Are natural resources a blessing or a curse for financial development in Pakistan? The importance of oil prices, economic growth and economic globalization

Ahmed Atil, Kishwar Nawaz, Amine Lahiani, David Roubaud

Version of Record: https://www.sciencedirect.com/science/article/pii/S0301420719309195
Manuscript_a3239edb7e2c68c2f360851e807ba09f

Are Natural Resources a Blessing or a Curse for Financial Development in Pakistan? The Importance of Oil Prices, Economic Growth and Economic Globalization

Ahmed Atil
Rennes School of Business, France
Email: ahmed.atil@rennes-sb.com

Kishwar Nawaz
LEO, University of Orleans, Orléans, France.
Email: kishwar.nawaz@etu.univ-orleans.fr

Amine Lahiani
LEO, University of Orleans, Orleans, France
Professor, Montpellier Business School, Montpellier, France
Email: amine.lahiani@univ-orleans.fr

David Roubaud
Montpellier Business School, Montpellier, France
Email: d.roubaud@Montpellier-BS.com

Abstract: This paper investigates the linkage between natural resources and financial development by considering oil prices, economic growth and economic globalization as additional determinants in finance demand function for case of Pakistan over the period of 1972-2017. In doing so, we have applied long run covariability developed by Muller and Watson (2018) and robustness of empirical results is tested by applying cross-quantilogram introduced by Han et al. (2016). The empirical evidence reveals that natural resource abundance is positively correlated with financial development i.e. natural resources are blessing for financial development. Oil prices have positive effect on financial development. Economic growth has positive and significant impact on financial development. Contrarily, economic globalization hinders financial development. The empirical evidence indicates new insights for policy makers to use natural resources as economic tool to increases financial development for long run.
Keywords: Natural Resources; Financial Development; Long Run Covariability
JEL Classification: Q0, P33, F21

Are Natural Resources a Blessing or a Curse for Financial Development in Pakistan? The Importance of Oil Prices, Economic Growth and Economic Globalization

Abstract: This paper investigates the linkage between natural resources and financial development by considering oil prices, economic growth and economic globalization as additional determinants in finance demand function for case of Pakistan over the period of 1972-2017. In doing so, we have applied long run covariability developed by Muller and Watson (2018) and robustness of empirical results is tested by applying cross-quantilogram introduced by Han et al. (2016). The empirical evidence reveals that natural resource abundance is positively correlated with financial development i.e. natural resources are blessing for financial development. Oil prices have positive effect on financial development. Economic growth has positive and significant impact on financial development. Contrarily, economic globalization hinders financial development. The empirical evidence indicates new insights for policy makers to use natural resources as economic tool to increases financial development for long run.

Keywords: Natural Resources; Financial Development; Long Run Covariability
JEL Classification: Q0, P33, F21

1. Introduction

The nexus between natural resource abundance and financial development is investigated for three main reasons: (i), The empirical investigation of natural resources-financial development relationship is new. Natural resources can be blessing or curse for financial development. The latter stimulates economic activity by providing financial resources to productive investment ventures and natural resources may affect finance-growth nexus which sheds light on natural resources-economic growth as well (Baland and Francois 2000, Guiso et al. 2004). (ii), The understanding of the relationship between natural resources and financial development is important for policy makers to help in designing comprehensive economic policy for utilizing natural resources as a tool to stimulate economic growth and improve financial development in the country based on obtained empirical results (Baltagi et al. 2009). (iii), The empirical investigation of natural resources and financial development relationship can also offer a new explanation for regions with different levels of financial development by deepening our undemanding of how natural resources abundance helps in shaping financial development (Gylfason and Zoega, 2006). Being a South Asian nation, Pakistan is characterized by richness in pool of natural resources, e.g. natural gas, crude oil, coal, iron, copper, salt, limestone etc. Owing to the existing network of water resources, Pakistan is also characterized by the potential of hydro power generation. The pool of coal resources in Pakistan amounts to nearly 175 billion tons, which can be approximated to 618 billion barrels of crude oil, and this pool is more than twofold compared to the largest crude oil pool persisting in top four countries. Electricity demand for nearly two centuries can be fulfilled by means of this pool of coal reserve. Besides, the pool of natural gas in Pakistan amounts to approximately 885.3 billion cubic meters, and this entire pool might be exploited over two subsequent decades. The Pothohar Plateau in Pakistan is rich in terms of not only the pool of gold and copper, but also the pool of Saindak and rock salt. The pool of mineral reserve in this region include gypsum, uranium, limestone, chromites, iron ore, rock salt, silver, precious stones, gems, marbles, tiles, sulfur, fire clay, and silica sand. In a nutshell, it might be concluded that Pakistan is characterized by an assortment of natural resources. A budding metropolitan middle class, intellectual and adolescent populace can be considered as a very significant human resource in Pakistan. In a not so distant future, Pakistan can be visualized as a nucleus of tradition, knowledge and prosperity concentrating to develop policy-level framework. A key position with the characteristics of natural resources points at attaining sustained economic expansion in Pakistan.

Natural resources abundance may affect financial development via four channels: Firstly, the exploitation of natural resources shifts factors of production from manufacturing (tradable) sector. This shows that natural resources abundance inclines to shrink tradable sector and trade openness plays important role in financial development. In such channel, abundance of natural resources impedes financial development by shrinking traded sector in the country (Baltagi et al. 2009). Secondly, the exploitation of natural resources may also be a source of rent-seeking and corruption. Rent-seeking and corruption tend to decrease number of entrepreneurs who basically promote financial development. This shows that natural resources abundance is harmful for financial development in the country if rent-seeking accompanied with corruption is promoted (Baland and Francois 2000). Thirdly, the abundance of natural resources not only de-incentivizes the accumulation of human capital both at private and public levels but also crowds-out social capital which is a significant factor of financial development. Social capital is determined by level of trust and financial development is affected by social capital if financial contracts are trust-based. This shows that human and social capitals are determined by natural resources abundance which in resulting, may affect financial development (Guiso et al. 2004). Fourthly, investment (private, public and foreign

direct investment) is also affected by human capital and social capital as well as rent-seeking and corruption. The presence of Dutch disease hinders investment in traded sector (manufacturing) and, rent-seeking and corruption further decline investment which in resulting, decline financial services and hence, financial development is hindered (Gylfason and Zoega, 2006)[1].

The contribution of the present paper to existing literature is three folds: (i), This paper examines the relationship between natural resources, oil prices, economic globalization, economic growth and financial development in case of Pakistan. (ii), This paper applies long-run covariability method introduced by Muller and Watson (2018). This approach has potential of offering reliable and consistent empirical results about long-run covariability at various range of persistent forms. If variables are integrated at I(0), I(1) or I(1)/I(0), then long-run covariability approach works well. Long run variability of each of natural resources, oil prices, economic globalization and economic growth with financial development is investigated. It is argued by Hodrick and Prescott, (1997) and Baxter and King, (1999) that such models including population second moments for long run projections, incorporate the populace second moments of the long run projections, where these projections are equivalent to those of the low-pass separated version of the example. For the long run projections, we use long-run covariability which is relatively seized by the covariability of a minimum number q of the trigonometrically weighted mean of taken period. The populace second moment of projections subsequently compare to a mean range over a low-frequency range. Like Engle (1974), the parameters of long-run covariance are those from the low-frequency range regression planned to captured forms with more than I(0) parameters. The center distinction between the present examination and prior semi-parametric models that focus to consolidate the low-frequency execution of selected time arrangement (Shimotsu, 2012) is that in our asymptotic examination, we hold the q fixed as an element of the total number of annotations. This affirms the short sample insufficiency of the low-frequency proof is uncovered in our current asymptotic assessments, as in Muller and Watson (2008), which accomplish even more reliable understanding of data typically used in practical examinations. (iii), The cross-quantilogram is also applied for examining dependence structure from globalization, natural resources, economic growth and oil prices to financial development in Pakistan. Our empirical evidence reveals the positive impact of natural resources, oil prices and economic growth on financial development. Economic globalization declines financial development. The empirical results reported by cross-quantilogram confirm the robustness of empirical results shown by long run covariability.

[1] Oil prices may affect financial development in oil importing or oil-exporting countries via various channels. For instance, crude oil prices may impact economic activity. In oil-importing countries, rise in oil prices adversely affects economic activity or economic development but in oil exporting countries, crude oil prices rise provides needful financial resources to stimulate economic activity. In the international market, crude oil prices changes affect not only economic but also political factors. Changes in oil prices in oil-importing or oil-exporting countries may affect their fiscal spending determining economic development as well as financial services demand. This reveals that development of financial sector is also a function of oil prices (Poghosyan and Hesse, 2009; Samargandi et al., 2014)[1]. In era of globalization, financial development may be benefited from economic globalization by various channels. For instance, Mishkin (2009) noted that globalization leads financial development by stimulating economic activity by strengthening institutional quality. Globalization not only provides access to capital but also lowers cost of loans by opening domestic financial markets for foreigners to invest in local productive investment projects. Globalization is source of financial globalization that strengthens institutions which in resulting, leads local financial markets to develop and hence, financial development is increased. Globalization attracts foreign capital inflows to recipient countries which in return, boosts economic growth and leads financial development. Last but not least, globalization enables domestic financial sector to acquire fruits of foreign capital inflows as institutional quality in developing economies is weak.

The rest of paper is designed as follows: Literature review is detailed in Section 2. Section 3 describes the empirical modeling and data. The empirical results and their discussion are reported in Section 4. Section 5 concludes and highlights policy implications.

