (n 2181) were included from nationally representative cross-sectional Bangladesh Demographic and Health Survey 2017–2018. Multivariable linear and multinomial logistic regression models examined the relationships between BMI, overweight/obesity and BP metrics. Findings reveal that higher BMI was associated with higher SBP (0.83; 95 % CI 0.67, 0.99), DBP (0.66; 95 % CI 0.54, 0.74) and higher odds of having EBP (adjusted OR 1.24; 95 % CI 1.17, 1.31). These relationships were stronger among males than females. Moreover, overweight/obese individuals had higher SBP, DBP and higher odds of having EBP than individuals with normal BMI. Strategies to reduce body weight and to improve healthy lifestyle, and awareness and monitoring of BP may help to address these serious health problems, particularly at an early age.

Keywords: Elevated blood pressure; Overweight and obesity; Young people; Association

Published in *the British journal of nutrition* (Cambridge university press) (December 29, 2021)

Journal Category: Q1

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10. Do the issues of religious minority and coastal climate crisis increase the burden of chronic illness in Bangladesh?

Altaf Hossain¹, Md. Jahangir Alam², Janardhan Mydam³, Mohammad Tareque⁴

Abstract

Background

Chronic illness with disability and its out-of-pocket expenditure (OOPE) remains a big financial challenge in Bangladesh. The purpose of this study was to explore how religious minority problem and coastal climate crisis with other common risk factors determined chronic illness with a disability and its financial burden in Bangladesh. Existing policy responses, especially, social safety net programs and their governance were analyzed for suggesting better policy options that avoid distress financing.

Methods

Binary logistic and multiple linear regression models were respectively used to identify the factors of disability, and high OOPE based on Bangladesh Household Income and Expenditure Survey 2016 data.

Results

We found that disable people had relatively higher OOPE than their non-disabled counterparts and this OOPE further surges when the number of disabilities increases. In addition to the common factors, the novelty of our findings indicated that the religious minority problem as well as the coastal climate crisis have bearing on the disability burden in Bangladesh. The likelihood of having a chronic illness with a disability was 13.2% higher for the religious minorities compared to the majorities (Odds ratio (OR): 1.132, 95% confidence interval (CI): 1.033–1.241) and it was 21.6% higher for the people who lived in the exposed coast than those who lived in the non-exposed area (OR: 1.216, 95% CI: 1.107–1.335). With disabilities, people from the exposed coast incurred higher OOPE than those from the non-exposed areas. Although receiving assistance from social safety net programs (SSNPs) seemed to reduce their high OOPE and financial distress such as selling assets and being indebted, the distribution was not equitably and efficiently managed to confirm the process of inclusion leakage-free. On average, those who enrolled from the minority group and the exposed coast paid the relatively higher bribes.

Conclusions

To reduce burden, the government should strengthen and specify the existing SSNPs more for disable people, especially from the minority group and the exposed coast, and ensure the selection process more inclusive and leakage-free.

Keywords: Religious minority problem; Coastal climate crisis; Chronic illness; Disability; Distress financing; Social safety net; Bangladesh

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Journal Category: Q1

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11. Impacts of COVID-19 pandemic on national security issues: Indonesia as a case study

Md. Mahmudul Alam¹, Agung Masyad Fawzi², Md. Monirul Islam³, Jamaliah Said⁴

Abstract: The national security issues in particular non-traditional security issues such as law enforcement, health, food, supply chain management, industry etc. are severely impacted by the COVID-19 outbreak in all countries of the world. As such, the developing country like Indonesia has largely been suffering from this epidemic. In this context, this paper attempts to analyse some national security issues that are affecting Indonesia, which is currently struggling with the COVID-19 pandemic. Proposed here are policy measures to combat both present and future challenges. The study uses secondary data collected from different sources concerning COVID-19 pandemic and security issues of Indonesia. The study analyses the data based on descriptive statistics, highlighting the impact of the COVID-19 pandemic on Indonesian law enforcement issues, and security of health, food, supply chain management, industrial and other economic sectors. The study argues that if the vulnerability continues in these security-related issues due to pandemic, the country will face a harsh reality to manage the state-affairs. Therefore, the policy options are mainly concerned with the COVID-19 issue. Indonesia's government should identify what measures to take by conducting rapid diagnostics and polymerase chain reaction tests in the laboratory, respectively. Moreover, the government and relevant stakeholders need to develop strategies that break the stranglehold of COVID-19 transmission in order to resolve Indonesian national security concern.

