

A Nexus Between Financial Development and its Determinants; A Panel Data Analysis From A Global Perspective

Bilal Ashraf^{a,b,1}, Qianxiao Zhang^c, Naveed Aslam^d, and Touqeer Ahmad^e

^aSchool of Economics and Finance, Xi'an Jiaotong University, CHINA

^bAssistant Registrar, University of Gujrat, Punjab, PAKISTAN

Email: bilal.ashraf@uog.edu.pk

^cProfessor, School of Economics and Finance, Xi'an Jiaotong University, CHINA

Email: zhqxiao@mail.xjtu.edu.cn

^dPh.d.Scholar, School of Economics and Finance, Xi'an Jiaotong University, CHINA

Email: naveed_ak1@stu.xjtu.edu.cn

^eAssistant Professor, Department of Economics, University of Sargodha, PAKISTAN

Email: touqeer.ahmad@uos.edu.pk

ABSTRACT

In this era of globalization, the importance of financial sector growth in economic development procedures is not to be disregarded for economies with high and low incomes, globally. The adoption of ICT-based technology improvements raised and optimized capital accumulation decreased information asymmetry, encouraged and mobilized savings, and supported the economy's current account balance, contributing to the financial sector development's ability to accelerate economic development. This study empirically investigated the linkage amid financial development and its important determinants such as information and communication technology (ICT), natural resource rents (NRR), economic growth (EG), current account balance (CAB), and gross savings (S) in 107 economies worldwide. This paper preferred to employ the second-generation unit root tests to handle the issues of slope heterogeneity and "cross-sectional dependence" in panel data. The results of "Kao, Pedroni, and Westerlund tests" confirm the long-lasting connections among the variables under study, while the significant endings of "cross-sectionally augmented autoregressive distributed lag (CS-ARDL)" exposed that NRR, CAB, and S negatively affected the financial development while ICT and EG stimulates the procedure of FD. Further, the robustness analysis's application of "Feasible Generalized Least Squares (FGLS)" further supports the appropriateness and applicability of CS-ARDL. Finally, the findings of "Dumitrescu-Hurlin causality analysis" endorse the bidirectional causality linkages amongst research factors. Based on the study's empirical outcomes, we suggest some effective policy suggestions that empower the process of financial development to boost the overall economic well-being, globally.

Keywords: Determinants of financial developments, CS-ARDL, financial development, global sample, Causality analysis

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¹ Corresponding Author: E-mail IDs: bilal.ashraf@uog.edu.pk (B. Ashraf), zhqxiao@mail.xjtu.edu.cn (Q. Zhang), naveed_ak1@stu.xjtu.edu.cn (N. Aslam), touqeer.ahmad@uos.edu.pk (T. Ahmad)

1. INTRODUCTION

The financial sector which comprises financial markets and institutions plays many functions and has unique traits. It's considered the backbone of emerging and developed economies across the world (T. Beck et al., 2009; Vincent L.Y. Lin, 1981). A well-developed financial sector provides funds to the real sector for investment, low-cost information about efficient and productive investment opportunities, accelerates capital accumulation by redirecting savings from non-productive to productive sectors, eliminates informational asymmetries for individual savers, facilitates risk diversification and sharing, and provides platforms for contract trading as initiated by (T. Beck & Levine, 2004, Faisal et al.) and recently endorsed by (Çetin et al., 2023). The developed financial sector is considered essential for progressive and balanced economic growth for developing and under-developing, as well as for developed economies.

The debates about the connection between financial development (FD) and economic growth (EG) were initiated from conceptual and experimental collections of (Goldsmith, 1959) and (Ronald I. McKinnon, 1970). A lot of studies in the given literature (Adu et al., 2013; Ang, 2008; Bist, 2018; Calderón & Liu, 2003; A. Khan, 2001; King & Levine, 1993; Law & Singh, 2014; Lenka & Sharma, 2020; Levine, 2005a; Long & Broadbent, 2014; Nain & Kamaiah, 2014; Shahbaz et al., 2022; Uddin et al., 2013) have empirically and theoretically investigated the economy's growth due to the growth of the financial industry in diverse directions. Current literature on FD-EG linkage emphasizes demand pull and supply pull approaches. Firstly, financial development is influenced by the demand side, which is driven by the financial needs of investors and individual savers. As the economy grows, the demand for financial services from these actors increases, leading to the expansion of the financial industry and contributing positively to the process of financial development. Firstly, by following the demand side; the demands for financial services from financial actors such that investors and individual savers decide the nature and direction of financial development, so the financial industry expands hence as demand from the mentioned financial actors grows in the positive direction means as the economy grows it directly positively contributes in the process of financial development (Calderón & Liu, 2003). Secondly, to follow the supply side; the allocation of resources or cash from less productive sectors or regions to more productive ones, including technologically advanced corporate structures, plays a crucial role in the formation of banking institutions and financial markets. This suggests that a strong financial sector has a substantial impact on contributing favorably to the total productivity of countries (M. A. Khan et al., 2019; Patrick, 1966). (K. Karaman & Yıldırım, 2019) examined the impact of FD on economic expansion in 50 economies, concluding that FD mitigates uncertainty's negative impact on output. On the other side, few of the prevailing studies, (Cave et al., 2020; Nain & Kamaiah, 2014; Shan & Morris, 2002) also empirically investigated the negative or weak effects of economic expansion on the FD.

The question of whether natural resource rents (NRR) and FD are related was initially raised by Adam Smith (1776), and (Ricardo, 1817). Latterly, during the final decade of the 19th century, (Auty & Warhurst, 1993) first originated the term "Duct disease" from the "Resource curse theory". The fictitious "resource curse" emphasized that Natural resource-rich economies have

poor performance economically as compared to other nations, those having less earnings from natural resources. The basic logic that supports the myth of the “resource curse” is the weak financial sectors in various economies, in the given literature, there is an unfavorable NRR's effect on FD as empirically proved by (Li et al., 2021) in G7 nations, (M. A. Khan et al., 2022) for emerging economies but the association is positive amid the NRR and FD as empirically investigated by (Shahbaz et al., 2018) taking the USA as case study.

In this era of digitization, the process of FD is not executable by ignoring the effective performance of ICT. In the prevailing literature, many studies, (Asongu, 2014; González-Páramo, 1995; Sarma & Pais, 2006; Zagorchev et al., 2011) stated that there are associations between FD and electronic applications in growing and advanced nations. The ICT adoption reduces the risk level between the financial intermediaries and various financial actors by encouraging the smooth and safe accomplishment of internal and external financial transactions (Asaleye & Strydom, 2022). The conventional financial systems shifted to digitalization through automation by adopting the ICT infrastructure (Odei-appiah et al., 2022). In the available literature, (Sassi & Goaid, 2013) and (Das et al., 2018) elaborated on the function of ICT diffusion on FD, while recently, (Gheraia et al., 2022) studied ICT as a mediator in the affiliation between FD and EG. Furthermore, (M. S. Chien et al., 2020) and (Alshubiri et al., 2019) also investigated the advantages of ICT on FD in about 81 economies and six GCC economies respectively.

Financial Development (FD) is heavily influenced by external shocks like financial global crises and pandemics, which can have a devastating macro impact on all economies, developing, underdeveloped, or developed (Hsu et al., 2023). These massive shocks disrupted international trade, affecting currency rates, balance of payments, financial stability, and deficit current account balance (CAB). Further, these negative impacts on CAB also tighten the performance of financial sector developments internally and globally (Salisu, 2005). In a deficit current account, declining domestic savings deter financial actors from submitting small savings to financial markets. So, the financial industry is unable to secure enough resources to enhance investment prospects, which hurts the financial sector's growth. Along the same line, (Owusu-Agyei et al., 2020) found that the CAB hurts FD in emerging economies. So, it is important to further include in the listed literature, by empirically analyzing the CAB's impact on FD from a global perspective.

Finally, gross savings (S) are crucial to FD (Ben Naceur et al., 2014). In most cases, investors move towards the financial sectors to get investment funds for major long-run projects. If a country has developed financial markets then these markets may be capable of providing investment funds to such long-run projects (Ito & Chinn, 2007). In some economies, natural resource earning may lead to a boost the savings through the rapid increase in government spending (Shahbaz et al., 2018). The transformation of these savings into the financial markets is the main source to generate the funds and boosts the process of financial development in such economies (Lucas, 1988). Further, (Bayar, 2014) also suggested that savings play the character of the injector in the course of economic progress by empowering the financial intermediaries and stimulating the procedure for FD. In the available literature, many empirical studies (Adebayo et al., 2023; Deng et al., 2022; P. Avci, 2022) also suggested that

saving is an important injector and main contributor to stimulating the process of FD for emerging economies. So there is a dire need to see the empirical influence of savings on FD from a worldwide perspective.

The above-mentioned theoretical justifications about the relationships amongst economic growth (EG), natural resource rents (NRR), Information and communication technology (ICT), Saving, Current account balance (CAB), and financial developments highlighted the importance of this empirical investigation in a global perspective. In the available literature, most research studies such as (Zaidi et al., 2019) considered the connection of globalization, human capital, and NRR with FD for thirty-one OECD economies, although (Madsen et al., 2018) include income inequality along with EG and FD, while most lately, (Çetin et al., 2023) investigating the influence of NRR, EG, S, and CAB on FD for thirty-three (33) developing economies. Along the same line, the present study looked into the impacts of EG, NRR, ICT, CAB, and Savings on FD in one hundred and seven (107) countries, globally and noted the novelties of this research in diverse directions: firstly, the research concluded the shorter as well as longer periods causal relationships amongst Economic growth, natural resources rents, information & communication technology, savings, current account balance, and FD by executing the “CS-ARDL” and “Dumitrescu-Hurlin panel causality analysis”, secondly, the CIPS and CADF tests from second-generation panel unit root analysis are employed to judge “cross-sectional dependence (CSD)” in this large panel data set where numbers of cross dimensions (N) is exceeded than time dimensions (T) means $N > T$. Further, unlike the previous empirical research studies, we employed the most advanced test named Blomquist-Westerlund test to find the slop-homogeneity. Thirdly, we employed (Kao, 1999; Pedroni, 2004), and (Westerlund, 2005) to find the association amongst EG, NRR, ICT, S, CAB, and FD over longer periods. Fourthly, after performing the prerequisite diagnostic analyses, for both the immediate and longer-term coefficients of the research variables, we favored to execute the “CS-ARDL technique”. This estimation method is most advanced and novel to other traditional panel data estimation approaches, further, it's produced more steadfast as well reliable conclusions in the company of CSD and “slop-heterogeneity”. Furthermore, to support and strengthen the results of CS-ARDL, this study also performed a robustness analysis using the FGLS estimations technique to reconfirm the outcomes of “CS-ARDL”. Finally, this study again creates novelty by investigating the fundamental linkage amid study parameters by utilizing the most advanced test for causality named the “Dumitrescu-Hurlin panel causality (DH) test”, and proposing some effective policy recommendations based on research outcome. The experimental outcomes of this research revealed an advantageous impression of ICT and EG on FD but NRR, S, and CAB hurt the financial development of 107 sample economies across the globe.

The remaining portion of this research manuscript is arrayed in the following order: segment 2 covers the summaries of the related research studies, which the literature has available. Segment 3 comprises the study's theoretical structure as well brief data description along with the empirical model. The econometric methodology that covers different analyses is framed in fragment 4, while segment 5 elaborates on the results and discussions and finally, unit 6 includes a conclusion, policy suggestions, and recommendations for upcoming studies.

2. LITERATURE REVIEW

The evolution of the financial industry through empirical investigations is traced in the era of Goldsmith (1969); he measures the financial development in thirty-five (35) economies by using the assets of financial intermediaries as indicators to measure financial development. Later on, many scholars, scientists, and policy developers (Baltagi et al., 2009; Domowitz, 2002; González-Páramo, 1995; Ibrahim Raheem Mutiu Abimbola Oyinlola, 2017; King & Levine, 1993; Law, 2009; Law & Singh, 2014; Levine, 2005a; Liberti et al., 2016; Nain & Kamaiah, 2014; Shahbaz et al., 2018; Shan & Morris, 2002; Yuxiang & Chen, 2011) have focused and further deeply measures the financial developments more preciously and elaborated the process of financial development with its different types of determinants as well as other key macroeconomic contributors. The nexus amongst financial developments and its determinants such as economic growth, natural resource rents, ICT, savings, and current account balance has been empirically investigated by several researchers but not in a single study in a global perspective. The remaining portion of the literature review comprises the panel and time series inquiries that scrutinized the impact of NRR, ICT, EG, S, and CAB on FD. The literature contains numerous experimental studies about panel and time series analysis that describe and evaluate the favorable and negative impacts of EG on the peace of FD along with other prominent determinants.

First, we focus on the specific research studies that performed time series studies to further examine how financial development and its influential factors are connected; (M. A. Khan et al., 2019) revisiting the time series data of the USA by applying the extended version of autoregressive distributive lag approach (ARDL) named as “ARDL Bounds Testing approach” and evaluated the association amongst the NRR, institutional quality, FD and EG over the longer periods, however institutional quality responds in a moderating way and mitigate negative consequences of NRR on FD. Similarly (Shahbaz et al., 2018) also applied the ARDL Bound test methodology and found the positive role of some additional determinants such as natural resource rents, EG, and education on FD, but capitalization responded inversely in the case of USA for the period 1960-2016. In the case of the Angolan economy; (Quixina & Almeida, 2014) utilized “The Granger-causality test” to investigate a causative linkage among FD and natural resource earnings (Oil revenue) as well as non-oil GDP. The significant outcomes suggested that oil revenue has an impact on FD as well as non-oil GDP, but the Angolan economy and oil revenues remain unaffected by FD. Further, in the scenario of the Venezuelan economy for the period 1971-211; (Latif et al., 2014) concluded the beneficial effect of EG on FD by governing the role of trade openness and capital stock by performing the VECM Granger causality test. All study variables are cointegrated; while there is an encouraging role of FD, capital stock, and trade openness on EG, however, natural resources do not have supportive behavior with economic well-being.

Applying the ARDL-Bound test methodology to Pakistani time series data for the years 1975-2011;(Asif et al., 2020) determined that the FD's process is hampered by the EG and NRR, while among the other determinants such as fixed capital formation have useful contributions in it, but statistically, there is no meaningful correlation among financial progress and open trade. Similarly, (Atil et al., 2020a) included economic growth, globalization, and oil prices as the drivers of FD in the finance-growth

demand function of Pakistan. The variability approach's outcomes suggested the positive role of NRR, EG, and oil prices on FD, but globalization hinders the growth of FD. In China's situation, (Jiang et al., 2021) reinvestigated the connection among nature's resources and FD by taking into account the effects of EG, TO, and gross capital formation. The noteworthy conclusions of the "Quantile Autoregressive Distributed lagged (QARDL) model" suggested a positive effect of EG, TO, and gross fixed capital formation on FD, while natural resources followed a "resource curse" for the Chinese economy. Recently, (Ali et al., 2022) applied Bootstrapped ARDL and examined the NRR's constructive impression on the stock market, but the stock market's growth is adversely correlated with institutional quality, however, EG has a statistically significant positive influence on FD's overall trajectory, in case of Malaysian economy.

With regard to panel data investigations; (Christopoulos & Tsionas, 2004) concluded that EG has a favorable and statistically meaningful impact on the depth of finances by using the fully modified OLS on the panel data of ten developing countries. Further, (Liang & Teng, 2006) used the Multivariate vector autoregressive (VAR) approach for China (1952-2001) to dugout the unidirectional causality among the EG and FD with the existence of trade ratio, real interest rate, inflation, fixed capital formation for China. While, (Brunnschweiler, 2008) reinvestigated the direct positive influence of EG on FD, when there is institutional quality by applying the approaches for OLS and 2SLS regressions in one hundred economies across the globe. Further, by applying the Panel GMM technique, the findings (Yuxiang & Chen, 2011) suggested that there is a supportive connection amid EG and FD with the existence of trade openness and capital formation for provincial data of the Chinese economy. In the worldwide sample of 133 economics for the years 1970-2005; (Bhattacharyya and Hodler, 2014) provided empirical evidence to support their hypothesis that when political institutions deteriorate, profits from natural resources will also impede the expansion of the economy generally and the financial sector's advancement. In the case of the North African (MENA) region; (Cherif & Dreger, 2016) applied the panel econometric technique by considering the institutional determinants (law and order condition, TO, corruption) on FD and found a constructive link among economic growth and FD when there are a trade openness, corruption, and law and order issues. Further, taking the scenario of four KART economies for the years 1992 to 2017; (Gokmenoglu & Rustamov, 2019) examined how loans from the World Bank and natural resources have historically encouraged financial development by using the dynamic method of ordinary least squares.

In the same way, (Zaidi et al., 2019) practiced the "Westerlund panel cointegration test" on thirty-one OECD economies' panel data from 1990 to 2016 and found an encouraging correlation amongst the NRR, HC, formation of fixed capital, and FD through managing the impacts of economic expansion as well as globalization. Similarly by employing the "two-step system GMM" on 109 economies 'panel data in a global perspective, (Phuc Nguyen et al., 2020) conclude that in immediate periods, the usage of the internet helps FD, but has a detrimental impact on FD over the time by considering all dimension such as depth, access, and efficiency, as also confirmed through executing the PMG, ARDL, and PDOLS techniques in the robustness analysis. Furthermore, the most prominent African nations; (Farouq et al., 2020) again confirmed the encouraging effects of EG, FDI, and financial globalization on FD by executing "pooled-mean group estimates (PMG)". Similarly, by running the ARDL

bound test approach; (Z. Khan et al., 2020a) investigated the adverse effects of NRR on FD in China, but technological innovation, human capital, and trade openness have progressive impacts on FD.

Considering the NRR, EG, HC, and institution factor in the panel data analysis of ten (10) economies with better financial systems for the period 1984-2016; (Hadj & Ghodbane, 2021) endorsed the myth of the 'resource curse' through the execution of fixed effect Panel quantile regression model and supported the negative consequences of NRR for the growth of the financial industry, although HC, law, and order situation have also had a favorable impact. Additionally, by the utilization of the AMG model to panel data of seven emerging economies; (Gu et al., 2021) concluded that NRR, HC, income, technological innovation, and research and development spending (R&D) all relate to FD with favorable long-term effects. The outcomes achieved based on the Panel FMOLS estimation approach, (Song et al., 2021a) suggested the significant supportive role of economic growth on FD By regulating the impact of corruption in 142 economies across the world. Recently, (Tang et al., 2022) results of the econometric technique validated the "financial resource curse" hypothesis by showing the positive character of business guidelines that mitigate the detrimental effects of NRR on FD by managing the impact of gross fixed capital formation in a sample of eleven (11) ASEAN economies. Most recently (Çetin et al., 2023) explored the nexus amongst the NRR, EG, S, CAB, and FD for thirty-three (33) developing economies but they did not consider the important role of ICT.

The aforementioned literature about the association within FD and its determinants from a global perspective is ambiguous and needs further debate, because most of the researchers particularly concentrated on studying the connection between FD and NRR through seeing the role of EG, TO, HC, capital formation, corruption, law & order, FDI, globalization, world bank lending, , institutional quality, trade ratio, real interest rate, current account balance, savings, inflation for ASEAN, Emerging, OECD, MENA, KART, OPEC, developing and under-developing as well as developed economies across the world. The current study creates its novelty by adding the ICT as a determinant in the demand function of financial development and empirically investigating the impact of NRR, EG, ICT, S, and CAB on FD through the use of panel data covering the years 2000–2021, of one hundred and seven (107) economies across the world. This study is distinct and adds three things to the body of literature; Firstly, as per the author's literature review, there is not a single study mentioned in the existing literature that studied the influence of NRR, EG, ICT, CAB, Savings on FD in a global scenario. So findings from this investigation contribute to the given literature in a novel way. Secondly, this research employs the unique indices of FD and ICT by using more indicators with different dimensions, to more precisely and accurately evaluate these economic terms. Thirdly, after reviewing the above-mentioned literature; it has come to the notice that the application of most improved approaches to estimate dynamic panel data such as CS-ARDL, and the DH test are ignored, so in this study, we employed these advanced estimation techniques to find the long-run coefficients and causality analysis.

3. THEORETICAL FRAMEWORK AND DATA

The importance of economic growth (EG) being a macro-level influential factor for financial development (FD) cannot be overlooked because both have a direct and indirect connection with each other, as the

economy grows positively, it supports the financial sector to boost its financial services and vice versa (De Gregorio & Guidotti, 1995; Patrick, 1966). The growth process systematically affects the financial sector; firstly it empowers individuals through providing employment which increases the individual income level and leads to an increase in the individual's purchasing power along with their domestic savings which ultimately boosts the bank deposits. Thus the availability of additional investment funds held by financial markets increases the opportunities for both borrowers and lenders, which leads to more opportunities for public and private investors to boost and create further economic activities and vice versa. Hence, this suggested that the terms "Economic Growth" and "Financial Development" have a reciprocal association among them (Valickova et al., 2015). These supportive arguments amongst EG and FD become the foundation for our hypothesis.

In connection to the reciprocal connotation between EG and FD, gross savings react as the main facilitator and contributor in promoting the FD as well as to economic well-being (Ang, 2011). People's insufficient purchasing power means a reduction in domestic and gross savings that leads to a decline in the amount of money available for investments in the financial sector which ultimately affects the growth process (Ribaj & Mexhuani, 2021). So through the mobilization of savings, the participation of various financial actors in financial markets increased leading to promoting financial development (Djankov et al., 2007; Patrick, 1966). So we hypothesize that the positive role of savings may contribute a vital role towards financial development.

Another prominent variable attached to financial development in diverse scenarios is NRR, which has an opposing impact on financial development explained by (Baland & Francois, 2000; T. Beck, 2002) who stated that the surplus wealth of earth's resources may have an impact on the nation's FD adversely, due to the corruption, Absence of leadership and governance as well as low-quality and non-productive institutions, that squeeze the manufacturing sector. Further, (Dwumfour and Ntow-Gyamfi, 2018) concluded that well-structured and autonomous institutions, competent human possessions, and the use of cutting-edge technologies may develop financial markets and shift the blessing to a curse about earth's resources. The empirical research on the beneficial effects of abundant resources elaborated by (Badeeb et al., 2017; and Shahbaz et al., 2018) that countries with surplus earth resources earn more foreign reserves through the rent of natural resources and can invest more in public and private projects which leads to boost the domestic saving that ultimately enhances the deposits and liquidity of banking sector. In this process, the financial sector becomes an active actor throughout the expansion of the economy with the availability of sufficient investment funds to public and private investors. Therefore, based on a brief discussion, the study hypothesizes that the NRR's effect on FD is still controversial and further debatable, worldwide.

The inclusion of ICT in demand function as an influencing factor of FD becomes more interesting with the existence of NRR, EG, and savings (Tiba & Frikha, 2019). In this digitally advanced age, the effectiveness and prominence of ICT are not neglected almost all sectors of the economies, but here particularly in financial markets (Odei-appiah et al., 2022). All financial markets are connected and rely on the ICT infrastructure to execute their different internal and external financial matters as well as transactions in a very monitored and secured way with the very least operating cost

(Calandra et al., 2023). In the given literature, (Alshubiri et al., 2019; M. Chien et al., 2020) empirically investigated a statistically noteworthy and favorable ICT influence on FD, while (Cheng et al., 2020) considered the ICT's interconnected age effect in the growth and finance analysis and found a positive ICT's effect on EG via the FD in economies with large incomes, but the results are not clear in case of economies with low and moderate incomes.