2. Literature Review

Existing literature contains several studies investigating the relationship between financial development and its determinants. We have divided existing literature review into three nexuses based on the interest of our study such as: natural resources-financial development; oil prices-financial development nexus and, nexus between economic globalization and financial development.

2.1. Natural Resources-Financial Development Nexus

The relationship between natural resources and financial development is much empirically investigated. Few studies are available on resources-finance nexus with conflicting empirical findings. For instance, Bakwena and Bodman (2010) used data of non-oil economies for the period of 1984-2003 to examine the association between financial development and natural resources. They find that financial development helps to improve the efficiency of investment using natural resources as economic tool, which in resulting, stimulates economic growth. Yuxiang and Chen (2011), explored the direct relationship between natural resource abundance and financial development using Chinese provincial data for the period of 1996-2006. They explored the potential channels how natural resources affects financial development via shrinking traded sector, rent-seeking and corruption, decline in human and social capital as well as low private and public investments. For empirical analysis, they applied system GMM approach and reported the presence of resource curse hypothesis in financial sector development for China. Additionally, a positive relationship exists between financial development and economic growth which confirms that financial development provides an effective mechanism for using natural resources as economic tool to promote economic growth. Hooshmand et al. (2013) used data for oil-exporting countries to estimate finance demand function by considering resource rents and institutions as main determinants of financial development. They applied GMM approach for empirical analysis over the period of 2000-2010. Their empirical evidence indicates the presence of resource-curse hypothesis in financial sector development i.e. resource rents impede financial development.

Using data for 133 developed and developing countries, Bhattacharyya and Hodler (2014) investigated the effect of natural resources on financial development by introducing democracy and political institutions into finance function. They applied GMM approach for empirical analysis for the period of 1970-2005. Their empirical analysis shows that natural resources abundance (measures by natural resource rents) hinders financial development in resource-rich countries where quality of political institutions is poor. They also noted that economic growth is significant contributor of financial development. Later on, Badeeb et al. (2016) examined the relationship between natural resources and economic growth by adding financial development and investment in production function for Malaysian economy using the period of 1970-2013. They estimated empirical results by employing bounds testing approach which confirms the existence of cointegration between the variables. Their empirical results indicate the presence of indirect but weak effect of natural resources (oil dependence) via financial development. Javadi et al. (2017) used panel data of 70 countries to determine relationship between resource rents and financial development for the period of 2006-2014. Their empirical analysis indicates that resource rents play significant role in financial development for developed countries. Law and Moradbeigi (2017) collected data for

63 oil-producing countries to test the linkages between natural resources and financial development by applying common correlated effect mean group estimator i.e. CCEMG which is suitable in the presence of high degree of heterogeneity. They find that financial development helps in reducing negative effect of natural resources on economic growth as financial sector allocates resource to more productive projects.

For African countries, Dwumfour and Ntow-Gyamfi (2018) visited the nexus between financial development and natural resources by including institutional quality in finance function by applying GMM approach for the period of 2000-2012. They indicated that empirical relationship between financial development and natural resources depends on the measure of financial development. Their empirical analysis reports the positive effect of natural resources (proxies by resource rent) on financial development (measures by domestic credit to private sector). Additionally, institutional quality helps in reducing inverse impact of resource rents on financial development. For Nigerian economy, Bamidele et al. (2018) used oil dependence as measure of natural resources to examine the resource-finance nexus for period of 1981-2015 by applying Johansen cointegration approach. They confirm the presence of long run relationship between the variables. Their empirical analysis further indicates that oil rent increases financial development. The causality results show that oil rents cause financial development and similar is not true from opposite-side. Similarly, Shahbaz et al. (2018a) applied finance demand function to examine the impact of natural resources on financial development for the US economy. They consider economic growth, education and capitalization as additional factors affecting financial development. The bounds testing approach to cointegration is applied for examining long run relationship between the variables and robustness of long run empirical results is tested by applying Bayer and Hanck (2013) approach. Their empirical results confirmed the presence of cointegration and results are robust. Furthermore, they noted that natural resources are positively linked with financial development. Economic growth and education have positive effect on financial development but capitalization declines it. Their causality analysis also reveals the existence of feedback effect between financial development and natural resources. Khan et al. (2019) revisited the nexus of natural resource-financial development by considering resource rents as measure of natural resources and financial development index proposed by Svirydzenka (2016) for the United States. They applied ARDL bounds testing for cointegration by including institutional quality into finance demand function for the period of 1984-2016. Their empirical evidence reports the existence of cointegration between financial development and its determinants. They further note that resource rents impede financial development i.e. negated the argument raised by Shahbaz et al. (2018a). Institutional quality helps in declining inverse effect of natural resources on financial development. Their causality analysis reveals the unidirectional causality running from resource rents to financial development.

2.2. Oil Prices-Financial Development Nexus

Existing literature provides various studies investigating the relationship between crude oil prices and financial development. It suggests that financial development is divided into stock market-based financial development and bank-based financial development. The studies investigated the association between oil prices and financial development by using stock prices as an indicator of stock market-based financial development but reported inconclusive empirical findings. Similarly, Antonakakis and Filis (2013) noted that relationship between oil prices and stock market is time-varying. Further, we find that stock markets show stock-market based financial development but do not cover bank-based financial development. Broadstock and Filis (2014) applied time-varying correlation between oil price shocks and stock markets returns using the USA and Chinese data for the period of 1995-2003. They

noted the systematic time-varying correlation and the US stock market responds more on oil price shocks compared to Chinese market. Zhang (2017) used global level data to reinvestigate the connectedness between oil prices and stock-market based financial development by applying Diebold and Yilmaz (2009, 2012, 2014) approaches. The empirical analysis indicates the limited effect of oil prices on world financial development. Further, large stock markets are significantly contributed by oil prices. Balcilar et al. (2017) used more than 150 years data for US economy to revisit the relationship between stock prices and oil prices. They noted the presence of cointegration between the variables. Their empirical analysis further confirms the existence of positive relationship between crude oil prices and stock prices in the presence of structural break of 1945. In case of GCC countries, Fenech and Vosgha (2018) applied time-varying GJR copula method to examine the dependence between oil prices and stock prices over the period of 2007-2016 using month frequency data. They found mixed empirical results such as positive co-movement between the variables is found for the case of Saudi Arabia, Abu Dhabi, Qatar and Oman but negative co-movements exist in case of Dubai, Bahrain and Kuwait[2]. Yun and Yoon (2019) revisited the association between oil prices and stock prices (airlines) for China and South Korea by applying VAR-GARCH-BEKK model(s). Their empirical analysis reveals the presence of spillover effect between the variables for both countries.

Using bank-based financial development indicators, Nwani et al. (2016) applied bounds testing approach to cointegration for investigating the role of oil prices in financial sector intermediation using data for Nigeria for the period of 1975-2011. They found cointegration association between the variables and noted that oil prices significantly contribute to financial intermediation development. Zaccheaus (2016) revisited the nexus between oil prices and banking sector profitability using unbalanced panel of 12 banks for the period of 2009-2015. The generalized moment method is applied for empirical analysis and results show that oil and gas are key elements affecting banking profitability in Nigeria. Furthermore, profit persistence phenomenon is also validated in Nigeria. Applying multiple panel data for GCC region, Khandelwal et al. (2016) examined the effect of oil prices changes on economic and financial development for the period of 1999-2014. Their empirical analysis by GMM approach reveals that feedback effect exists between oil prices and financial indicators such as bank balance sheets as well as asset prices. They noted that the relationship between oil prices and bank capital along with provisioning is countercyclical. Gazdar et al. (2018) reinvestigated the association between oil prices and economic growth by including financial development (Islamic) in production function for GCC countries over the period of 1999-2016. They found that oil prices in terms of trading has stimulating effect on economic growth. Their empirical analysis also indicates that financial development strengthens oil prices – economic growth nexus in GCC countries. In case of QISMUT plus 3 countries, Mammadov and Mukhtarov (2018) applied panel SVAR model to examine the impact of oil prices on financial development (Islamic banking). Their empirical results show the positive effect of oil prices on financial development before crisis but this effect is vaccinated after financial crisis.

2.3. Economic Globalization-Financial Development Nexus

The relationship between globalization and financial development is well debated empirically and provides ambiguous results. For example, Mishkin (2009) theoretically showed how globalization affects domestic financial development. He exposed that globalization strengthens the quality of institutions which in resulting, boosts financial development. Garcia

[2] See Hamdi et al. (2019) for more details

(2012) indicated that globalization helps in growing domestic financial sector via financial globalization. Rousseau and Sylla (2003) also reported that globalization attracts foreign capital inflows to increase capital market globalization which benefits growing financial sector in recipient countries.

Several studies investigated the relationship between globalization and financial development using various measures of globalization. For example, O'Rourke (2001) used trade barriers as measure of globalization and indicated that globalization is important not only to promote financial development but also to stimulate economic activity in receipt countries. Similarly, Law and Demetriades (2006) investigated the relationship between globalization and financial development by using trade openness as proxy for globalization in the case of developed and developing countries. Their empirical analysis revealed that trade openness affects financial development in developing economies containing good quality and strong institutions. They unveiled that trade openness attracts foreign capital inflows is a factor that contributes to development of domestic financial sector. Shahbaz et al. (2018b) investigated the effect of trade openness on financial development by considering government size, industrialization and urbanization as additional determinants of economic growth and financial development for China and India. They noted that trade openness impedes financial development in Chinese economy but for India, trade openness stimulates development of financial sector. Their empirical analysis further indicates that industrialization and urbanization are important determinants of financial development for India and China. The empirical findings of above studies are questioned due to use of inappropriate measures of globalization.

