ELECTRICITY CONSUMPTION AND FOREIGN DIRECT INVESTMENT: EMPIRICAL EVIDENCE FROM INDONESIA

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Abstract

Over the last three decades, most of developing countries pay more attention to foreign direct investments (FDI) activities, at both national and international level. Economists believe that FDI is one of the most important sources of globalization and an important catalyst for economic growth, especially for the developing countries. FDI can be one of the sources of capital to stimulate the economy of the country, as well as a contributor to the national development through the transfer of an asset, generators of employment, high productivity, competitiveness, management, and technology spillovers. However, deficiency in quality and a limited quantity of electricity is one of the issues that remains a perpetual bugbear that hampering Indonesia's economic and social development. The objective of this study is to investigate whether electricity consumption affects the inflow of FDI in Indonesia. The analysis is based on Autoregressive Distributed Lag (ARDL) model using time series annual data from 1980-2016 of FDI, electricity consumption, and other macroeconomic variables such as GDP, exchange rate, openness, labor force, and education expenditure as control variables. Using various econometric techniques like Unit Root Test, Bounds Test, Cointegrating and long-run test and Granger causality test, it was found that there are a long-run relationship and positive correlation between electricity consumption and FDI in Indonesia. However, Granger causality result shows that there is no causality running from FDI to electricity consumption and vice versa.

Keywords: electricity consumption, foreign direct investment, Indonesia

Abstrak

Sepanjang tiga dekad yang lalu, kebanyakan negara sedang membangun lebih menumpu ke atas aktiviti pelaburan langsung asing (FDI), di peringkat kebangsaan dan antarabangsa. Ahli ekonomi percaya bahawa FDI adalah salah satu daripada sumber globalisasi yang paling penting dan pemangkin penting bagi pertumbuhan ekonomi terutamanya di negara sedang membangun. FDI boleh menjadi salah satu sumber modal untuk merangsang ekonomi negara, serta penyumbang kepada pembangunan negara dengan pemindahan aset, penjana pekerjaan, produktiviti tinggi, daya saing, pengurusan, dan tumpuan teknologi. Walau bagaimanapun, kekurangan dalam kualiti dan kuantiti elektrik yang terhad merupakan salah satu isu yang menghalang pembangunan ekonomi dan sosial Indonesia. Objektif kajian ini adalah untuk menyiasat sama ada penggunaan elektrik mempengaruhi aliran masuk FDI di Indonesia. Analisis ini berdasarkan kepada model Lag Terdistribusi Autoregressive (ARDL) dengan menggunakan data tahun siri masa 1980-2016 meliputi FDI, penggunaan elektrik, dan pemboleh ubah makroekonomi seperti KDNK, kadar pertukaran, keterbukaan, tenaga buruh, dan perbelanjaan Pendidikan sebagai pemboleh ubah kawalan. Dengan pelbagai teknik ekonometrik seperti Ujian Unit Root, Ujian Bounds, Cointegrating dan uji jangka panjang dan ujian kausal Granger, didapati bahawa terdapat hubungan jangka panjang dan korelasi positif antara penggunaan elektrik dan FDI di Indonesia. Walau bagaimanapun, hasil kausal Granger menunjukkan bahawa tidak ada hubungan kausaliti dari FDI ke penggunaan elektrik dan sebaliknya.

Kata kunci: penggunaan elektrik, pelaburan langsung asing, Indonesia.

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List of Abbreviations

ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed lag
CUSUM	Cumulative Sum of Recursive Residuals
ECM	Error Correction Model
ECT	Error Correction Term
EDU	Education Expenditure
ELC	Electric Power Consumption
EXC	Exchange Rate
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moment
LFP	Labor Force Participation
MNEs	Multinational Enterprises
OLS	Ordinary Least Squares
OPN	Openness
TNCs	Transnational Corporations
UNCTAD	United Nations Conference on Trade and Development
VEC	Vector Error Correction
VECM	Vector Error Correction Model
WEF	World Economic Forum

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Amid the 60s, Foreign Direct Investment (FDI) was essentially not an extremely alluring but rather respected with incredible doubt by most developing nations including Indonesia. FDI was viewed as a risk to national sovereignty and was associated with decreasing social welfare by manipulating transfer costs and the formation of enclaves. The coming to the energy of President Soeharto in 1965 saw a sharp change in monetary strategy settings, with the presentation of multi-year financial plans to manage improvement.

On March 11, 1966, Soeharto's New Order government profoundly changed the FDI atmosphere while reestablishing Indonesia's association with the industrialist world economy. In response to the pressure of the early 1980s, Indonesia is compelled to change their monetary arrangement to wind up noticeably more market-situated, and FDI had all the earmarks of being one of the most straightforward approaches to get an external source of financing without expanding the outside obligation of the nation.