Current account balance (CAB) is also a prominent indicator of the external imbalances in the global economies that affected the process of financial development in different ways particularly here through savings, NRR, and investment channels following the hypothesis of this study. In the situation of a current account deficit, investors are at high risk due to the lack of intended investment funds in financial markets because of extremely low savings levels (Tan et al., 2021), these causes unsettle the movement of both foreign and domestic capital into the country financial markets, so it affects adversely to the FD and ultimately steady expansion in the economy. This very brief discussion provides the basis to further investigate the role of CAB along with other relevant determinants of FD.

In addition to the above theoretical debate and keeping in view the experimental works of (Asif et al., 2020; Shahbaz et al., 2018) and (Dogan et al., 2020) that particularly focused on FD and NRR, while (Calderón & Liu, 2003; Junior Abeka et al., 2021; A. Khan, 2001; Law & Singh, 2014; Shahbaz et al., 2022; Song et al., 2021a) stress on Economic Growth, (Ibrahim Raheem Mutiu Abimbola Oyinlola, 2017; Oluwatosin Adeniyi & Festus O. Egwaikhide, 2013) focused on Savings, and (Acikalin et al., 2008) explored the CAB. There is a dire need to collectively analyze the empirical impact of NRR, ICT, EG, CAB, and gross savings on FD; from a universal perspective using the latest panel data estimation technique (CS-ARDL). Based on above mentioned theoretical discussion and evidence-based models created by (Owusu-Agyei et al., 2020) for forty-two African economies and more recently (Çetin et al., 2023) for thirty-three developing economies; the general demand function for financial development is as given below:

$$FD_{it} = \beta_0 + \beta_1 ICT_{it} + \beta_2 NRR_{it} + \beta_3 GDP_{it} + \beta_4 CAB_{it} + \beta_5 S_{it} + \epsilon_{it} \text{-----} (1)$$

Whereas FD and ICT represent the indices of financial development and information and communication technology respectively. Both FD and ICT represent the dependent and explanatory variables and are measured by using four different indicators from various dimensions (see Table 1 in the appendix) with the utilization of Principal Component Analysis (PCA) as done by (Cheng et al., 2020; Samargandi et al., 2015) and particularly in the research on ICT by (Akande et al., 2019; Dabbous, 2018; F. N. Khan et al., 2020). The index formation of ICT and FD through the PCA approach avoided the problem of multicollinearity (Dabbous, 2018). PCA is a statistical method that improves the credibility of the newly created uncorrelated variables without affecting the dataset. It also minimizes data loss, reduces the dimensionality, and increases the credibility of the dataset (F. N. Khan et al., 2020). While, GDP is a measure of economic growth expressed as an annual percentage increase in GDP per capita as practiced by (Cheng et al., 2020); S shows the gross saving in (% of GDP) as taken by (Ibrahim & Sare, 2018) and most recently (Çetin et al., 2023); CAB denoted the current account balance in (% of GDP) recently used by (Maitra, 2018) and most recently (Çetin et al., 2023) in their empirical investigations; NRR represents the natural resource rents (Dwumfour & Ntow-Gyamfi, 2018;

Z. Khan et al., 2020a), while missing data are filled through the moving average method as practiced by (Behera & Sahoo, 2022) and for detail variable description and data sources see Table 1. i , t , and ϵ are the representation of the specific country, time, and error term that capture all other effects those not describes by the long run coefficients ($\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$) of economic growth, natural resource rents, ICT, gross savings, current account balance, and constant β_0 .

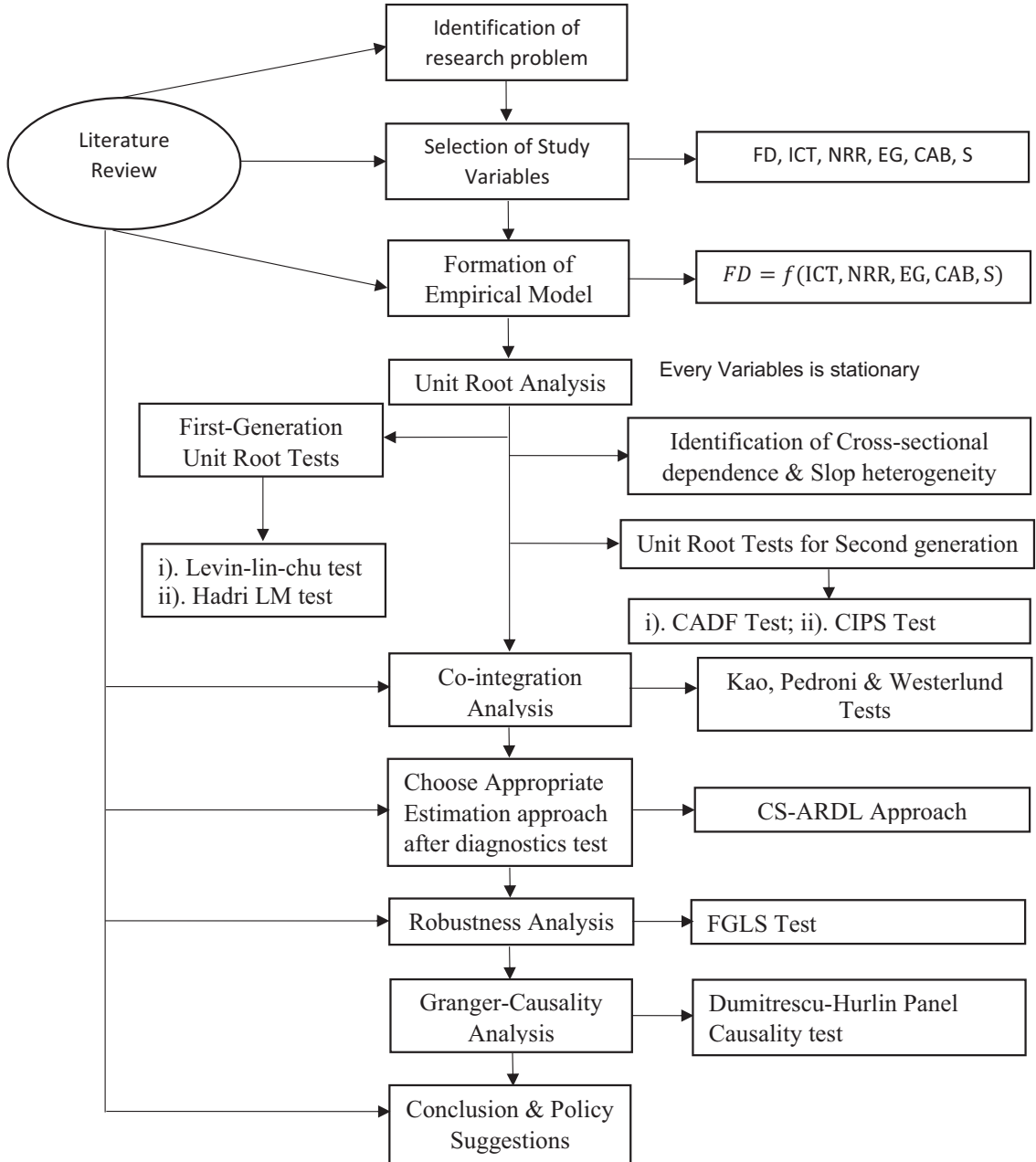
The present research collects panel data from 107 economies for the years 2000-2021, using the World Bank's Development Indicators database (Indicators, 2021). The sample economies list is attached in Annex-A in the appendix. The nations and indicators included in the sample depend on the data's accessibility for another study variable such as gross saving, natural resource rents, current account balance, and economic growth. To confirm that the series conforms to normality the study converted data of all studies variables in setting the range (0 to 1) by using the Origin software.

4. METHODOLOGY

To correctly choose the econometric method to compute the immediate and long-run components, this methodology section comprises several steps. The flow chart for empirical analysis is framed in Figure 1. First, from a global perspective, the impact of EG, NRR, ICT, S, and CAB on FD hints at the interconnections between FD and various determinants across the countries. In such type of large cross-section dimensions, the problem of the variable's cross-sectional dependence (CSD) cannot be ignored, because it leads to produce the bias results. In case, where cross dimensions (N) are smaller and the count of time dimensions (T) are sufficiently large, then traditional diagnostic techniques such as log-likelihood ratio tests, Breusch and Pagan's LM (1980) statistic could be applicable to check pair-wise correlation among the residuals. However, in other cases, panel data frameworks with larger number of panels (N) than time dimensions (T) mean $N > T$ and particularly depend on the weight matrix. In such a scenario, traditional diagnostic tests are not applicable, the given literature (Dogan & Seker, 2016; Dumitrescu & Hurlin, 2012; Feng et al., 2021; Haseeb et al., 2019; Saldivia et al., 2020; Voumik et al., 2023) led us to use the CD-test that firstly presented via (Pesaran, 2004).

The CD statistic applies to various panel data models those having larger numbers of panels (N) than time (T) data characteristics mean $N > T$ and mainly depends on the weight matrix. In this case where N is larger than T; the command 'xtcdf' is used in STATA to implement the Pesaran's CD technique to verify the panels' CSD. Below is the simple form of the Pesaran CD-test that relies on pair-wise correlation instead of squares, which is compatible with both unbalanced and balanced panels;

Figure 1. Flowchart of Study Analysis



Source: Author's construction

$$CD_{statistics} = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\rho}_{ij} \right) \Rightarrow N(0,1) \text{ --- (2)}$$

By using the non-parametric estimates, according to (Pesaran, 2004) the operationalized version of the CS test is presented below;

$$\hat{E}(\hat{\rho}_{ij}^2) = \sum_{t=1}^T \delta_{it}^2 \delta_{jt}^2 = \sum_{t=1}^T \frac{\varphi_{it}^2 \varphi_{jt}^2}{(\varphi_{it}^2 \varphi_{jt}^2)} \text{-----} (3)$$

Secondly, the preliminary work related to testing of slop-homogeneity is associated with the extended work of (Swamy, 1970), but later (Hashem Pesaran & Yamagata, 2008) further improved the procedure and made further contributions to the family of Δ statistics in cases where several cross panels (N) exceeds the count of time dimensions (T). An adjusted version of Δ the family statistic is given below;

$$\tilde{\Delta}_{adj} = \sqrt{n} \left(\frac{n^{-1} \bar{S} - L}{v(T, L)} \right) \sim n(0,1) \text{-----} (5)$$

Where n represents the explanatory variables, L shows the group number and S is the Swamy statistics. The advanced works of (Hashem Pesaran & Yamagata, 2008; Swamy, 1970) get gaining more attention and are frequently mentioned in scholarly works (Ahmad et al., 2020; Akwasi Gyamfi et al., 2023; Dogan & Seker, 2016; Tao et al., 2021), but these version of Δ the family are not compatible when autocorrelation and heteroskedasticity issues are present, keeping because of this deficiency (Blomquist & Westerlund, 2013), extended the Δ family by introducing the heteroskedasticity and autocorrelation consistent (HAC) and adjusted versions denoted by Δ_{HAC} and $(\Delta_{HAC})_{adj}$ to test the slop homogeneity in the presence of heteroskedasticity and autocorrelation;

$$(\Delta_{HAC})_{adj} = \sqrt{n} \left(\frac{n^{-1} S_{HAC} - L}{v(T, L)} \right) \sim n(0,1) \text{-----} (6)$$

The null hypothesis supposition is 'Homogeneous slop coefficients' and the H_1 : Slop coefficients are not homogenous'. We will compare the calculated values with probability values at $\alpha = 1\%$, 5% , and 10% , and if the calculated figure is lower than the probability value, the H_0 is discarded.

Thirdly, the execution of the unit root analysis reveals whether a variable is stationary or not, which is the prerequisite analysis to get the desired actual outcomes about the study variables, and ultimately this may avoid spurious results (Raihan & Tuspekova, 2022). The Stationary of a variable reflected how the covariance, variance, and mean structure don't change with time. Within the existing body of work (Ahmad et al., 2023; Khraief et al., 2020; Pesaran, 2021; Voumik et al., 2023), several unit root tests practiced by various researchers to verify the sequence of integration of the series. After identifying CSD and slop-homogeneity issues in the current study, the cited literature (Ahmad et al., 2023; Haseeb et al., 2019; Tao et al., 2021; Voumik et al., 2023; Zafar et al., 2019) provide guidance and insisted shifts towards the unit root analysis by employing the tests from the second generation, because all tests from a first-generation family of unit root analysis are not compatible to produce actual results when CSD is present among one of the research factors. Most recently (Çetin et al., 2023) and (Ahmad et al., 2023) used an extended version of the standard ADF regression recognized as "cross-sectionally augmented ADF (CADF)" and "cross-sectionally augmented IPS (CIPS)" tests invented by

(Pesaran, 2007) from 2nd generation for unit root examination. Herein lies the research, the H_0 for unit root analysis is that the presence of unit root with CSD is the same for both the CADF test and CIPS. In STATA the command 'pescadf' is used to calculate the t-test. The calculated values will decide whether or not there is stationarity among the variables. Following is the CIPS estimation equation:

$$CIPS(n, t) = n^{-1} \sum_{i=1}^n CADF_i \quad n \rightarrow \infty \quad \text{-----} \quad (7)$$

Fourthly, once it has been established if the series is stationary or not, the review of given literature (Asaleye & Strydom, 2022; Azam & Haseeb, 2021; Çetin et al., 2023; Chudik et al., 2016; Erum & Hussain, 2019; Hussain et al., 2021; Lee et al., 2022; Singh, Deep Sharma, et al., 2023; Voumik et al., 2023) further guided us move towards the co-integration analysis. A lot of economists utilized linear regression approaches in the non-stationary collection of data before the 1980s and incorporated the results of spurious regression in their studies. The groundbreaking work of (Granger, 1981) established a process known as the co-integrated vector approach and first introduced the term 'co-integration', and Later (Engle, R.F; Granger, 1987) extended this procedure to develop a test using the Monte Carlo Simulation for future empirical research studies. The co-integration implies that the series move along together in Lon-run equilibrium means all of the variables being studied have a long-term connection. Extensive existing literature (Christopoulos & Tsionas, 2004; Phuc Nguyen et al., 2020; Saba & Ngpeah, 2022; Singh, Arya, et al., 2023; Tao et al., 2021; Voumik et al., 2023; Zafar et al., 2019; Zagorchev et al., 2011) guides us to execute (Kao, 1999), (Pedroni, 2004) and (Westerlund, 2005) co-integration checks on this study due to the panels' CSD and slope heterogeneity. The command 'xtcointtest' is executed to run these tests by excluding or including the fixed effect or time trend in the STATA software. In the case of Kao, Pedroni, and Westerlund co-integration exams, the H_0 : no co-integration in the panels, but the alternative hypotheses vary and are mentioned below:

H_1 for Kao, Pedroni = Variables are cointegrated in all panels

H_1 for Westerlund = Variables are cointegrated in some of the panels

Fifthly, in this type of large panel data set that has the problems of CSD and slope heterogeneity, we decided to employ the "CS-ARDL" econometric methodology, which was produced by (Chudik et al., 2016) and recently practiced by several researchers (Adebayo et al., 2023; Ahmad et al., 2020; Asaleye & Strydom, 2022; Çetin et al., 2023; Erum & Hussain, 2019; Hussain et al., 2021; Lee et al., 2022; Tao et al., 2021; Voumik et al., 2023), to figure out both the brief and lengthy-term coefficients. Here, we ignore the traditional panel data estimation approaches such as Panel dynamic (Mark & Sul, 2003) and panel fully modified OLS techniques (Pedroni, 2000) because these methods do not consider the CSD issues along with heterogeneity problems in the dynamic heterogeneous panel models. When slope heterogeneity and CSD are present among the large heterogeneous panel data models; the "CS-ARDL approach" is a flexible second-generation econometric model with lagged dependent variable to reflect the dynamic behaviors coefficients in both longer-, as well as immediate periods. Furthermore, it can successfully capture the impact of unobserved common factors (Çoban & Topcu, 2013) and successfully tackle the endogeneity. The general regression equation to compute the CS-ARDL is presented below:

$$y_{nt} = c_{yn}^* + \sum_{l=1}^{p_y} \theta_{n,l} y_{n,t-l} + \sum_{l=0}^{p_x} \sigma'_{nl} X_{n,t-l} + \sum_{l=0}^{p_z} \delta'_{nl} z_{t-l} + \varepsilon_{nt}^* \text{---(8)}$$

Below is the updated and revised version of the ARDL that represents the estimation function of CS-ARDL in the case of the present study:

$$Fd_{n,t} = \sum_{n=0}^{pf} \theta_{1,t-1} Fd_{n,t-1} + \sum_{n=0}^{pz} \sigma_{1,n} Z_{n,t-1} + \sum_{n=0}^{px} \delta_n \bar{X}_{t-1} + \varepsilon_{n,t} \text{---(9)}$$

Where $Fd_{n,t}$, $Z_{i,t}$, and X represent the dependent variable, independent elements' vector, and averages over sections, correspondingly. $\varepsilon_{n,t}$ Captures other's effects and is known as an error term. Finally, the formula for calculating the CS-ARDL's coefficients over time using the mean group estimators is given below:

$$\hat{\pi}_{CS-ARDL,n} = \frac{\sum_{l=0}^{pz} \hat{\sigma}_{l,n}}{1 - \sum_{l=1}^{pf} \theta_{l,n}} \text{---(10)}$$

While the immediate coefficients for CS-ARDL are assessed in the following way:

$$\Delta Fd_{i,t} = \xi_i [Fd_{n,t-1} - \pi Z_{n,t}] - \sum_{n=0}^{pf-1} \theta_{1,i} \Delta_i Fd_{n,t-1} + \sum_{n=0}^{pz} \sigma_{1,n} \Delta_n Z_{n,t-1} + \sum_{n=0}^{px} \delta_n \bar{X}_t + \varepsilon_{n,t} \text{---(11)}$$

In the sixth step of the methodology section, we follow the (G.C., 2020; Raifu et al., 2023; Salahuddin & Gow, 2016; Sarkodie & Owusu, 2020; Voumik et al., 2023) and perform robustness analysis to confirm the viability of CS-ARDL that already performed in the methodology's fifth stage. We choose the "Feasible Generalized Least Squares (FGLS)" approach recommended by (N. Beck et al., 1995) and most recently used by (Çetin et al., 2023) for robustness check. If the signs and magnitude of the calculated coefficients through FGLS estimates are plausible that means the coefficients obtained using the CS-ARDL approach are authenticated and actual to elaborate the causal effects among the studied variables and further suggest some effective policy implications.

As a final stage, after establishing the validity of outcomes through robustness analysis, we opted to turn to causality analysis by applying the extended version of "Granger causality test" named the "Dumitrescu-Hurlin panel causality tests" (Dumitrescu & Hurlin, 2012) to identify and classify the causes and effects among the FD and study other variables such as EG, NRR, ICT, S, and CAB, when CSD is present. Emphasis of this causality approach is on the subsequent linear specification:

$$z_{it} = \alpha_i + \sum_{i=1}^J \eta_i^j z_{i,t-j} + \sum_{i=1}^j \delta_i^j y_{i,t-j} + \varepsilon_{i,t} \text{---(12)}$$

In the panel data model, the y and z are regarded as stationary variables for M entities across T times, where $i = 1, 2, 3, \dots, N$ individuals in a panel data model with $J \in N^*$ and $\delta_i = (\delta_i^1, \delta_i^2, \dots, \delta_i^k)'$. Where J represents the lag order, η_i^j is the autoregressive parameters, δ_i^j shows the slopes of regression coefficients. This advanced panel data technique recommended asymptotic critical values

for decision-making as endorsed by (Saldivia et al., 2020). Below are the null and alternate hypotheses for “Dumitrescu-Hurlin Panel causality test”;

H_0 = No causality among the panels Or (X does not homogenously cause Y)

H_1 = A causal connection in at least one cross – sectional unit Or (X does homogenously cause Y)

The calculated probability values associated with ($\bar{Z}$) statistic and ($\bar{W}$) statistic were used to determine whether to approve or deny the H_0 . Following formulas are used to get the numeric values of ($\bar{Z}$) statistic and ($\bar{W}$) statistic:

$$\bar{W} = \frac{1}{N} \sum_{i=1}^N W_i = J \times \frac{T - 2J - 1}{T - 2J - 3} \text{----- (13)}$$

$$\bar{Z} = \sqrt{\frac{N}{2J}} (\bar{W} - J) \text{----- (14)}$$

5. EMPIRICAL RESULTS AND DISCUSSIONS

The brief deliberations of the summary statistics (Table 2) of 107 economies from the years 2000 to 2021 serve as the starting point for this empirical debate. In Table 2, the first row and column contain the names of study variables and summary statistics. Average values for FD, ICT, NRR, GDP, CAB, and S are respectively 0.679, 0.872, 0.403, 0.575, 0.498, and 0.499. The NRR has the lowest median (0.363), but it also has the highest skewness (0.437). The ICT has the highest S.D value (0.508) but keeps the lowest value (1.892) for Kurtosis. The skewness value of CAB is bigger (0.014) than that of GDP (-0.493). The bottom half of Table 2 depicts the relationship among the studied variables. Except for ICT, all explanatory factors (GDP, NRR, CAB, and S) have a negative correlation with FD.

The findings to know the conclusive remarks about the occurrence of cross-sectional dependence (CSD) about each parameter under consideration are showcased in Table 3. Findings from the CD test (Pesaran, 2004), show the computed value is less than the p-value, which forces the researcher to deny the conjecture means the presence of CSD among the panels or countries. In the present modern world, globalization and liberalization are the most important sources that force the whole world to live and thrive like a combined family(Gozgor et al., 2020). Moreover, growing ICT, digitalization, automation and most importantly free trade agreements among different countries have tightly linked the economies to one another, so that each major economic action done by one economy directly influences the other's economies. Such spillover effects are the primary causes of the CSD issue. Furthermore, factors contributing to the issue of CSD include global financial and energy crises, as well as dependence on common and shared global financial institutions like the ‘World Bank’, and ‘International Monetary Funds’ (F. N. Khan et al., 2020).

In the Second step, the outcomes mentioned in Table 3 were, however, obtained by employing the tests of the delta family to determine whether or not there was slope homogeneity. The p-values calculated through the delta family suggested to disapprove the conjecture which means the slope heterogeneity existed in the model.

Table 2. Summary and correlation statistics

Statistics / Study Variables	FD	ICT	NRR	GDP	CAB	S
Mean	0.679	0.872	0.403	0.575	0.498	0.499
Median	0.632	0.838	0.363	0.608	0.487	0.495
S.Dev.	0.489	0.508	0.299	0.264	0.293	0.3
Skewness	0.33	0.183	0.437	-0.493	0.014	0.033
Max.	1.719	1.949	1	1	1	1
Min.	-0.096	0	0	0	0	0
Kurtosis	2.056	1.892	2.103	2.611	1.975	1.911
N	2354	2354	2354	2354	2354	2354
FD	1					
ICT	0.566	1				
NRR	-0.05	-0.076	1			
GDP	-0.071	-0.133	0.153	1		
CAB	-0.068	-0.061	0.092	0.002	1	
S	-0.0001	0.022	0.062	0.114	0.4	1

In the third step, after identifying the issues of CSD and Slope-heterogeneity through outcomes mentioned in Tables 2 and 3. We have executed the “CIPS and CADF tests” from the 2nd generation unit root family following the literature (Ahmad et al., 2023; Dogan & Seker, 2016; Tao et al., 2021; Zafar et al., 2019) to assess whether the research variables are stationary or not. According to outcomes mentioned in Table 4, every variable under consideration is stationary, either at first difference or on level.

Table 3. Slop homogeneity tests

	Test Statistic	Prob. Value
$\tilde{\Delta}$	22.380***	0.000
$\tilde{\Delta}_{ADJ}$	27.104***	0.000
(Δ_{HAC})	39.092***	0.000
$(\Delta_{HAC})_{ADJ}$	47.343***	0.000

Note: Statistical importance at a 1% level of significance is represented by the symbol ***.