In doing so, Falahaty and Law (2012) used data for MENA region to investigate the relationship between globalization and financial development by applying PVAR and FMOLS approaches. Their results validated the Mishkin (2009) hypothesis that globalization promotes financial reforms which in resulting, leads financial development in recipient countries. The neutral effect is also noted between globalization and financial development. Law et al. (2014) examined causal linkages between economic globalization and financial development by considering role of economic growth, institutional quality and index of financial reforms. Their empirical analysis confirmed the presence of cointegration relationship between the variables. They further found that economic globalization and economic growth have positive effect on financial development but financial reforms decline it. Their causality analysis shows that economic globalization causes financial development by promoting institutional quality. Kandil et al. (2015) reinvestigated the association between globalization and financial development in 32 developed and developing economies by applying panel cointegration and causality approaches. They used comprehensive index of globalization introduced by Dreher (2006) which is further composition of economic, political and social globalization indices. Financial development is composite index of domestic credit to private sector, liquid liabilities, value-traded, turnover ratio and stock market capitalization. Their empirical analysis indicates the absence of cointegration between the variables. The PVAR causality analysis reveals that financial development is impeded by globalization but globalization is positively affected by financial development i.e. relax of constraints for external financing, may reduce spurs for further financial development in recipient countries. In European countries, Nasreen et al. (2015) reinvestigated the association between financial development, institutions, globalization and economic growth by applying PVAR approach. They found the existence of cointegration relationship between the variables. Their empirical findings show that globalization stimulates process of financial reforms which leads economic growth and in resulting, financial development is affected. In East Asian countries, Law et al. (2015) applied DOLS and VECM causality approaches to examine the linkage between

financial development and its determinants for the period of 1984-2008. Their empirical exercise indicated the existence of cointegration between the variables. They also noted that globalization contributes to financial development directly via promoting stock market capitalization and indirectly via financial reforms.

Similarly, Muye and Muye (2017) examined the causal relationship between financial development, institutional quality and globalization by applying panel cointegration and causality approaches in BRCIS, MINTS and ECOWAS economic blocs. They found that a long run and positive relationship exists between the variables. Their empirical analysis further probes that globalization positively affects financial development as causality is running from globalization to financial development and institutional quality strengthens globalization-financial development nexus. For India and China, Kandil et al. (2017) determined the derivers of economic growth including financial development and globalization in production function. Their empirical results show that globalization affects economic growth positively and negatively in India and China. The VECM Granger causality analysis also confirmed the presence of feedback effect between financial development and globalization. Using time series data for Indian economy, Shahbaz et al. (2018c) applied bounds testing approach and causality test to examine the relationship between globalization and financial development by considering population intensity and inflation as additional determinants. They reported the presence of cointegration between financial development and its determinants. Their empirical analysis reveals that globalization and inflation impede financial development. The causality analysis indicates the presence of globalization-led finance hypothesis i.e. financial development is cause of globalization (economic, political and social).

Balcilar et al. (2019) used data of 36 countries for examining the effect of globalization on financial development by applying panel CCEMG and AMG long run estimators. They noted that although, globalization positively affects financial development but economic globalization improves the efficiency of financial institutions in recipient countries. Lee et al. (2019) investigated the relationship between financial services and globalization using data of belt and road countries. They found that globalization improves financial services in recipient counties that in results, affects economic growth.

3. The Empirical Modeling and Data

Existing empirical literature provides numerous studies investigating the determinants of financial development using time-series and panel data sets but empirical results are still inconclusive. This provides rational for exploring relationship between natural resources and financial development by considering oil prices, economic globalization and economic growth as additional determinants in finance demand function. Natural resources may affect financial development via shifting production factors from manufacturing, rent-seeking, corruption and investment (Gylfason and Zoega 2006, Yuxiang and Chen 2011). Oil prices may affect financial development via economic activity (Samargandi et al. 2014). Economic globalization provides competitive environment by opening access to foreign investors in local financial markets. This not only strengthens the quality of financial institutions but also increases the demand of financial services at domestic level which in resulting, increases financial development (Mishkin, 2009). A rise in per capita income raises demand for financial services that leads financial development (Shahbaz, 2012). Following above theoretical channels, the general form of finance demand function is modelled as follows:

$$F_t = f(R_t, O_t, Y_t, G_t) \qquad (1)$$

We have converted all the variables into natural-log form for empirical analysis. The empirical equation of finance demand function is modelled as follows:

$$\ln F_t = \beta_0 + \beta_1 \ln R_t + \beta_2 \ln O_t + \beta_3 \ln Y_t + \beta_4 \ln G_t + \mu_i \qquad (2)$$

where, ln , F_t, R_t, O_t, Y_t and G_t is natural-log, financial development[3], real oil prices, real GDP per capita measure of economic growth (income) and economic globalization. It is expected that $\beta_1 < 0$ if natural resources is a curse for financial development otherwise $\beta_1 > 0$ (Yuxiang and Chen, 2011; Shahbaz et al., 2018a). $\beta_2 > 0$ if oil prices lead financial development otherwise $\beta_2 < 0$ i.e. oil prices impede financial development (Khandelwal et al. 2016). Economic growth adds to financial development if $\beta_3 > 0$ otherwise $\beta_3 < 0$ if financial development is negatively affected by economic growth (Shahbaz, 2012). $\beta_4 > 0$ if economic globalization becomes an external source of finance for domestic financial development otherwise $\beta_4 < 0$ (Shahbaz et al., 2018c). μ_i is residual term conations normal distribution.

This study covers the period of 1972-2017. The data for real GDP (constant 2010 LCU) is collected from Economic Survey of Pakistan (GoP, 2018). Oil prices data is borrowed from State Bank of Pakistan (http://www.sbp.org.pk/ecodata). The data on economic globalization is borrowed from Drexel (2006). Economic globalization is a composite index of "trade, foreign direct and portfolio investment, and, income payment to foreigners as % of GDP, import barriers, mean tariff rate, tax on international trade as % of current revenue and capital account restriction". The data of sub-indices of financial development index such as broad money (M_2) as a share of GDP, domestic credit to private sector as a share of GDP, nonperforming loans as share of total loans (NL), stock market capitalization as a share of GDP, stock market traded value as a share of GDP and stock market turnover as a share of GDP is also collected from the Economic Survey of Pakistan (GoP, 2018). These indicators have converted into per capita units before constructing financial development index by using principal component index (see Nawaz et al., 2019 for more details).

3.1. Long Run Covariability

3.1.1. Long-Run Projections

We describe the fundamental features and significance of the long-run covariability (LRCOV) approach following Müller and Watson (2018)'s description of the model to examine the relationship between natural resources and financial development in Pakistan. The long-run projections are assumed as follows. Let y_t, $t = 1, \ldots, T$ represents a time series (for instance natural resources or financial development). The current study utilizes the cosine functions for the periodic purposes; suppose Ω_k (P) = $\sqrt{2}$ cos(kPτ) represents role with period 2/*k* (where the element $\sqrt{2}$ streamlines a computation beneath), Ω(P) = [Ω_1(P), Ω_2(P), . . . , Ω_q(P)]' signify a vector of these roles with period 2 over 2/*q,* and Ω_T symbolizes the *T* x *q* matrix along with t_{th} row specified by Ω((*t* – 1/2) / *T*)', therefore the k_{th} column of Ω_T has period 2*T*/*k*. In our study, natural resources and financial development data span *T* = 184 quarters, hence fixing *q* = 8 holds periodicities longer than 184/6 ≈ 29 quarters, or 7.8 years. Finally the projection of y_t onto Ω((*t* – 1/2) / *T*) for *t* = 1, . . . , *T* provides the fixed values:

[3] See Kishwar et al. (2019) for more details.

$$\widehat{y_t} = Y_T' \, \Omega\left(\left(t - \frac{1}{2}\right) / T\right) \tag{3}$$

where Y_T are the projection (linear regression) coefficients, $Y_T = (\Omega_T'\Omega_T)^{-1}\Omega_T' y_{1:T}$, and $y_{1:T}$ is the T x 1 vector along with tth part provided by y_t. The fixed values by these projections is called $(\widehat{y_t}, \widehat{z_t})$. The matrix Ω_T has dual features that streamline estimations and explanation of the long-run projections. Initially, $\Omega_T' M_T = 0$, where M_T is a vector of ones, therefore the $\widehat{y_t}$ also relates to the projection of $y_t - \overline{y}_{1:T}$ against $\Omega((t - 1/2) / T)$, where $\overline{y}_{1:T}$ is the data average. Technically speaking, Y_T and $\widehat{y_t}$ are invariant to position changes in the y_t-process, hence with $y_t = \varphi + \phi_t$, the features of Y_T and $\widehat{y_t}$ are not focused on the usually unidentified value of φ[4]. Secondly, thus Y_T relates to basic cosine loaded mean of the sample (which are the "cosine transform" of $\{y_t\}$).

$$Y_T = T^{-1}\Omega_T' y_{1:T} \tag{4}$$

The orthogonality of the cosine regressor Ω_T influences to a fitted relationship between covariability and variability in the long-run projections $(\widehat{y_t}, \widehat{z_t})$ and the cosine transform of (Y_{kT}, Z_{kT}):

$$T^{-1} \sum_{t=1}^{T} \begin{pmatrix} \widehat{y_t} \\ \widehat{z_t} \end{pmatrix} (\widehat{y_t} \; \widehat{z_t}) = T^{-1} \begin{pmatrix} Y_T' \\ Z_T' \end{pmatrix} \Omega_T'\Omega_T \, (Y_T \; Z_T) = \begin{pmatrix} Y_T' Y_T & Y_T' Z_T \\ Z_T' Y_T & Z_T' Z_T \end{pmatrix} \tag{5}$$

Consequently, the data covariability of the T time series projections $(\widehat{y_t}, \widehat{z_t})$ overlaps with the data covariability of the q projection cosine/coefficient transform (Y_T, Z_T)[5]. The figure obtained by this computation will show a scatterplot of the projections $(\widehat{y_t}, \widehat{z_t})$ and is displayed as small dots whereas, the display of large circles reflect the projection of coefficients (Y_T, Z_T). However, the scatterplots hold the equal covariablity and variablity in the long-run movement between the variables.