The roles and benefits of FDI in developing economies have been long debated. FDI is no longer considered only as an augmenting the capital inflows, however as a noteworthy channel for innovation and administration practice transfer, and aptitudes improvement and advancement, and additionally to access global promoting systems (Hymer, 1976; Rugman, 1980; Dunning, 1980; Mallampally & Sauvant, 1999; Nunnenkamp, 2002). In this manner, the worldwide economy has been totally changed

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References

Akinlo, A. E. (2008). Energy consumption and economic growth: evidence from 11 Sub-Sahara African countries. *energy economics*, *30*(5), 2391-2400.

Alam, M. (2013). Coping with blackouts: Power outages and firm choices. In *Yale Seminar. http://economics. ucr. edu/seminars_colloquia/2013 14/econometrics/Alam% 20paper% 20for* (Vol. 202, No. 203, p. 2014).

Aliber, R. Z. (1970). Speculation in the flexible exchange revisited. *Kyklos*, *23*(2), 303-314.

Aliber, R. Z. (1971). The multinational enterprise in a multiple currency world. *The multinational enterprise*, 49-56.

Antweiler, W., Copeland, R. B., & Taylor, M. S. (2001). Is free trade good for the emissions: 1950-2050. *The Review of Economics and Statistics*, *80*, 15-27.

Artige, L., & Nicolini, R. (2010). Market potential, productivity and foreign direct investment: Some evidence from three case studies. *European Planning Studies*, *18*(2), 147-168.

Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: is Africa different?. *World development*, *30*(1), 107-119.

Asiedu, E. (2006). Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability. *The World Economy*, *29*(1), 63-77.

Babatunde, M. A., & Adefabi, R. A. (2005). Long run relationship between education and economic growth in Nigeria: Evidence from the Johansen's cointegration approach. In *regional conference on education in West Africa: Constraints and opportunities Dakar, Senegal*.

Banerjee, A., Dolado, J., Galbraith, J., & Hendry, D. (1993). Co-integration, Error Correction, and the Econometric Analysis of Non-Stationary Data: Oxford University Press. Retrieved 14 Jan. 2018, from http://www.oxfordscholarship.com/view/10.1093/0198288107.001.0001/acprof-9780198288107.

Baron-Cohen, S., Jolliffe, T., Mortimore, C., & Robertson, M. (1997). Another advanced test of theory of mind: Evidence from very high functioning adults with autism or Asperger syndrome. *Journal of Child psychology and Psychiatry*, *38*(7), 813-822.

Bekhet, H. A., & bt Othman, N. S. (2011). Causality analysis among electricity consumption, consumer expenditure, gross domestic product (GDP) and foreign direct investment (FDI): Case study of Malaysia. *Journal of economics and international finance*, *3*(4), 228.

Bevan, A. A., & Estrin, S. (2004). The determinants of foreign direct investment into European transition economies. *Journal of comparative economics*, *32*(4), 775-787.

Bhattacharya, M. (2016). Problem with error correction coefficient. Research Gate. Retrieved on 27 Dec 2017 from, https://www.researchgate.net/post/Problem_with_Error_correction_coefficient

Blonigen, B. A. (1997). Firm-specific assets and the link between exchange rates and foreign direct investment. *The American Economic Review*, 87(3), 447-465.

Bouoiyour, J. (2003). Productivity and spillovers diffusion in Morocco: Is there a difference between high tech and low tech sectors?. *WP-CATT, University of Pau*.

Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society. Series B (Methodological)*, 149-192.

Buckley, P. J., & Casson, M. (2016). *The future of the multinational enterprise*. Springer.

Buckley, P. J., Clegg, J., & Wang, C. (2002). The impact of inward FDI on the performance of Chinese manufacturing firms. *Journal of international business studies*, *33*(4), 637-655.

Campa, J. M. (1993). Entry by foreign firms in the United States under exchange rate uncertainty. *The Review of Economics and Statistics*, 75(4), 614-622.

Cole, M. A. (2006). Does trade liberalization increase national energy?
use? *Economics Letters*, *92*(1), 108-112.

Cushman, D. O. (1985). Real exchange rate risk, expectations, and the level of direct investment. *The Review of Economics and Statistics*, 67(2), 297-308.

Cushman, D. O. (1988). Exchange-rate uncertainty and foreign direct investment in the United States. *Review of World Economics*, *124*(2), 322-336.

