

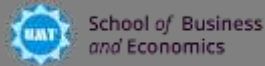
ISSN(E):2522-2260  
ISSN(P):2522-2252

### Indexing/Abstracting



### Published by

Department of Quantitative Methods



University of Management and  
Technology, Lahore, Pakistan

This manuscript has been published under the terms of Creative Commons Attribution-ShareAlike 4.0 International License (CC-BY SA). JQM under this license lets others distribute, remix, tweak, and build upon the work it publishes, even commercially, as long as the authors of the original work are credited for the original creation and the contributions are distributed under the same license as original.



## Financial Development and Economic Growth: The Role of Energy Consumption

### Author(s)

Hafiz Muhammad Abubakar Siddique<sup>1</sup>  
Sadaf Usman<sup>2</sup>  
Junaid Ishaq<sup>3</sup>

### Affiliations

<sup>1</sup>PhD Candidate, Federal Urdu University, Islamabad, Pakistan  
Email: bakar343@gmail.com

<sup>2</sup>Punjab Group of Colleges, Bhara Kahu Campus, Islamabad, Pakistan

<sup>3</sup>PhD Candidate, Federal Urdu University, Islamabad, Pakistan

### Manuscript Information

Citation in APA Style

Siddique, H. M. A., Usman, S. & Ishaq, J. (2018). Financial Development and Economic Growth: The Role of Energy Consumption. *Journal of Quantitative Methods* 2(2), 43-55.

This manuscript contains references to 27 other manuscripts.

The online version of this manuscript can be found at

<https://journals.umt.edu.pk/sbe/jqm/volume2issue2.aspx#>

DOI: <https://doi.org/10.29145/2018/jqm/020204>

### Additional Information

Subscriptions: [editorasst.jqm@umt.edu.pk](mailto:editorasst.jqm@umt.edu.pk)

Email Alert: [editorasst.jqm@umt.edu.pk](mailto:editorasst.jqm@umt.edu.pk)

For further information, please visit

<http://journals.umt.edu.pk/sbe/jqm/Home.aspx>

## Financial Development and Economic Growth: The Role of Energy Consumption

Hafiz Muhammad Abubakar Siddique<sup>1</sup>

Sadaf Usman<sup>2</sup>

Junaid Ishaq<sup>3</sup>

<https://doi.org/10.29145/2018/jqm/020204>

### Abstract

*The study investigates financial development and economic growth nexus, incorporating use of energy resources for Pakistan for 1980-2016, using Johansen co-integration and granger causality approach. The results of Johansen test for co-integration show the link between financial development, energy and economic growth in the long time span. The findings of granger causation test uncovered a two-way causality between capital and economic growth. The one-way causality exists from economic growth in energy and financial development. The findings also exposed the one-way causality from capital formation and exports to use of energy. The government should take steps to make financial sectors stronger as it has a great role in increasing the growth of an economy.*

**Keywords:** Financial Development, Energy Consumption, Johansen co-integration, Pakistan

**JEL Classification:** O40, Q40, E50

### 1. Introduction

Economic growth is an increase in economic capacity for producing output. It plays a vital role in the welfare which includes better education, health facilities and employment opportunities. Various factors of production are used to produce goods and services. The study is focused on two determinants, one is a private investment and second is power resources, as both factors are indispensable for growth and development.

---

<sup>1</sup>PhD Candidate, Federal Urdu University, Islamabad, Pakistan  
Email: bakar343@gmail.com

<sup>2</sup>Punjab Group of Colleges, Bhara Kahu Campus, Islamabad, Pakistan

<sup>3</sup>PhD Candidate, Federal Urdu University, Islamabad, Pakistan

Private investment is one of the sources to enhance the economic activities in an economy. It has a direct and strong impact on economic growth as compared to public investment (see, for example, Khan & Reinhart, 1990). Economic growth is affected by financial development, as it is the strategy for the development of private sectors. According to Demetriades and Hussein (1996), financial development is also supportive to increase the economic development. It is a crucial building block for the private sector as it has a greater role in reducing the risk of loss and poverty. It plays an indispensable character in increasing economic growth under different determinants which vary from country to country.

Energy is the basic factor of production of goods and services to enhance output and income (Asafu-Adjaye, 2000). It acts as an indispensable part in enhancing production as well as economic growth (Lee & Chang, 2008). It is a factor which accelerates the production efficiency and capacity. It is also helpful to fulfill the market demands of goods and timely services.