3.1.2. Measurement of Long-Run Covariability using Long-Run Projections

A basic and simple explanation of long-run covariability is focused on population analogue of the data next moment matrices in equation-5. Suppose $\sum T$ symbolizes the covariance matrix of (Y_T', Z_T'), decomposed as $\sum_{YY,T}, \sum_{YZ,T}$ etc., and explain

$$\psi_T = T^{-1} \sum_{t=1}^{T} E\left[\begin{pmatrix} \widehat{y_t} \\ \widehat{z_t} \end{pmatrix} (\widehat{y_t} \; \widehat{z_t})\right] = \sum_{k=1}^{q} E\left[\begin{pmatrix} Y_{kT} & Y_{kT} \\ Z_{kT} & Z_{kT} \end{pmatrix}'\right] = \begin{pmatrix} tr\,(\sum YY,T) & tr\,(\sum YZ,T) \\ tr\,(\sum ZY,T) & tr\,(\sum ZZ,T) \end{pmatrix} \tag{6}$$

where the equivalences straightly follow from equation-5. The 2 x 2 matrix ψ_T is the mean covariance matrix of the long-run projections $(\widehat{y_t} \; \widehat{z_t})$ in a data of length T and yields a conclusion of the covariability and variability of the long-run projections upon frequent samples. Consistently, by the other equivalence, ψ_T also examines the covariability of the cosine transform (Y_T, Z_T). The coefficient of long-run correlation and linear regression measures follow from the normal formulations:

---

[4] If the y_t-process comprises a linear pattern, say $y_t = \varphi_0 + \varphi_2 t + \varphi_t$, then different purposes that are orthogonal to a time pattern could be utilized so that Y_T and $\widehat{y_t}$ are not influenced on (φ_o, φ_1) (Müller and Watson, 2008) .

[5] Different low-frequency loads, such as Fourier transform, have the similar orthogonality features and might be utilized instead cosine purpose. Whereas the common approach compensates these different loads, in the present study we use cosine weights displayed in the text.

$$\alpha_T = \frac{\psi_{yz,T}}{\sqrt{\psi_{yy,T}\,\psi_{zz,T}}}\,,$$
$$\beta_T = \frac{\psi_{yz,T}}{\psi_{yy,T}}, \tag{7}$$
$$\gamma^2_{z|y,T} = \frac{\psi_{zz,T} - \left(\psi_{yz,T}\right)^2}{\psi_{yy,T}},$$

where, $(\psi_{yz,T}, \psi_{yy,T}, \psi_{zz,T})$ are the components of ψ_T. Along with this, the coefficient of linear regression β_T unravels the least-square population issue.

$$\beta_T = \underset{b}{\overset{\text{argmin}E}{}} \left[T^{-1} \sum_{t=1}^{T} (\widehat{z_t} - b\widehat{y_t})^2\right] \tag{8}$$

where β_T is the measurement of long-run projection in population preeminent linear likelihood $\widehat{z_t}$ via long-run projection $\widehat{y_t}$, $\gamma^2_{z|y,T}$ is mean adjustment of the forecasting residual and α^2_T is the resultant population R^2. So, population linear dependence of the long-run variation of (y_t, z_t) is reflected by these parameters. Consistently, by the next equivalence in equation (6), β_T also explains:

$$\beta_T = \underset{b}{\overset{\text{argmin}E}{}} \left[\sum_{k=1}^{q} (Z_{kT} - bY_{kT})^2\right] \tag{9}$$

with a relating explanation for $\gamma^2_{z|y,T}$ and α^2_T. Hence, these measurements equally reflect the population linear dependence in the scatterplots. Interestingly, covriance matrix, ψ_T, or equally $(\alpha_T, \beta_T, \gamma^2_{z|y,T})$ are the long-run population measurements that are core of the current analysis. These measurements focus on the phases utilized to explain "long-run" i.e. the amount of q operated to build the long-run projections.

3.2. The Cross-Quantilogram Approach

In this approach, we explain two different series for example $\{y_{i,t}, t \epsilon Z\}, i = 1, 2$ where $y_{1,t}$ and $y_{2,t}$ explain the nexus between natural resources and financial development correspondingly. The function of density and scattering of time series $y_{i,t}$ are symbolized by $f_i(\cdot)$ and $F_i(\cdot)$, separately. The γ_i-quantile of $y_{i,t}$ is $q_i(\gamma_i) = \inf\{\delta: F_i(\delta) \geq \gamma_i\}$ for $\gamma_i \epsilon$ (0, 1). The appearance of smooth sequence of quantiles are signified by $(q_1(\gamma_1)\; q_2(\gamma_2))^V$ here the V represents the vector transfer operator. Moreover, with m lags of cross-quantilogram for γ quantile is written as follows:

$$\omega_\gamma(m) = \frac{K\left[\varphi_{\gamma_1}\left(y_{1,t} - q_1(\gamma_1)\right)\varphi_{\gamma_2}\left(y_{2,t} - q_2(\gamma_2)\right)\right]}{\sqrt{K\left[\varphi^2_{\gamma_1}\left(y_{1,t} - q_1(\gamma_1)\right)\right]}\sqrt{K\left[\varphi^2_{\gamma_2}\left(y_{2,t} - q_2(\gamma_2)\right)\right]}} \tag{10}$$

for m = 0, ± 1, ± 2, ± 3, …, where $\varphi_\gamma(\pi) \equiv 1\,[\pi < 0] - \gamma, 1(\cdot)$ symbolized the function of indication and 1 $[y_{i,t} \leq q_i(\gamma_i)]$ is termed a *quantile hit.* In the current research, we calculate the predictability of direction of natural resources by $\tau_\gamma(1)$ above or below a quantile $q_{FD}(\gamma_{FD})$ or $q_{NR}(\gamma_{NR})$ at any time period. $\tau_\gamma\,(1) = 0$ specifies natural resources presence above or below the quantile $q_{NR}(\gamma_{NR})$ on the subsequent month *(t+1)*. Alternatively, $\tau_\gamma\,(1) \neq 0$ specifies a one month predictability of direction from *natural resources* to *financial development* at $\gamma = \gamma_{FD}(\gamma_{NR})$ or $\gamma_{NR}(\gamma_{FD})$. The cross-quantilogram of model analog can be written as follows:

$$\widehat{\tau_\gamma}\,(m) = \frac{\sum_{t=\,m+1}^{V} \varphi_{\gamma_1}\left(y_{1,t} - \widehat{q_1}(\gamma_1)\right) \varphi_{\gamma_2}\left(y_{2,t-m} - \widehat{q_2}2(\gamma_2)\right)}{\sqrt{\sum_{t=\,m+1}^{V} \varphi_{\gamma_1}^2\left(y_{1,\ t} - \widehat{q_1}(\gamma_1)\right)} \sqrt{\sum_{t=\,m+1}^{V} \varphi_{\gamma_2}^2\left(y_{2,\ t-k} - \widehat{q_2}(\gamma_2)\right)}} \qquad (11)$$

then, for m = 0, ± 1, ± 2, ± 3, …. here in equation-5, $\widehat{q_l}(\gamma_i)$ specifies the unrestricted quantile of $y_{i,t}$, as suggested by Han et al. (2016). Moreover, for j > 1, Han et al. (2016) recommend a quantile type of the Ljung-Box-Pierce stats to check the null hypothesis i.e. H_o: $\tau_\gamma(m) = 0$ for all $m, 1 \leq m \leq j$ in contrast to the H_1: $\tau_\gamma(m) \neq 0$ for minimum one $m, 1 \leq m \leq j$, using underneath hybrid test statistics, $\hat{R}_\gamma^{(j)}$, for prediction of direction from one variable to another variable for up to j lags using quantile pair $\gamma = (\gamma_1, \gamma_2)$.

$$\hat{R}_\gamma^{(j)} = \frac{V\,(V+2) \sum_{m=1}^{j} \hat{\tau}_\gamma^2\,(m)}{V-m} \qquad (12)$$

Han et al. (2016) highlight the importance of conduct inferences and the null distribution. Therefore, the utilization of stationary bootstrapping of Politis and Romano (1994), which considers taking care of intrinsic sequential dependence in sample. Furthermore, the bootstrapped confidence intervals are created by pseudo re-sampling focused on the arrangement of slabs and the related hybrid test statistics. Also, the method introduced by Han et al. (2016) was newly applied by Bouri et al. (2018), Gkillas et al. (2019) and Zhou et al. (2019).

4. Empirical Results and their Discussion

Table-1 reports the results of descriptive analysis. The empirical results highlight that real GDP per capita is highly volatile i.e. standard deviation is high. The standard deviation is less in economic globalization compared to oil prices. Natural resources have high volatility compared to financial development. The Jarque-Bera analysis shows that financial development, natural resources, economic globalization, oil prices and economic growth do not have normal distribution. This provides rational for applying long-run covariability for further empirical analysis.