Dauda, R. O. (2009). Investment in education and economic growth in Nigeria: A co integration approach. In *9th Global Conference on Business and Economic held at University of Cambridge, UK*.

Demirhan, E., & Masca, M. (2008). Determinants of foreign direct investment flows to developing countries: a cross-sectional analysis. *Prague economics*, *4*(4), 356-369.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American statistical association*, *74*(366a), 427-431.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica: Journal of the Econometric Society*, 49(4), 1057-1072.

Dunning, J. H. (1973). The determinants of international production. *Oxford economic papers*, *25*(3), 289-336.

Dunning, J. (1980). Toward an Eclectic Theory of International Production: Some Empirical Tests. *Journal of International Business Studies, 11*(1), 9-31. Retrieved from http://www.jstor.org/stable/154142

Dunning, J. H. (1988). The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of international business studies*, 19(1), 1-31.

Dunning, J. (1993). Internationalizing Porter's Diamond. *MIR: Management International Review*, *33*, 7-15. Retrieved from http://www.jstor.org/stable/40228187

Engle, R.F. and C.W.J. Granger (1987) 'Co-integration and Error Correction: Representation, Estimation, and Testing', Econometrica, 55, pp. 251-76.

Elliott, R. J., Sun, P., & Chen, S. (2013). Energy intensity and foreign direct investment: A Chinese city-level study. *Energy Economics*, *40*, 484-494.

Foon Tang, C. (2009). Electricity consumption, income, foreign direct investment, and population in Malaysia: new evidence from multivariate framework analysis. *Journal of Economic Studies*, *36*(4), 371-382.

Froot, K. A., & Stein, J. C. (1991). Exchange rates and foreign direct investment: an imperfect capital markets approach. *The Quarterly Journal of Economics*, *106*(4), 1191-1217.

Grossman, G., & Helpman, E. (1991). Innovation and growth in the world economy. MIT Press, Cambridge. *International Journal of Industrial Organization*, 10(2), 323-324.

Heckman, J., & Klenow, P. (1997). Is there underinvestment in human? capital. *Unpublished . Chicago, Center for Social Program Evaluation, University of Chicago*.

Helpman, E. (1984). A simple theory of international trade with multinational corporations. *Journal of political economy*, *92*(3), 451-471.

Hübler, M. (2009). *Energy saving technology diffusion via FDI and trade: a CGE model of China* (No. 1479). Kiel working paper.

Hymer, S. H. (1976). *International operations of national firms*. MIT press. *Journal of Development Economics*, 4(4), 387-400.

Indonesia Investment (Aug 16, 2014). Electricity in Indonesia: Plenty natural resources but shortage of electricity. Retrieved on 27 Nov 2017 from, https://www.indonesia-investments.com/news/todays-headlines/electricity-in-indonesia-plenty-natural-resources-but-shortage-of-electricity/item2325?

Ishak, Y., & Rahmah, I. (2002). Human resource competitiveness and the Inflow of Foreign Direct Investment. *Asia-Pacific Development Journal*, *9*(1), 89-107.

Ismail, R., & Yussof, I. (2003). Labour market competitiveness and foreign direct investment: The case of Malaysia, Thailand and the Philippines. *Papers in Regional Science*, *82*(3), 389-402.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and statistics*, *52*(2), 169-210.

Johansen, S. (1988) 'Statistical Analysis of Cointegration Vectors', Journal of Economics Dynamics and Control, 12, pp. 231-54.

Jordaan, J. A. (2004). Estimating FDI-induced externalities when FDI is endogenous: A comparison between OLS and IV estimates of FDI-induced externalities in Mexico. *London School of Economics and Political Science, Research Paper in Environment and Spatial Analysis*, *92*, 28.

Keyou, M. J., Bernard, P., Plaisent, M., & Kuofie, M. (2009). Why have East and South East Asian countries received more foreidn direct investment than African countries?. *Journal of International Global Business*, 2(2), 1–29.

Klein, M. W., & Rosengren, E. (1994). The real exchange rate and foreign direct investment in the United States: relative wealth vs. relative wage effects. *Journal of international Economics*, *36*(3), 373-389.

Kojima, K. (1982). Macroeconomic versus international business approach to direct foreign investment. *Hitotsubashi Journal of Economics*, 23(1), 1-19.

Krugell, W. (2005). The determinants of foreign direct investment in Africa. *Multinational Enterprises, Foreign Direct Investment and Growth in Africa*, 49-71. Physica-Verlag HD.

Krugman, P. (1980). Scale economies, product differentiation, and the pattern of trade. *The American Economic Review*, *70*(5), 950-959.