Both energy and financial development are helpful in different ways to enhance economic growth. A substantial body of previous literature found a progressive relationship between financial development, energy and growth. According to Siddique and Majeed (2015), development of finance and consumption of energy enhance growth level in South Asia. The study of Crichton and De Silva (1989) also investigated a strong relationship between economic development and financial institutions. Financial development also helps the government sector to implement its policies in better ways (Hau & Billington, 1992). Akinlo and Egbetunde (2010) also investigated that growth rate is activated by financial development in Africa.

The analysis inspects the association among development in finance and economic growth by incorporating energy which is considered a basic indicator of production for Pakistan over the period of 1980-2016. The paper is arranged as; the previous studies are reported in Section 2, Section 3 comprises methodology. The data and descriptive statistics are depicted in Section 4. The results and conclusion are reported in Section 5 and 6 respectively.

## 2. Literature Review

Financial development plays a dynamic role in economic growth in the presence of various determinants. Financial development and energy consumption increase the economic growth in different ways. Most of the studies found a positive connection between financial development, energy use and growth of an economy. According to Siddique and Majeed (2015), financial development and energy consumption, enhance the level of economic growth for South Asia over 1980-2010. They exposed a long run positive effect of energy, trade and financial development on growth.

Levine (1999), and Akinlo and Egbetunde (2010) investigated that financial intermediaries had a great influence on growth. Similarly, Hassan, Sanchez, and Yu (2011) found a positive association among financial development and economic growth. Darrat (1999) explained the role of financial development on economic growth for Saudi Arabia, Turkey and UAE. The findings of granger casualty approach suggest that financial deepening is the major factor that affects economic growth, and the level is different in all countries.

Habibullah and Eng (2006) exposed that growth is promoted by financial development in Asian developing countries over 1990-1998. Likewise, the findings of Calderon and Liu (2003) recommend that financial development is helpful for economic growth in 109 industrialized countries for 1960-1994. Habibullah (1999) inspected a strong association among economic progress and financial expansion in seven Asian developing countries over 1980-1990.

Crichton and De Silva (1989) explained the development in financial sector and progress of financial intermediation with economic growth over 1973-1987. The results exposed a strong positive association between development and financial institutions. Yang and Yi (2008) described a one-path causation from financial development to growth of Korea during 1971-2002.

The study of Blackburn and Hung (1998) established an affirmative link among trade, financial development and growth for the panel of different countries, and also found a two-way causal relationship between financial development and growth. Khan, Qayyum, Sheikh and Siddique (2005) also statistically

proven that financial depth is an increasing factor of economic growth in Pakistan over 1971-2004.

Nasreen, Anwar and Ozturk (2017) established a link among energy consumption, financial instability and environment in South Asia for 1980-2012. They used granger causality and bond testing approach. Their findings described that environmental quality was improved by financial stability and all the variables are co-integrated in the long time span.

Mahalik, Babu, Loganathan and Shahbaz (2017) discovered the causal affiliation among energy consumption and financial development in South Arabia over 1971-2011. Boulila and Trabelsi (2004) also reviewed causative affiliation between financial development and growth in Tunisia and found that economic growth is caused by finance.

Bakhouch (2007) tried to establish a connection among various proxies of financial development and economic growth in Algeria for 1971 to 2004. The results showed that the financial sector is not playing an effective role in investment projects.

Several studies establish a positive association among financial development, energy use and economic growth in the long and short run (see, for example, Crichton & De Silva, 1989; Habibullah, 1999; Siddique & Majeed 2015). Some studies found no significant tie among financial development and economic growth (see, for example, Bakhouch, 2007). The purpose of the study is to extract fresh evidences about the association among financial development, economic growth and energy use for Pakistan.

### **3. Methodology**

We have applied various techniques to find out the correlation between used variables. The study has incorporated development of finance, exports and power resources in basic production function. It is also used in the previous studies (see, Jalil & Ma, 2008; Siddique & Majeed, 2015; Sadorsky, 2012).