Table-1: Descriptive Statistics Analysis

Variables	F_t	R_t	G_t	P_t	Y_t
Mean	55.185	154.844	8.400	14.132	10285.730
Maximum	197.933	414.915	11.032	30.788	15587.930
Minimum	16.257	1.554	5.939	2.520	5717.567
Std. Dev.	50.848	107.739	1.108	7.441	2781.336
Jarque-Bera	75.309	26.974	5.383	17.552	9.027
Probability	0.000	0.000	0.068	0.000	0.011
Observations	184	184	184	184	184

Table-2: The Long Run Pair-wise Correlation Analysis

Variables	$\ln F_t$	$\ln R_t$
$\ln F_t$	-	0.832 (0.773, 0.890)
$\ln R_t$	(0.801, 0.912)	-
	$\ln F_t$	$\ln P_t$

$\ln F_t$	-	0.567 (0.493, 0.603)
$\ln P_t$	(0.523, 0.634)	-
	$\ln F_t$	$\ln G_t$
$\ln F_t$	-	-0.737 (-0.801, - 0.693)
$\ln G_t$	(-0.825, -0.711)	-
	$\ln F_t$	$\ln Y_t$
$\ln F_t$	-	0.923 (0.883, 0.954)
$\ln Y_t$	(0.911, 0.978)	-
Notes: All variables are measured in growth rates. The entries above the diagonal show the median of the posterior distribution followed by the 90% confidence interval. The entries below the diagonal show the 95% confidence interval.		

The long run pair-wise correlation analysis is reported in Table-2. We note that correlation coefficient between financial development and natural resources is with low-and-high range of 90% and 95% confidence intervals. We find based on sign of correlation coefficient that natural resources are positively correlated with financial development i.e. natural resources and financial development are interdependent. The positive correlation exists between oil prices and financial development although correlation coefficient is 0.523 at low and high range of confidential intervals such as 90% and 95%. At the first glance these results might be surprising, as the increase in the oil prices may hamper the economic activity and hence the financial development as well. However, it shows that the increase in the oil price leads to higher demand for finance and increased financial activity and development. For a country like Pakistan which heavily depends on the oil imports increasing prices will induce the credit creation and hence necessitating the financial activity. Economic globalization is negatively correlated with financial development at low and high range of confidential intervals i.e. 67% and 90%. The correlation between economic growth and financial development is also positive. The correlation coefficient between economic growth and financial development is 0.923 with low-and-high range of 90% and 95% confidence intervals. This seems that natural resources, oil prices and economic growth are positively linked with financial development but economic globalization is inversely linked with it.

Table-3: Long Run CoVariability Analysis

Dependent Variable	Independent Variable	β	90% CI	95% CI	$\gamma_{y\|x}$	t-statistics
$\ln F_t$	$\ln R_t$	0.326	(0.194, 0.392)	(0.158, 0.401)	0.096	3.396***
$\ln F_t$	$\ln P_t$	0.379	(0.260, 0.823)	(0.280, 0.873)	0.193	1.964**
$\ln F_t$	$\ln G_t$	-0.394	(-0.430, -0.183)	(-0.415, -0.153)	0.128	-3.080***
$\ln F_t$	$\ln Y_t$	0.220	(0.031, 0.329)	(0.180, 0.385)	0.064	3.438***
Notes: All variables are measured in growth rates, in percentage points at a quarterly rate. The entries were constructed from the long-run regression of $\ln R_t$, $\ln P_t$, $\ln G_t$ and $\ln Y_t$ on $\ln F_t$. *, ** and *** represent level of significance at 10%, 5% and 1% respectively.						

The long run covariability analysis is reported in Table-3. Table-3 shows the long run regression coefficients with low-and-high ranges of 90% and 95% confidence intervals for financial development and its determinants. The corresponding standard deviations are also provided in Table-3 along with regression residuals. We find that natural resources beta coefficient is 0.326 which exceeds the low range of 0.158. The beta coefficient of natural resources on financial development is surpassed by 0.401. This shows that natural resources

have positive effect on financial development at 95% confidence interval. We conclude that natural resources are blessing for financial development in case of Pakistan and statistically significant at 1% significance level. This empirical finding is consistent with Dwumfour and Ntow-Gyamfi (2018) for African countries, Bamidele et al. (2018) for Nigeria, Shahbaz et al. (2018a) for the US economy, who reported that natural resources leads financial development via additional sources of funds for productive investment projects. On contrary, Yuxiang and Chen (2011) for China, Hooshmand et al. (2013) for oil-exporting countries, Bhattacharyya and Hodler (2014) for 133 developing and developing countries, Javadi et al. (2017) for 70 countries, Law and Moradbeigi (2017) oil-producing countries, Svirydzenka (2016) for the United States, who noted that natural resources hinder financial development via rent-seeking and corruption. The effect of oil prices on financial development is statistically significant at 5% significance level. The beta coefficient of oil prices on financial development is 0.379 which is positive and exceeds low-range of 0.280 but surpasses by high-range of 0.873 at 95% confidence interval. We note that oil prices increase financial development. This empirical evidence is similar with Fenech and Vosgha (2018) for GCC countries, Yun and Yoon (2019) for China and Korea, Nwani et al. (2016) for Nigeria, Mammadov and Mukhtarov (2018) for QISMUT plus 3 countries, who found that oil prices have positive effect on financial development. The beta coefficient of economic globalization shows negative effect on financial development in case of Pakistan. We find that beta coefficient of economic globalization on financial development is -0.394 which is outperformed by low-range of -0.415 but exceeded by high-range of -0.153 at 95% confidence interval. This confirms that economic globalization has negative effect on financial development and it is statistically significant at 1% level of significance. This empirical finding is consistent with Falahaty and Law (2012) for MENA region, and Shahbaz et al. (2018c) for India, who validated the absence globalization-led-financial development hypothesis by of Mishkin (2009). Contrarily, Law and Demetriades (2006) for developing economies, Nasreen et al. (2015) for European countries, Law et al. (2015) for East Asian countries, Muye and Muye (2017) for BRCIS, MINTS and ECOWAS economic blocs, Balcilar et al. (2019) 36 countries, Lee et al. (2019) for belt and road countries, found that economic globalization contributes to financial development by stimulating economic activity. Economic growth has positive and significant effect on financial development at 1% level of significance. The results reported in Table-3 reveal that coefficient of economic growth is 0.220 exceeding low-range of 0.180 and surpassing high-range of 0.385 at 95% confidence interval. This confirms the presence of demand-side hypothesis revealing that increase in income per capita leads the demand for financial services which in resulting, increases financial development. This empirical evidence is similar with Ibrahim and Sare (2018) for Africa, Tsaurai (2018) for SADC countries, Arif and Rawat (2019) for South Asian countries, who noted that rise in income leads financial development.

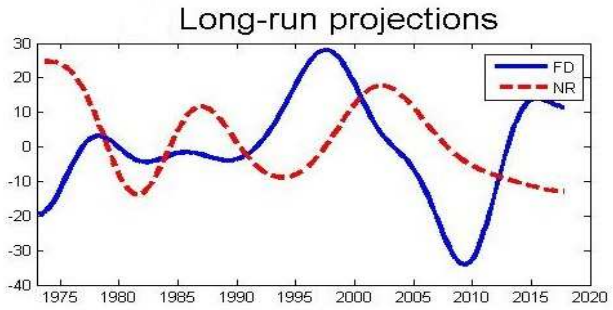
The empirical results of long run variability i.e. long run projection of financial development and its determinants and, long run projections coefficients of financial development and its determinants are reported in Figure-1. In natural resources – financial development nexus, we find that till 1977, association between natural resources and financial development is weak. This confirms that initially, inefficient allocation of revenues obtained from natural resources could not help financial sector although relationship between natural resources and financial development exists. The relationship between natural resources and financial development starts to be strong after 1990s till 2007. This confirms the implementation of financial reforms in financial sector which helped not only financial sector to reap optimal fruits from natural resources but also helped economic activity. After 2016, relationship between natural resources and financial development is going to be stronger. This shows that long run

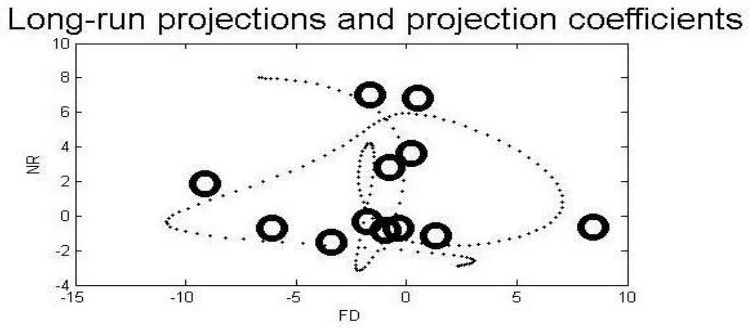
covariability between natural resources has fluctuation but positive. The validity of long-run covariability results can be seen from scatterplot projections. The smaller dots show the movement between natural resources and financial development but large circles represent the projection of beta coefficient. We note that small dots and large circles confirms the robustness of long run projections. This validates that long run covariability between natural resources and financial development has positive association in case of emerging economy such as Pakistan.