Keywords: COVID-19; Law enforcement; Health security; Economic security; Social security; Food security; Supply chain management

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Journal Category: SCIE, ESI, Q1

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12. How the COVID-19 lockdown affects social relationships in Bangladesh: A social media-based cross-sectional study

Sima Rani Dey¹

Abstract: For controlling the rapid spread of COVID-19 infections, the Bangladesh Government imposed lockdown to ensure social distancing among the mass. The study aimed to investigate the effect of COVID-19 lockdown on social relationships among Bangladeshi nationals. A social media-based cross-sectional study was conducted from May 15 through June 7, 2020. The study used a survey questionnaire to ascertain the people's perception on COVID-19 pandemic and its associated lockdown, and on how the lockdown affected their social relationships. In this study, social relationships referred to the connections between family members, friends, and relatives. Linear regression was employed to determine the predictors of social relationships. A total of 352 survey responses were collected, out of which 64.2 per cent reported that their social relationships became stronger during lockdown. Age, marital status, occupation, and financial condition exhibited significant associations with social relationships. More specifically, young through middle-aged, married, housewives, and financially solvent people had a significant association with having strong social relationships. This study found that the COVID-19 lockdown revealed a positive impact on the social relationships of Bangladeshis. Healthy bonding and cordial support of family and friends are understood to have helped them to mitigate their mental stress, leading to positive health implications.

Published in *International Social Science Journal* (Willey) (May 04, 2022)

Journal Category: Q3

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13. Partnerships in the introduction of new routine vaccines in Bangladesh: evidence from a prospective process evaluation

Sharmin Khan Luies¹, Tahmina Sultana², Ashwin Budden³, Mohammad Asaduzzaman⁴, Md. Billal Hossain⁵, Matthew Kelly⁶, Darren Gray⁷, Md. Jasim Uddin⁸, Haribondhu Sarma⁹

Abstract:

Objective To assess the contribution of partners in the introduction of two new vaccines concurrently: pneumococcal 10-valent conjugate vaccine (PCV-10) and inactivated polio vaccine (IPV) into the routine Expanded Programme on Immunization (EPI) in Bangladesh.

Design We conducted a prospective process evaluation that included the theory of change development, root cause analysis and in-depth investigation. As part of process tracking, we reviewed relevant documents, observed trainers' and vaccinators' training and key stakeholder meetings. We analysed the data thematically.

Setting We purposively selected eight *Upazila* (subdistrict) and one city corporation covering nine districts and seven administrative divisions of Bangladesh.

Participants Nineteen national key informants were interviewed and 16 frontline health workers were invited to the group discussions considering their involvement in the vaccine introduction process.

Results The EPI experienced several challenges during the joint introduction of PCV-10 and IPV, such as frequent changes in the vaccine introduction schedule, delays in budget allocation, vaccine supply shortage and higher wastage rates of IPV. EPI addressed these challenges in collaboration with its partners, that is, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF), who provided technical assistance to develop a training curriculum and communication materials and enhanced demand generation at the community level. In addition, the WHO conducted a country readiness assessment for PCV-10, and UNICEF supported vaccine shipment. Other government ministries, City Corporations and municipalities also supported the EPI.

Conclusions The partnership among the EPI stakeholders effectively addressed various operational challenges during the joint introduction of PCV-10 and IPV helped strengthen Bangladesh's immunisation systems. These accomplishments are attributed to several factors

that should be supported and strengthened for future vaccine introductions in Bangladesh and other low and-middle countries.

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Journal Category: SCIE, ESI, Q1

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**G. HUMAN RESOURCE AND ORGANIZATIONAL
DEVELOPMENT**

1. Linking transformational leadership with employees' engagement in the creative process

Mohammad Tahlil Azim¹, Luo Fan², Md. Aftab Uddin³, Munshi Muhammad Abdul Kader Jilani⁴, Sumayya Begum⁵

Abstract:

Purpose

Given that individual creativity is a critical element to achieving organizational competitiveness, the purpose of this study is to attempt to investigate how transformational leadership (TL) drives employee creative process engagement (CPE) by improving their creative self-efficacy (CSE).

Design/methodology/approach

Analysis has been performed based on 194 responses from information and communication technology firms using a cross-sectional survey design. The study follows a deductive research approach to test the hypotheses. It uses SmartPLS2 and IBM SPSS 21 for a structural equation model.

Findings

The investigation finds that TL significantly predicts CPE, and CSE partially mediates the TL–CPE relationship. The result demonstrates that TL shapes an organizational climate conducive to the employees' CPE by building employees' self-efficacy.