Table 4. Unit root examination

Study Factors	CIPS statistic		CADF statistic	
	I(0)	I(1)	I(0)	I(1)
FD	-1.594***	-3.099	-1.590	-2.601***
ICT	-2.859	-3.321	-2.860***	-3.164***
NRR	-1.973***	-3.702	-2.549***	-3.203***
GDP	-3.043	-5.345	-2.313	-3.709***
CAB	-2.383	-4.325	-2.481**	-3.355***
S	-1.838***	-4.419	-2.080	-3.230***

Note: Signs ** and *** symbolize statistical importance at $\alpha = 1\%$ and 5% , respectively.

In step four, we displayed the findings for co-integration analysis in Table 5 by using the most appropriate tests of co-integration formulated by (Kao, 1999; Pedroni, 2004) and (Westerlund, 2005).

Based on the estimated p-values of these tests, we concluded to approve the H_1 that a sustained connection exists amongst the NRR, EG, ICT, CAB, S, and FD in 107 economies globally.

Table 5. Co-integration analysis

Tests	Statistic	probe-value
Pedroni test		
Altered Phillips-Perron t	10.7345***	0.000
Phillips-Perron t	-4.8622***	0.000
ADF t	-4.3201***	0.000
Kao test		
MDF t	-6.9751***	0.000
DF t	-3.3943***	0.000
ADF t	-4.4626***	0.000
U-MDF t	-8.5186***	0.000
U-DF t	-4.0848***	0.000
Westerlund		
Variance Ratio	4.4855***	0.000

Note: The symbol *** represents the statistical importance at a 1% significance level.

In the fifth stage, the execution of the CS-ARDL offers research coefficients both immediately and over an extended period as displayed in Table 6. Based on significant outcomes of CS-ARDL, ICT has a beneficial effect on FD, and the calculated value of ICT (0.223) over longer periods becomes significant at $\alpha=1\%$. It means that is one percent (1%) increase in ICT caused a 0.223% boost in financial development across 107 economies worldwide. This positive association between ICT and FD is empirically endorsed by (Alshubiri et al., 2019) for six GCC economies, (Owusu-Agyei et al., 2020) in the sample of forty-two African economies, and (M. S. Chien et al., 2020) for eighty-one economies globally. As the literature responded the reason behind this supportive role of ICT to smooth financial development is threefold; firstly ICT provides a secured and motorized digital transaction system(Mignamissi & Djijo T., 2021), secondly, it reduces the transaction cost and provide a secured path to enhance the confidence level between various financial actors, and thirdly, it reduced the problem of information asymmetric in the financial institutions and markets(M. S. Chien et al., 2020).

The computed coefficient value (-0.080) for natural resource rents is statistically meaningful at $\alpha=5\%$. Econometrically, we can interpret if the NRR rises by one percent, resulting in a -0.081% decline in FD among 107 sample economies, worldwide. These statistics concluded that NRR has a detrimental impact on FD, which demonstrated the reality of the "resource curse" phenomenon, globally. This inverse relationship between NRR and FD accords with (M. A. Khan et al., 2020)'s conclusions for eighty-seven (87) emerging and developing economies, globally, (Bhattacharyya & Hodler, 2014) for 133 countries globally, (Dwumfour & Ntow-Gyamfi, 2018) for thirty-eight African economies, (Guan et al., 2020) and (Z. Khan et al., 2020b) in case of China, and more recently (Çetin et al., 2023) for developing nations. The occurrence of the "resource curse" is primarily caused by excessive exports of earth's resources, which monopolize non-resource sectors like the manufacturing industry by only

supporting enterprises depending on natural resources (Zhang & Brouwer, 2019). Furthermore, excessive rent-seeking practices in economies with abundant natural resources encouraged inefficient resource exploitation, corruption, the ineffectiveness of various institutions, excessive government spending, and poor governance, all of which ultimately hampered financial as well as economic development (Javadi et al., 2017; Weidmann, 1999; Zhou Wen-xia; Chen Xiao-Yuan, 2014). On the other hand, the direction of the connection between FD and NRR in this study differs from the conclusions of (Shahbaz et al., 2018) and (Li et al., 2021), which both proved the NRR's beneficial effects on FD for G7 nations and USA, respectively.

Table 6. CS-ARDL Analysis's outcomes

Research Parameters	Long-run Statistic			Short-run Statistic		
Dependent Variable:	Coefficients	St. Error	Prob-v	Coefficients	St. Error	Prob-v
FD						
ICT	0.223***	0.053	0.000	0.197***	0.052	0.000
NRR	-0.080**	0.036	0.025	-0.116**	0.051	0.025
GDP	0.147***	0.055	0.008	0.161**	0.064	0.012
CAB	-0.086**	0.036	0.016	-0.102**	0.043	0.016
S	-0.079*	0.044	0.074	-0.090*	0.048	0.060
ECM(-1)	-1.228***	0.035	0.000	-0.228***	0.035	0.000
Diagnostic tests						
R^2			0.69			
F_{prob}			0.95			
CD-Statistics			0.80			
Number of countries			107			

Note: The symbols *, **, and *** denoted statistical worth at $\alpha = 1\%$, 5% and 10% , respectively.

The economic growth coefficients (0.161 and 0.147) throughout the short and long terms are statistically important at $\alpha=5\%$ and displayed in Table 6. The economic growth coefficient value (0.147) in the long term reflected that if there were a one percent rise in GDP, FD in 107 economies across the globe would increase by 0.147%. According to the literature review, the benefits of EG for FD is backed by the factual discoveries of (Li et al., 2021) in the G7 economics, (Yıldırım et al., 2020) for 16 developing economies, (Zaidi et al., 2019) in OECD economies, (Song et al., 2021a) taking scenario of 142 economies, and (Atil et al., 2020b) in case of Pakistan. The conception behind the positive and supportive role of economic growth in the process of FD is that it boosts individual savings through an increase in income levels because when the overall production of goods and services increases, it increases employment levels and purchasing power which ultimately increase the individual's participation in financial markets that positively contribute to strengthen the process of financial development (Appiah-Otoo & Song, 2021). In contrast to this investigation, (Çetin et al., 2023)' most recent empirical study demonstrated the adverse effects of EG on FD for 33 developing nations and suggested that EG impedes the FD's process in emerging nations by preventing the availability of funds to financial sectors due to the lowest saving pattern during the growth process of developing economies (Fosu, 2019). Additionally, it was determined by (Ben Naceur et al., 2014), that economic growth did not favorably contribute to the FD's process for MENA nations. Finally, (Cave et al., 2020) arrived at

the judgment for 101 economies across the world that FD (stock markets) is positively impacted by EG, while economic growth hurts financial development (banking sector).

The CS-ARDL findings mentioned in Table 6 also depicted, that the CAB's coefficient value (-0.086) is statistically significant at $\alpha = 5\%$. For interpretation, we can state that a 1% increase in CAB led to a reduction of 0.086% over the longer periods in the FD and 0.102% in the near term. Such statistically substantial correlations between CAB and FD demonstrate that current account balances have an adverse influence on FD in 107 economies, worldwide. These noteworthy conclusions align with those made by (Owusu-Agyei et al., 2020) regarding the 42 African economies, (Kearney & Daly, 1998) in the case of the Australian economy, and more recently (Çetin et al., 2023) for thirty-three (33) developing economies. On the other side, Our findings conflict with (Ben Naceur et al., 2014) empirical investigation of MEANA economies. Countries' financial sectors face a funding shortage as a result of current account imbalances and changes in savings habits, which eventually hurts the process of financial development (Maitra, 2018). Furthermore, it was suggested by (Christiansen et al., 2009) that in the situation of a current account deficit, the economies experience several macroeconomic consequences, including unexpected changes in the values of local currencies and fluctuation in exchange rates due to the various interior and exterior shocks, which serve as the origin of this particular negative association between CAB-FD.

Table 6 also revealed the statistically significant coefficient values (-0.079, -0.090) at $\alpha = 10\%$ for savings over long and short periods. The financial development is reduced by 0.079% and 0.090% immediately and over the periods respectively, for every one percent increase in gross savings.

Table 7. Robustness Analysis

Dependent Variable: FD	FGLS	
	Coefficients	P-value
ICT	0.479***	0.000
NRR	-0.045*	0.093
GDP	0.106***	0.000
CAB	-0.074***	0.000
S	-0.060**	0.036
Constant	0.287***	0.000
Diagnostic Statistic		
Wald chi2	473.73	
P-value	0.000	
Numbers of Panels	107	

Note: The level of statistical importance is shown by the symbols *, **, and *** at the 10%, 5%, and 1% significance levels, respectively.

Similar outcomes were obtained by (Ben Naceur et al., 2014), who examined the detrimental effects of gross saving on financial development in the instance of MENA nations, and (Phuc Nguyen et al., 2020) for 109 economies globally. Most recently, (Çetin et al., 2023) empirically have similar findings to the current research study for 33 emerging economies. Table 6's bottom section displayed

the results of diagnostic tests for CS-ARDL. The computed value of R^2 is 0.69, which indicates that 69% variations in response variables can be accounted for through independent variables and the model's CD statistic value shows the problem of CSD has been resolved. So the model results are appropriate and statistically suitable for further economic insights and policy recommendations. The coefficients for longer periods, obtained by employing "CS-ARDL" are likewise the robustness tests evaluated in the sixth stage of methodology, and results from the FGLS estimator are presented with the help of Table 7. The coefficient signs and directions for each research variable are consistent with the findings of "CS-ARDL estimates", which validates the choice of study econometric technique. Additionally, the probe-value of Wald (χ^2) is also statistically important which indicates the selection of the study model is very suitable and adequate.

Last but not least, to strengthen the study results, we move towards the causality analysis by employing the DH test to examine the causative linkages among analyzed factors after the execution of cointegration analysis, CS-ARDL, and robustness analysis. The causal graph displayed in Fig 2, represents the causality relationships among the study-dependent and response variables. Table 8 presents the findings. The p-values against computed $\bar{Z}$ -Stat suggested, that rejecting the null hypothesis amongst the ICT and FD, means there exists a twofold causal link between ICT and FD. The causality linkages' directions are comparable to the outcomes of (Gheraia et al., 2022) for Saudi Arabia and (Haseeb et al., 2019) taking the sample of BRICS economies.

Table .8 Outcomes for DH-Test

H_0	$\bar{Z}$ -Stat	$\bar{Z}$ -Stat	Prob-V	Direction
ICT does not affect FD	16.5051	21.3755	0.000	$ICT \leftrightarrow FD$
FD does not affect ICT	19.2583	24.7886	0.000	$FD \leftrightarrow ICT$
NRR has no impact on FD	5.5666	7.8152	0.000	$NRR \leftrightarrow FD$
FD does not affect NRR	4.4193	6.3929	0.000	$FD \leftrightarrow NRR$
GDP has no impact on FD	32.0021	40.5869	0.000	$GDP \leftrightarrow FD$
FD does not granger-cause GDP	6.0197	8.3769	0.000	$FD \leftrightarrow GDP$
CAB has no impact on FD	12.9627	16.9840	0.000	$CAB \leftrightarrow FD$
FD does not affect CAB	5.3230	7.5131	0.000	$FD \leftrightarrow CAB$
S has no impact on FD	5.9666	8.3110	0.000	$S \leftrightarrow FD$
FD does not granger-cause S	7.1651	9.7968	0.000	$FD \leftrightarrow S$

Note: The ideal lag time is chosen through SIC criteria. *** represents the statistical significance at 1%.

Furthermore, based on the derived probability values for $\bar{Z}$ -Statistics, the causality analysis once more recommended accepting the alternative hypothesis in the cases of NRR and FD. The refusal of the null hypothesis indicates that NRR and FD are causally related in both directions, which means the NRR causes the FD and vice versa for 107 economies worldwide. Our results concur with those of (Çetin et al., 2023), which proved a bidirectional association between earth's resources and FD taking the sample of thirty-three emerging economies. The identical conclusions were discovered by (Shahbaz

et al., 2018) considering the case of the USA, (Latif et al., 2014) for Malaysia, however (Guan et al., 2020) and (Jiang et al., 2021) concluded a unidirectional association between NRR and FD for China, where FD does not contribute to NRR.

Similarly, we discover a bidirectional causal link among EG and FD, because we refute H_0 that GDP does affect FD, based on computed probability values as mentioned in Table 8. Our significant findings regarding the causal relationship between EG and FD are similar to outcomes discovered by (Çetin et al., 2023) for thirty-three emerging economies, (Calderón & Liu, 2003) for industrial and emerging economies, and (Shan & Morris, 2002) in the case of nineteen (19) OECD economies. However, the results of causality analysis do not agree with those of (Liang & Teng, 2006), who concluded that EG and FD have a single-direction causal connection in the case of China, further (Christopoulos & Tsionas, 2004) demonstrated that financial depth and economic well-being are causally related in a single direction for ten (10) emerging nations. Further, regarding the entire sample and subset of emerging economies across 142 nations, (Song et al., 2021b) found a one-way long-term unidirectional correlation between FD and EG. Lastly, (Nain & Kamaiah, 2014) empirically investigated that EG and FD are not causally related to each other in India.

Additionally, the probability value computations using the Dumitrescu-Hurlin Panel causality test further demonstrated the causation association somewhere between FD and CAB in both directions i.e., $CAB \rightarrow FD$; $FD \rightarrow CAB$. Similar to these outcomes, very recently, (Çetin et al., 2023) also examined the two-way causality relationship between CAB and FD by using the Dumitrescu-Hurlin Panel causality test for developing nations. Our research results, however, disagree with those of (Acikalin et al., 2008), who investigated one-way causation from CAB to FD ($CAB \rightarrow FD$) for the Turkish economy. In the same way, the results are not parallel to the conclusion by (Ahad, 2017) for Pakistan.

Lastly, the causality analysis findings listed in Table 8 also depicted that both savings and FD are affected by one another. The conclusions about the causality linkage between S and FD are comparable to those of (Çetin et al., 2023) for 33 emerging economies, who concluded that there is a causal link between S and FD in both directions, meaning both savings and financial development are impacted by one another. However, the conclusions of this investigation differ from those of (Odhiambo, 2008) and (Bağcı, 2020) in the scenarios of Kenya and Turkish economies, respectively. In a similar vein, (Sahoo and Dash, 2013) looked at the five South Asian economies and came to a different conclusion that is incompatible with the findings of this research study.

6. CONCLUSION AND POLICY SUGGESTIONS

Three other sub-headings make up this section. The first sub-heading provides some suggestions to conclude this research study, the second sub-heading discusses some recommendations for future policies according to the research's results and the third sub-heading gives some suggestions for future research studies on the theme of the current study.

6.1. Conclusion

Any nation's financial sector's expansion has a significant impact on that nation's economic well-being. All the important economic elements that contribute substantially to the endeavor of economic

development are considered factors that influence the procedure of financial development. The realistic link between the financial industry's evolution with its numerous factors begins with an examination of the (King & Levine, 1993) and particularly by (Levine, 2005b). After this many researchers (Akwasi Gyamfi et al., 2023; Atil et al., 2020a; Bağcı, 2020; Çoban & Topcu, 2013; Dogan et al., 2020; Jiang et al., 2021; M. A. Khan et al., 2020, 2022; Li et al., 2021; Mignamissi & Djijo T., 2021; Shahbaz et al., 2018, 2022; Song et al., 2021b; Tang et al., 2022; Yıldırım et al., 2020) empirically explored the construction between FD and its various determinants including savings, corruption, globalization, oil prices, earth's resources, trade liberalization, gross fixed capital formation, gross domestic product, institutional quality, education, capitalization, national culture, labour, energy consumption, business regulations, technological innovation, export diversity, inflation for different regions and economies such as 142 economies, sixteen developing economies, eighty-seven (87) emerging and developing economies, developing and emerging economies, G7 economies, resource rich economies, top-10 financially developed countries, ASEAN countries, and thirty-four (34) African countries as well as in the cases of Turkey, Pakistan, China, USA and Tanzania. More recently, (Çetin et al., 2023; Owusu-Agyei et al., 2020) preferred to use EG, NRR, CAB, internet usage, trade openness, FDI, and savings as explanatory variables in their demand functions of FD for 33 emerging economies and sub-Saharan African economies respectively. In the current study, we have developed the demand function uniquely by incorporating the index of ICT along with NRR, EG, CAB, and savings in the case of 107 countries globally.

This is the first and most original study that uniquely develops the index of ICT by taking into account the four different indicators. It also employs advanced dynamic estimation approaches like "CS-ARDL" and "Dumitrescu-Hurlin causality test" to carry out an empirical study on the impact of ICT, NRR, EG, CAB, and GS on FD. The methodology section comprises seven stages as follows; In the first phase, we executed the CD-test initiated by (Pesaran, 2004) and analyzed the "Cross-sectional dependence", secondly, moved towards the slop homogeneity test created by (Blomquist & Westerlund, 2013), then the coexistence of slop-heterogeneity and CSD issues guided us to perform the 2nd generation unit root analysis by using the "CIPS and CADF tests" of (Pesaran, 2007) in third stage. While, in the fourth stage, we performed the co-integration analysis by using the (Kao, 1999), (Pedroni, 2004), and (Westerlund, 2005) statistic of co-integration. The fifth and sixth stages comprise the "CS-ARDL" established by (Chudik et al., 2016) and Robustness analysis, finally, in the seventh stage, we perform the causality analysis by executing the (Dumitrescu & Hurlin, 2012) test of causality. The empirical results derived through CS-ARDL suggested the constructive and statistically important impression of ICT and GDP on FD, but CAB, NRR as well gross savings hurt the procedure of FD taking a sample of 107 economies globally. ICT and economic growth have a positive impact on financial development by contributing to the balanced growth of all sectors. This is achieved by focusing on the diverse economy and promoting steady and balanced economic expansion through efficient resource allocation and economic stability. The negative correlation between natural resource rents, savings, current account balance, and financial development hinders the progress of financial development by discouraging economic diversification and neglecting the balanced growth of all sectors. This leads to inefficiencies and promotes unequal distribution of resources, which in turn fosters political and

economic instabilities, ultimately impeding the process of financial development. These linkages between the study variables are also authenticated through the executions of FGLS estimators and causality analysis in the seventh stage. Finally, we concluded our analysis by suggesting some effective policy suggestions for sampled economies, based on our empirical investigations. According to (Boyce and Herbert Emery, 2011), Growth rate and the availability of natural resources are inversely connected, although income levels and growth rate are positively correlated in the case of the USA.

6.2. Policy Recommendations

Based on the realistic outcomes and conclusion, the following few policies are suggested for the financial development in sample countries globally:

First and foremost, keeping in view the harmful and progressive effects of NRR and ICT on FD, we strongly recommend that Governments and policymakers should reevaluate the current policies on the inefficient usage of natural resource 'earnings and the poor management of natural resources. To effectively use the natural resource rents for productive purposes and efficiently manage the natural resources as suggested by (Z. Khan et al., 2020b), they should move towards automation by adopting the ICT infrastructure (internet, broadband expansion) to support and strengthen the financial development process.

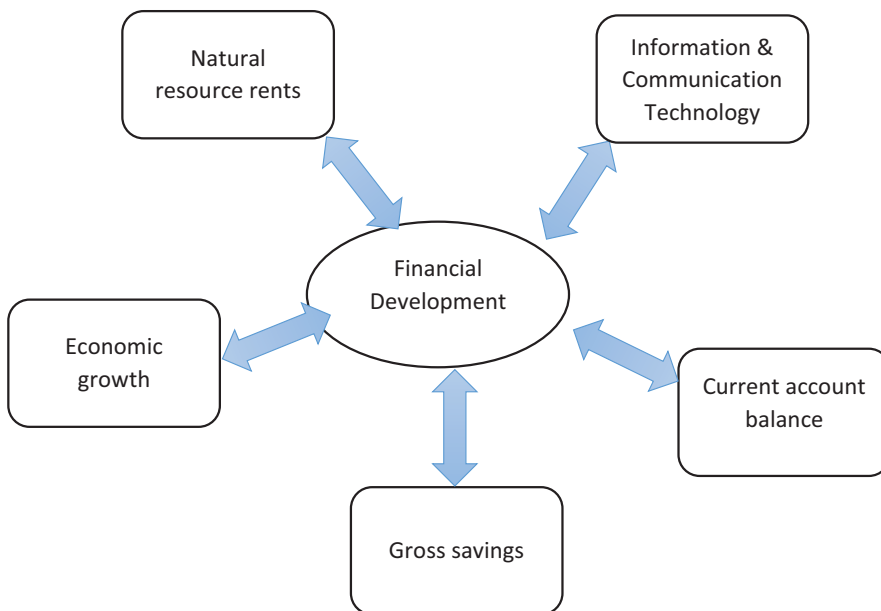


Fig. 2. Causal Graph for Causality Analysis

Secondly, taking into account EG's beneficial effects on FD, it is advised that policymakers and practitioners reconsider their existing regulations or formulize new ones regarding the consumption of earnings received through natural resource rents because these spending directly or indirectly affects

each nation's GDP level. The new policies should encourage to use of these earnings to provide investment funds in private sectors, especially in the manufacturing sector which boosts the nation's economic growth positively, and supports the economy's internal credit sectors that are ultimately strengthening the financial sectors globally.

Finally, because of the destructive impact of the CAB on FD in this study; we strongly suggested governments should launch those projects and take protective measures that encourage domestic savings that positively convert the current account deficit into a surplus, provide additional funds to financial markets and accelerates the real sector investment that's ultimately strengthen the financial sector development.

6.3. Recommendation for future researchers

The limitations of this research study, like those of all viable and fruitful research investigations, may serve as motivations for future researchers to pursue this line of inquiry further. Below are the few limitations that need to be required to further investigate:

Firstly and most importantly, this research considers the sample of 107 countries around the world, which includes all low, lower-middle, upper-middle, and high-income nations together. Future investigations can be conducted by splitting the whole data into four sub-samples to efficiently reconsider the state of ICT, economic growth, natural resource rents, CAB, and gross savings to effectively suggest better policies according to the state of economic characteristics of each sub-sample.

Secondly, because of the data constraints, this research employs the four different indicators to construct the index of financial development, future research may reconstruct this index in a precise way with a large data set by considering more indicators from all four dimensions i.e. Depth, access, efficiency, and stability.

Finally, in future studies other important variables such as urbanization, technology, and innovation, Artificial Intelligence, internal and external migrations, population growth may be included in the FD's demand function to reveal nexuses amongst financial development and its determinants in a unique way and better and effective policies to strengthen the financial sectors.