For oil prices – financial development nexus, we find that before 1977, relationship between oil prices and financial development is weak. The association between oil prices and financial development is strong from 1978 till 2007. Over the period of 2008-2012, relationship between oil prices and financial development is weak and after it, oil prices and financial development are strongly related. Overall, we note that linkage between oil prices and financial development is strong. The robustness of long run projections is also confirmed by small dots and large circles. The long run projections between economic globalization and financial development reveals the presence of weak relationship over the period of 1996-2003 and similar results are found for the period of 2007-2013. Rest of time period, the relationship between oil prices and financial development is strong which is also confirmed by small dots and large circles. In case of economic growth – financial development nexus, relationship between both variables is strong after 1975 till 1995. For period of 1996-2000 (2005-2014), economic growth and financial development are weakly linked. The co-movement and strength of relationship between economic growth and financial development is also confirmed by small dots and large circles.

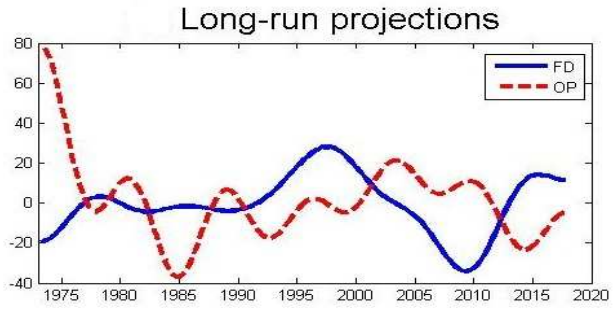
Figure-1: Long-Run Projections and Projection Coefficients Analysis

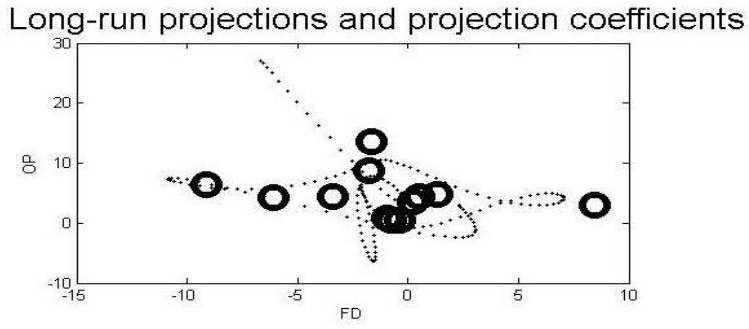
Long-Run Projections of $\ln F_t$ **and** $\ln R_t$



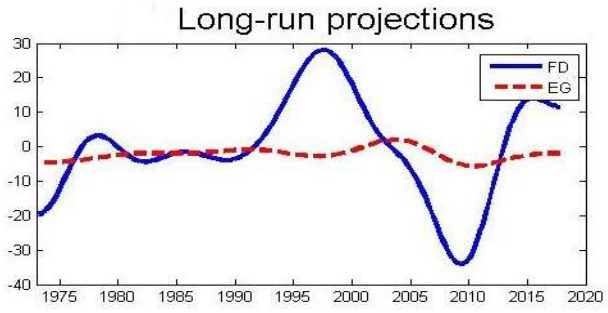


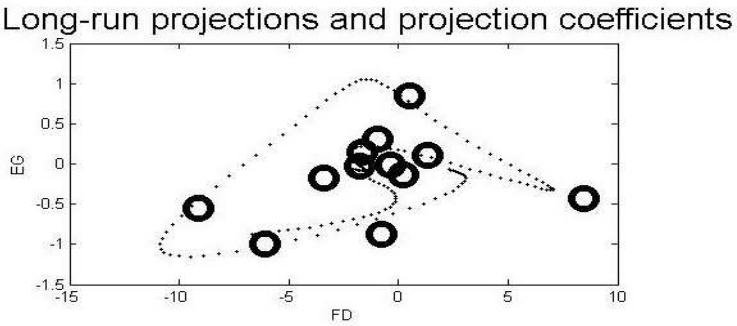
Long-Run Projections of $\ln F_t$ **and** $\ln P_t$



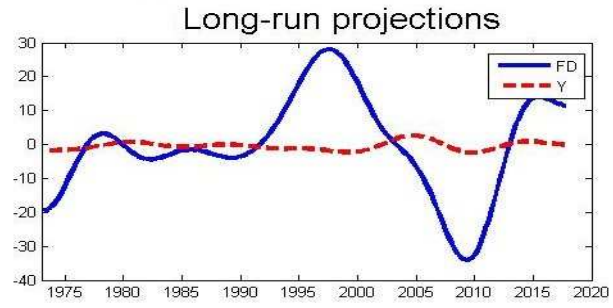


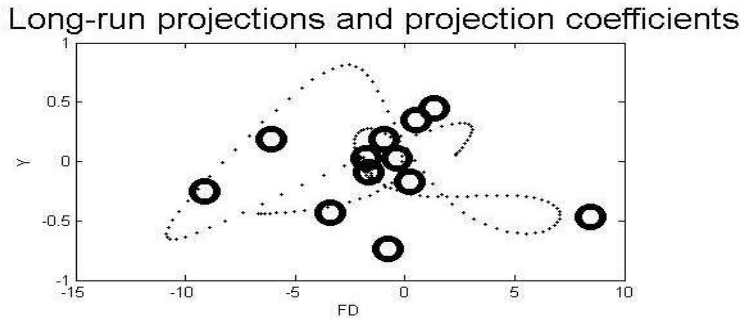
Long-Run Projections of $\ln F_t$ **and** $\ln G_t$





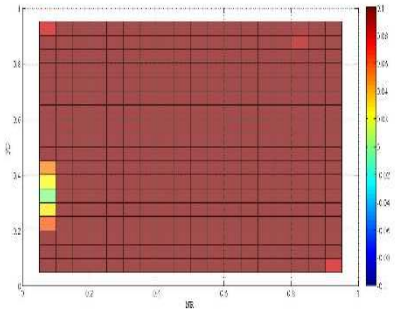
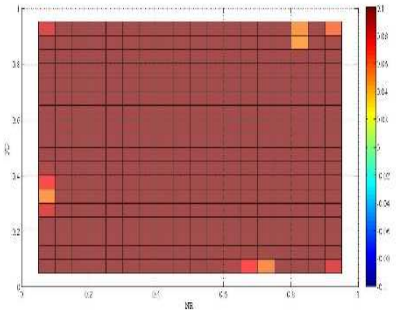
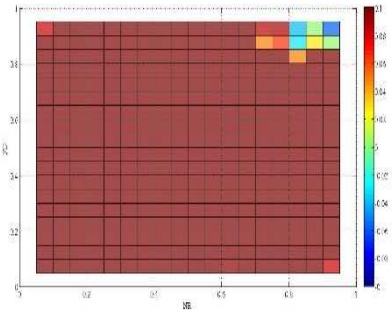
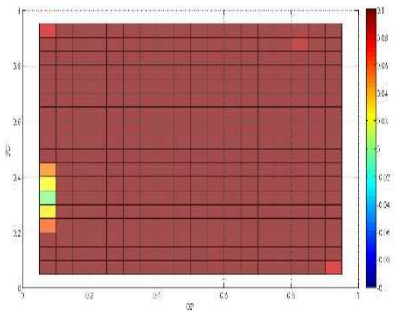
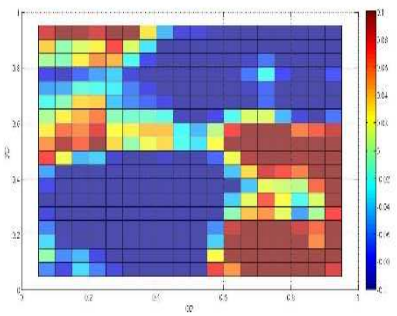
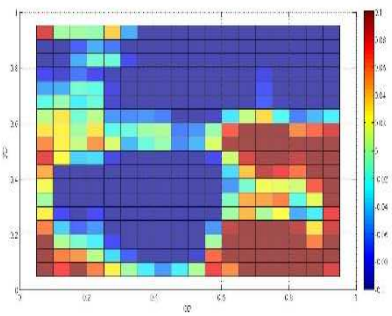
Long-Run Projections of $\ln F_t$ **and** $\ln Y_t$

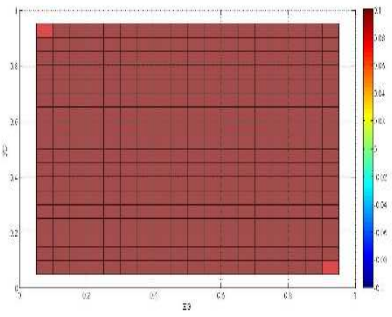
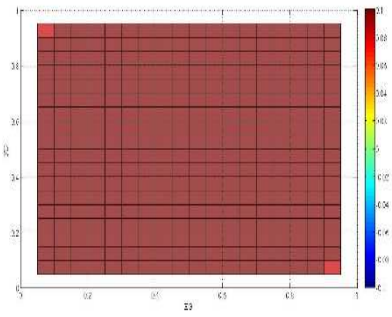
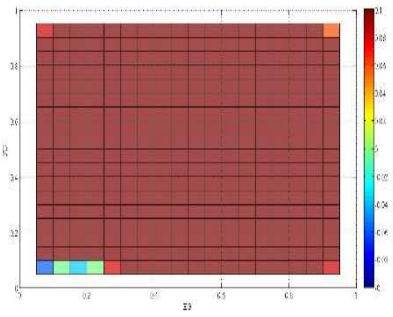




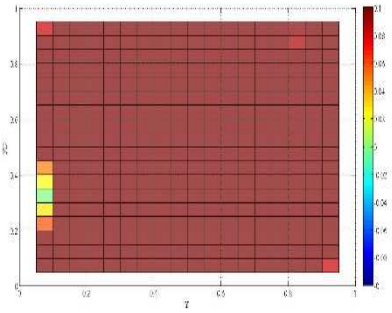
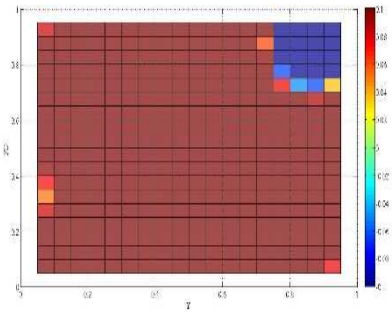
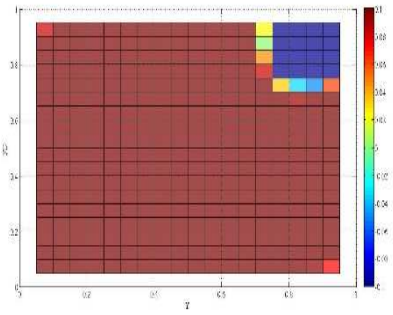
Note: Long-run projections and projection coefficients: periods longer than 7 years. The first plot in each panel shows the long-run projections of the time series. The second plot is a scatterplot of the long-run projection coefficients where the plot symbols indicate the period of the associated cosine function.