Research limitations/implications

The study sample was drawn from a single sector of the Bangladeshi economy. The sampling design represents a limitation, for which the findings cannot be broadly generalized. Replications and augmentations of the study in various industrial areas will help test the robustness and generalizability of the discoveries.

Practical implications

TL and CPE are desirable organizational outcomes across all cultures. From a practical standpoint, the outcomes demonstrate that TL is linked to CPE and CSE among information and communication technology employees. This study extends the appropriateness of CSE into Asian countries. Notably, it provides additional insight into a contemporary TL model that can unequivocally impact leadership development in the Bangladeshi information and communication technology firms. Managers or chief executive officers in the small and medium enterprises are expected to exhibit TL attributes by designing a supportive organizational climate that will motivate employees to exhibit creative activities.

Social implications

TL transforms employees' psychological state to get them to engage in creative processes, benefiting the organizational stakeholders by their unconventional creative behavior. The TL-driven innovative outcome through employees' CPE contributes to the development of social well-being.

Originality/value

This paper adds significance to the extant literature regarding the determinants of the mediating impact of CSE on TL and CPE from the viewpoints of information and

communication technology firms, particularly from developing countries, such as Bangladesh. It also contributes to reconcile the findings of the previous studies around the globe in both developed and developing countries.

Keywords: Transformational Leadership; Innovation; Small and Medium Enterprises; Information and communication technology; Organizational theory and behavior; Creative process engagement; Creative self-efficacy

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Journal Category: ESCI, C, Q1

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2. Corporate Environmental Strategy and Voluntary Environmental Behavior-Mediating Effect of Psychological Green Climate

Anupam Kumar Das¹, Shetu Ranjan Biswas², Munshi Muhammad Abdul Kader Jilani³, Md Aftab Uddin⁴

Abstract: Given the growing intent to prevent decay in environmental management, the present study seeks to unearth the impact of corporate environmental strategy on employees' voluntary environmental behavior by regulating or facilitating their perceived psychological green climate. Research problems and research questions are built on the essence of multiple theories—goal-setting theory, social identity theory, and social learning theory for grounding the research model. A total of 294 replies were collected through a self-administered survey from diverse industrial panoramas. We used structural equation modeling (SEM) analytics via AMOS-version 20.0 for measuring the hypothesized results. The study revealed that the corporate environmental strategy is displaying an insignificant direct influence on voluntary environmental behavior. However, the corporate environmental strategy indirectly influences, via the mediation effect, voluntary environmental behavior of employees through their psychological green climate perception. Directions for future research are recommended based on insights from the implications and limitations of the study.

Keywords: Corporate environmental strategy; voluntary environmental behavior; psychological green climate; goal setting theory; social identity theory; and social learning theory

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Journal Category: Science Citation Index Expanded, Social Sciences Citation Index, Q1

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3. The Influence of Knowledge Sharing on Sustainable Performance: A Moderated Mediation Study

Munshi Muhammad Abdul Kader Jilani¹, Luo Fan², Mohammad Tazul Islam³,
Md Aftab Uddin⁴

Abstract: The past few decades showed inadequate discussion of the impact of employees' knowledge sharing and its diffusion on advancing banks' long-term sustainability. The objective of the study is to examine the role of employees' knowledge sharing on the sustainable performance of the banks operating in Bangladesh. Furthermore, this study tested the "moderated mediation model" of knowledge hiding and employees' ambidexterity on the association above. The researchers applied the deductive reasoning method through the application of quantitative techniques, using structural equation modeling. Finally, 287 respondents from different banks were chosen through a self-administered questionnaire survey in the capital city of Dhaka. The findings indicated that all the predictor variables significantly explain the outcome variable, except the influence of knowledge sharing. Mediation analysis showed that employees' ambidexterity mediated the association between knowledge sharing and sustainable performance. Surprisingly, moderation analysis revealed that the influence of knowledge sharing on employees' ambidexterity is not affected by knowledge hiding. This study adds to the existing literature by demonstrating the importance of knowledge hiding, along with explaining how knowledge sharing can motivate and influence employees to achieve sustainable performances. In addition, the main contribution of this study is to advance knowledge and add values in the forms of knowledge creation, preservation, and dissemination among practitioners, banking professionals, and academics for utilizing their domain-specific areas to increase long-term sustainability.