Appendix

Table 1: Variables Description and Data Source

Variables	Signs	Definition	Source
Financial Development Indicators			
Domestic Credit to the private sector (% of GDP)	DCTPS	Availability of 'financial resources from various financial firms and institutions (e.g. finance, leasing, insurance, foreign-exchange corporations, and pension funds) to private sector investors.	WDI
Domestic Credit; to Private Sector by Banks (% of GDP)	DCTPSBB	Providing financial resources to private investors by depository institutions other than the central bank.	WDI
Broad Money (% of GDP)	BM	The amount of money that is not available in bank deposits means currencies issued outside the central government.	WDI
Deposit Interest rate (%)	DIR	Margin of payments on various types of deposits in banks and other financial institutions.	WDI
Financial Development'	FD	'Index of Financial development'.	Author Construction
ICT Indicators			
Subscriptions to Mobile Cellular / 100 people)	MC	It includes public telephone services that provide users with access to the PSTN via mobile phones, as well as prepaid and postpaid subscriptions.	WDI
Internet users (% of the population)	IU	It covers anyone who uses the internet through any digital device.	WDI
subscription to Fixed Broadband / Per 100 people	FB	It includes all users of high-speed public internet (256kbit/s) through different communication i.e. (i.e. satellite broadband, terrestrial fixed wireless broadband, DS'L, fiber to the home, and other wired-based 'broad-band subscription')'.	WDI
subscription to Fixed Telephone service / Per 100 people	FT	This includes public payphones, landlines, ISDN "voice over IP" and fixed local wireless subscribers.	WDI
Information & Communication Technology index	ICT	Information and Communication Technology Index. (Añón Higón et al., 2017; M. S. Chien et al., 2020)	Author Construction
Study other variables			
'Economic Growth	GDP	It is the GDP per capita growth rate annually, calculated by dividing the GDP by half of the annual population, without taking into account considering the depreciations. (Asif et al., 2020)	WDI
Natural Resource Rents	NRR	It represents the rental income derived from all natural resources, including mineral, timber, oil, and gas (Asif et al., 2020; Li et al., 2021).	WDI

Gross Savings	S	It is measured by subtracting the total consumption from the national income and adding the net transfers. (Bayar, 2014)	WDI
Current account balance	CAB	It is calculated by adding the net primary and secondary income along with net exports of goods and services. (Çetin et al., 2023)	Author Construction

Annex-A: List of sample economies

Albania	Congo Rep.	Korea Rep.	Paraguay
Algeria	Costa Rica	Kyrgyz Rep.	Peru
Armenia	Cote d'Ivoire	Lebanon	Philippines
Australia	Croatia	Lesotho	Romania
Azerbaijan	Dominican Rep.	Libya	Russian Federation
Bahamas, The	Ecuador	Macao SAR, China	Rwanda
Bahrain	Egypt, Arab Rep.	Madagascar	Senegal
Bangladesh	Eswatini	Malaysia	Serbia
Barbados	Fiji	Mali	Singapore
Belarus	Gabon	Mauritius	South Africa
Benin	Gambia, The	Mexico	Sri Lanka
Bolivia	Georgia	Moldova	Sweden
Bosnia and Herzegovina	Ghana	Mongolia	Switzerland
Botswana	Guatemala	Montenegro	Tajikistan
Brazil	Guinea	Morocco	Tanzania
Brunei Darussalam	Guinea-Bissau	Mozambique	Thailand
Bulgaria	Haiti	Myanmar	Timor-Leste
Burkina Faso	Honduras	Namibia	Togo
Cabo Verde	Hong Kong SAR, China	New Zealand	Tonga
Cambodia	Hungary	Nicaragua	Turkiye
Cameroon	Indonesia	Niger	Uganda
Canada	Iraq	Nigeria	Ukraine
Chile	Israel	North Macedonia	Uruguay
China	Jamaica	Norway	Vanuatu
Colombia	Japan	Oman	Zambia
Comoros	Jordan	Pakistan	Zimbabwe
Congo, Dem.Rep.	Kenya	Panama	

REFERENCES

- Acikalin, S., Aktas, R., & Unal, S. (2008). Relationships between stock markets and macroeconomic variables: An empirical analysis of the Istanbul Stock Exchange. *Investment Management and Financial Innovations*, 5(1), 8–16.
- Adebayo, T. S., Ullah, S., Kartal, M. T., Ali, K., Pata, U. K., & Ağa, M. (2023). Endorsing sustainable development in BRICS: The role of technological innovation, renewable energy consumption, and natural resources in limiting carbon emission. *Science of the Total Environment*, 859(August 2022). <https://doi.org/10.1016/j.scitotenv.2022.160181>
- Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? *Review of Development Finance*, 3(4), 192–203. <https://doi.org/10.1016/j.rdf.2013.11.001>
- Ahad, M. (2017). Impact of Financial Development on Trade Balance: An ARDL Cointegration and Causality Approach for Pakistan. *Global Business Review*, 18(5), 1199–1214. <https://doi.org/10.1177/0972150917710152>
- Ahmad, M., Jiang, P., Majeed, A., Umar, M., Khan, Z., & Muhammad, S. (2020). The dynamic impact of natural resources, technological innovations and economic growth on ecological footprint: An advanced panel data estimation. *Resources Policy*, 69(July), 101817. <https://doi.org/10.1016/j.resourpol.2020.101817>
- Ahmad, M., Kuldashaeva, Z., Nasriddinov, F., Balbaa, M. E., & Fahlevi, M. (2023). Is achieving environmental sustainability dependent on information communication technology and globalization? Evidence from selected OECD countries. *Environmental Technology and Innovation*, 31, 103178. <https://doi.org/10.1016/j.eti.2023.103178>
- Akande, A., Cabral, P., & Casteleyn, S. (2019). Assessing the Gap between Technology and the Environmental Sustainability of European Cities. *Information Systems Frontiers*, 21(3), 581–604. <https://doi.org/10.1007/s10796-019-09903-3>
- Akwasi Gyamfi, B., Taiwo Onifade, S., Haouas, I., & Fatai Adedoyin, F. (2023). The impacts of resource abundance and export diversity on financial development in the South Asian economic bloc. *Heliyon*, 9(4), e15105. <https://doi.org/10.1016/j.heliyon.2023.e15105>
- Ali, A., Ramakrishnan, S., & Faisal. (2022). Financial development and natural resources. Is there a stock market resource curse? *Resources Policy*, 75(October 2021), 102457. <https://doi.org/10.1016/j.resourpol.2021.102457>
- Alshubiri, F., Jamil, S. A., & Elheddad, M. (2019). The impact of ICT on financial development: Empirical evidence from the Gulf Cooperation Council countries. *International Journal of Engineering Business Management*, 11, 1–14. <https://doi.org/10.1177/1847979019870670>
- Ang, J. B. (2008). What are the mechanisms linking financial development and economic growth in Malaysia? *Economic Modelling*, 25(1), 38–53. <https://doi.org/10.1016/j.econmod.2007.04.006>
- Ang, J. B. (2011). Savings mobilization, financial development and liberalization: The case of Malaysia. *Review of Income and Wealth*, 57(3), 449–470. <https://doi.org/10.1111/j.1475-4991.2010.00411.x>
- Appiah-Otoo, I., & Song, N. (2021). The impact of ICT on economic growth-Comparing rich and poor countries. *Telecommunications Policy*, 45(2), 102082. <https://doi.org/10.1016/j.telpol.2020.102082>
- Asaleye, A. J., & Strydom, K. (2022). Assessing Productivity Channels of Human Capital in the Southern African Development Community: New Insights from Women's Empowerment. *Journal of Risk and Financial Management*, 15(11). <https://doi.org/10.3390/jrfm15110533>
- Asif, M., Khan, K. B., Anser, M. K., Nassani, A. A., Abro, M. M. Q., & Zaman, K. (2020). Dynamic interaction between financial development and natural resources: Evaluating the 'Resource curse' hypothesis. *Resources Policy*, 65(December 2019), 101566. <https://doi.org/10.1016/j.resourpol.2019.101566>
- Asongu, S. A. (2014). Knowledge Economy and Financial Sector Competition in African Countries.

African Development Review, 26(2), 333–346.

- Atil, A., Nawaz, K., Lahiani, A., & Roubaud, D. (2020a). Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization. *Resources Policy*, 67(November 2019), 101683. <https://doi.org/10.1016/j.resourpol.2020.101683>
- Atil, A., Nawaz, K., Lahiani, A., & Roubaud, D. (2020b). Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization. *Resources Policy*, 67(April), 101683. <https://doi.org/10.1016/j.resourpol.2020.101683>
- Auty, R., & Warhurst, A. (1993). Sustainable development in mineral exporting economies. *Resources Policy*, 19(1), 14–29. [https://doi.org/10.1016/0301-4207\(93\)90049-S](https://doi.org/10.1016/0301-4207(93)90049-S)
- Azam, M., & Haseeb, M. (2021). Determinants of foreign direct investment in BRICS- does renewable and non-renewable energy matter? *Energy Strategy Reviews*, 35(March), 100638. <https://doi.org/10.1016/j.esr.2021.100638>
- Badeeb, R. A., Lean, H. H., & Clark, J. (2017). The evolution of the natural resource curse thesis: A critical literature survey. *Resources Policy*, 51(October 2016), 123–134. <https://doi.org/10.1016/j.resourpol.2016.10.015>
- Bağcı, A. (2020). Saving, Financial Development and Economic Growth Nexus in Turkey: New Evidence from Asymmetric Causality Analysis. *Gaziantep University Journal of Social Sciences*, 19(1), 220–237.
- Baland, J. M., & Francois, P. (2000). Rent-seeking and resource booms. *Journal of Development Economics*, 61(2), 527–542. [https://doi.org/10.1016/S0304-3878\(00\)00067-5](https://doi.org/10.1016/S0304-3878(00)00067-5)
- Baltagi, B. H., Demetriades, P. O., & Law, S. H. (2009). Financial development and openness: Evidence from panel data. *Journal of Development Economics*, 89(2), 285–296. <https://doi.org/10.1016/j.jdevco.2008.06.006>
- Bayar, Y. (2014). Financial Development and Domestic Savings in Emerging Asian Countries. *Theoretical and Applied Economics*, XXI(7), 55–66. <https://www.researchgate.net/publication/333668204>
- Beck, N., Katz, J. N., American, T., & Science, P. (1995). What to do (and not to do) with Time-Series Cross-Sectional Data. *Political Science*, 89(3), 634–647.
- Beck, T. (2002). Financial Development and International Agricultural Trade: Is There a Connection. *Journal of International Economics*, 57, 1–27. www.elsevier.com/locate/econbase
- Beck, T., Demirgüç-Kunt, A., & Honohan, P. (2009). Access to financial services: Measurement, impact, and policies. *World Bank Research Observer*, 24(1), 119–145. <https://doi.org/10.1093/wbro/lkn008>
- Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance*, 28(3), 423–442. [https://doi.org/10.1016/S0378-4266\(02\)00408-9](https://doi.org/10.1016/S0378-4266(02)00408-9)
- Behera, J., & Sahoo, D. (2022). Asymmetric relationships between information and communication technology (ICT), globalization , and human development in India : evidence from non - linear ARDL analysis. *Journal of Economic Structures*. <https://doi.org/10.1186/s40008-022-00269-5>
- Ben Naceur, S., Cherif, M., & Kandil, M. (2014). What drives the development of the MENA financial sector? *Borsa Istanbul Review*, 14(4), 212–223. <https://doi.org/10.1016/j.bir.2014.09.002>
- Bhattacharyya, S., & Hodler, R. (2014). Do Natural Resource Revenues Hinder Financial Development? The Role of Political Institutions. *World Development*, 57, 101–113. <https://doi.org/10.1016/j.worlddev.2013.12.003>
- Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics and Finance*, 6(1). <https://doi.org/10.1080/23322039.2018.1449780>

- Blomquist, J., & Westerlund, J. (2013). Testing slope homogeneity in large panels with serial correlation. *Economics Letters*, 121(3), 374–378. <https://doi.org/10.1016/j.econlet.2013.09.012>
- Boyce, J. R., & Herbert Emery, J. C. (2011). Is a negative correlation between resource abundance and growth sufficient evidence that there is a “resource curse”? *Resources Policy*, 36(1), 1–13. <https://doi.org/10.1016/j.resourpol.2010.08.004>
- Brunnschweiler, C. N. (2008). Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth. *World Development*, 36(3), 399–419. <https://doi.org/10.1016/j.worlddev.2007.03.004>
- Calandra, D., Secinaro, S., Massaro, M., Dal Mas, F., & Bagnoli, C. (2023). The link between sustainable business models and Blockchain: A multiple case study approach. *Business Strategy and the Environment*, 32(4), 1403–1417. <https://doi.org/10.1002/bse.3195>
- Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, 72(1), 321–334. [https://doi.org/10.1016/S0304-3878\(03\)00079-8](https://doi.org/10.1016/S0304-3878(03)00079-8)
- Cave, J., K. Chaudhuri, & Kumbhakar, S. C. (2020). Do banking sector and stock market development matter for economic growth? *Empirical Economics*, 59(4), 1513–1535. <https://doi.org/10.1007/s00181-019-01692-7>
- Çetin, M., Sarıgül, S. S., Işık, C., Avcı, P., Ahmad, M., & Alvarado, R. (2023). The impact of natural resources, economic growth, savings, and current account balance on financial sector development: Theory and empirical evidence. *Resources Policy*, 81(January). <https://doi.org/10.1016/j.resourpol.2023.103300>
- Cheng, C., Chien, M., & Lee, C. (2020). ICT diffusion, financial development, and economic growth: An international cross-country analysis. *Economic Modelling*, February. <https://doi.org/10.1016/j.econmod.2020.02.008>
- Cherif, M., & Dreger, C. (2016). Institutional Determinants of Financial Development in MENA countries. *Review of Development Economics*, 20(3), 670–680. <https://doi.org/10.1111/rode.12192>
- Chien, M., Cheng, C., & Ayu, M. (2020). The non-linear relationship between ICT diffusion and financial development. *Telecommunications Policy*, 44(9), 102023. <https://doi.org/10.1016/j.telpol.2020.102023>
- Chien, M. S., Cheng, C. Y., & Kurniawati, M. A. (2020). The non-linear relationship between ICT diffusion and financial development. *Telecommunications Policy*, 44(9), 102023. <https://doi.org/10.1016/j.telpol.2020.102023>
- Christiansen, L., Prati, A., Ricci, L., & Tressel, T. (2009). External Balance in Low Income Countries. *IMF Working Papers*, 09(221), 1. <https://doi.org/10.5089/9781451873689.001>
- Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: Evidence from panel unit root and cointegration tests. *Journal of Development Economics*, 73(1), 55–74. <https://doi.org/10.1016/j.jdevco.2003.03.002>
- Chudik, A., Mohaddes, K., Pesaran, M. H., & Raissi, M. (2016). Long-run effects in large heterogeneous panel data models with cross-sectionally correlated errors. *Advances in Econometrics*, 36, 85–135. <https://doi.org/10.1108/S0731-905320160000036013>
- Çoban, S., & Topcu, M. (2013). The nexus between financial development and energy consumption in the EU: A dynamic panel data analysis. *Energy Economics*, 39, 81–88. <https://doi.org/10.1016/j.eneco.2013.04.001>
- Dabbous, A. (2018). The impact of information and communication technology and financial development on energy consumption: A dynamic heterogeneous panel analysis for MENA countries. *International Journal of Energy Economics and Policy*, 8(4), 70–76.
- Das, A., Chowdhury, M., & Seaborn, S. (2018). ICT Diffusion, Financial Development and Economic Growth: New Evidence from Low and Lower Middle-Income Countries. *Journal of the Knowledge Economy*, 9(3), 928–947. <https://doi.org/10.1007/s13132-016-0383-7>

- De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World Development*, 23(3), 433–448. [https://doi.org/10.1016/0305-750X\(94\)00132-I](https://doi.org/10.1016/0305-750X(94)00132-I)
- Deng, Q. S., Alvarado, R., Cuesta, L., Tillaguango, B., Murshed, M., Rehman, A., Işık, C., & López-Sánchez, M. (2022). Asymmetric impacts of foreign direct investment inflows, financial development, and social globalization on environmental pollution. *Economic Analysis and Policy*, 76, 236–251. <https://doi.org/10.1016/j.eap.2022.08.008>
- Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, 84(2), 299–329. <https://doi.org/10.1016/j.jfineco.2006.03.004>
- Dogan, E., Madaleno, M., & Altinoz, B. (2020). Revisiting the nexus of financialization and natural resource abundance in resource-rich countries: New empirical evidence from nine indices of financial development. *Resources Policy*, 69(August), 101839. <https://doi.org/10.1016/j.resourpol.2020.101839>
- Dogan, E., & Seker, F. (2016). An investigation on the determinants of carbon emissions for OECD countries: empirical evidence from panel models robust to heterogeneity and cross-sectional dependence. *Environmental Science and Pollution Research*, 23(14), 14646–14655. <https://doi.org/10.1007/s11356-016-6632-2>
- Domowitz, I. (2002). Liquidity, transaction costs, and reintermediation in electronic markets. *Journal of Financial Services Research*, 22(1–2), 141–157. <https://doi.org/10.1023/A:1016077023185>
- Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450–1460. <https://doi.org/10.1016/j.econmod.2012.02.014>
- Dwumfour, R. A., & Ntow-Gyamfi, M. (2018). Natural resources, financial development and institutional quality in Africa: Is there a resource curse? *Resources Policy*, 59(July), 411–426. <https://doi.org/10.1016/j.resourpol.2018.08.012>
- Engle, R.F; Granger, C. W. J. (1987). Co-Integration and Error Correction : Representation , Estimation , and Testing. *The Econometric Society*, 55(2), 251–276.
- Erum, N., & Hussain, S. (2019). Corruption, natural resources and economic growth: Evidence from OIC countries. *Resources Policy*, 63(March), 101429. <https://doi.org/10.1016/j.resourpol.2019.101429>
- Farouq, I., Sulong, Z., Ahmad, U., Jakada, A., & Sambo, N. (2020). Heterogeneous Data Approach on Financial development of Selected African Leading Economies. *Data in Brief*, 30. <https://doi.org/10.1016/j.dib.2020.105670>
- Feng, L., Zhao, P., Ding, Y., & Liu, B. (2021). Rank-based tests of cross-sectional dependence in panel data models. *Computational Statistics and Data Analysis*, 153, 107070. <https://doi.org/10.1016/j.csda.2020.107070>
- Fosu, P. (2019). The Determinants of Economic Growth: The Role of Infrastructure. *Theoretical and Applied Economics*, XXI(6), 23–36. <https://mp.ra.ub.uni-muenchen.de/id/eprint/93101>
- G.C., S. (2020). Relationship between Trade Openness, Financial Development and Economic Growth of Nepal: Evidence from a Developing Country. *Quest Journal of Management and Social Sciences*, 2(2), 206–224. <https://doi.org/10.3126/qjmss.v2i2.33270>
- Gheraia, Z., Abid, M., Sekrafi, H., & Abdelli, H. (2022). The moderating role of ICT diffusion between financial development and economic growth: a bootstrap ARDL approach in Saudi Arabia. *International Technology for Development*, 4, 816–836. <https://doi.org/10.1080/02681102.2021.1998759>
- Gokmenoglu, K. K., & Rustamov, B. (2019). Examining the World Bank Group lending and natural resource abundance induced financial development in KART countries. *Resources Policy*, 63(June), 101433. <https://doi.org/10.1016/j.resourpol.2019.101433>
- Goldsmith, R. W. (1959). Financial Structure and Development as a Subject for International Comparative Study. *Yale University, Press*, 114–123. <http://www.nber.org/chapters/c4417%0D>

- González-Páramo, J. M. (1995). Financial innovation in the digital age: Challenges for regulation and supervision. *Revista de Estabilidad Financiera*, 32, 9–37.
- Gozgor, G., Mahalik, M. K., Demir, E., & Padhan, H. (2020). The impact of economic globalization on renewable energy in the OECD countries. *Energy Policy*, 139(February), 111365. <https://doi.org/10.1016/j.enpol.2020.111365>
- Granger, C. W. J. (1981). Some Properties of time series data and their use in Econometric Model Specification. *Journal of Econometrics*, 16, 121–130.
- Gu, J., Gouliamos, K., Lobont, O. R., & Nicoleta-Claudia, M. (2021). Is the fourth industrial revolution transforming the relationship between financial development and its determinants in emerging economies? *Technological Forecasting and Social Change*, 165(January), 1–6. <https://doi.org/10.1016/j.techfore.2020.120563>
- Guan, J., Kirikkaleli, D., Bibi, A., & Zhang, W. (2020). Natural resources rents nexus with financial development in the presence of globalization: Is the “resource curse” exist or myth? *Resources Policy*, 66(February 2020), 101641. <https://doi.org/10.1016/j.resourpol.2020.101641>
- Hadj, T. B., & Ghodbane, A. (2021). Do natural resources rents and institutional development matter for financial development under quantile regression approach? *Resources Policy*, 73(June), 102169. <https://doi.org/10.1016/j.resourpol.2021.102169>
- Haseeb, A., Xia, E., Saud, S., Ahmad, A., & Khurshid, H. (2019). Does information and communication technologies improve environmental quality in the era of globalization? An empirical analysis. *Environmental Science and Pollution Research*, 26(9), 8594–8608. <https://doi.org/10.1007/s11356-019-04296-x>
- Hashem Pesaran, M., & Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of Econometrics*, 142(1), 50–93. <https://doi.org/10.1016/j.jeconom.2007.05.010>
- Hsu, C. C., Chau, K. Y., & Chien, F. S. (2023). Natural resource volatility and financial development during Covid-19: Implications for economic recovery. *Resources Policy*, 81(January), 103343. <https://doi.org/10.1016/j.resourpol.2023.103343>
- Hussain, M., Ye, Z., Bashir, A., Chaudhry, N. I., & Zhao, Y. (2021). A nexus of natural resource rents, institutional quality, human capital, and financial development in resource-rich high-income economies. *Resources Policy*, 74(June), 102259. <https://doi.org/10.1016/j.resourpol.2021.102259>
- Ibrahim, M., & Sare, Y. A. (2018). Determinants of financial development in Africa: How robust is the interactive effect of trade openness and human capital? *Economic Analysis and Policy*, 60, 18–26. <https://doi.org/10.1016/j.eap.2018.09.002>
- Ibrahim Raheem Mutiu Abimbola Oyinlola. (2017). Saving-Investment-Financial Development; Evidence from SSA. *Journal of Financial Economic Policy*, 9(1), 1–21.
- Indicators, W. B. D. (2021). The World Bank (producer and distributor), Washington, D.C. . In <http://data.worldbank.org/data-catalog/world-development-indicators>.
- Ito, H., & Chinn, M. (2007). East Asia and Global Imbalances: Saving, Investment, and Financial Development. In *Financial Sector Development in the Pacific Rim, East Asia Seminar on Economics*, (No. 13364; Vol. 18). <http://ideas.repec.org/h/nbr/nberch/0432.html>
- Javadi, S., Motevaseli, M., & Farsi, J. Y. (2017). Oil Rent and Financial Environment: A Cross-country Examination. *International Journal of Economics and Financial*, 7(1), 298–302.
- Jiang, C., Zhang, Y., Kamran, H. W., & Afshan, S. (2021). Understanding the dynamics of the resource curse and financial development in China? A novel evidence based on QARDL model. *Resources Policy*, 72(January), 102091. <https://doi.org/10.1016/j.resourpol.2021.102091>
- Junior Abeka, M., Andoh, E., Gatsi, J. G., & Kawor, S. (2021). Financial development and economic growth nexus in SSA economies: The moderating role of telecommunication development. *Cogent Economics and Finance*, 9(1). <https://doi.org/10.1080/23322039.2020.1862395>