Figure-2: Cross-Quantilogram Analysis

Lag-1 (Quarterly)	Lag-2 (Semi-Annually)	Lag-4 (Annually)
i). Effect of $\ln R_t$ on $\ln F_t$ 		
ii). Effect of $\ln P_t$ on $\ln F_t$ 		
iii). Effect of $\ln G_t$ on $\ln F_t$		

iv). Effect of $\ln Y_t$ on $\ln F_t$

Notes: The cross-quantilogram correlation is estimated and statistical significance is measured using Box-Ljung test as presented in methodology. All insignificant correlation was set to zero.

The empirical results of cross-quantilogram are presented in Figure-2. This explains the results of dependence structure from natural resources, economic growth, oil prices and economic globalization to financial development in Pakistan. In Figure-2, we select 3 sets of cross-quantilogram heat map arrangement reaching 1 (quarterly), 2 (semi-annually) and 4 (yearly) lag values. These lags at various intervals permit us to investigate the heat map more accurately and therefore explaining the related causality. The power of scale of beta coefficient parameter varieties from red (highly positive) to blue (highly negative) and is also represented by the multicolor bar at the beside of every heat map figure. If, we see the heat map more carefully, it is observed that no directional predictability is absent in all heat map and on every lag value, confirming that there is a significant directional predictability in all above-mentioned cases.

The empirical results of cross-quantilogram confirm that an increase in natural resources causes an increase in financial development and the size of this causal relationship is higher and positive in all quantiles of natural resources and financial development. Moreover, we observe the directional predictability relationship across all lag values, highlighting the constancy of our results from the previous long-run covariability approach. Similar results are found in observing the directional predictability from economic growth to financial development. The empirical evidence reported by cross-quantilogram validate that economic growth has a strong and positive causal association with financial development across all quantiles and all lag values. On other hand, we find that an increase in financial development is caused by an increase in oil prices and the size of this causal relationship is higher and positive in all quantiles of financial development and oil prices. The directional predictability relationship is observed at 2 lags (semi-annually) and 4 lags (yearly) values. An increase in economic globalization negatively caused financial development and the size of this causal relationship is higher and negative in all quantiles of economic globalization and financial development. Moreover, we observe the directional predictability relationship across all lag values, highlighting the constancy of our results from the previous long-run covariability

approach. The results of cross-quantilogram confirm that natural resources and oil prices and economic growth contribute to financial development positively and significantly in Pakistan. On contrary, economic globalization is negatively linked with financial development in Pakistan.

5. Conclusion and Policy Implications

This paper examined the relationship between natural resources and financial development by considering oil prices, economic growth and economic globalization as additional determinants in finance demand function in case of Pakistan for the period of 1972-2017. The long run covariability approach is applied to examine covariability of natural resources, oil prices, economic growth and economic globalization with financial development. The direction of predictability is investigated by employing cross-quantilogram. The empirical results indicate that natural resources have positive association with financial development. Oil prices contribute positively to financial development. The positive association of economic growth with financial development validates the presence of demand-side hypothesis. On contrary, economic globalization impedes financial development.

The positive role of natural resources in financial development confirm the hypothesis "natural resources as a blessing for financial development". This is an intuitive finding and logical inference to draw as income from natural resources can lead to accumulation of savings which provides the basis to domestic financial sector. Concomitantly, financial sector can act as an intermediary to channel these savings to the best and efficient sectors of domestic and global economy. This nexus between natural resources and financial development also has crucial policy implications in terms of natural resources management as well as their role in financial development. It would require to use natural resource revenues wisely and cautiously, and also facilitate the development of financial sector which can accommodate these revenues in the up and down swings in natural resources price and revenues. There would require a set of micro and macro-prudential policies and framework which can put financial sector at strong footings so that it can weather the risks to financial stability due to the cyclical movements of natural resource market. At the same juncture, the regulatory framework and prudential policies should be too stringent to act as hurdles in allocation and management of natural resource revenues by financial sector.

The results on the implications of oil price shocks lead us to conclude that oil prices contribute positively to financial development. This implies that booming oil market is beneficial for the financial sector which is undoubtedly the sign of activity and economic growth. This is an interesting inference to draw as one may expect that the increase in oil price may hamper the economic activity and financial development for an oil importing country while the oil exporting countries may benefit from increase in oil prices. However, if we take into account the fact that the increasing oil prices necessitates the credit creation and induce the financial activity, it is cogent to infer that the increased financial activity than leads to playing its part in the economic growth. Concomitantly, it also implies necessity for an appropriate policy framework to be put in place to fairly distribute the risks and rewards under financial activity and facilitate the role financial sector can play in the real economy. Financial sector also showed that a positive association of economic growth with financial development validates the presence of demand-side hypothesis. This also implies that financial and economic stability are two sides of the same coin. A vibrant financial sector which facilitates natural resources can also play an important role in economic growth. Hence, the supporting financial and public policies which can enhance the development of financial sector are necessary to achieve economic growth and development. Lastly, our key findings

also lead us to conclude that economic globalization impedes financial development in the subject economy. This implied that liberalization of the economy has not been fruitful to bring the fruitful results for financial sector. In policy setting, this has crucial implications, particularly in terms of increasing the competitiveness of real economy and financial sector which can then be able to reap the benefits of globalization as well as foreign direct investment and international trade. This would also imply revisiting trade and investment policy and taking appropriate measure to support the domestic industries which in resulting, directly and indirectly affect financial development.

Based on our study, several directions for future research arise. For example, this study can be augmented by introducing new variables such as export diversification and economy complexity in finance demand function not only for emerging economies but also for E-7 and G-7 countries. The inclusion of these variables would help policy makers in designing comprehensive economic policies for promoting financial in such countries. Also, as financial development is impacted by human accumulation or education, it would be great to concern this factor in the finance demand function. Furthermore, it would be interesting to investigate the time-varying behavior of the long-run covariability between natural resources and financial development which allows policy-makers to be dynamic and reactive to any change in the intensity and the nature of the long-run covariability between these two variables.

Reference

Antonakakis, N. and Filis, G. (2013). Oil prices and stock market correlation: A time-varying approach. International Journal of Energy and Statistics, 1, 17-29.

Arif, I. and Rawat, S. A. (2019). Trade and financial openness and their impact on financial development: Evidence from South Asian economies. South Asian Journal of Business Studies, 8, 26-39.

Badeeb, R. A., Lean, H. H. and Smyth, R. (2016). Oil curse and finance–growth nexus in Malaysia: the role of investment. Energy Economics, 57, 154-165.

Bakwena, M. and Bodman, P. (2010). The role of financial development in natural resource abundant economies: Does the nature of the resource matter? Botswana Journal of Economics, 7, 16-31.

Baland, J.-M. and Francois, P. (2000). Rent-seeking and resource booms. Journal of Development Economics, 61, 527-542.

Balcilar, M., Gungor, H. and Olasehinde-Williams, G. (2019). On the Impact of globalization on financial development: A multi-country panel study. European Journal of Sustainable Development (2019), 8, 350-364.

Balcilar, M., Gupta, R. and Wohar, M. E. (2017). Common cycles and common trends in the stock and oil markets: Evidence from more than 150 years of data. Energy Economics, 61, 72-86.

Baltagi, B. H., Demetriades, P. O. and Law, S. H. (2009). Financial development and openness: evidence from panel data. Journal of Development Economics, 89, 285-296.

Bamidele, I., Lucas, E. and Abiodun, S. W. (2018). Oil Rent and Financial Development: Evidence from Nigeria. Ilorin Journal of Finance, 152-167.

Baxter, M. and King, R. (1999). Measuring business cycles: Approximate band-pass filters for economic time series. Review of Economics and Statistics, 81, 575-593.

Bayer, C. and Hanck. C. (2013). Combining non cointegration tests. Journal of Time Series Analysis, 34, 83-95.

Bhattacharyya, S. and Hodler, P. (2014). Do natural resource revenues hinder financial development? The role of political institutions. World Development, 57, 101-113.

Bouri, E., Mahamitra, D., Gupta R. and Roubaud, D. (2018). Spillovers between Bitcoin and other assets during bear and bull markets. Applied Economics, 50, 5935-5949.