In this analysis, economic growth is dependent variable that is also used in the energy-growth models in the previous literature (Siddique & Majeed, 2015). The study used some independent variables which include capital, energy, financial development, labor

and exports (Jalil & Ma, 2008; Sadorsky, 2012). Shakeel, Iqbal and Majeed (2014) also used exports as an independent variable in his study. It is expressed in the following way.

$$Y = f (K, E, F, L, X) \quad (1)$$

It shows that economic growth is a function of capital (K), energy use (E), financial development (F), labor (L) and exports (X). To express with a meaningful relationship and parameters, we have to transform the functional form into econometrics model which is as follows:

$$Y_t = \alpha_0 + \alpha_1 K_t + \alpha_2 E_t + \alpha_3 F_t + \alpha_4 L_t + \alpha_5 X_t + \mu_t \quad (2)$$

where,

Y = economic growth;

K = capital;

E = energy consumption;

F = financial development;

L = labor;

X = exports;

$\alpha_0$  = intercept;

$\alpha_1$  = elasticity of capital with respect to economic growth;

$\alpha_2$  = elasticity of energy consumption;

$\alpha_3$  = coefficient of financial development;

$\alpha_4$  = coefficient of labor;

$\alpha_5$  = coefficient of exports;

$t = 1, 2, \dots, 37$  years; and

$\mu$  = error term.

The ADF test is employed to identify stationary of variables. The equation of ADF is given which is tested.

$$\Delta Y_t = \beta_0 + \beta_1 t + \beta_2 Y_{t-1} + \gamma_j \sum_{j=1}^q \Delta Y_{t-j} + \mu_t \quad (3)$$

The ordinary least square is suitable method, if all variables have zero order of integration. In case of one order of integration, Johansen co-integration approach is used. To identify the long run link among financial development, economic growth and energy consumption, Johansen co-integration technique is used. Granger causality test is employed to find out the direction and causality. The equation (2) can be extended for causality models in the following way;

$$\begin{bmatrix} \Delta Y_t \\ \Delta K_t \\ \Delta E_t \\ \Delta F_t \\ \Delta L_t \\ \Delta X_t \end{bmatrix} = \begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \\ \gamma_4 \\ \gamma_5 \\ \gamma_6 \end{bmatrix} + \begin{bmatrix} \alpha_{11,1} & \alpha_{12,1} & \alpha_{13,1} & \alpha_{14,1} & \alpha_{15,1} & \alpha_{16,1} \\ \alpha_{21,1} & \alpha_{22,1} & \alpha_{23,1} & \alpha_{24,1} & \alpha_{25,1} & \alpha_{26,1} \\ \alpha_{31,1} & \alpha_{32,1} & \alpha_{33,1} & \alpha_{34,1} & \alpha_{35,1} & \alpha_{36,1} \\ \alpha_{41,1} & \alpha_{42,1} & \alpha_{43,1} & \alpha_{44,1} & \alpha_{45,1} & \alpha_{46,1} \\ \alpha_{51,1} & \alpha_{52,1} & \alpha_{53,1} & \alpha_{54,1} & \alpha_{55,1} & \alpha_{56,1} \\ \alpha_{61,1} & \alpha_{62,1} & \alpha_{11,1} & \alpha_{11,1} & \alpha_{11,1} & \alpha_{11,1} \end{bmatrix} \begin{bmatrix} \Delta Y_t \\ \Delta K_t \\ \Delta E_t \\ \Delta F_t \\ \Delta L_t \\ \Delta X_t \end{bmatrix} \dots + \\
 \begin{bmatrix} \alpha_{11,k} & \alpha_{12,k} & \alpha_{13,k} & \alpha_{14,k} & \alpha_{15,k} & \alpha_{16,k} \\ \alpha_{21,k} & \alpha_{22,k} & \alpha_{23,k} & \alpha_{24,k} & \alpha_{25,k} & \alpha_{26,k} \\ \alpha_{31,k} & \alpha_{32,k} & \alpha_{33,k} & \alpha_{34,k} & \alpha_{35,k} & \alpha_{36,k} \\ \alpha_{41,k} & \alpha_{42,k} & \alpha_{43,k} & \alpha_{44,k} & \alpha_{45,k} & \alpha_{46,k} \\ \alpha_{51,k} & \alpha_{52,k} & \alpha_{53,k} & \alpha_{54,k} & \alpha_{55,k} & \alpha_{56,k} \\ \alpha_{61,k} & \alpha_{62,k} & \alpha_{11,k} & \alpha_{11,k} & \alpha_{11,k} & \alpha_{11,k} \end{bmatrix} \begin{bmatrix} \Delta Y_{t-k} \\ \Delta K_{t-k} \\ \Delta E_{t-k} \\ \Delta F_{t-k} \\ \Delta L_{t-k} \\ \Delta X_{t-k} \end{bmatrix} + \begin{bmatrix} \lambda_1 \\ \lambda_2 \\ \lambda_3 \\ \lambda_4 \\ \lambda_5 \\ \lambda_6 \end{bmatrix} \mu_{t-1} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \end{bmatrix}$$

Where,  $\Delta$  shows first difference,  $\gamma$ 's are intercepts, and  $k$  is lag length,  $\mu$  for lagged error terms,  $\varepsilon$  for error terms and the variables have been explained in the start of methodology.