Keywords: knowledge sharing; knowledge hiding; employees' ambidexterity; sustainable performance

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Journal Category: Science Citation Index Expanded, Social Sciences Citation Index, Q1

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4. Fighting ahead: Adoption of social distancing in COVID-19 outbreak through the lens of theory of planned behavior

Anupam Kumar Das¹, Munshi Muhammad Abdul Kader Jilani², Mohammad Shahab Uddin³, Md. Aftab Uddin⁴, Ajoy Kumer Ghosh⁵

Abstract: This study, being explorative, aims to identify the antecedents of social distancing behavior among people in a collective society, in Bangladesh. Based on the social-psychological behavioral model, i.e. theory of planned behavior (TPB), the current study incorporates attitudes, subjective norms, perceived behavioral control, and behavioral intention to assess their influence on actual social distancing behavior. The present study followed the deductive reasoning approach to conduct the research. A self-administered questionnaire was utilized to collect data from 331 respondents through social networks purposively and later analyzed using SPSS-21 and AMOS-20 to test the hypotheses. The results revealed that attitude toward social distancing, social pressure, and perceived control to social distance significantly influence the intention to maintain social distance. The core finding is that perceived behavioral control (directly and indirectly) is the most profound antecedent followed by subjective norms of both intention and actual social distancing behavior. We conclude by providing policy implications for policymakers and health concerns to focus on upholding the attitudinal awareness, normative beliefs, and self-control approach of people for maintaining social distance and behave proactively to contain the outbreak, as well as potential notes for further research.

Keywords: COVID-19; social distancing behavior; psycho-social factors; theory of planned behavior

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5. Creative Social Media Use for COVID-19 Prevention: A Structural Equation Modeling Approach

Md. Monirul Islam¹, Md. Mazharul Islam², Faroque Ahmed³, Afrin Sadia Rumana⁴

Abstract: In recent years, information dissemination has been quicker than earlier years with the sky-high development of diverse social media platforms, e.g., Facebook, WhatsApp, Twitter, YouTube and so on, which are more used in creative production. This advancement of social media disclosures has numerous merits and demerits to prevent and control contagious diseases like the Covid-19 pandemic. In this respect, this research scrutinizes the role of creative social media use in preventing the Covid-19 outbreak in Bangladesh utilizing the structural equation modeling (SEM) approach. To this end, this study uses an online survey from June to October 2020 engaging 265 (N=265) Bangladeshi people as respondents at different ages. The study results establish that creative social media use helps enhance the knowledge of Covid-19 precautions online, and this pertinent knowledge contributes to preventing Covid-19 outbreak in Bangladesh. It implies that creative social media use has a significant indirect effect on Covid-19 prevention, whereas knowledge of Covid-19 precautions online mediates this relationship between creative social media use and Covid-19 prevention. The results also discover that the educational level of the people has a significant direct and positive impact on Covid-19 prevention. Therefore, the study suggests more creative use of social media in preventing the spread of the Covid-19 epidemic in Bangladesh.

Keywords: Creative social media use; Knowledge of Covid-19 precautions online, Covid-19 prevention, SEM approach, Bangladesh

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6. Discovering Tourist Preference for discovering destination spots: A Pattern Mining based Approach

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Abstract: Awareness and access to information on travel benefits may bear importance for tourist preference in selecting popular destination. Tourism businesses are continuously exploring to improve their competitive advantage and offering an effective method for assisting tourist in electing their preferred destinations. However, current studies are still at an emergent stage. This paper presents a tourists preferences dataset and introduces preference pattern mining (PPM) method as a solution framework for discovering tourist spots. Our PPM method finds and validates the most active tourist hot spots from tourist preferences dataset. The proposed framework facilitates an unbiased approach for optimal tourism destination management in tourism-friendly countries.

Keywords: Destination spots, tourist preference, pattern mining, tourism management, destination management, tourist behaviour

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7. Strengthening the Trialability for the Intention to Use of mHealth Apps Amidst Pandemic: A Cross-Sectional Study

Munshi Muhammad Abdul Kader Jilani¹, Md. Moniruzzaman², Mouri Dey³,
Edris Alam⁴, Md. Aftab Uddin⁵