- K. Karaman, K., & Yıldırım, S. (2019). How does financial development alter the impact of uncertainty? *Journal of Banking and Finance*, 102, 33–42. <https://doi.org/10.1016/j.jbankfin.2019.03.008>
- Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90(1), 1–44. [https://doi.org/10.1016/S0304-4076\(98\)00023-2](https://doi.org/10.1016/S0304-4076(98)00023-2)
- Kearney, C., & Daly, K. (1998). The causes of stock market volatility in Australia. *Applied Financial Economics*, 8(6), 597–605. <https://doi.org/10.1080/096031098332637>
- Khan, A. (2001). Financial development and economic growth. *University of Chicago Press*, 5(3), 413–433. <https://doi.org/10.1017/s1365100500020046>
- Khan, F. N., Sana, A., & Arif, U. (2020). Information and communication technology (ICT) and environmental sustainability: a panel data analysis. *Environmental Science and Pollution Research*, 27(29), 36718–36731. <https://doi.org/10.1007/s11356-020-09704-1>
- Khan, M. A., Gu, L., Khan, M. A., & Meyer, N. (2022). The effects of national culture on financial sector development: Evidence from emerging and developing economies. *Borsa Istanbul Review*, 22(1), 103–112. <https://doi.org/10.1016/j.bir.2021.02.003>
- Khan, M. A., Gu, L., Khan, M. A., & Oláh, J. (2020). Natural resources and financial development: The role of institutional quality. *Journal of Multinational Financial Management*, 56. <https://doi.org/10.1016/j.mulfin.2020.100641>
- Khan, M. A., Khan, M. A., Abdulahi, M. E., Liaqat, I., & Shah, S. S. H. (2019). Institutional quality and financial development: The United States perspective. *Journal of Multinational Financial Management*, 49, 67–80. <https://doi.org/10.1016/j.mulfin.2019.01.001>
- Khan, Z., Hussain, M., Shahbaz, M., Yang, S., & Jiao, Z. (2020a). Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China. *Resources Policy*, 65(November), 101585. <https://doi.org/10.1016/j.resourpol.2020.101585>
- Khan, Z., Hussain, M., Shahbaz, M., Yang, S., & Jiao, Z. (2020b). Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China. *Resources Policy*, 65(November 2019), 101585. <https://doi.org/10.1016/j.resourpol.2020.101585>
- Khraief, N., Shahbaz, M., Heshmati, A., & Azam, M. (2020). Are unemployment rates in OECD countries stationary? Evidence from univariate and panel unit root tests. *North American Journal of Economics and Finance*, 51(March), 1–15. <https://doi.org/10.1016/j.najef.2018.08.021>
- King, R. G., & Levine, R. (1993). Finance and growth: schumpeter might be right. *Quarterly Journal of Economics*, 108(3), 717–737. <https://doi.org/10.2307/2118406>
- Latif, S., Farooq, A., Loganathan, N., & Shahbaz, M. (2014). Empirical evidence on the resource curse hypothesis in oil abundant economy. *Economic Modelling*, 42, 421–429. <https://doi.org/10.1016/j.econmod.2014.07.020>
- Law, S. H. (2009). Trade openness, capital flows and financial development in developing economies. *International Economic Journal*, 23(3), 409–426. <https://doi.org/10.1080/10168730903268398>
- Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking and Finance*, 41(1), 36–44. <https://doi.org/10.1016/j.jbankfin.2013.12.020>
- Lee, C. C., Yahya, F., & Razaq, A. (2022). Greening South Asia with Financial Liberalization, Human Capital, and Militarization: Evidence from the CS-ARDL Approach. *Energy and Environment*. <https://doi.org/10.1177/0958305X221105863>
- Lenka, S. K., & Sharma, R. (2020). Re-examining the Effect of Financial Development on Economic Growth in India: Does the Measurement of Financial Development Matter? *Journal of Asia-Pacific Business*, 21(2), 124–142. <https://doi.org/10.1080/10599231.2020.1745050>
- Levine, R. (2005a). Finance and Growth: Theory and Evidence. *Nber Working Paper Series*, September, 1–118. <http://www.nber.org/papers/w10766>

- Levine, R. (2005b). Finance and Growth: Theory and Evidence. *Handbook of Economic Growth*, 1(SUPPL. PART A), 865–934. [https://doi.org/10.1016/S1574-0684\(05\)01012-9](https://doi.org/10.1016/S1574-0684(05)01012-9)
- Li, Z., Rizvi, S. K. A., Rubbaniy, G., & Umar, M. (2021). Understanding the dynamics of resource curse in G7 countries: The role of natural resource rents and the three facets of financial development. *Resources Policy*, 73(May), 102141. <https://doi.org/10.1016/j.resourpol.2021.102141>
- Liang, Q., & Teng, J. Z. (2006). Financial development and economic growth: Evidence from China. *China Economic Review*, 17(4), 395–411. <https://doi.org/10.1016/j.chieco.2005.09.003>
- Liberti, J. M., Seru, A., & Vig, V. (2016). Information, Credit, and Organization. *SSRN Electronic Journal*, June. <https://doi.org/10.2139/ssrn.2798608>
- Long, D. L., & Broadbent, C. D. (2014). Does the natural resource curse exist for electricity exports in African nations? *International Journal of Ecological Economics and Statistics*, 32(1), 1–13.
- Lucas, R. E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22(February), 3–42. <http://linkinghub.elsevier.com/retrieve/pii/0304393288901687>
- Madsen, J. B., Islam, M. R., & Doucouliagos, H. (2018). Inequality, financial development and economic growth in the OECD, 1870–2011. *European Economic Review*, 101, 605–624. <https://doi.org/10.1016/j.eurocorev.2017.11.004>
- Maitra, B. (2018). Dynamics of capital account and current account in Sri Lanka. *Journal of International Trade and Economic Development*, 27(1), 54–73. <https://doi.org/10.1080/09638199.2017.1337804>
- Mark, N. C., & Sul, D. (2003). Cointegration Vector Estimation by Panel DOLS and Long-run Money Demand. *Oxford Bulletin of Economics and Statistics*, 65(5), 655–.
- Mignamissi, D., & Djijo T., A. J. (2021). Digital divide and financial development in Africa. *Telecommunications Policy*, 45(9). <https://doi.org/10.1016/j.telpol.2021.102199>
- Nain, M. Z., & Kamaiah, B. (2014). Financial development and economic growth in India: some evidence from non-linear causality analysis. *Economic Change and Restructuring*, 47(4), 299–319. <https://doi.org/10.1007/s10644-014-9151-5>
- Odei-appiah, S., Wiredu, G., & Adjei, J. K. (2022). Fintech use , digital divide and fi nancial inclusion. *DIGITAL POLICY, REGULATION AND GOVERNANCE*, 24(5), 435–448. <https://doi.org/10.1108/DPRG-09-2021-0111>
- Odhiambo, N. M. (2008). Financial depth, savings and economic growth in Kenya: A dynamic causal linkage. *Economic Modelling*, 25(4), 704–713. <https://doi.org/10.1016/j.econmod.2007.10.009>
- Oluwatosin Adeniyi, & Festus O. Egwaikhide. (2013). Saving-Investment Nexus in Developing Countries: Does Financial Development Matter? *Journal of Economic Development*, 38(2), 119–140. <https://doi.org/10.35866/caujed.2013.38.2.005>
- Owusu-Agyei, S., Okafor, G., Chijoke-Mgbame, A. M., Ohalehi, P., & Hasan, F. (2020). Internet adoption and financial development in sub-Saharan Africa. *Technological Forecasting and Social Change*, 161(August), 120293. <https://doi.org/10.1016/j.techfore.2020.120293>
- P. Avci, S. S. S. (2022). Is the performance of the companies operating in the participation index in the Turkish economy affected by the macroeconomic perspective? *Ekonomi*, 08(October), 63–73.
- Patrick, H. T. (1966). Growth Financial Development in Underdeveloped Countries. *Journals Uchicago*, 174–189.
- Pedroni, P. (2000). Fully modified OLS for heterogeneous cointegrated panels. In *Advances in Econometrics* (Vol. 15). [https://doi.org/10.1016/S0731-9053\(00\)15004-2](https://doi.org/10.1016/S0731-9053(00)15004-2)
- Pedroni, P. (2004). Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, 20(3), 597–625. <https://doi.org/10.1017/S0266466604203073>
- Pesaran, M. H. (2004). General Diagnostic Tests for Cross Section Dependence in Panels. In *University*

of cambridge press (No. 1240). <http://www.emeraldinsight.com/loi/afr>

- Pesaran, M. H. (2007). A SIMPLE PANEL UNIT ROOT TEST IN THE PRESENCE OF CROSS-SECTION DEPENDENCE. *Journal of Applied Econometrics*, 312, 256–312. <https://doi.org/10.1002/jae>
- Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, 60(1), 13–50. <https://doi.org/10.1007/s00181-020-01875-7>
- Phuc Nguyen, C., Dinh Su, T., & Doytch, N. (2020). The drivers of financial development: Global evidence from internet and mobile usage. *Information Economics and Policy*, 53(xxxx), 100892. <https://doi.org/10.1016/j.infoecopol.2020.100892>
- Quixina, Y., & Almeida, Á. (2014). Financial Development and Economic Growth in a Natural Resource Based Economy: Evidence from Angola. *FEP Working Papers*, September, 16.
- Raifu, I. A., Kumeka, T. T., & Aminu, A. (2023). Financial Development and Unemployment in MENA: Evidence from Heterogeneous Panel Causality and Quantile via Moment Regression. In *Journal of the Knowledge Economy* (Issue 0123456789). Springer US. <https://doi.org/10.1007/s13132-023-01260-6>
- Raihan, A., & Tuspekova, A. (2022). Nexus between energy use, industrialization, forest area, and carbon dioxide emissions: New insights from Russia. *Journal of Environmental Science and Economics*, 1(4), 1–11. <https://doi.org/10.56556/jescae.v1i4.269>
- Ribaj, A., & Mexhuani, F. (2021). The impact of savings on economic growth in a developing country (the case of Kosovo). *Journal of Innovation and Entrepreneurship*, 10(1), 1–13. <https://doi.org/10.1186/s13731-020-00140-6>
- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation* (Third edit, pp. 1772–1823). John Murray, London.
- Ronald I. McKinnon. (1970). *Money and Capital in Economic Development*. Brookings Institution Press. <https://www.brookings.edu/books/money-and-capital-in-economic-development/>
- Saba, C. S., & Ngepah, N. (2022). ICT Diffusion, Industrialisation and Economic Growth Nexus: an International Cross-country Analysis. *Journal of the Knowledge Economy*, 13(3), 2030–2069. <https://doi.org/10.1007/s13132-021-00795-w>
- Sahoo, P., & Dash, R. K. (2013). Financial sector development and domestic savings in South Asia. *Economic Modelling*, 33, 388–397. <https://doi.org/10.1016/j.econmod.2013.04.018>
- Salahuddin, M., & Gow, J. (2016). The effects of Internet usage, financial development and trade openness on economic growth in South Africa: A time series analysis. *Telematics and Informatics*, 33(4), 1141–1154. <https://doi.org/10.1016/j.tele.2015.11.006>
- Saldivia, M., Kristjanpoller, W., & Olson, J. E. (2020). Energy consumption and GDP revisited: A new panel data approach with wavelet decomposition. *Applied Energy*, 272(February), 115207. <https://doi.org/10.1016/j.apenergy.2020.115207>
- Salisu, M. (2005). The role of capital flight and remittances in current account sustainability in Sub-Saharan Africa. *African Development Review*, 17(3), 382–404. <https://doi.org/10.1111/j.1017-6772.2006.00121.x>
- Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the Relationship Between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle-Income Countries. *World Development*, 68(1), 66–81. <https://doi.org/10.1016/j.worlddev.2014.11.010>
- Sarkodie, S. A., & Owusu, P. A. (2020). How to apply dynamic panel bootstrap-corrected fixed-effects (xtbcsfe) and heterogeneous dynamics (panelhetero). *MethodsX*, 7, 101045. <https://doi.org/10.1016/j.mex.2020.101045>
- Sarma, M., & Pais, J. (2006). Financial Inclusion and Development: A Cross Country Analysis. *Journal of International Development*, 18(10–13), 1–30. <https://doi.org/10.1002/jid>
- Sassi, S., & Goaid, M. (2013). Financial development, ICT diffusion and economic growth: Lessons

- from MENA region. *Telecommunications Policy*, 37(4–5), 252–261. <https://doi.org/10.1016/j.telpol.2012.12.004>
- Shahbaz, M., Naeem, M., Ahad, M., & Tahir, I. (2018). Is natural resource abundance a stimulus for financial development in the USA? *Resources Policy*, 55(September), 223–232. <https://doi.org/10.1016/j.resourpol.2017.12.006>
- Shahbaz, M., Nasir, M. A., & Lahiani, A. (2022). Role of financial development in economic growth in the light of asymmetric effects and financial efficiency. *International Journal of Finance and Economics*, 27(1), 361–383. <https://doi.org/10.1002/ijfe.2157>
- Shan, J., & Morris, A. (2002). Does financial development “lead” economic growth? *International Review of Applied Economics*, 16(2), 153–168. <https://doi.org/10.1080/02692170110118885>
- Singh, S., Arya, V., Yadav, M. P., & Power, G. J. (2023). Does financial development improve economic growth? The role of asymmetrical relationships. *Global Finance Journal*, 56(D), 100831. <https://doi.org/10.1016/j.gfj.2023.100831>
- Singh, S., Deep Sharma, G., Radulescu, M., Balsalobre-Lorente, D., & Bansal, P. (2023). Do natural resources impact economic growth: An investigation of P5 + 1 countries under sustainable management. *Geoscience Frontiers*, xxxx, 101595. <https://doi.org/10.1016/j.gsf.2023.101595>
- Song, C. Q., Chang, C. P., & Gong, Q. (2021a). Economic growth, corruption, and financial development: Global evidence. *Economic Modelling*, 94(February), 822–830. <https://doi.org/10.1016/j.econmod.2020.02.022>
- Song, C. Q., Chang, C. P., & Gong, Q. (2021b). Economic growth, corruption, and financial development: Global evidence. *Economic Modelling*, 94(February 2020), 822–830. <https://doi.org/10.1016/j.econmod.2020.02.022>
- Swamy, P. A. V. B. (1970). Efficient Inference in a Random Coefficient Regression Model. *Journal of the EcEconometrica*, 38(2), 311–323.
- Tan, Z., Koondhar, M. A., Nawaz, K., Malik, M. N., Khan, Z. A., & Koondhar, M. A. (2021). Foreign direct investment, financial development, energy consumption, and air quality: A way for carbon neutrality in China. *Journal of Environmental Management*, 299(August), 113572. <https://doi.org/10.1016/j.jenvman.2021.113572>
- Tang, C., Irfan, M., Razzaq, A., & Dagar, V. (2022). Natural resources and financial development: Role of business regulations in testing the resource-curse hypothesis in ASEAN countries. *Resources Policy*, 76(March), 102612. <https://doi.org/10.1016/j.resourpol.2022.102612>
- Tao, R., Umar, M., Naseer, A., & Razi, U. (2021). The dynamic effect of eco-innovation and environmental taxes on carbon neutrality target in emerging seven (E7) economies. *Journal of Environmental Management*, 299(April), 113525. <https://doi.org/10.1016/j.jenvman.2021.113525>
- Tiba, S., & Frikha, M. (2019). The controversy of the resource curse and the environment in the SDGs background: The African context. *Resources Policy*, 62(March), 437–452. <https://doi.org/10.1016/j.resourpol.2019.04.010>
- Uddin, G. S., Sjö, B., & Shahbaz, M. (2013). The causal nexus between financial development and economic growth in Kenya. *Economic Modelling*, 35(June 2011), 701–707. <https://doi.org/10.1016/j.econmod.2013.08.031>
- Valickova, P., Havranek, T., & Horvath, R. (2015). Financial development and economic growth: A meta-analysis. *Journal of Economic Surveys*, 29(3), 506–526. <https://doi.org/10.1111/joes.12068>
- Vincent L.Y. Lin. (1981). The Impact of Financial sector on Economic Development: Some cross-section evidence. *Studies in Comparative International Development*, 16(1), 44–52.
- Voumik, L. C., Mimi, M. B., & Raihan, A. (2023). Nexus Between Urbanization, Industrialization, Natural Resources Rent, and Anthropogenic Carbon Emissions in South Asia: CS-ARDL Approach. *Anthropocene Science*, 2(1), 48–61. <https://doi.org/10.1007/s44177-023-00047-3>
- Weidmann, C. L. J. (1999). Does Mother Nature Corrupt? Natural Resources, Corruption, and

- Economic Growth. *International Monetary Fund, Internatio*(6(11)), 951–952.
- Westerlund, J. (2005). New simple tests for panel cointegration. *Econometric Reviews*, 24(3), 297–316. <https://doi.org/10.1080/07474930500243019>
- Yıldırım, S., Gedikli, A., Erdoğan, S., & Yıldırım, D. Ç. (2020). Natural resources rents-financial development nexus: Evidence from sixteen developing countries. *Resources Policy*, 68(April). <https://doi.org/10.1016/j.resourpol.2020.101705>
- Yuxiang, K., & Chen, Z. (2011). Resource abundance and financial development: Evidence from China. *Resources Policy*, 36(1), 72–79. <https://doi.org/10.1016/j.resourpol.2010.05.002>
- Zafar, M. W., Saud, S., & Hou, F. (2019). The impact of globalization and financial development on environmental quality: Evidence from selected countries in the organization for economic co-operation and development (OECD). *Environmental Science and Pollution Research*, 26(13), 13246–13262. <https://doi.org/10.1007/s11356-019-04761-7>
- Zagorchev, A. G., Vasconcellos, G., & Bae, Y. (2011). The long-run relation among financial development , technology and GDP : a panel cointegration study The long-run relation among financial development , technology and GDP : a panel cointegration study. *Applied Financial Economics*, 21, 1021–1034. <https://doi.org/10.1080/09603107.2011.562164>
- Zaidi, S. A. H., Wei, Z., Gedikli, A., Zafar, M. W., Hou, F., & Iftikhar, Y. (2019). The impact of globalization, natural resources abundance, and human capital on financial development: Evidence from thirty-one OECD countries. *Resources Policy*, 64(June), 101476. <https://doi.org/10.1016/j.resourpol.2019.101476>
- Zhang, Q., & Brouwer, R. (2019). Is China Affected by the Resource Curse? A Critical Review of the Chinese Literature. *Journal of Policy Modeling*, 42(1), 133–152. <https://doi.org/10.1016/j.jpolmod.2019.06.005>
- Zhou Wen-xia; Chen Xiao-Yuan. (2014). A case study on Bijie city; Relation between coal enriching areas and Economic Growth. *Resources and Industries*, 16(3).
- Acikalin, S., Aktas, R., & Unal, S. (2008). Relationships between stock markets and macroeconomic variables: An empirical analysis of the Istanbul Stock Exchange. *Investment Management and Financial Innovations*, 5(1), 8–16.
- Adebayo, T. S., Ullah, S., Kartal, M. T., Ali, K., Pata, U. K., & Ağa, M. (2023). Endorsing sustainable development in BRICS: The role of technological innovation, renewable energy consumption, and natural resources in limiting carbon emission. *Science of the Total Environment*, 859(August 2022). <https://doi.org/10.1016/j.scitotenv.2022.160181>
- Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? *Review of Development Finance*, 3(4), 192–203. <https://doi.org/10.1016/j.rdf.2013.11.001>
- Ahad, M. (2017). Impact of Financial Development on Trade Balance: An ARDL Cointegration and Causality Approach for Pakistan. *Global Business Review*, 18(5), 1199–1214. <https://doi.org/10.1177/0972150917710152>
- Ahmad, M., Jiang, P., Majeed, A., Umar, M., Khan, Z., & Muhammad, S. (2020). The dynamic impact of natural resources, technological innovations and economic growth on ecological footprint: An advanced panel data estimation. *Resources Policy*, 69(July), 101817. <https://doi.org/10.1016/j.resourpol.2020.101817>
- Ahmad, M., Kuldashева, Z., Nasriddinov, F., Balbaa, M. E., & Fahlevi, M. (2023). Is achieving environmental sustainability dependent on information communication technology and globalization? Evidence from selected OECD countries. *Environmental Technology and Innovation*, 31, 103178. <https://doi.org/10.1016/j.eti.2023.103178>
- Akande, A., Cabral, P., & Casteleyn, S. (2019). Assessing the Gap between Technology and the Environmental Sustainability of European Cities. *Information Systems Frontiers*, 21(3), 581–604. <https://doi.org/10.1007/s10796-019-09903-3>

- Akwasi Gyamfi, B., Taiwo Onifade, S., Haouas, I., & Fatai Adedoyin, F. (2023). The impacts of resource abundance and export diversity on financial development in the South Asian economic bloc. *Heliyon*, 9(4), e15105. <https://doi.org/10.1016/j.heliyon.2023.e15105>
- Ali, A., Ramakrishnan, S., & Faisal. (2022). Financial development and natural resources. Is there a stock market resource curse? *Resources Policy*, 75(October 2021), 102457. <https://doi.org/10.1016/j.resourpol.2021.102457>
- Alshubiri, F., Jamil, S. A., & Elheddad, M. (2019). The impact of ICT on financial development: Empirical evidence from the Gulf Cooperation Council countries. *International Journal of Engineering Business Management*, 11, 1–14. <https://doi.org/10.1177/1847979019870670>
- Ang, J. B. (2008). What are the mechanisms linking financial development and economic growth in Malaysia? *Economic Modelling*, 25(1), 38–53. <https://doi.org/10.1016/j.econmod.2007.04.006>
- Ang, J. B. (2011). Savings mobilization, financial development and liberalization: The case of Malaysia. *Review of Income and Wealth*, 57(3), 449–470. <https://doi.org/10.1111/j.1475-4991.2010.00411.x>
- Appiah-Otoo, I., & Song, N. (2021). The impact of ICT on economic growth-Comparing rich and poor countries. *Telecommunications Policy*, 45(2), 102082. <https://doi.org/10.1016/j.telpol.2020.102082>
- Asaleye, A. J., & Strydom, K. (2022). Assessing Productivity Channels of Human Capital in the Southern African Development Community: New Insights from Women's Empowerment. *Journal of Risk and Financial Management*, 15(11). <https://doi.org/10.3390/jrfm15110533>
- Asif, M., Khan, K. B., Anser, M. K., Nassani, A. A., Abro, M. M. Q., & Zaman, K. (2020). Dynamic interaction between financial development and natural resources: Evaluating the 'Resource curse' hypothesis. *Resources Policy*, 65(December 2019), 101566. <https://doi.org/10.1016/j.resourpol.2019.101566>
- Asongu, S. A. (2014). Knowledge Economy and Financial Sector Competition in African Countries. *African Development Review*, 26(2), 333–346.
- Atil, A., Nawaz, K., Lahiani, A., & Roubaud, D. (2020a). Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization. *Resources Policy*, 67(November 2019), 101683. <https://doi.org/10.1016/j.resourpol.2020.101683>
- Atil, A., Nawaz, K., Lahiani, A., & Roubaud, D. (2020b). Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization. *Resources Policy*, 67(April), 101683. <https://doi.org/10.1016/j.resourpol.2020.101683>
- Auty, R., & Warhurst, A. (1993). Sustainable development in mineral exporting economies. *Resources Policy*, 19(1), 14–29. [https://doi.org/10.1016/0301-4207\(93\)90049-S](https://doi.org/10.1016/0301-4207(93)90049-S)
- Azam, M., & Haseeb, M. (2021). Determinants of foreign direct investment in BRICS- does renewable and non-renewable energy matter? *Energy Strategy Reviews*, 35(March), 100638. <https://doi.org/10.1016/j.esr.2021.100638>
- Badeeb, R. A., Lean, H. H., & Clark, J. (2017). The evolution of the natural resource curse thesis: A critical literature survey. *Resources Policy*, 51(October 2016), 123–134. <https://doi.org/10.1016/j.resourpol.2016.10.015>
- Bağcı, A. (2020). Saving, Financial Development and Economic Growth Nexus in Turkey: New Evidence from Asymmetric Causality Analysis. *Gaziantep University Journal of Social Sciences*, 19(1), 220–237.
- Baland, J. M., & Francois, P. (2000). Rent-seeking and resource booms. *Journal of Development Economics*, 61(2), 527–542. [https://doi.org/10.1016/S0304-3878\(00\)00067-5](https://doi.org/10.1016/S0304-3878(00)00067-5)
- Baltagi, B. H., Demetriades, P. O., & Law, S. H. (2009). Financial development and openness: Evidence from panel data. *Journal of Development Economics*, 89(2), 285–296. <https://doi.org/10.1016/j.jdevco.2008.06.006>