#### 4. Data

The nexus among financial development and growth is determined, using various indicators. Economic growth is dependent variable derived from natural logarithm of per capita GDP (at constant price 2010 US\$), while natural logarithm of gross capital formation (at constant price 2010 US\$) used as capital, natural logarithm of energy use per capita (kilogram of equivalent to oil), domestic private sector credit used as an alternative of financial development that is also applied by Siddique and Majeed (2015), and Jalil and Ma (2008), labor force participation rate, and total exports as a share of GDP are the independent variables. The data on all used variables are taken from world development indicator (2017).

##### 4.1. Descriptive Statistics

Table 1 shows the result of descriptive statistic. The mean, median, and standard deviation of economic growth is 6.7208, 6.7202 and 0.2026 respectively. The minimum and maximum value of economic growth is 6.3212 and 7.0411. The mean, median and standard deviation of capital is 23.7205, 23.7709 and 0.3242 respectively. The minimum and maximum value of capital is 22.9751 and 24.1895. The mean, median and standard deviation of energy consumption is 6.0603, 6.1061 and 0.1430 respectively.

The minimum and maximum value of energy is 5.7593 and 6.26009 respectively.

The mean, median and standard deviation of financial development is 23.8936, 24.3851, and 3.6774. The minimum and maximum value of financial development is 15.3818 and 29.7860 respectively. The mean, median and standard deviation of labor is 50.8152, 50.5500 and 2.3478. The minimum and maximum value of the labor force is 47.0302 and 54.7133. The mean, median and standard deviation of exports is 14.0082, 13.3747 and 2.0900. The minimum and maximum value of exports is 9.9455 and 17.3593.

**Table 1: Descriptive Statistics**

Variables	Obs.	Mean	Median	Maximum	Minimum	Std. Dev.
Y	37	6.7208	6.7202	7.0411	6.3212	0.2026
K	37	23.7205	23.7709	24.1895	22.9751	0.3242
E	37	6.0603	6.1061	6.26009	5.7593	0.14303
F	37	23.8936	24.3851	29.7860	15.3818	3.6774
L	37	50.8152	50.5500	54.7133	47.0302	2.3478
X	37	14.0082	13.7347	17.3593	9.9455	2.0900

#### 4.2. Correlation among Variables

Table 2 shows the result of correlation among variables. Economic growth has a strong correlation with independent variables. The capital has a strong (97%) correlation with economic growth as compared to the explanatory variables. Energy consumption, labor force and exports have a positive correlation with economic growth, and energy has a weak correlation with other independent variables. The variable financial development has a negative correlation with economic growth.

**Table 2: Correlation Matrix**

Variables	Y	K	E	F	L	X
Y	1.0000					
K	0.9789	1.0000				
E	0.9440	0.9497	1.0000			
F	-0.4388	-0.34004	-0.24056	1.0000		
L	0.9749	0.9304	0.88197	-0.5133	1.0000	
X	0.4112	0.2227	0.3447	0.1278	0.0482	1.0000



## 5. Results and Discussion

We have applied various techniques to investigate the nexus among financial development, energy consumption and economic growth, and the results are discussed in this section. Table 3 shows the report of the ADF test. The integration order of all variables is one, so Johansen co-integration is the appropriate test to find the long relationship.

**Table 3: Results of Unit Root Test**

Variables	Level	First Difference
Y	-0.7125	-3.9069
K	-1.9589	-4.8919
E	-1.5217	-3.5667
F	-1.6494	-4.5092
L	-0.5689	-6.0858
X	-1.2946	-5.5486

**Table 4: Results of Co-Integration**

Rank Test (Trace)				
No. of Co-integrations	Eigen Value	Trace stat.	Critical Value at 5%	p-value
None *	0.8005	121.5302	95.7536	0.0003
At most 1	0.6028	66.7136	69.8188	0.0863
At most 2	0.3989	35.3158	47.8461	0.4314
At most 3	0.3090	18.0053	29.7970	0.5657
At most 4	0.1468	5.4351	15.4947	0.7610
Rank Test (Max. Eigen value)				
No. of Co-integrations	Eigen Value	Max-Eigen Stat.	Critical Value at 5%	p-value
None *	0.8005	54.81658	40.0775	0.0006
At most 1	0.6028	31.3977	33.8768	0.0961
At most 2	0.3989	17.3105	27.5843	0.5534
At most 3	0.3090	12.5701	21.1316	0.4925
At most 4	0.1468	5.4006	14.2646	0.6906