Abstract: Recent advancements in mHealth apps and services have played a vital role in strengthening healthcare services and enabling their accessibility to marginalized people. With the alarming rise in COVID-19 infection rates around the world, there appears to be an urgent call to modernize traditional medical practices to combat the pandemic. This study aims to investigate the key factors influencing the trialability of mHealth apps/services and behavioral intention to adopt mobile health applications. The study also examines the moderating effects of self-discipline motivation, knowledge, and attitude on the relationship between trialability and behavioral intention to use. The deductive reasoning approach was followed in a positivism paradigm. The study used convenience sampling and collected responses from 280 Generation Y participants in Bangladesh. Partial least square-based structural equation modeling was employed. The results revealed that relative advantage ($\beta = 0.229$, $p < 0.05$), compatibility ($\beta = 0.232$, $p < 0.05$), complexity ($\beta = -0.411$, $p < 0.05$), and observability ($\beta = 0.235$, $p < 0.05$) of mHealth apps influence the trialability of mHealth apps and services among users. Trialability compatibility ($\beta = 0.425$, $p < 0.05$) of mHealth was positively related to the behavioral intention to use these mobile apps. The study found no moderating effects of attitude ($\beta = 0.043$, $p > 0.05$) or self-discipline motivation ($\beta = -0.007$, $p > 0.05$) on the hypothesized relationships. The empirical findings of this study may facilitate the development, design process, and implementation of mHealth applications with improved features that can lead to high user acceptance among Generation Y during future health crises.

Keywords: mHealth; DOI model; Generation

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H. THINK TANK

1. The Role of Think Tanks in Social Policy-Making: The Bangladesh Perspective

Md. Monirul Islam¹

Abstract: Think tanks uphold up-to-date policies through evidence-based research, the exchange of views and ideas among multifarious stakeholders, and civic activism in most of the countries of the world. Historically, the formation of the Clarkson's Committee in the US is regarded as the first think tank, which focused its efforts against the African Slave Trade in 1782. Now, in many countries of the world, especially in Bangladesh with different nomenclatures, these think tanks are playing a crucial role in different affairs of the state and society. The prime focus of this study is to examine the role of think tanks in social aspects, such as with health, education, gender, poverty, and the environment. Based on secondary data and information derived from literature reviews, the author quite strongly argues that the think tanks of Bangladesh are playing a very positive role in social policy making through research, dialogue, programs, projects, and civic activism. However, it has also been found that Bangladesh's think tanks have witnessed some gaps in terms of performance in comparison to global think tanks when playing a role in the policy-relevant issues. Hence, some recommendations have been made to improve the roles of think tanks in Bangladesh.

Keywords: Think Tank; Role, Policy; Social Policy-Making; Bangladesh Entrepreneur

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2. Rise and Trend of Think Tanks: A Policy Relevant Perspective

Md. Monirul Islam¹

Abstract: Idea comes from think tanks. And the policy relevant idea that does not exclusively come from other source but think tanks to play an important role in the policy-making process of a country. From this point of view, the notion of think tank has significantly been the magnetic phenomenon to the policy makers, statesmen, administrators, donor agencies, civil society, and other stakeholders. In this backdrop, the study mainly aims to look into the rise and trend of think tanks in different countries, such as US, China, India and Bangladesh, and identify the potentials of global think tanks to exploit these into the policy-making process of Bangladesh. Based on the secondary data, the study is carried out following the content analysis method to reach the study objective. The study argues that the rise of think tanks worldwide is time-necessitated and their current trend in policy-making process is enormously traced out with their rigorous potentials. Therefore, Bangladesh as a developing country can exploit the potentials of think tanks into its policy-making process as followed by the global think tanks.

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I. MACHINE LEARNING

1. Machine learning to promote health management through lifestyle changes for hypertension patients

Md. Mazharul Islam¹, Rittika Shamsuddin²

Abstract: The purpose of this paper is to investigate the use of machine learning models to develop a diagnostic system for hypertension patients so that people can modify their daily lifestyle to manage their condition. We propose this system by adopting the concepts of saliency maps for image data to non-image, lifestyle data with a data perturbation simulation technique. We trained the proposed system on a new lifestyle dataset that we extracted from a survey on Asian sub-population. The proposed system consists of a convolution neural network (CNN) as the diagnostic model, and is combined with simulation techniques to explain the concepts/insights learnt by the CNN. We compared classification performance of the CNN model with other baseline models fitted with other types of hypertension data including neural network, decision tree and other CNN model from literature. The CNN achieved a 68–70% accuracy on training and testing datasets. Comparing with other baseline models, our CNN model provided more consistent performance in terms of accuracy, sensitivity, specificity and area under receiver operating characteristic (ROC) curve. Using the simulations, we learnt that CNN captured not only direct correlation between the variables and the target, but also learnt group-based interactions. Our study reveals that age, gender, diabetes status, body mass index, smoking, occupation and education are some important lifestyle factors affecting hypertension. Avoiding smoking, maintaining a balanced diet to prevent unnecessary weight gaining, regular monitoring of blood sugar level for diabetic care, and stress relief exercise can reduce hypertension risk.