- Bayar, Y. (2014). Financial Development and Domestic Savings in Emerging Asian Countries. *Theoretical and Applied Economics*, XXI(7), 55–66. <https://www.researchgate.net/publication/333668204>
- Beck, N., Katz, J. N., American, T., & Science, P. (1995). What to do (and not to do) with Time-Series Cross-Sectional Data. *Political Science*, 89(3), 634–647.
- Beck, T. (2002). Financial Development and International Agricultural Trade: Is There a Connection. *Journal of International Economics*, 57, 1–27. www.elsevier.com/locate/econbase
- Beck, T., Demirgüç-Kunt, A., & Honohan, P. (2009). Access to financial services: Measurement, impact, and policies. *World Bank Research Observer*, 24(1), 119–145. <https://doi.org/10.1093/wbro/lkn008>
- Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance*, 28(3), 423–442. [https://doi.org/10.1016/S0378-4266\(02\)00408-9](https://doi.org/10.1016/S0378-4266(02)00408-9)
- Behera, J., & Sahoo, D. (2022). Asymmetric relationships between information and communication technology (ICT), globalization , and human development in India : evidence from non - linear ARDL analysis. *Journal of Economic Structures*. <https://doi.org/10.1186/s40008-022-00269-5>
- Ben Naceur, S., Cherif, M., & Kandil, M. (2014). What drives the development of the MENA financial sector? *Borsa Istanbul Review*, 14(4), 212–223. <https://doi.org/10.1016/j.bir.2014.09.002>
- Bhattacharyya, S., & Hodler, R. (2014). Do Natural Resource Revenues Hinder Financial Development? The Role of Political Institutions. *World Development*, 57, 101–113. <https://doi.org/10.1016/j.worlddev.2013.12.003>
- Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics and Finance*, 6(1). <https://doi.org/10.1080/23322039.2018.1449780>
- Blomquist, J., & Westerlund, J. (2013). Testing slope homogeneity in large panels with serial correlation. *Economics Letters*, 121(3), 374–378. <https://doi.org/10.1016/j.econlet.2013.09.012>
- Boyce, J. R., & Herbert Emery, J. C. (2011). Is a negative correlation between resource abundance and growth sufficient evidence that there is a “resource curse”? *Resources Policy*, 36(1), 1–13. <https://doi.org/10.1016/j.resourpol.2010.08.004>
- Brunnschweiler, C. N. (2008). Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth. *World Development*, 36(3), 399–419. <https://doi.org/10.1016/j.worlddev.2007.03.004>
- Calandra, D., Secinaro, S., Massaro, M., Dal Mas, F., & Bagnoli, C. (2023). The link between sustainable business models and Blockchain: A multiple case study approach. *Business Strategy and the Environment*, 32(4), 1403–1417. <https://doi.org/10.1002/bse.3195>
- Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, 72(1), 321–334. [https://doi.org/10.1016/S0304-3878\(03\)00079-8](https://doi.org/10.1016/S0304-3878(03)00079-8)
- Cave, J., K. Chaudhuri, & Kumbhakar, S. C. (2020). Do banking sector and stock market development matter for economic growth? *Empirical Economics*, 59(4), 1513–1535. <https://doi.org/10.1007/s00181-019-01692-7>
- Çetin, M., Sarıgül, S. S., Işık, C., Avcı, P., Ahmad, M., & Alvarado, R. (2023). The impact of natural resources, economic growth, savings, and current account balance on financial sector development: Theory and empirical evidence. *Resources Policy*, 81(January). <https://doi.org/10.1016/j.resourpol.2023.103300>
- Cheng, C., Chien, M., & Lee, C. (2020). ICT diffusion , fi nancial development , and economic growth : An international cross-country analysis. *Economic Modelling*, February. <https://doi.org/10.1016/j.econmod.2020.02.008>
- Cherif, M., & Dreger, C. (2016). Institutional Determinants of Financial Development in MENA countries.

- Review of Development Economics*, 20(3), 670–680. <https://doi.org/10.1111/rode.12192>
- Chien, M., Cheng, C., & Ayu, M. (2020). The non-linear relationship between ICT diffusion and financial development. *Telecommunications Policy*, 44(9), 102023. <https://doi.org/10.1016/j.telpol.2020.102023>
- Chien, M. S., Cheng, C. Y., & Kurniawati, M. A. (2020). The non-linear relationship between ICT diffusion and financial development. *Telecommunications Policy*, 44(9), 102023. <https://doi.org/10.1016/j.telpol.2020.102023>
- Christiansen, L., Prati, A., Ricci, L., & Tressel, T. (2009). External Balance in Low Income Countries. *IMF Working Papers*, 09(221), 1. <https://doi.org/10.5089/9781451873689.001>
- Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: Evidence from panel unit root and cointegration tests. *Journal of Development Economics*, 73(1), 55–74. <https://doi.org/10.1016/j.jdevco.2003.03.002>
- Chudik, A., Mohaddes, K., Pesaran, M. H., & Raissi, M. (2016). Long-run effects in large heterogeneous panel data models with cross-sectionally correlated errors. *Advances in Econometrics*, 36, 85–135. <https://doi.org/10.1108/S0731-905320160000036013>
- Çoban, S., & Topcu, M. (2013). The nexus between financial development and energy consumption in the EU: A dynamic panel data analysis. *Energy Economics*, 39, 81–88. <https://doi.org/10.1016/j.eneco.2013.04.001>
- Dabbous, A. (2018). The impact of information and communication technology and financial development on energy consumption: A dynamic heterogeneous panel analysis for MENA countries. *International Journal of Energy Economics and Policy*, 8(4), 70–76.
- Das, A., Chowdhury, M., & Seaborn, S. (2018). ICT Diffusion, Financial Development and Economic Growth: New Evidence from Low and Lower Middle-Income Countries. *Journal of the Knowledge Economy*, 9(3), 928–947. <https://doi.org/10.1007/s13132-016-0383-7>
- De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World Development*, 23(3), 433–448. [https://doi.org/10.1016/0305-750X\(94\)00132-I](https://doi.org/10.1016/0305-750X(94)00132-I)
- Deng, Q. S., Alvarado, R., Cuesta, L., Tillaguango, B., Murshed, M., Rehman, A., Işık, C., & López-Sánchez, M. (2022). Asymmetric impacts of foreign direct investment inflows, financial development, and social globalization on environmental pollution. *Economic Analysis and Policy*, 76, 236–251. <https://doi.org/10.1016/j.eap.2022.08.008>
- Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, 84(2), 299–329. <https://doi.org/10.1016/j.jfineco.2006.03.004>
- Dogan, E., Madaleno, M., & Altinoz, B. (2020). Revisiting the nexus of financialization and natural resource abundance in resource-rich countries: New empirical evidence from nine indices of financial development. *Resources Policy*, 69(August), 101839. <https://doi.org/10.1016/j.resourpol.2020.101839>
- Dogan, E., & Seker, F. (2016). An investigation on the determinants of carbon emissions for OECD countries: empirical evidence from panel models robust to heterogeneity and cross-sectional dependence. *Environmental Science and Pollution Research*, 23(14), 14646–14655. <https://doi.org/10.1007/s11356-016-6632-2>
- Domowitz, I. (2002). Liquidity, transaction costs, and reintermediation in electronic markets. *Journal of Financial Services Research*, 22(1–2), 141–157. <https://doi.org/10.1023/A:1016077023185>
- Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450–1460. <https://doi.org/10.1016/j.econmod.2012.02.014>
- Dwumfour, R. A., & Ntow-Gyamfi, M. (2018). Natural resources, financial development and institutional quality in Africa: Is there a resource curse? *Resources Policy*, 59(July), 411–426. <https://doi.org/10.1016/j.resourpol.2018.08.012>
- Engle, R.F; Granger, C. W. J. (1987). Co-Integration and Error Correction : Representation , Estimation

- , and Testing. *The Econometric Society*, 55(2), 251–276.
- Erum, N., & Hussain, S. (2019). Corruption, natural resources and economic growth: Evidence from OIC countries. *Resources Policy*, 63(March), 101429. <https://doi.org/10.1016/j.resourpol.2019.101429>
- Farouq, I., Sulong, Z., Ahmad, U., Jakada, A., & Sambo, N. (2020). Heterogeneous Data Approach on Financial development of Selected African Leading Economies. *Data in Brief*, 30. <https://doi.org/10.1016/j.dib.2020.105670>
- Feng, L., Zhao, P., Ding, Y., & Liu, B. (2021). Rank-based tests of cross-sectional dependence in panel data models. *Computational Statistics and Data Analysis*, 153, 107070. <https://doi.org/10.1016/j.csda.2020.107070>
- Fosu, P. (2019). The Determinants of Economic Growth: The Role of Infrastructure. *Theoretical and Applied Economics*, XXI(6), 23–36. <https://mpira.ub.uni-muenchen.de/id/eprint/93101>
- G.C., S. (2020). Relationship between Trade Openness, Financial Development and Economic Growth of Nepal: Evidence from a Developing Country. *Quest Journal of Management and Social Sciences*, 2(2), 206–224. <https://doi.org/10.3126/qjmss.v2i2.33270>
- Gheraia, Z., Abid, M., Sekrafi, H., & Abdelli, H. (2022). The moderating role of ICT diffusion between financial development and economic growth: a bootstrap ARDL approach in Saudi Arabia. *International Technology for Development*, 4, 816–836. <https://doi.org/10.1080/02681102.2021.1998759>
- Gokmenoglu, K. K., & Rustamov, B. (2019). Examining the World Bank Group lending and natural resource abundance induced financial development in KART countries. *Resources Policy*, 63(June), 101433. <https://doi.org/10.1016/j.resourpol.2019.101433>
- Goldsmith, R. W. (1959). Financial Structure and Development as a Subject for International Comparative Study. *Yale University, Press*, 114–123. <http://www.nber.org/chapters/c4417%0D>
- González-Páramo, J. M. (1995). Financial innovation in the digital age: Challenges for regulation and supervision. *Revista de Estabilidad Financiera*, 32, 9–37.
- Gozgor, G., Mahalik, M. K., Demir, E., & Padhan, H. (2020). The impact of economic globalization on renewable energy in the OECD countries. *Energy Policy*, 139(February), 111365. <https://doi.org/10.1016/j.enpol.2020.111365>
- Granger, C. W. J. (1981). Some Properties of time series data and their use in Econometric Model Specification. *Journal of Econometrics*, 16, 121–130.
- Gu, J., Gouliamos, K., Lobont, O. R., & Nicoleta-Claudia, M. (2021). Is the fourth industrial revolution transforming the relationship between financial development and its determinants in emerging economies? *Technological Forecasting and Social Change*, 165(January), 1–6. <https://doi.org/10.1016/j.techfore.2020.120563>
- Guan, J., Kirikkaleli, D., Bibi, A., & Zhang, W. (2020). Natural resources rents nexus with financial development in the presence of globalization: Is the “resource curse” exist or myth? *Resources Policy*, 66(February 2020), 101641. <https://doi.org/10.1016/j.resourpol.2020.101641>
- Hadj, T. B., & Ghodbane, A. (2021). Do natural resources rents and institutional development matter for financial development under quantile regression approach? *Resources Policy*, 73(June), 102169. <https://doi.org/10.1016/j.resourpol.2021.102169>
- Haseeb, A., Xia, E., Saud, S., Ahmad, A., & Khurshid, H. (2019). Does information and communication technologies improve environmental quality in the era of globalization? An empirical analysis. *Environmental Science and Pollution Research*, 26(9), 8594–8608. <https://doi.org/10.1007/s11356-019-04296-x>
- Hashem Pesaran, M., & Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of Econometrics*, 142(1), 50–93. <https://doi.org/10.1016/j.jeconom.2007.05.010>
- Hsu, C. C., Chau, K. Y., & Chien, F. S. (2023). Natural resource volatility and financial development

- during Covid-19: Implications for economic recovery. *Resources Policy*, 81(January), 103343. <https://doi.org/10.1016/j.resourpol.2023.103343>
- Hussain, M., Ye, Z., Bashir, A., Chaudhry, N. I., & Zhao, Y. (2021). A nexus of natural resource rents, institutional quality, human capital, and financial development in resource-rich high-income economies. *Resources Policy*, 74(June), 102259. <https://doi.org/10.1016/j.resourpol.2021.102259>
- Ibrahim, M., & Sare, Y. A. (2018). Determinants of financial development in Africa: How robust is the interactive effect of trade openness and human capital? *Economic Analysis and Policy*, 60, 18–26. <https://doi.org/10.1016/j.eap.2018.09.002>
- Ibrahim Raheem Mutiu Abimbola Oyinlola. (2017). Saving-Investment-Financial Development; Evidence from SSA. *Journal of Financial Economic Policy*, 9(1), 1–21.
- Indicators, W. B. D. (2021). The World Bank (producer and distributor), Washington, D.C. . In <http://data.worldbank.org/data-catalog/world-development-indicators>.
- Ito, H., & Chinn, M. (2007). East Asia and Global Imbalances: Saving, Investment, and Financial Development. In *Financial Sector Development in the Pacific Rim, East Asia Seminar on Economics*, (No. 13364; Vol. 18). <http://ideas.repec.org/h/nbr/nberch/0432.html>
- Javadi, S., Motevaseli, M., & Farsi, J. Y. (2017). Oil Rent and Financial Environment: A Cross-country Examination. *International Journal of Economics and Financial*, 7(1), 298–302.
- Jiang, C., Zhang, Y., Kamran, H. W., & Afshan, S. (2021). Understanding the dynamics of the resource curse and financial development in China? A novel evidence based on QARDL model. *Resources Policy*, 72(January), 102091. <https://doi.org/10.1016/j.resourpol.2021.102091>
- Junior Abeka, M., Andoh, E., Gatsi, J. G., & Kawor, S. (2021). Financial development and economic growth nexus in SSA economies: The moderating role of telecommunication development. *Cogent Economics and Finance*, 9(1). <https://doi.org/10.1080/23322039.2020.1862395>
- K. Karaman, K., & Yıldırım, S. (2019). How does financial development alter the impact of uncertainty? *Journal of Banking and Finance*, 102, 33–42. <https://doi.org/10.1016/j.jbankfin.2019.03.008>
- Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90(1), 1–44. [https://doi.org/10.1016/S0304-4076\(98\)00023-2](https://doi.org/10.1016/S0304-4076(98)00023-2)
- Kearney, C., & Daly, K. (1998). The causes of stock market volatility in Australia. *Applied Financial Economics*, 8(6), 597–605. <https://doi.org/10.1080/096031098332637>
- Khan, A. (2001). Financial development and economic growth. *University of Chicago Press*, 5(3), 413–433. <https://doi.org/10.1017/s1365100500020046>
- Khan, F. N., Sana, A., & Arif, U. (2020). Information and communication technology (ICT) and environmental sustainability: a panel data analysis. *Environmental Science and Pollution Research*, 27(29), 36718–36731. <https://doi.org/10.1007/s11356-020-09704-1>
- Khan, M. A., Gu, L., Khan, M. A., & Meyer, N. (2022). The effects of national culture on financial sector development: Evidence from emerging and developing economies. *Borsa Istanbul Review*, 22(1), 103–112. <https://doi.org/10.1016/j.bir.2021.02.003>
- Khan, M. A., Gu, L., Khan, M. A., & Oláh, J. (2020). Natural resources and financial development: The role of institutional quality. *Journal of Multinational Financial Management*, 56. <https://doi.org/10.1016/j.mulfin.2020.100641>
- Khan, M. A., Khan, M. A., Abdulahi, M. E., Liaqat, I., & Shah, S. S. H. (2019). Institutional quality and financial development: The United States perspective. *Journal of Multinational Financial Management*, 49, 67–80. <https://doi.org/10.1016/j.mulfin.2019.01.001>
- Khan, Z., Hussain, M., Shahbaz, M., Yang, S., & Jiao, Z. (2020a). Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China. *Resources Policy*, 65(November), 101585. <https://doi.org/10.1016/j.resourpol.2020.101585>

- Khan, Z., Hussain, M., Shahbaz, M., Yang, S., & Jiao, Z. (2020b). Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China. *Resources Policy*, 65(November 2019), 101585. <https://doi.org/10.1016/j.resourpol.2020.101585>
- Khraief, N., Shahbaz, M., Heshmati, A., & Azam, M. (2020). Are unemployment rates in OECD countries stationary? Evidence from univariate and panel unit root tests. *North American Journal of Economics and Finance*, 51(March), 1–15. <https://doi.org/10.1016/j.najef.2018.08.021>
- King, R. G., & Levine, R. (1993). Finance and growth: schumpeter might be right. *Quarterly Journal of Economics*, 108(3), 717–737. <https://doi.org/10.2307/2118406>
- Latif, S., Farooq, A., Loganathan, N., & Shahbaz, M. (2014). Empirical evidence on the resource curse hypothesis in oil abundant economy. *Economic Modelling*, 42, 421–429. <https://doi.org/10.1016/j.econmod.2014.07.020>
- Law, S. H. (2009). Trade openness, capital flows and financial development in developing economies. *International Economic Journal*, 23(3), 409–426. <https://doi.org/10.1080/10168730903268398>
- Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking and Finance*, 41(1), 36–44. <https://doi.org/10.1016/j.jbankfin.2013.12.020>
- Lee, C. C., Yahya, F., & Razzaq, A. (2022). Greening South Asia with Financial Liberalization, Human Capital, and Militarization: Evidence from the CS-ARDL Approach. *Energy and Environment*. <https://doi.org/10.1177/0958305X221105863>
- Lenka, S. K., & Sharma, R. (2020). Re-examining the Effect of Financial Development on Economic Growth in India: Does the Measurement of Financial Development Matter? *Journal of Asia-Pacific Business*, 21(2), 124–142. <https://doi.org/10.1080/10599231.2020.1745050>
- Levine, R. (2005a). Finance and Growth: Theory and Evidence. *Nber Working Paper Series*, September, 1–118. <http://www.nber.org/papers/w10766>
- Levine, R. (2005b). Finance and Growth: Theory and Evidence. *Handbook of Economic Growth*, 1(SUPPL. PART A), 865–934. [https://doi.org/10.1016/S1574-0684\(05\)01012-9](https://doi.org/10.1016/S1574-0684(05)01012-9)
- Li, Z., Rizvi, S. K. A., Rubbaniy, G., & Umar, M. (2021). Understanding the dynamics of resource curse in G7 countries: The role of natural resource rents and the three facets of financial development. *Resources Policy*, 73(May), 102141. <https://doi.org/10.1016/j.resourpol.2021.102141>
- Liang, Q., & Teng, J. Z. (2006). Financial development and economic growth: Evidence from China. *China Economic Review*, 17(4), 395–411. <https://doi.org/10.1016/j.chieco.2005.09.003>
- Liberti, J. M., Seru, A., & Vig, V. (2016). Information, Credit, and Organization. *SSRN Electronic Journal*, June. <https://doi.org/10.2139/ssrn.2798608>
- Lucas, R. E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22(February), 3–42. <http://linkinghub.elsevier.com/retrieve/pii/0304393288901687>
- Madsen, J. B., Islam, M. R., & Doucouliagos, H. (2018). Inequality, financial development and economic growth in the OECD, 1870–2011. *European Economic Review*, 101, 605–624. <https://doi.org/10.1016/j.euroecorev.2017.11.004>
- Maitra, B. (2018). Dynamics of capital account and current account in Sri Lanka. *Journal of International Trade and Economic Development*, 27(1), 54–73. <https://doi.org/10.1080/09638199.2017.1337804>
- Mark, N. C., & Sul, D. (2003). Cointegration Vector Estimation by Panel DOLS and Long-run Money Demand. *Oxford Bulletin of Economics and Statistics*, 65(5), 655–.
- Mignamissi, D., & Djijo T., A. J. (2021). Digital divide and financial development in Africa. *Telecommunications Policy*, 45(9). <https://doi.org/10.1016/j.telpol.2021.102199>
- Nain, M. Z., & Kamaiah, B. (2014). Financial development and economic growth in India: some evidence from non-linear causality analysis. *Economic Change and Restructuring*, 47(4), 299–319. <https://doi.org/10.1007/s10644-014-9151-5>

- Odei-appiah, S., Wiredu, G., & Adjei, J. K. (2022). Fintech use , digital divide and fi nancial inclusion. *DIGITAL POLICY, REGULATION AND GOVERNANCE*, 24(5), 435–448. <https://doi.org/10.1108/DPRG-09-2021-0111>
- Odhiambo, N. M. (2008). Financial depth, savings and economic growth in Kenya: A dynamic causal linkage. *Economic Modelling*, 25(4), 704–713. <https://doi.org/10.1016/j.econmod.2007.10.009>
- Oluwatosin Adeniyi, & Festus O. Egwaikhide. (2013). Saving-Investment Nexus in Developing Countries: Does Financial Development Matter? *Journal of Economic Development*, 38(2), 119–140. <https://doi.org/10.35866/caujed.2013.38.2.005>
- Owusu-Agyei, S., Okafor, G., Chijoke-Mgbame, A. M., Ohalehi, P., & Hasan, F. (2020). Internet adoption and financial development in sub-Saharan Africa. *Technological Forecasting and Social Change*, 161(August), 120293. <https://doi.org/10.1016/j.techfore.2020.120293>
- P. Avci, S. S. S. (2022). Is the performance of the companies operating in the participation index in the Turkish economy affected by the macroeconomic perspective? *Ekonomi*, 08(October), 63–73.
- Patrick, H. T. (1966). Growth Financial Development in Underdeveloped Countries. *Journals Uchicago*, 174–189.
- Pedroni, P. (2000). Fully modified OLS for heterogeneous cointegrated panels. In *Advances in Econometrics* (Vol. 15). [https://doi.org/10.1016/S0731-9053\(00\)15004-2](https://doi.org/10.1016/S0731-9053(00)15004-2)
- Pedroni, P. (2004). Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, 20(3), 597–625. <https://doi.org/10.1017/S0266466604203073>
- Pesaran, M. H. (2004). General Diagnostic Tests for Cross Section Dependence in Panels. In *University of cambridge press* (No. 1240). <http://www.emeraldinsight.com/loi/afr>
- Pesaran, M. H. (2007). A SIMPLE PANEL UNIT ROOT TEST IN THE PRESENCE OF CROSS-SECTION DEPENDENCE. *Journal of Applied Econometrics*, 312, 256–312. <https://doi.org/10.1002/jae>
- Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, 60(1), 13–50. <https://doi.org/10.1007/s00181-020-01875-7>
- Phuc Nguyen, C., Dinh Su, T., & Doytch, N. (2020). The drivers of financial development: Global evidence from internet and mobile usage. *Information Economics and Policy*, 53(xxxx), 100892. <https://doi.org/10.1016/j.infoecopol.2020.100892>
- Quixina, Y., & Almeida, Á. (2014). Financial Development and Economic Growth in a Natural Resource Based Economy: Evidence from Angola. *FEP Working Papers*, September, 16.
- Raifu, I. A., Kumeka, T. T., & Aminu, A. (2023). Financial Development and Unemployment in MENA: Evidence from Heterogeneous Panel Causality and Quantile via Moment Regression. In *Journal of the Knowledge Economy* (Issue 0123456789). Springer US. <https://doi.org/10.1007/s13132-023-01260-6>
- Raihan, A., & Tuspekova, A. (2022). Nexus between energy use, industrialization, forest area, and carbon dioxide emissions: New insights from Russia. *Journal of Environmental Science and Economics*, 1(4), 1–11. <https://doi.org/10.56556/jescae.v1i4.269>
- Ribaj, A., & Mexhuani, F. (2021). The impact of savings on economic growth in a developing country (the case of Kosovo). *Journal of Innovation and Entrepreneurship*, 10(1), 1–13. <https://doi.org/10.1186/s13731-020-00140-6>
- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation* (Third edit, pp. 1772–1823). John Murray, London.
- Ronald I. McKinnon. (1970). *Money and Capital in Economic Development*. Brookings Institution Press. <https://www.brookings.edu/books/money-and-capital-in-economic-development/>
- Saba, C. S., & Ngepah, N. (2022). ICT Diffusion, Industrialisation and Economic Growth Nexus: an International Cross-country Analysis. *Journal of the Knowledge Economy*, 13(3), 2030–2069.