Note: \* indicates the non-accepting the hypotheses at 5% level of significance

Table 4 shows the outcomes of co-integration rank test. The rank test contains the trace and maximum Eigen values that indicate one co-integration equation. It implies that there exists a long run relationship among economic growth, energy consumption, capital, labor, exports and financial development. De Gregorio and Guidotti (1995) exposed a progressive influence of financial development on economic growth. There is a long run relationship between trade and growth (Calderon & Liu, 2003). Sadorsky (2012) also found the long run association between energy consumption, output, capital, labor and exports.

**Table 5: Results of Granger Causality Test**

Variables	Y	K	E	F	L	X
Y		15.0090	3.2337	2.7676	5.2242	0.9088
Prob.		(0.0005)	(0.0813)	(0.1057)	(0.0288)	(0.3476)
K	6.32122		6.2313	1.8344	0.5840	0.2173
Prob.	(0.0170)		(0.0177)	(0.1848)	(0.4502)	(0.6442)
E	1.8144	0.5445		2.3056	1.4262	0.4566
Prob.	(0.1871)	(0.4658)		(0.1384)	(0.2409)	(0.5041)
F	0.0973	0.6640	0.5506		1.1491	0.3688
Prob.	(0.7571)	(0.4210)	(0.4633)		(0.2915)	(0.5479)
L	1.9993	6.0129	1.0069	3.7748		1.1887
Prob.	(0.1677)	(0.0197)	(0.3229)	(0.0606)		(0.2837)
X	0.02446	8.4E-06	9.9780	0.3709	0.0269	
Prob.	(0.8767)	(0.9977)	(0.0034)	(0.5648)	(0.8705)	

Table 5 reported the results of granger causality approach. There is bidirectional causality between capital and growth, which implies that both indicators are the enhancing factors to each other. A two-way causal relationship is also exposed by Siddique, Majeed and Ahmad (2016). There exists a one-way causality from economic growth to energy use, to financial development, and to labor force. The literature also established a unidirectional causation from economic growth to energy consumption for exporting countries (Mehrara, 2007). We also found a one-way causality from labor force to capital and to financial development. The findings also exposed the one-way causality from capital and exports to energy consumption. It means that capital and exports are the increasing factors of energy consumption in Pakistan.

## 6. Conclusion

We have tried to reinvestigate the influence of financial development on economic growth by incorporating energy consumption, capital, exports and labor for Pakistan over 1980-2016. We have applied ADF test, Johansen co-integration and granger causality approach. The results of the ADF test show that all variables are stationary at first difference. The results of Johansen test for co-integration showed the long run association between energy consumption, economic growth, exports, labor, capital and financial development.

The granger causality results give an indication of two-way causation between capital and economic growth, which implies that both indicators are the enhancing factors to each other. The one sided causality from economic growth to energy use, to financial development, and to labor force is found. We also found a one-way causality from labor force to capital and to financial development. The findings also exposed the one-way causation from exports and capital to energy consumption.

The study suggested to make the financial sector stronger as it has a major role in boosting up the growth level. It is also recommended to produce such resources which provide sufficient energy, according to the industrial demand.

## References

- Akinlo, A. E., & Egbetunde, T. (2010). Financial development and economic growth: The experience of 10 sub-Saharan African countries revisited. *The Review of Finance and Banking*, 2(1), 17-26.
- Asafu-Adjaye, J. (2000). The relationship between energy consumption, energy prices and economic growth: Time series evidence from Asian developing countries. *Energy Economics*, 22(6), 615-625. [https://doi.org/10.1016/S0140-9883\(00\)00050-5](https://doi.org/10.1016/S0140-9883(00)00050-5).
- Bakhouche, A. (2007). Does the financial sector promote economic growth? A case of Algeria. *Savings and Development*, 31(1), 23-44.