Broadstock, D. C. and Filis, G. (2014). Oil price shocks and stock market returns: New evidence from the United States and China. Journal of International Financial Markets, Institutions and Money, 33, 417-433.

Diebold, F. X. and Yilmaz, K. (2009). Measuring financial asset return and volatility spillovers, with application to global equity markets. Economic Journal, 119, 158-171.

Diebold, F. X. and Yilmaz, K. (2012). Better to give than to receive: forecast-based measurement of volatility spillovers. International Journal of Forecasting, 28, 57-66.

Diebold, F. X. and Yilmaz, K. (2014). On the network topology of variance decompositions: measuring the connectedness of financial firms. Journal of Econometrics, 182, 119-134.

Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. Applied Economics, 38, 1091-1110.

Dwumfour, R. A. and Ntow-Gyamfi, M. (2018). Natural resources, financial development and institutional quality in Africa: Is there a resource curse? Resources Policy, 59, 411-426.

Engle, R. W. (1974). The modality effect: Is precategorical acoustic storage responsible? *Journal of Experimental Psychology***,** 102, 824–829.

Falahaty, M. and Law, S. H. (2012). The effect of globalization on financial development in the MENA region. Transition Studies Review, 19, 205-223.

Fenech, J-P. and Vosgha, H. (2018). Oil price and Gulf Corporation Council stock indices: New evidence from time-varying copula models. Economic Modeling, forthcoming.

García, E. D. T. (2012). Financial globalization and financial development in transition countries. National Research University "Higher School of Economics", Moscow, Russia.

Gazdar, K., Hassan, M. K. Safa, M. F. and Grassa, R. (2018). Oil price volatility, Islamic financial development and economic growth in Gulf Cooperation Council (GCC) countries. Borsa Istanbul Review, forthcoming.

Gkillas, K., Gupta, R. and Wohar, M. E. (2019). Review of Quantitative Finance and Accounting, 1-26.

Guiso, L., Sapienza, P. and Zingales, L. (2004). The role of social capital in financial development. American Economic Review, 94, 526-556.

Gylfason, T. and Zoega, G. (2006). Natural resources and economic growth: the role of investment. World Economy, 29, 1091-1115.

Hamdi, B., Aloui, M., Alqahtani, F. and Tiwari, Relationship between the oil price volatility and sectoral stock markets in oil-exporting economies: Evidence from wavelet nonlinear denoised based quantile and Granger-causality analysis. Energy Economics, 80, 536-552.

Han, H., Linton, O., Oka, T., Yoon-Jae, W. (2016). The cross-quantilogram: Measuring quantile dependence and testing directional predictability between time series. Journal of Econometrics, 193, 251-270.

Hodrick, R. and Prescott, E. C. (1997). Postwar business cycles: an empirical investigation. Journal of Money, Credit, and Banking, 29, 1-16.

Hoshmand, H., Hosseini, S. A. A. and Moghani, N. R. (2013). Oil rents, institutions and financial development: case study of selected oil exporting countries. Research Journal of Recent Sciences, 2, 100-108.

Ibrahim, M. and Sare, Y. (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.

Javadi, S., Motevaseli, M. and Farsi, J. Y. (2017). Oil Rent and Financial Environment: A Cross-country Examination. International Journal of Economics and Financial Issues, 7, 298-302.

Kandil, M., Shahbaz, M. and Nasreen, S. (2015). The interaction between globalization and finnacial development: New evidence from panel cointegration and causality analysis. Empirical Economics, 49, 1317-1339.

Kandil, M., Shahbaz, M., Mahalik, M. K. and Nguyen, D. K. (2017). The drivers of economic growth in China and India: globalization or financial development? International Journal of Development Issues, 16, 54-84.

Khan, M. A., Khan, M. A., Abdulahi, M. E., Liaqat, I. and Shah, S. S. H. (2019). Institutional quality and financial development: The United States perspective. Journal of Multinational Financial Management, 49, 67-80.

Khandelwal, P., Miyajima, K. and Santos, A. (2016). The Impact of Oil Prices on the Banking System in the GCC. IMF WP/16/161, Middle East and Central Asia Department, 2016 International Monetary Fund, Washington DC.

Kishwar, K., Lahiani, A. and Roubaud, D. (2019). Natural resources as blessings and finance-growth nexus: A bootstrap ARDL approach in an emerging economy. Resources Policy, 60, 277-287.

Law, S. K. and Demetriades, P. (2006). Openness, institutions and financial development. World Economy & Finance Research Programme, Birkbeck, University of London, Malet Street, London, WC1E 7HX.

Law, S. K., Azman-Saini, W. N. W. and Tan, T. B. (2014). Economic globalization and financial development in East Asia: A panel cointegration and causality Analysis. Emerging Markets Finance and Trade, 50, 210-225.

Law, S-K., Tan, H. B. and Azman-Saini, N. W. N. (2015). Globalisation, Institutional Reforms and Financial Development in East Asian Economies. The World Economy, 38, 379-398.

Law, S. H. and Moradbeigi, M. (2017). Financial development and oil resource abundance–growth relations: evidence from panel data. Environmental Science and Pollution Research, 24, 22458-22475.

Lee, H-S., Chong, S-C. and Sia, B-K. (2019). Financial services and globalisation in belt and road countries. The Service Industries Journal, forthcoming.

Mammadov, E. and Mukhtarov, S. (2018). The Impact of Oil Price Shocks on Islamic Banking: Evidence from QISMUT plus 3 Countries. Proceedings of New York International Business and Social Science Research Conference 13-14 July 2018, Hilton Garden Inn, New York; 978-0-6481678-1-5.

Mishkin, F. (2009). Globalization and financial development. Journal of Development Economics, 89, 164-169.

Müller, U. K., and Watson, M. W. (2018). Long-Run Covariability. *Econometrica*, *86*(3), 775-804.

Muye, I. M., Muye, I. Y. (2017). Testing for causality among globalization, institution and financial development: Further evidence from three economic blocs. Borsa Istanbul Review, 17, 117-132.

Nasreen, S., Mahalik, M. K., Abbas, Q. and Shahbaz, M. (2015). The interaction between financial development, globalization, institutions and growth: The statistical experience from 23 European countries. MS Working Paper series, MS WP-11/2015.

Nwani, C., Iheanacho, E. and Okogbue, C. (2016). Oil price and the development of financial intermediation in developing oil-exporting countries: Evidence from Nigeria. Cogent Economics & Finance, 4, 1-15.

O'Rourke, K. H. (2001). Globalization and inequality: historical trends. Trinity Economics Papers 20019, Trinity College Dublin, Department of Economics.

Omitogun, O., Longe, A. E. and Muhammad, S. (2018). The impact of oil price and revenue variations on economic growth in Nigeria. OPEC Energy Reviews, 42, 387-402.

Poghosyan, T. and Hesse, H. (2009). *Oil prices and bank profitability: Evidence from major oil-exporting countries in the Middle East and North Africa.* IMF Working paper No. 09/220). Washington, DC. USA.

Rousseau, P. L. and Sylla, R. (2003). Financial systems, economic growth, and globalization. Working Paper No. 01–W19. Department of Economics, Vanderbilt University, NASHVILLE, TN 37235

Samargandi, N., Fidrmuc, J. and Ghosh, S. (2014). Financial development and economic growth in an oil-rich economy: The case of Saudi Arabia. Economic Modelling, 43, 267-278.

Shahbaz, M. (2012). Does trade openness affect long run growth? Cointegration, causality and forecast error variance decomposition tests for Pakistan. Economic Modelling, 29, 2325-2339.

Shahbaz, M., Bhattacharya, M. and Mahalik, M. K. (2018b). Financial development, industrialization, the role of institutions and government: A comparative analysis between India and China, Applied Economics, 50, 1952-1977.

Shahbaz, M., Mallick, H., Mahalik, M. K. and Hammoudeh, S. (2018c). Is globalization detrimental to financial development? Further evidence from a very large emerging economy with significant orientation towards policies. Applied Economics, 50. 574-789.

Shahbaz, M., Naeem, M., Ahad, M. and Tahir, I. (2018a). Is natural resource abundance a stimulus for financial development in the USA? Resources Policy, 55, 223-232.

Shimotsu, K. (2012). Exact local Whittle estimation of fractionally cointegrated systems. Journal of Econometrics, 169, 266-278.

Svirydzenka, K. (2015). Introducing a new broad-based index of financial development. International Monetary Fund (2016), WP/16/5.

Tsaurai, K. (2018). An Empirical Study of the Determinants of Banking Sector Development in the SADC Countries. Journal of Developing Areas, 52, 71-84.

Yun, X. and Yoon, S-M. (2019). Impact of oil price change on airline's stock price and volatility: Evidence from China and South Korea. Energy Economics, 668-679.

Yuxiang, K. and Chen, Z. (2011). Resource abundance and financial development: Evidence from China. Resources Policy, 36, 72-79.

Zaccheaus, O. D. (2016). Oil price dynamics and the Nigerian banking industry profitability. Disertation for Master of Philosophy in Development Finance, Stellenbosch University, South Africa.

Zhang, D. (2017). Oil shocks and stock markets revisited: Measuring connectedness from a global perspective. Energy Economics, 62, 323-333.

Zhou, Z., Jiang, Y., Lui, Y., Lin, L. and Liu, Q. (2019). Does international oil volatility have directional predictability for stock returns? Evidence from BRICS countries based on cross-quantilogram analysis. Economic Modelling, forthcoming.