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The linkages among energy consumption, economic growth, relative price, foreign direct investment, and financial development in Malaysia



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Abstract

The aim of this study is to analyse the causal relationship among energy consumption, economic growth, relative price, financial development (FD) and foreign direct investment in Malaysia using a multivariate framework. This study covers a sample from 1972 to 2009. Both the Johansen–Juselius cointegration test and bounds testing approach to cointegration consistently suggest that the variables are cointegrated. We find that energy consumption and economic growth Granger causes each other in the short and long run. In addition, both FDI-led growth and finance-led growth hypotheses are also supported by the findings from this study. Ultimately, energy is a prominent resource for financial sector development in Malaysia because we find that energy consumption Granger

causes FD. Policymakers should implement a dual strategy that, on one hand, increases investment in energy infrastructure to ensure that the supply of energy is sufficient for the financial sector and economic development, while, on the other, encourages R&D in green technology such as exercising proper soil conservation techniques and sustainable farming practices in order to reduce the consumption of fossil fuels. By doing so, environmental problems such as carbon dioxide emissions can be minimised without affecting economic growth and financial sector development in Malaysia.

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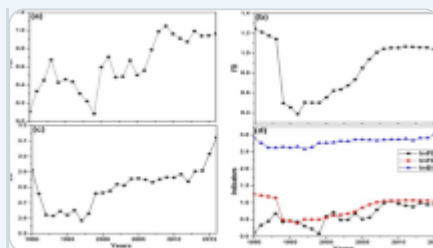
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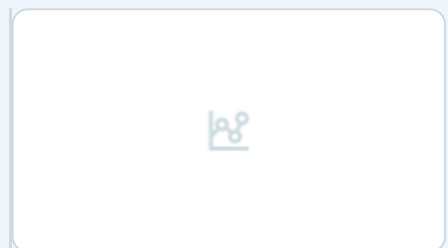
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References

Ang J.B.: Financial development and the FDI-growth nexus: the Malaysian experience. *Appl. Econ.* **41**, 1595–1601 (2009)

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Ang J.B., McKibbin W.J.: Financial liberalization, financial sector development and growth: evidence from Malaysia. *J. Dev. Econ.* **84**, 215–233 (2007)

[Article](#) [Google Scholar](#)

APERC.: APEC energy overview 2010. Asia Pacific Energy Research Centre, Tokyo, Japan (2011)

Bekhet H.A., Othman N.S.: Causality analysis among electricity consumption, consumer expenditure, gross domestic product (GDP) and foreign direct investment (FDI): case study of Malaysia. *J. Econ. Int. Financ.* **3**, 228–235 (2011)

[Google Scholar](#)

Chandran V.G.R., Sharma S., Madhavan K.: Electricity consumption-growth nexus: the case of Malaysia. *Energy Policy* **38**, 606–612 (2010)

[Article](#) [Google Scholar](#)

Chen S.T., Kou H.I., Chen C.C.: The relationship between GDP and electricity consumption in 10 Asian countries. *Energy Policy* **35**, 2611–2621 (2007)

[Article](#) [Google Scholar](#)

Cheung Y.W., Lai K.S.: Finite-sample sizes of Johansen's likelihood ratio tests for

cointegration. *Oxf. Bull. Econ. Stat.* **55**, 313–328 (1993)

[Article](#) [Google Scholar](#)

Dolado J.J., Lütkepohl H.: Making wald tests work for cointegrated VAR systems. *Econom. Rev.* **15**, 369–386 (1996)

[Article](#) [Google Scholar](#)

Economic Planning Unit.: Tenth Malaysian Plan 2010–2015. Prime Minister's Department, Putrajaya, Malaysia (2010)

Engle R.F., Granger C.W.J.: Co-integration and error correction: representation, estimation, and testing. *Econometrica* **55**, 251–276 (1987)

[Article](#) [Google Scholar](#)

Fatai K., Oxley L., Scrimgeour F.G.: Modeling and forecasting the demand for electricity in New Zealand: a comparison of alternative approaches. *Energy J.* **24**, 75–102 (2003)

[Article](#) [Google Scholar](#)

Gandolfo G.: *Quantitative Analysis and Econometric Estimation of Continuous-Time Dynamic Models*. North-Holland, Amsterdam (1981)

[Google Scholar](#)

Granger C.W.J.: Investigating causal relations by econometric models and cross-spectral methods. *Econometrica* **37**, 424–438 (1969)

[Article](#) [Google Scholar](#)

Henricsson R., Lundbäck E.: Testing the presence and the absence of PPP: results for fixed and flexible regimes. *Appl. Econ.* **27**, 635–641 (1995)

Islam, F., Shahbaz, M., Alam, M.: Financial development and energy consumption nexus in Malaysia: a multivariate time series analysis. MPRA Paper, No: 28403 (2011)

Johansen S.: Statistical analysis of cointegration vectors. J. Econ. Dyn. Control **12**, 231-254 (1988)

[Article](#) [Google Scholar](#)

Johansen S., Juselius K.: Maximum likelihood estimation and inference on cointegration with—applications to the demand for money. Oxf. Bull. Econ. Stat. **52**, 169-210 (1990)

[Article](#) [Google Scholar](#)

Jomo K.S.: Mahathir's Economy Legacy. Vinlin Press Sdn. Bhd., Kuala Lumpur (2003)

Kanioura A., Turner P.: Critical values for an F-test for cointegration in a multivariate model. Appl. Econ. **37**, 265-270 (2005)

[Article](#) [Google Scholar](#)

Karanfil F.: How many times again will we examine the energy-income nexus using a limited range of traditional econometric tools. Energy Policy **37**, 1191-1194 (2009)

[Article](#) [Google Scholar](#)