- Blackburn, K., & Hung, V. T. Y (1998). A theory of growth, financial development and trade. *Economica*, 65(257), 107-124.
- Boulila, G., & Trabelsi, M. (2004). Financial Development and long-run growth: Evidence from Tunisia: 1962-1997. *Savings and Development*, 28(3), 289-314.
- Calderon, 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).
- Crichton, N., & De Silva, C. (1989). Financial development and economic growth: Trinidad and Tobago, 1973–1987. *Social and Economic Studies*, 38(4),133-164.
- Darrat, A. F. (1999). Are financial deepening and economic growth causally related? Another look at the evidence. *International Economic Journal*, 13(3), 19-35. <https://doi.org/10.1080/10168739900000002>.
- 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).
- Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51(2), 387-411. [https://doi.org/10.1016/S0304-3878\(96\)00421-X](https://doi.org/10.1016/S0304-3878(96)00421-X).
- Habibullah, M. S. (1999). Financial Development and Economic Growth in Asian Countries: Testing the Financial-Led Growth Hypothesis/ Development Financier Et Croissance Economique En Asie: Verification De L'hypothese De La Croissance Guidee Par Le Developpement Financier. *Savings and Development*, 23(3), 279-291.
- Habibullah, M. S., & Eng, Y. K. (2006). Does financial development cause economic growth? A panel data dynamic analysis for the Asian developing countries. *Journal of the Asia Pacific Economy*, 11(4), 377-393. <https://doi.org/10.1080/13547860600923585>.

- Hassan, M. K., Sanchez, B., & Yu, J. S. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics and Finance*, 51(1), 88-104. <https://doi.org/10.1016/j.qref.2010.09.001>.
- Hau, L. L., & Billington, C. (1992). Managing supply chain inventory: pitfalls and opportunities. *Sloan Management Review*, 33(3), 65-75.
- Jalil, A., & Ma, Y. (2008). Financial development and economic growth: Time series evidence from Pakistan and China. *Journal of Economic Cooperation*, 29(2), 29-68.
- Khan, M. A., Qayyum, A., Sheikh, S. A., & Siddique, O. (2005). Financial development and economic growth: The case of Pakistan. *The Pakistan Development Review*, 44(4), 819-837.
- Khan, M. S., & Reinhart, C. M. (1990). Private investment and economic growth in developing countries. *World Development*, 18(1), 19-27. [https://doi.org/10.1016/0305-750X\(90\)90100-C](https://doi.org/10.1016/0305-750X(90)90100-C).
- Lee, C. C., & Chang, C. P. (2008). Energy consumption and economic growth in Asian economies: A more comprehensive analysis using panel data. *Resource and Energy Economics*, 30(1), 50-65. <https://doi.org/10.1016/j.reseneeco.2007.03.003>.
- Levine, R. (1999). Law, finance, and economic growth. *Journal of financial Intermediation*, 8(1-2), 8-35. <https://doi.org/10.1006/jfin.1998.0255>.
- Mahalik, M. K., Babu, M. S., Loganathan, N., & Shahbaz, M. (2017). Does financial development intensify energy consumption in Saudi Arabia? *Renewable and Sustainable Energy Reviews*, 75, 1022-1034. <https://doi.org/10.1016/j.rser.2016.11.081>.
- Mehrara, M. (2007). Energy consumption and economic growth: the case of oil exporting countries. *Energy Policy*, 35(5), 2939-2945. <https://doi.org/10.1016/j.enpol.2006.10.018>.
- Nasreen, S., Anwar, S., & Ozturk, I. (2017). Financial stability, energy consumption and environmental quality: Evidence from South Asian economies. *Renewable and Sustainable Energy Reviews*, 67, 1105-1122. <https://doi.org/10.1016/j.rser.2016.09.021>.

- Sadorsky, P. (2012). Energy consumption, output and trade in South America. *Energy Economics*, 34(2), 476-488. <https://doi.org/10.1016/j.eneco.2011.12.008>.
- Shakeel, M., Iqbal, M. M., & Majeed, M. T. (2014). Energy consumption, trade and GDP: A case study of South Asian countries. *The Pakistan Development Review*, 53(4)461-476.
- Siddique, H. M. A., & Majeed M. T., (2015). Energy consumption, economic growth, trade and financial development nexus in South Asia. *Pakistan Journal of Commerce and Social Science*, 9(2), 658-682.
- Siddique, H. M. A., Majeed M. T. and Ahmad H. K., (2016). The impact of urbanization and energy consumption on CO2 emissions in South Asia. *A Research Journal of South Asian Studies*, 31(2), 745-757.
- Yang, Y. Y., & Yi, M. H. (2008). Does financial development cause economic growth? Implication for policy in Korea. *Journal of Policy Modeling*, 30(5), 827-840. <https://doi.org/10.1016/j.jpolmod.2007.09.006>.