<https://doi.org/10.1007/s13132-021-00795-w>

- Sahoo, P., & Dash, R. K. (2013). Financial sector development and domestic savings in South Asia. *Economic Modelling*, 33, 388–397. <https://doi.org/10.1016/j.econmod.2013.04.018>
- Salahuddin, M., & Gow, J. (2016). The effects of Internet usage, financial development and trade openness on economic growth in South Africa: A time series analysis. *Telematics and Informatics*, 33(4), 1141–1154. <https://doi.org/10.1016/j.tele.2015.11.006>
- Saldivia, M., Kristjanpoller, W., & Olson, J. E. (2020). Energy consumption and GDP revisited: A new panel data approach with wavelet decomposition. *Applied Energy*, 272(February), 115207. <https://doi.org/10.1016/j.apenergy.2020.115207>
- Salisu, M. (2005). The role of capital flight and remittances in current account sustainability in Sub-Saharan Africa. *African Development Review*, 17(3), 382–404. <https://doi.org/10.1111/j.1017-6772.2006.00121.x>
- Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the Relationship Between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle-Income Countries. *World Development*, 68(1), 66–81. <https://doi.org/10.1016/j.worlddev.2014.11.010>
- Sarkodie, S. A., & Owusu, P. A. (2020). How to apply dynamic panel bootstrap-corrected fixed-effects (xtbefe) and heterogeneous dynamics (panelhetero). *MethodsX*, 7, 101045. <https://doi.org/10.1016/j.mex.2020.101045>
- Sarma, M., & Pais, J. (2006). Financial Inclusion and Development: A Cross Country Analysis. *Journal of International Development*, 18(10–13), 1–30. <https://doi.org/10.1002/jid>
- Sassi, S., & Goaid, M. (2013). Financial development, ICT diffusion and economic growth: Lessons from MENA region. *Telecommunications Policy*, 37(4–5), 252–261. <https://doi.org/10.1016/j.telpol.2012.12.004>
- Shahbaz, M., Naeem, M., Ahad, M., & Tahir, I. (2018). Is natural resource abundance a stimulus for financial development in the USA? *Resources Policy*, 55(September), 223–232. <https://doi.org/10.1016/j.resourpol.2017.12.006>
- Shahbaz, M., Nasir, M. A., & Lahiani, A. (2022). Role of financial development in economic growth in the light of asymmetric effects and financial efficiency. *International Journal of Finance and Economics*, 27(1), 361–383. <https://doi.org/10.1002/ijfe.2157>
- Shan, J., & Morris, A. (2002). Does financial development “lead” economic growth? *International Review of Applied Economics*, 16(2), 153–168. <https://doi.org/10.1080/02692170110118885>
- Singh, S., Arya, V., Yadav, M. P., & Power, G. J. (2023). Does financial development improve economic growth? The role of asymmetrical relationships. *Global Finance Journal*, 56(D), 100831. <https://doi.org/10.1016/j.gfj.2023.100831>
- Singh, S., Deep Sharma, G., Radulescu, M., Balsalobre-Lorente, D., & Bansal, P. (2023). Do natural resources impact economic growth: An investigation of P5 + 1 countries under sustainable management. *Geoscience Frontiers*, xxxx, 101595. <https://doi.org/10.1016/j.gsf.2023.101595>
- Song, C. Q., Chang, C. P., & Gong, Q. (2021a). Economic growth, corruption, and financial development: Global evidence. *Economic Modelling*, 94(February), 822–830. <https://doi.org/10.1016/j.econmod.2020.02.022>
- Song, C. Q., Chang, C. P., & Gong, Q. (2021b). Economic growth, corruption, and financial development: Global evidence. *Economic Modelling*, 94(February 2020), 822–830. <https://doi.org/10.1016/j.econmod.2020.02.022>
- Swamy, P. A. V. B. (1970). Efficient Inference in a Random Coefficient Regression Model. *Journal of the EcEconometrica*, 38(2), 311–323.
- Tan, Z., Koondhar, M. A., Nawaz, K., Malik, M. N., Khan, Z. A., & Koondhar, M. A. (2021). Foreign direct investment, financial development, energy consumption, and air quality: A way for carbon neutrality in China. *Journal of Environmental Management*, 299(August), 113572.

<https://doi.org/10.1016/j.jenvman.2021.113572>

- Tang, C., Irfan, M., Razzaq, A., & Dagar, V. (2022). Natural resources and financial development: Role of business regulations in testing the resource-curse hypothesis in ASEAN countries. *Resources Policy*, 76(March), 102612. <https://doi.org/10.1016/j.resourpol.2022.102612>
- Tao, R., Umar, M., Naseer, A., & Razi, U. (2021). The dynamic effect of eco-innovation and environmental taxes on carbon neutrality target in emerging seven (E7) economies. *Journal of Environmental Management*, 299(April), 113525. <https://doi.org/10.1016/j.jenvman.2021.113525>
- Tiba, S., & Frikha, M. (2019). The controversy of the resource curse and the environment in the SDGs background: The African context. *Resources Policy*, 62(March), 437–452. <https://doi.org/10.1016/j.resourpol.2019.04.010>
- Uddin, G. S., Sjö, B., & Shahbaz, M. (2013). The causal nexus between financial development and economic growth in Kenya. *Economic Modelling*, 35(June 2011), 701–707. <https://doi.org/10.1016/j.econmod.2013.08.031>
- Valickova, P., Havranek, T., & Horvath, R. (2015). Financial development and economic growth: A meta-analysis. *Journal of Economic Surveys*, 29(3), 506–526. <https://doi.org/10.1111/joes.12068>
- Vincent L.Y. Lin. (1981). The Impact of Financial sector on Economic Development: Some cross-section evidence. *Studies in Comparative International Development*, 16(1), 44–52.
- Voumik, L. C., Mimi, M. B., & Raihan, A. (2023). Nexus Between Urbanization, Industrialization, Natural Resources Rent, and Anthropogenic Carbon Emissions in South Asia: CS-ARDL Approach. *Anthropocene Science*, 2(1), 48–61. <https://doi.org/10.1007/s44177-023-00047-3>
- Weidmann, C. L. J. (1999). Does Mother Nature Corrupt? Natural Resources, Corruption, and Economic Growth. *International Monetary Fund, Internatio*(6(11)), 951–952.
- Westerlund, J. (2005). New simple tests for panel cointegration. *Econometric Reviews*, 24(3), 297–316. <https://doi.org/10.1080/07474930500243019>
- Yıldırım, S., Gedikli, A., Erdoğan, S., & Yıldırım, D. Ç. (2020). Natural resources rents-financial development nexus: Evidence from sixteen developing countries. *Resources Policy*, 68(April). <https://doi.org/10.1016/j.resourpol.2020.101705>
- Yuxiang, K., & Chen, Z. (2011). Resource abundance and financial development: Evidence from China. *Resources Policy*, 36(1), 72–79. <https://doi.org/10.1016/j.resourpol.2010.05.002>
- Zafar, M. W., Saud, S., & Hou, F. (2019). The impact of globalization and financial development on environmental quality: Evidence from selected countries in the organization for economic co-operation and development (OECD). *Environmental Science and Pollution Research*, 26(13), 13246–13262. <https://doi.org/10.1007/s11356-019-04761-7>
- Zagorchev, A. G., Vasconcellos, G., & Bae, Y. (2011). The long-run relation among financial development , technology and GDP : a panel cointegration study The long-run relation among financial development , technology and GDP : a panel cointegration study. *Applied Financial Economics*, 21, 1021–1034. <https://doi.org/10.1080/09603107.2011.562164>
- Zaidi, S. A. H., Wei, Z., Gedikli, A., Zafar, M. W., Hou, F., & Iftikhar, Y. (2019). The impact of globalization, natural resources abundance, and human capital on financial development: Evidence from thirty-one OECD countries. *Resources Policy*, 64(June), 101476. <https://doi.org/10.1016/j.resourpol.2019.101476>
- Zhang, Q., & Brouwer, R. (2019). Is China Affected by the Resource Curse? A Critical Review of the Chinese Literature. *Journal of Policy Modeling*, 42(1), 133–152. <https://doi.org/10.1016/j.jpolmod.2019.06.005>
- Zhou Wen-xia; Chen Xiao-Yuan. (2014). A case study on Bijie city; Relation between coal enriching areas and Economic Growth. *Resources and Industries*, 16(3).
- Acikalin, S., Aktas, R., & Unal, S. (2008). Relationships between stock markets and macroeconomic variables: An empirical analysis of the Istanbul Stock Exchange. *Investment Management and*

Financial Innovations, 5(1), 8–16.

- Adebayo, T. S., Ullah, S., Kartal, M. T., Ali, K., Pata, U. K., & Ağa, M. (2023). Endorsing sustainable development in BRICS: The role of technological innovation, renewable energy consumption, and natural resources in limiting carbon emission. *Science of the Total Environment*, 859(August 2022). <https://doi.org/10.1016/j.scitotenv.2022.160181>
- Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? *Review of Development Finance*, 3(4), 192–203. <https://doi.org/10.1016/j.rdf.2013.11.001>
- Ahad, M. (2017). Impact of Financial Development on Trade Balance: An ARDL Cointegration and Causality Approach for Pakistan. *Global Business Review*, 18(5), 1199–1214. <https://doi.org/10.1177/0972150917710152>
- Ahmad, M., Jiang, P., Majeed, A., Umar, M., Khan, Z., & Muhammad, S. (2020). The dynamic impact of natural resources, technological innovations and economic growth on ecological footprint: An advanced panel data estimation. *Resources Policy*, 69(July), 101817. <https://doi.org/10.1016/j.resourpol.2020.101817>
- Ahmad, M., Kuldashewa, Z., Nasriddinov, F., Balbaa, M. E., & Fahlevi, M. (2023). Is achieving environmental sustainability dependent on information communication technology and globalization? Evidence from selected OECD countries. *Environmental Technology and Innovation*, 31, 103178. <https://doi.org/10.1016/j.eti.2023.103178>
- Akande, A., Cabral, P., & Casteleyn, S. (2019). Assessing the Gap between Technology and the Environmental Sustainability of European Cities. *Information Systems Frontiers*, 21(3), 581–604. <https://doi.org/10.1007/s10796-019-09903-3>
- Akwasi Gyamfi, B., Taiwo Onifade, S., Haouas, I., & Fatai Adedoyin, F. (2023). The impacts of resource abundance and export diversity on financial development in the South Asian economic bloc. *Heliyon*, 9(4), e15105. <https://doi.org/10.1016/j.heliyon.2023.e15105>
- Ali, A., Ramakrishnan, S., & Faisal. (2022). Financial development and natural resources. Is there a stock market resource curse? *Resources Policy*, 75(October 2021), 102457. <https://doi.org/10.1016/j.resourpol.2021.102457>
- Alshubiri, F., Jamil, S. A., & Elheddad, M. (2019). The impact of ICT on financial development: Empirical evidence from the Gulf Cooperation Council countries. *International Journal of Engineering Business Management*, 11, 1–14. <https://doi.org/10.1177/1847979019870670>
- Ang, J. B. (2008). What are the mechanisms linking financial development and economic growth in Malaysia? *Economic Modelling*, 25(1), 38–53. <https://doi.org/10.1016/j.econmod.2007.04.006>
- Ang, J. B. (2011). Savings mobilization, financial development and liberalization: The case of Malaysia. *Review of Income and Wealth*, 57(3), 449–470. <https://doi.org/10.1111/j.1475-4991.2010.00411.x>
- Appiah-Otoo, I., & Song, N. (2021). The impact of ICT on economic growth-Comparing rich and poor countries. *Telecommunications Policy*, 45(2), 102082. <https://doi.org/10.1016/j.telpol.2020.102082>
- Asaleye, A. J., & Strydom, K. (2022). Assessing Productivity Channels of Human Capital in the Southern African Development Community: New Insights from Women's Empowerment. *Journal of Risk and Financial Management*, 15(11). <https://doi.org/10.3390/jrfm15110533>
- Asif, M., Khan, K. B., Anser, M. K., Nassani, A. A., Abro, M. M. Q., & Zaman, K. (2020). Dynamic interaction between financial development and natural resources: Evaluating the 'Resource curse' hypothesis. *Resources Policy*, 65(December 2019), 101566. <https://doi.org/10.1016/j.resourpol.2019.101566>
- Asongu, S. A. (2014). Knowledge Economy and Financial Sector Competition in African Countries. *African Development Review*, 26(2), 333–346.
- Atil, A., Nawaz, K., Lahiani, A., & Roubaud, D. (2020a). Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic

- globalization. *Resources Policy*, 67(November 2019), 101683.
<https://doi.org/10.1016/j.resourpol.2020.101683>
- Atil, A., Nawaz, K., Lahiani, A., & Roubaud, D. (2020b). Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization. *Resources Policy*, 67(April), 101683.
<https://doi.org/10.1016/j.resourpol.2020.101683>
- Auty, R., & Warhurst, A. (1993). Sustainable development in mineral exporting economies. *Resources Policy*, 19(1), 14–29. [https://doi.org/10.1016/0301-4207\(93\)90049-S](https://doi.org/10.1016/0301-4207(93)90049-S)
- Azam, M., & Haseeb, M. (2021). Determinants of foreign direct investment in BRICS- does renewable and non-renewable energy matter? *Energy Strategy Reviews*, 35(March), 100638.
<https://doi.org/10.1016/j.esr.2021.100638>
- Badeeb, R. A., Lean, H. H., & Clark, J. (2017). The evolution of the natural resource curse thesis: A critical literature survey. *Resources Policy*, 51(October 2016), 123–134.
<https://doi.org/10.1016/j.resourpol.2016.10.015>
- Bağcı, A. (2020). Saving, Financial Development and Economic Growth Nexus in Turkey: New Evidence from Asymmetric Causality Analysis. *Gaziantep University Journal of Social Sciences*, 19(1), 220–237.
- Baland, J. M., & Francois, P. (2000). Rent-seeking and resource booms. *Journal of Development Economics*, 61(2), 527–542. [https://doi.org/10.1016/S0304-3878\(00\)00067-5](https://doi.org/10.1016/S0304-3878(00)00067-5)
- Baltagi, B. H., Demetriades, P. O., & Law, S. H. (2009). Financial development and openness: Evidence from panel data. *Journal of Development Economics*, 89(2), 285–296.
<https://doi.org/10.1016/j.jdevco.2008.06.006>
- Bayar, Y. (2014). Financial Development and Domestic Savings in Emerging Asian Countries. *Theoretical and Applied Economics*, XXI(7), 55–66.
<https://www.researchgate.net/publication/333668204>
- Beck, N., Katz, J. N., American, T., & Science, P. (1995). What to do (and not to do) with Time-Series Cross-Sectional Data. *Political Science*, 89(3), 634–647.
- Beck, T. (2002). Financial Development and International Agricultural Trade: Is There a Connection. *Journal of International Economics*, 57, 1–27. www.elsevier.com/locate/econbase
- Beck, T., Demirgüç-Kunt, A., & Honohan, P. (2009). Access to financial services: Measurement, impact, and policies. *World Bank Research Observer*, 24(1), 119–145.
<https://doi.org/10.1093/wbro/lkn008>
- Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance*, 28(3), 423–442. [https://doi.org/10.1016/S0378-4266\(02\)00408-9](https://doi.org/10.1016/S0378-4266(02)00408-9)
- Behera, J., & Sahoo, D. (2022). Asymmetric relationships between information and communication technology (ICT), globalization , and human development in India : evidence from non - linear ARDL analysis. *Journal of Economic Structures*. <https://doi.org/10.1186/s40008-022-00269-5>
- Ben Naceur, S., Cherif, M., & Kandil, M. (2014). What drives the development of the MENA financial sector? *Borsa Istanbul Review*, 14(4), 212–223. <https://doi.org/10.1016/j.bir.2014.09.002>
- Bhattacharyya, S., & Hodler, R. (2014). Do Natural Resource Revenues Hinder Financial Development? The Role of Political Institutions. *World Development*, 57, 101–113.
<https://doi.org/10.1016/j.worlddev.2013.12.003>
- Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics and Finance*, 6(1).
<https://doi.org/10.1080/23322039.2018.1449780>
- Blomquist, J., & Westerlund, J. (2013). Testing slope homogeneity in large panels with serial correlation. *Economics Letters*, 121(3), 374–378. <https://doi.org/10.1016/j.econlet.2013.09.012>
- Boyce, J. R., & Herbert Emery, J. C. (2011). Is a negative correlation between resource abundance and

- growth sufficient evidence that there is a “resource curse”? *Resources Policy*, 36(1), 1–13. <https://doi.org/10.1016/j.resourpol.2010.08.004>
- Brunnschweiler, C. N. (2008). Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth. *World Development*, 36(3), 399–419. <https://doi.org/10.1016/j.worlddev.2007.03.004>
- Calandra, D., Secinaro, S., Massaro, M., Dal Mas, F., & Bagnoli, C. (2023). The link between sustainable business models and Blockchain: A multiple case study approach. *Business Strategy and the Environment*, 32(4), 1403–1417. <https://doi.org/10.1002/bse.3195>
- Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, 72(1), 321–334. [https://doi.org/10.1016/S0304-3878\(03\)00079-8](https://doi.org/10.1016/S0304-3878(03)00079-8)
- Cave, J., K. Chaudhuri, & Kumbhakar, S. C. (2020). Do banking sector and stock market development matter for economic growth? *Empirical Economics*, 59(4), 1513–1535. <https://doi.org/10.1007/s00181-019-01692-7>
- Çetin, M., Sarıgül, S. S., Işık, C., Avcı, P., Ahmad, M., & Alvarado, R. (2023). The impact of natural resources, economic growth, savings, and current account balance on financial sector development: Theory and empirical evidence. *Resources Policy*, 81(January). <https://doi.org/10.1016/j.resourpol.2023.103300>
- Cheng, C., Chien, M., & Lee, C. (2020). ICT diffusion , fi nancial development , and economic growth : An international cross-country analysis. *Economic Modelling*, February. <https://doi.org/10.1016/j.econmod.2020.02.008>
- Cherif, M., & Dreger, C. (2016). Institutional Determinants of Financial Development in MENA countries. *Review of Development Economics*, 20(3), 670–680. <https://doi.org/10.1111/rode.12192>
- Chien, M., Cheng, C., & Ayu, M. (2020). The non-linear relationship between ICT diffusion and financial development. *Telecommunications Policy*, 44(9), 102023. <https://doi.org/10.1016/j.telpol.2020.102023>
- Chien, M. S., Cheng, C. Y., & Kurniawati, M. A. (2020). The non-linear relationship between ICT diffusion and financial development. *Telecommunications Policy*, 44(9), 102023. <https://doi.org/10.1016/j.telpol.2020.102023>
- Christiansen, L., Prati, A., Ricci, L., & Tressel, T. (2009). External Balance in Low Income Countries. *IMF Working Papers*, 09(221), 1. <https://doi.org/10.5089/9781451873689.001>
- Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: Evidence from panel unit root and cointegration tests. *Journal of Development Economics*, 73(1), 55–74. <https://doi.org/10.1016/j.jdevco.2003.03.002>
- Chudik, A., Mohaddes, K., Pesaran, M. H., & Raissi, M. (2016). Long-run effects in large heterogeneous panel data models with cross-sectionally correlated errors. *Advances in Econometrics*, 36, 85–135. <https://doi.org/10.1108/S0731-905320160000036013>
- Çoban, S., & Topcu, M. (2013). The nexus between financial development and energy consumption in the EU: A dynamic panel data analysis. *Energy Economics*, 39, 81–88. <https://doi.org/10.1016/j.eneco.2013.04.001>
- Dabbous, A. (2018). The impact of information and communication technology and financial development on energy consumption: A dynamic heterogeneous panel analysis for MENA countries. *International Journal of Energy Economics and Policy*, 8(4), 70–76.
- Das, A., Chowdhury, M., & Seaborn, S. (2018). ICT Diffusion, Financial Development and Economic Growth: New Evidence from Low and Lower Middle-Income Countries. *Journal of the Knowledge Economy*, 9(3), 928–947. <https://doi.org/10.1007/s13132-016-0383-7>
- De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World Development*, 23(3), 433–448. [https://doi.org/10.1016/0305-750X\(94\)00132-1](https://doi.org/10.1016/0305-750X(94)00132-1)

- Deng, Q. S., Alvarado, R., Cuesta, L., Tillaguango, B., Murshed, M., Rehman, A., Işık, C., & López-Sánchez, M. (2022). Asymmetric impacts of foreign direct investment inflows, financial development, and social globalization on environmental pollution. *Economic Analysis and Policy*, 76, 236–251. <https://doi.org/10.1016/j.eap.2022.08.008>
- Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, 84(2), 299–329. <https://doi.org/10.1016/j.jfineco.2006.03.004>
- Dogan, E., Madaleno, M., & Altinoz, B. (2020). Revisiting the nexus of financialization and natural resource abundance in resource-rich countries: New empirical evidence from nine indices of financial development. *Resources Policy*, 69(August), 101839. <https://doi.org/10.1016/j.resourpol.2020.101839>
- Dogan, E., & Seker, F. (2016). An investigation on the determinants of carbon emissions for OECD countries: empirical evidence from panel models robust to heterogeneity and cross-sectional dependence. *Environmental Science and Pollution Research*, 23(14), 14646–14655. <https://doi.org/10.1007/s11356-016-6632-2>
- Domowitz, I. (2002). Liquidity, transaction costs, and reintermediation in electronic markets. *Journal of Financial Services Research*, 22(1–2), 141–157. <https://doi.org/10.1023/A:1016077023185>
- Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450–1460. <https://doi.org/10.1016/j.econmod.2012.02.014>
- Dwumfour, R. A., & Ntow-Gyamfi, M. (2018). Natural resources, financial development and institutional quality in Africa: Is there a resource curse? *Resources Policy*, 59(July), 411–426. <https://doi.org/10.1016/j.resourpol.2018.08.012>
- Engle, R.F; Granger, C. W. J. (1987). Co-Integration and Error Correction : Representation , Estimation , and Testing. *The Econometric Society*, 55(2), 251–276.
- Erum, N., & Hussain, S. (2019). Corruption, natural resources and economic growth: Evidence from OIC countries. *Resources Policy*, 63(March), 101429. <https://doi.org/10.1016/j.resourpol.2019.101429>
- Faisal, Faisal, Turgut Tursoy, and Nil Günsel Resatoglu. "Is there any causality between financial development, energy consumption, and economic growth in Pakistan? Evidence from ARDL bounds testing approach and vector error correction model." *International Journal of Ecological Economics & Statistics* 38.2 (2017): 33-48.
- Farouq, I., Sulong, Z., Ahmad, U., Jakada, A., & Sambo, N. (2020). Heterogeneous Data Approach on Financial development of Selected African Leading Economies. *Data in Brief*, 30. <https://doi.org/10.1016/j.dib.2020.105670>
- Feng, L., Zhao, P., Ding, Y., & Liu, B. (2021). Rank-based tests of cross-sectional dependence in panel data models. *Computational Statistics and Data Analysis*, 153, 107070. <https://doi.org/10.1016/j.csda.2020.107070>
- Fosu, P. (2019). The Determinants of Economic Growth: The Role of Infrastructure. *Theoretical and Applied Economics*, XXI(6), 23–36. <https://mpra.ub.uni-muenchen.de/id/eprint/93101>
- G.C., S. (2020). Relationship between Trade Openness, Financial Development and Economic Growth of Nepal: Evidence from a Developing Country. *Quest Journal of Management and Social Sciences*, 2(2), 206–224. <https://doi.org/10.3126/qjms.v2i2.33270>
- Gheraia, Z., Abid, M., Sekrafi, H., & Abdelli, H. (2022). The moderating role of ICT diffusion between financial development and economic growth: a bootstrap ARDL approach in Saudi Arabia. *International Technology for Development*, 4, 816–836. <https://doi.org/10.1080/02681102.2021.1998759>
- Gokmenoglu, K. K., & Rustamov, B. (2019). Examining the World Bank Group lending and natural resource abundance induced financial development in KART countries. *Resources Policy*, 63(June), 101433. <https://doi.org/10.1016/j.resourpol.2019.101433>
- Goldsmith, R. W. (1959). Financial Structure and Development as a Subject for International