Keywords: Hypertension, Deep learning, Convolutional neural network, Health management, Perturbation-based simulation, Prediction

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2. A comparative study of credit card fraud detection using the combination of machine learning techniques with data imbalance solution

Faroque Ahmed¹, Rittika Shamsuddin²

Abstract: Due to the rapid spread of fraud and cybersecurity risks in digital economy, fraud detection stands as a prime issue of modern technology. However, the analysis of fraud cases is computationally difficult because, fraud cases conjure less than 0.2% of the transactions. Thus to figure out the best classification technique to use for fraud detection, this paper has conducted a thorough experimentation of Machine Learning (ML) techniques. It has implemented six ML techniques i.e. Logistic Regression (LR), Support Vector Machine (SVM), Naïve Bayes (NB), Random forest (RF), Decision Tree (DT), and K-nearest neighbour (KNN) classifiers to detect credit card fraud. The investigation used five type of datasets i.e. imbalanced data, Under Sampled (US) data, Over Sampled (OS) data, sampled data using Synthetic Minority Over Sampling Technique (SMOTE) and Adaptive Synthetic Sampling Method for Imbalanced Data (ADASYN). The best combination of these classification approaches is selected based on five performance evaluation criteria i.e. Accuracy, Area Under the Curve (AUC), Precision, Recall score and fl-score. After evaluation of the classifiers it has showed that among 30 different classification approaches, RF classifier with over sampling (OS) technique was found to be the best approach in terms of all the performance criteria. It showed 99.99 % accurate and precise results with 99.99 % AUC, fl-score and 100 % Recall rate. Our chosen approach has obtained the highest accuracy over other studies on the same dataset. The banking sector as well as other financial institutions might use this suggested machine learning based combination approach to minimize (debit/credit card) frauds.

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3. Exploring the behavior of app developers and the future of digital Bangladesh

Altaf Hossain¹, Md. Abdullah Amir Hamja², Faroque Ahmed³, Kayum Mohammad Arafat⁴

Abstract: In 2009, the government of Bangladesh formulated a vision named as the “Vision 2021”. The main goal of the vision was to digitalize the services for bringing up them in front of people and make Bangladesh a middle-income country within 2021. As part of digitalization, the ministry of ICT Division of Bangladesh took projects for creating mobile apps for public services. Unfortunately, these apps are not currently working; only 100 apps were available in the play store at the time of data collection. This paper explores the behavior of app developers for understanding – why they are not working for the public services and removed from the play store. Data on app duration, size, update, download, and rating were collected from 100 government and 294 non-government apps in the Google Play Store on 15 October 2017. The analysis shows that the average rating of government apps is less than that of the apps developed by individual developers. Primarily, the causes are observed that the size and number of updates of the government apps are less than that of non-government. It is also observed that app size and number of its updates accelerate app rating and increase its usability. However, these are not the root causes; the study has identified the main cause that an aggressive developer developed the government apps of Bangladesh. This aggressive behavior of app development must underestimate the future of Digital Bangladesh, for example.

Keywords: Vision 2021, Digital Bangladesh, Mobile Apps, Government, Nongovernment and Aggressive Developers.

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4. Analyzing volatility of Dhaka stock exchange (DSE) with historical events around breakpoints: ICSS algorithm approach

Faroque Ahmed¹, Md. Monirul Islam², Md. Mazharul Islam³

Abstract: This paper inspects the types of incidence that lead to the hefty changes in the volatility of Dhaka Stock Exchange (DSE). We identify when the bulky shifts in the volatility of DSE returns takes place and then determine the local events at the time of change in volatility. An Iterated Cumulative Sum of Squares (ICSS) algorithm is used to detect the points of abrupt quakes in the variance of returns. DSE General Index & DSE Broad Index daily data are combinedly collected from 1st January, 2003 to 29 July, 2019. Our contribution is to detect each point of changes in the volatility. Then the study sightsees around the events and policy regime over those detected periods. The findings help the policy makers to modify and execute discussed rules and regulations in order to avoid such collapses in future.

Keywords: Dhaka Stock market, Volatility, ICSS algorithm, DSE, GARCH, Historical Break Points

JEL Classification: C22, G14, G18, G41

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