Kremers J.J.M., Ericsson N.R., Dolado J.J.: The power of cointegration tests. Oxf. Bull. Econ. Stat. **54**, 325-348 (1992)

[Article](#) [Google Scholar](#)

Kwiatkowski D., Phillips P.C.B., Schmidt P., Shin Y.: Testing the null hypothesis of stationarity against the alternative of a unit root: how sure are we that economic time series have a unit root?. *J. Econom.* **54**, 159–178 (1992)

[Article](#) [Google Scholar](#)

Lean H.H., Smyth R.: Multivariate Granger causality between electricity generation, exports, prices and GDP in Malaysia. *Energy* **35**, 3640–3648 (2010a)

[Article](#) [Google Scholar](#)

Lean H.H., Smyth R.: On the dynamics of aggregate output, electricity consumption and exports in Malaysia: evidence from multivariate Granger causality tests. *Appl. Energy* **87**, 1963–1971 (2010b)

[Article](#) [Google Scholar](#)

Lumsdaine R.L., Papell D.H.: Multiple trend breaks and the unit-root hypothesis. *Rev. Econ. Stat.* **79**, 212–218 (1997)

[Article](#) [Google Scholar](#)

Maddala G., Kim I.: Unit roots, cointegration, and structural change. Cambridge University Press, Cambridge (1998)

[Google Scholar](#)

Murry D.A., Nan G.D.: A definition of the gross domestic product-electricity interrelationship. *J. Energy Dev.* **19**, 275–283 (1994)

[Google Scholar](#)

Narayan P.K.: The saving and investment nexus for China: evidence from

cointegration tests. Appl. Econ. **37**, 1979-1990 (2005)

[Article](#) [Google Scholar](#)

Narayan P.K., Smyth R.: Electricity consumption, employment and real income in Australia evidence from multivariate Granger causality tests. Energy Policy **33**, 1109-1116 (2005a)

[Article](#) [Google Scholar](#)

Narayan P.K., Smyth R.: The residential demand for electricity in Australia: an application of the bounds testing approach to cointegration. Energy Policy **33**, 467-474 (2005b)

[Article](#) [Google Scholar](#)

Ozturk I.: A literature survey on energy-growth nexus. Energy Policy **38**, 340-349 (2010)

[Article](#) [Google Scholar](#)

Payne J.E.: A survey of the electricity consumption-growth literature. Appl. Energy **87**, 723-731 (2010a)

[Article](#) [Google Scholar](#)

Payne J.E.: Survey of the international evidence on the causal relationship between energy consumption and growth. J. Econ. Stud. **37**, 53-95 (2010b)

[Article](#) [Google Scholar](#)

Perron P.: The great crash, the oil price shock, and the unit root hypothesis. Econometrica **57**, 1361-1401 (1989)

[Article](#) [Google Scholar](#)

Pesaran M.H., Shin Y., Smith R.J.: Bounds testing approaches to the analysis of level relationships. *J. Appl. Econom.* **16**, 289–326 (2001)

[Article](#) [Google Scholar](#)

Reinsel G.C., Ahn S.K.: Vector autoregressive models with unit roots and reduced rank structure: estimation, likelihood ratio test and forecasting. *J. Time Ser. Anal.* **13**, 353–375 (1992)

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Sadorsky P.: The impact of financial development on energy consumption in emerging economies. *Energy Policy* **38**, 2528–2535 (2010)

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Sadorsky P.: Financial development and energy consumption in Central and Eastern European frontier economies. *Energy Policy* **39**, 999–1006 (2011)

[Article](#) [Google Scholar](#)

Shahbaz M., Tang C.F., Shahbaz Shabbir M.: Electricity consumption and economic growth nexus in Portugal using cointegration and causality approaches. *Energy Policy* **39**, 3529–3536 (2011)

[Article](#) [Google Scholar](#)

Stock J.H., Watson M.W.: Forecasting using principal components from a large number of predictors. *J. Am. Stat. Assoc.* **97**, 1167–1179 (2002a)

[Article](#) [Google Scholar](#)

Stock J.H., Watson M.W.: Macroeconomic forecasting using diffusion indexes. *J. Bus. Econ. Stat.* **20**, 147–162 (2002b)

[Article](#) [Google Scholar](#)

Tang C.F.: A re-examination of the relationship between electricity consumption and economic growth in Malaysia. *Energy Policy* **36**, 3077–3085 (2008a)

[Article](#) [Google Scholar](#)

Tang C.F.: A re-examination of the role of foreign direct investment and exports in Malaysia's economic growth: a time series analysis, 1970–2006. *Int. J. Manag. Stud.* **15**, 47–67 (2008b)

[Google Scholar](#)

Tang C.F.: Electricity consumption, income, foreign direct investment, and population in Malaysia: new evidence from multivariate framework analysis. *J. Econ. Stud.* **36**, 371–382 (2009)

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Tang C.F., Tan E.C.: Electricity consumption and economic growth in Portugal: evidence from a multivariate framework analysis. *Energy J.* **33**, 23–48 (2012)

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Toda H.Y., Yamamoto T.: Statistical inference in vector autoregressions with possibly integrated processes. *J. Econom.* **66**, 225–250 (1995)

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Wolde-Rufael Y.: Re-examining the financial development and economic growth nexus in Kenya. *Econ. Model.* **26**, 1140–1146 (2009)

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Yoo S.H.: The causal relationship between electricity consumption and economic growth in the ASEAN countries. *Energy Policy* **34**, 3573–3582 (2006)

Zivot E., Andrews D.W.K.: Further evidence of the great crash, the oil-price shock and the unit-root hypothesis. *J. Bus. Econ. Stat.* **10**, 251–270 (1992)

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