- Comparative Study. *Yale University, Press*, 114–123. <http://www.nber.org/chapters/c4417%0D>
- González-Páramo, J. M. (1995). Financial innovation in the digital age: Challenges for regulation and supervision. *Revista de Estabilidad Financiera*, 32, 9–37.
- Gozgor, G., Mahalik, M. K., Demir, E., & Padhan, H. (2020). The impact of economic globalization on renewable energy in the OECD countries. *Energy Policy*, 139(February), 111365. <https://doi.org/10.1016/j.enpol.2020.111365>
- Granger, C. W. J. (1981). Some Properties of time series data and their use in Econometric Model Specification. *Journal of Econometrics*, 16, 121–130.
- Gu, J., Gouliamos, K., Lobonț, O. R., & Nicoleta-Claudia, M. (2021). Is the fourth industrial revolution transforming the relationship between financial development and its determinants in emerging economies? *Technological Forecasting and Social Change*, 165(January), 1–6. <https://doi.org/10.1016/j.techfore.2020.120563>
- Guan, J., Kirikkaleli, D., Bibi, A., & Zhang, W. (2020). Natural resources rents nexus with financial development in the presence of globalization: Is the “resource curse” exist or myth? *Resources Policy*, 66(February 2020), 101641. <https://doi.org/10.1016/j.resourpol.2020.101641>
- Hadj, T. B., & Ghodbane, A. (2021). Do natural resources rents and institutional development matter for financial development under quantile regression approach? *Resources Policy*, 73(June), 102169. <https://doi.org/10.1016/j.resourpol.2021.102169>
- Haseeb, A., Xia, E., Saud, S., Ahmad, A., & Khurshid, H. (2019). Does information and communication technologies improve environmental quality in the era of globalization? An empirical analysis. *Environmental Science and Pollution Research*, 26(9), 8594–8608. <https://doi.org/10.1007/s11356-019-04296-x>
- Hashem Pesaran, M., & Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of Econometrics*, 142(1), 50–93. <https://doi.org/10.1016/j.jeconom.2007.05.010>
- Hsu, C. C., Chau, K. Y., & Chien, F. S. (2023). Natural resource volatility and financial development during Covid-19: Implications for economic recovery. *Resources Policy*, 81(January), 103343. <https://doi.org/10.1016/j.resourpol.2023.103343>
- Hussain, M., Ye, Z., Bashir, A., Chaudhry, N. I., & Zhao, Y. (2021). A nexus of natural resource rents, institutional quality, human capital, and financial development in resource-rich high-income economies. *Resources Policy*, 74(June), 102259. <https://doi.org/10.1016/j.resourpol.2021.102259>
- Ibrahim, M., & Sare, Y. A. (2018). Determinants of financial development in Africa: How robust is the interactive effect of trade openness and human capital? *Economic Analysis and Policy*, 60, 18–26. <https://doi.org/10.1016/j.eap.2018.09.002>
- Ibrahim Raheem Mutiu Abimbola Oyinlola. (2017). Saving-Investment-Financial Development; Evidence from SSA. *Journal of Financial Economic Policy*, 9(1), 1–21.
- Indicators, W. B. D. (2021). The World Bank (producer and distributor), Washington, D.C. . In <http://data.worldbank.org/data-catalog/world-development-indicators>.
- Ito, H., & Chinn, M. (2007). East Asia and Global Imbalances: Saving, Investment, and Financial Development. In *Financial Sector Development in the Pacific Rim, East Asia Seminar on Economics*, (No. 13364; Vol. 18). <http://ideas.repec.org/h/nbr/nberch/0432.html>
- Javadi, S., Motevaseli, M., & Farsi, J. Y. (2017). Oil Rent and Financial Environment: A Cross-country Examination. *International Journal of Economics and Financial*, 7(1), 298–302.
- Jiang, C., Zhang, Y., Kamran, H. W., & Afshan, S. (2021). Understanding the dynamics of the resource curse and financial development in China? A novel evidence based on QARDL model. *Resources Policy*, 72(January), 102091. <https://doi.org/10.1016/j.resourpol.2021.102091>
- Junior Abeka, M., Andoh, E., Gatsi, J. G., & Kawor, S. (2021). Financial development and economic growth nexus in SSA economies: The moderating role of telecommunication development. *Cogent*

- Economics and Finance*, 9(1). <https://doi.org/10.1080/23322039.2020.1862395>
- K. Karaman, K., & Yildirim, S. (2019). How does financial development alter the impact of uncertainty? *Journal of Banking and Finance*, 102, 33–42. <https://doi.org/10.1016/j.jbankfin.2019.03.008>
- Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90(1), 1–44. [https://doi.org/10.1016/S0304-4076\(98\)00023-2](https://doi.org/10.1016/S0304-4076(98)00023-2)
- Kearney, C., & Daly, K. (1998). The causes of stock market volatility in Australia. *Applied Financial Economics*, 8(6), 597–605. <https://doi.org/10.1080/096031098332637>
- Khan, A. (2001). Financial development and economic growth. *University of Chicago Press*, 5(3), 413–433. <https://doi.org/10.1017/s1365100500020046>
- Khan, F. N., Sana, A., & Arif, U. (2020). Information and communication technology (ICT) and environmental sustainability: a panel data analysis. *Environmental Science and Pollution Research*, 27(29), 36718–36731. <https://doi.org/10.1007/s11356-020-09704-1>
- Khan, M. A., Gu, L., Khan, M. A., & Meyer, N. (2022). The effects of national culture on financial sector development: Evidence from emerging and developing economies. *Borsa Istanbul Review*, 22(1), 103–112. <https://doi.org/10.1016/j.bir.2021.02.003>
- Khan, M. A., Gu, L., Khan, M. A., & Oláh, J. (2020). Natural resources and financial development: The role of institutional quality. *Journal of Multinational Financial Management*, 56. <https://doi.org/10.1016/j.mulfin.2020.100641>
- Khan, M. A., Khan, M. A., Abdulahi, M. E., Liaqat, I., & Shah, S. S. H. (2019). Institutional quality and financial development: The United States perspective. *Journal of Multinational Financial Management*, 49, 67–80. <https://doi.org/10.1016/j.mulfin.2019.01.001>
- Khan, Z., Hussain, M., Shahbaz, M., Yang, S., & Jiao, Z. (2020a). Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China. *Resources Policy*, 65(November), 101585. <https://doi.org/10.1016/j.resourpol.2020.101585>
- Khan, Z., Hussain, M., Shahbaz, M., Yang, S., & Jiao, Z. (2020b). Natural resource abundance, technological innovation, and human capital nexus with financial development: A case study of China. *Resources Policy*, 65(November 2019), 101585. <https://doi.org/10.1016/j.resourpol.2020.101585>
- Khraief, N., Shahbaz, M., Heshmati, A., & Azam, M. (2020). Are unemployment rates in OECD countries stationary? Evidence from univariate and panel unit root tests. *North American Journal of Economics and Finance*, 51(March), 1–15. <https://doi.org/10.1016/j.najef.2018.08.021>
- King, R. G., & Levine, R. (1993). Finance and growth: schumpeter might be right. *Quarterly Journal of Economics*, 108(3), 717–737. <https://doi.org/10.2307/2118406>
- Latif, S., Farooq, A., Loganathan, N., & Shahbaz, M. (2014). Empirical evidence on the resource curse hypothesis in oil abundant economy. *Economic Modelling*, 42, 421–429. <https://doi.org/10.1016/j.econmod.2014.07.020>
- Law, S. H. (2009). Trade openness, capital flows and financial development in developing economies. *International Economic Journal*, 23(3), 409–426. <https://doi.org/10.1080/10168730903268398>
- Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking and Finance*, 41(1), 36–44. <https://doi.org/10.1016/j.jbankfin.2013.12.020>
- Lee, C. C., Yahya, F., & Razzaq, A. (2022). Greening South Asia with Financial Liberalization, Human Capital, and Militarization: Evidence from the CS-ARDL Approach. *Energy and Environment*. <https://doi.org/10.1177/0958305X221105863>
- Lenka, S. K., & Sharma, R. (2020). Re-examining the Effect of Financial Development on Economic Growth in India: Does the Measurement of Financial Development Matter? *Journal of Asia-Pacific Business*, 21(2), 124–142. <https://doi.org/10.1080/10599231.2020.1745050>
- Levine, R. (2005a). Finance and Growth: Theory and Evidence. *Nber Working Paper Series*,

- September, 1–118. <http://www.nber.org/papers/w10766>
- Levine, R. (2005b). Finance and Growth: Theory and Evidence. *Handbook of Economic Growth*, 1(SUPPL. PART A), 865–934. [https://doi.org/10.1016/S1574-0684\(05\)01012-9](https://doi.org/10.1016/S1574-0684(05)01012-9)
- Li, Z., Rizvi, S. K. A., Rubbaniy, G., & Umar, M. (2021). Understanding the dynamics of resource curse in G7 countries: The role of natural resource rents and the three facets of financial development. *Resources Policy*, 73(May), 102141. <https://doi.org/10.1016/j.resourpol.2021.102141>
- Liang, Q., & Teng, J. Z. (2006). Financial development and economic growth: Evidence from China. *China Economic Review*, 17(4), 395–411. <https://doi.org/10.1016/j.chieco.2005.09.003>
- Liberti, J. M., Seru, A., & Vig, V. (2016). Information, Credit, and Organization. *SSRN Electronic Journal*, June. <https://doi.org/10.2139/ssrn.2798608>
- Lucas, R. E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22(February), 3–42. <http://linkinghub.elsevier.com/retrieve/pii/0304393288901687>
- Madsen, J. B., Islam, M. R., & Doucouliagos, H. (2018). Inequality, financial development and economic growth in the OECD, 1870–2011. *European Economic Review*, 101, 605–624. <https://doi.org/10.1016/j.eurocorev.2017.11.004>
- Maitra, B. (2018). Dynamics of capital account and current account in Sri Lanka. *Journal of International Trade and Economic Development*, 27(1), 54–73. <https://doi.org/10.1080/09638199.2017.1337804>
- Mark, N. C., & Sul, D. (2003). Cointegration Vector Estimation by Panel DOLS and Long-run Money Demand. *Oxford Bulletin of Economics and Statistics*, 65(5), 655–.
- Mignamissi, D., & Djijo T., A. J. (2021). Digital divide and financial development in Africa. *Telecommunications Policy*, 45(9). <https://doi.org/10.1016/j.telpol.2021.102199>
- Nain, M. Z., & Kamaiah, B. (2014). Financial development and economic growth in India: some evidence from non-linear causality analysis. *Economic Change and Restructuring*, 47(4), 299–319. <https://doi.org/10.1007/s10644-014-9151-5>
- Odei-appiah, S., Wiredu, G., & Adjei, J. K. (2022). Fintech use , digital divide and fi nancial inclusion. *DIGITAL POLICY, REGULATION AND GOVERNANCE*, 24(5), 435–448. <https://doi.org/10.1108/DPRG-09-2021-0111>
- Odhiambo, N. M. (2008). Financial depth, savings and economic growth in Kenya: A dynamic causal linkage. *Economic Modelling*, 25(4), 704–713. <https://doi.org/10.1016/j.econmod.2007.10.009>
- Oluwatosin Adeniyi, & Festus O. Egwaikhide. (2013). Saving-Investment Nexus in Developing Countries: Does Financial Development Matter? *Journal of Economic Development*, 38(2), 119–140. <https://doi.org/10.35866/caujed.2013.38.2.005>
- Owusu-Agyei, S., Okafor, G., Chijoke-Mgbame, A. M., Ohalehi, P., & Hasan, F. (2020). Internet adoption and financial development in sub-Saharan Africa. *Technological Forecasting and Social Change*, 161(August), 120293. <https://doi.org/10.1016/j.techfore.2020.120293>
- P. Avci, S. S. S. (2022). Is the performance of the companies operating in the participation index in the Turkish economy affected by the macroeconomic perspective? *Ekonomi*, 08(October), 63–73.
- Patrick, H. T. (1966). Growth Financial Development in Underdeveloped Countries. *Journals Uchicago*, 174–189.
- Pedroni, P. (2000). Fully modified OLS for heterogeneous cointegrated panels. In *Advances in Econometrics* (Vol. 15). [https://doi.org/10.1016/S0731-9053\(00\)15004-2](https://doi.org/10.1016/S0731-9053(00)15004-2)
- Pedroni, P. (2004). Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, 20(3), 597–625. <https://doi.org/10.1017/S0266466604203073>
- Pesaran, M. H. (2004). General Diagnostic Tests for Cross Section Dependence in Panels. In *University of cambridge press* (No. 1240). <http://www.emeraldinsight.com/loi/afr>

- Pesaran, M. H. (2007). A SIMPLE PANEL UNIT ROOT TEST IN THE PRESENCE OF CROSS-SECTION DEPENDENCE. *Journal of Applied Econometrics*, 312, 256–312. <https://doi.org/10.1002/jae>
- Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, 60(1), 13–50. <https://doi.org/10.1007/s00181-020-01875-7>
- Phuc Nguyen, C., Dinh Su, T., & Doytch, N. (2020). The drivers of financial development: Global evidence from internet and mobile usage. *Information Economics and Policy*, 53(xxxx), 100892. <https://doi.org/10.1016/j.infoecopol.2020.100892>
- Quixina, Y., & Almeida, Á. (2014). Financial Development and Economic Growth in a Natural Resource Based Economy: Evidence from Angola. *FEP Working Papers*, September, 16.
- Raifu, I. A., Kumeka, T. T., & Aminu, A. (2023). Financial Development and Unemployment in MENA: Evidence from Heterogeneous Panel Causality and Quantile via Moment Regression. In *Journal of the Knowledge Economy* (Issue 0123456789). Springer US. <https://doi.org/10.1007/s13132-023-01260-6>
- Raihan, A., & Tuspekova, A. (2022). Nexus between energy use, industrialization, forest area, and carbon dioxide emissions: New insights from Russia. *Journal of Environmental Science and Economics*, 1(4), 1–11. <https://doi.org/10.56556/jescae.v1i4.269>
- Ribaj, A., & Mexhuani, F. (2021). The impact of savings on economic growth in a developing country (the case of Kosovo). *Journal of Innovation and Entrepreneurship*, 10(1), 1–13. <https://doi.org/10.1186/s13731-020-00140-6>
- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation* (Third edit, pp. 1772–1823). John Murray, London.
- Ronald I. McKinnon. (1970). *Money and Capital in Economic Development*. Brookings Institution Press. <https://www.brookings.edu/books/money-and-capital-in-economic-development/>
- Saba, C. S., & Ngepah, N. (2022). ICT Diffusion, Industrialisation and Economic Growth Nexus: an International Cross-country Analysis. *Journal of the Knowledge Economy*, 13(3), 2030–2069. <https://doi.org/10.1007/s13132-021-00795-w>
- Sahoo, P., & Dash, R. K. (2013). Financial sector development and domestic savings in South Asia. *Economic Modelling*, 33, 388–397. <https://doi.org/10.1016/j.econmod.2013.04.018>
- Salahuddin, M., & Gow, J. (2016). The effects of Internet usage, financial development and trade openness on economic growth in South Africa: A time series analysis. *Telematics and Informatics*, 33(4), 1141–1154. <https://doi.org/10.1016/j.tele.2015.11.006>
- Saldivia, M., Kristjanpoller, W., & Olson, J. E. (2020). Energy consumption and GDP revisited: A new panel data approach with wavelet decomposition. *Applied Energy*, 272(February), 115207. <https://doi.org/10.1016/j.apenergy.2020.115207>
- Salisu, M. (2005). The role of capital flight and remittances in current account sustainability in Sub-Saharan Africa. *African Development Review*, 17(3), 382–404. <https://doi.org/10.1111/j.1017-6772.2006.00121.x>
- Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the Relationship Between Financial Development and Economic Growth Monotonic? Evidence from a Sample of Middle-Income Countries. *World Development*, 68(1), 66–81. <https://doi.org/10.1016/j.worlddev.2014.11.010>
- Sarkodie, S. A., & Owusu, P. A. (2020). How to apply dynamic panel bootstrap-corrected fixed-effects (xtbefe) and heterogeneous dynamics (panelhetero). *MethodsX*, 7, 101045. <https://doi.org/10.1016/j.mex.2020.101045>
- Sarma, M., & Pais, J. (2006). Financial Inclusion and Development: A Cross Country Analysis. *Journal of International Development*, 18(10–13), 1–30. <https://doi.org/10.1002/jid>
- Sassi, S., & Goaid, M. (2013). Financial development, ICT diffusion and economic growth: Lessons from MENA region. *Telecommunications Policy*, 37(4–5), 252–261.

<https://doi.org/10.1016/j.telpol.2012.12.004>

- Shahbaz, M., Naeem, M., Ahad, M., & Tahir, I. (2018). Is natural resource abundance a stimulus for financial development in the USA? *Resources Policy*, 55(September), 223–232. <https://doi.org/10.1016/j.resourpol.2017.12.006>
- Shahbaz, M., Nasir, M. A., & Lahiani, A. (2022). Role of financial development in economic growth in the light of asymmetric effects and financial efficiency. *International Journal of Finance and Economics*, 27(1), 361–383. <https://doi.org/10.1002/ijfe.2157>
- Shan, J., & Morris, A. (2002). Does financial development “lead” economic growth? *International Review of Applied Economics*, 16(2), 153–168. <https://doi.org/10.1080/02692170110118885>
- Singh, S., Arya, V., Yadav, M. P., & Power, G. J. (2023). Does financial development improve economic growth? The role of asymmetrical relationships. *Global Finance Journal*, 56(D), 100831. <https://doi.org/10.1016/j.gfj.2023.100831>
- Singh, S., Deep Sharma, G., Radulescu, M., Balsalobre-Lorente, D., & Bansal, P. (2023). Do natural resources impact economic growth: An investigation of P5 + 1 countries under sustainable management. *Geoscience Frontiers*, xxxx, 101595. <https://doi.org/10.1016/j.gsf.2023.101595>
- Song, C. Q., Chang, C. P., & Gong, Q. (2021a). Economic growth, corruption, and financial development: Global evidence. *Economic Modelling*, 94(February), 822–830. <https://doi.org/10.1016/j.econmod.2020.02.022>
- Song, C. Q., Chang, C. P., & Gong, Q. (2021b). Economic growth, corruption, and financial development: Global evidence. *Economic Modelling*, 94(February 2020), 822–830. <https://doi.org/10.1016/j.econmod.2020.02.022>
- Swamy, P. A. V. B. (1970). Efficient Inference in a Random Coefficient Regression Model. *Journal of the EcEconometrica*, 38(2), 311–323.
- Tan, Z., Koondhar, M. A., Nawaz, K., Malik, M. N., Khan, Z. A., & Koondhar, M. A. (2021). Foreign direct investment, financial development, energy consumption, and air quality: A way for carbon neutrality in China. *Journal of Environmental Management*, 299(August), 113572. <https://doi.org/10.1016/j.jenvman.2021.113572>
- Tang, C., Irfan, M., Razzaq, A., & Dagar, V. (2022). Natural resources and financial development: Role of business regulations in testing the resource-curse hypothesis in ASEAN countries. *Resources Policy*, 76(March), 102612. <https://doi.org/10.1016/j.resourpol.2022.102612>
- Tao, R., Umar, M., Naseer, A., & Razi, U. (2021). The dynamic effect of eco-innovation and environmental taxes on carbon neutrality target in emerging seven (E7) economies. *Journal of Environmental Management*, 299(April), 113525. <https://doi.org/10.1016/j.jenvman.2021.113525>
- Tiba, S., & Frikha, M. (2019). The controversy of the resource curse and the environment in the SDGs background: The African context. *Resources Policy*, 62(March), 437–452. <https://doi.org/10.1016/j.resourpol.2019.04.010>
- Uddin, G. S., Sjö, B., & Shahbaz, M. (2013). The causal nexus between financial development and economic growth in Kenya. *Economic Modelling*, 35(June 2011), 701–707. <https://doi.org/10.1016/j.econmod.2013.08.031>
- Valickova, P., Havranek, T., & Horvath, R. (2015). Financial development and economic growth: A meta-analysis. *Journal of Economic Surveys*, 29(3), 506–526. <https://doi.org/10.1111/joes.12068>
- Vincent L.Y. Lin. (1981). The Impact of Financial Sector on Economic Development: Some cross-section evidence. *Studies in Comparative International Development*, 16(1), 44–52.
- Voumik, L. C., Mimi, M. B., & Raihan, A. (2023). Nexus Between Urbanization, Industrialization, Natural Resources Rent, and Anthropogenic Carbon Emissions in South Asia: CS-ARDL Approach. *Anthropocene Science*, 2(1), 48–61. <https://doi.org/10.1007/s44177-023-00047-3>
- Weidmann, C. L. J. (1999). Does Mother Nature Corrupt? Natural Resources, Corruption, and Economic Growth. *International Monetary Fund, Internatio*(6(11)), 951–952.

- Westerlund, J. (2005). New simple tests for panel cointegration. *Econometric Reviews*, 24(3), 297–316. <https://doi.org/10.1080/07474930500243019>
- Yıldırım, S., Gedikli, A., Erdoğan, S., & Yıldırım, D. Ç. (2020). Natural resources rents-financial development nexus: Evidence from sixteen developing countries. *Resources Policy*, 68(April). <https://doi.org/10.1016/j.resourpol.2020.101705>
- Yuxiang, K., & Chen, Z. (2011). Resource abundance and financial development: Evidence from China. *Resources Policy*, 36(1), 72–79. <https://doi.org/10.1016/j.resourpol.2010.05.002>
- Zafar, M. W., Saud, S., & Hou, F. (2019). The impact of globalization and financial development on environmental quality: Evidence from selected countries in the organization for economic co-operation and development (OECD). *Environmental Science and Pollution Research*, 26(13), 13246–13262. <https://doi.org/10.1007/s11356-019-04761-7>
- Zagorchev, A. G., Vasconcellos, G., & Bae, Y. (2011). The long-run relation among financial development , technology and GDP : a panel cointegration study The long-run relation among financial development , technology and GDP : a panel cointegration study. *Applied Financial Economics*, 21, 1021–1034. <https://doi.org/10.1080/09603107.2011.562164>
- Zaidi, S. A. H., Wei, Z., Gedikli, A., Zafar, M. W., Hou, F., & Iftikhar, Y. (2019). The impact of globalization, natural resources abundance, and human capital on financial development: Evidence from thirty-one OECD countries. *Resources Policy*, 64(June), 101476. <https://doi.org/10.1016/j.resourpol.2019.101476>
- Zhang, Q., & Brouwer, R. (2019). Is China Affected by the Resource Curse? A Critical Review of the Chinese Literature. *Journal of Policy Modeling*, 42(1), 133–152. <https://doi.org/10.1016/j.jpolmod.2019.06.005>
- Zhou Wen-xia; Chen Xiao-Yuan. (2014). A case study on Bijie city; Relation between coal enriching areas and Economic Growth. *Resources and Industries*, 16(3)