Krugman, P. (1983). New theories of trade among industrial countries. *The American Economic Review*, *73*(2), 343-347.

Leit, N. C. (2015). Energy consumption and foreign direct investment: a panel data analysis for Portugal. *International Journal of Energy Economics and Policy*, *5*(1), 138.

Lipsey, R. E. (2004). Home-and host-country effects of foreign direct investment. In *Challenges to globalization: Analyzing the economics*, 333-382. University of Chicago Press.

Loree, D. W., & Guisinger, S. E. (1995). Policy and non-policy determinants of US equity foreign direct investment. *Journal of International Business Studies*, *26*(2), 281-299.

Lucas, R. E. (1990). Why doesn't capital flow from rich to poor countries?. *The American Economic Review*, *80*(2), 92-96.

Makoni, P. L. (2015). An extensive exploration of theories of foreign direct investment. *Risk Governance & Control: Financial markets and institutions*, 5(2), 77.

Mallampally, P., & Sauvant, K. P. (1999). Foreign direct investment in developing countries. *Finance and Development*, *36*(1), 34.

Markusen, J. R. (1997). *Trade versus investment liberalization* (No 6231). National Bureau of Economic Research.

Martin, S. (Mar 9, 2017). Beyond a connection: Improving energy access in Indonesia with open data. World Resources Institute. Retrieved on 27 Nov 2017 from, http://www.wri.org/blog/2017/03/beyond-connection-improving-energy-access-indonesia-open-data

Michaelowa, K. (2000). Returns to education in low income countries: Evidence for Africa. *Committee on Developing Countries of the German Economic Association, 30/6/00.*

Mielnik, O., & Goldemberg, J. (2000). Converging to a common pattern of energy use in developing and industrialized countries. *Energy Policy*, *28*(8), 503 508.

Mohamed, S. E., & Sidiropoulos, M. G. (2010). Another look at the determinants of foreign direct investment in MENA countries: an empirical investigation. *Journal of economic development*, *35*(2), 75.

Morisset, J. P. (1999). Foreign direct investment in Africa: policies also matter. *Policy Research Working Paper*, *No. 2481*. World Bank, Washington. Retrieved from *https://openknowledge.worldbank.org/handle/10986/19748*

Morley, B. (2006). Causality between economic growth and immigration: An ARDL bounds testing approach. *Economics Letters*, *90*(1), 72-76.

Narayan, P. K., & Smyth, R. (2005). Electricity consumption, employment and real income in Australia evidence from multivariate Granger causality tests. *Energy policy*, *33*(9), 1109-1116.

Nayak, D., & Choudhury, R. N. (2014). *A selective review of foreign direct investment theories*, No. 143. ARTNeT Working Paper Series.

Nunnenkamp, P. (2002). *Determinants of FDI in developing countries: has globalization changed the rules of the game?*, No. 1122. Kiel Working Paper.

Omri, A., & Kahouli, B. (2014). Causal relationships between energy consumption, foreign direct investment and economic growth: Fresh evidence from dynamic simultaneous-equations models. *Energy Policy*, *67*, 913-922.

Ouattara, B. (2004). *Foreign aid and fiscal policy in Senegal*. Manchester: Mimeo University of Manchester.

Pesaran, M. H. (1997). The role of economic theory in modelling the long run. *The Economic Journal*, *107*(440), 178-191.

Pesaran, M. H., & Smith, R. P. (1998). Structural analysis of cointegrating VARs. *Journal of Economic Surveys*, *12*(5), 471-505.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, *94*(446), 621-634.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2000). Structural analysis of vector error correction models with exogenous I (1) variables. *Journal of Econometrics*, *97*(2), 293-343.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3), 289 326.

Popovici, O. C., & Călin, A. C. (2014). FDI theories. A location-based approach. *Romanian Economic Journal*, *17*, 53.

Porter, M. E. (1990). The competitive advantage of nations. *Harvard business review*, *68*(2), 73-93.

Ranjan, V., & Agrawal, G. (2011). FDI inflow determinants in BRIC countries: A panel data analysis. *International Business Research*, *4*(4), 255.

Razafimahefa, I., & Hamori, S. (2005). An empirical analysis of FDI competitiveness in Sub-Saharan Africa and developing countries. *Economics Bulletin*, *6*(20), 1-8.

Resmini, L. (2000). The determinants of foreign direct investment in the CEECs: new evidence from sectoral patterns. *Economics of transition*, *8*(3), 665-689.

Richaud, C., Sekkat, K., & Varoudakis, A. (1999). Infrastructure and growth spillovers: A case for a regional infrastructure policy in Africa. *manuscript, University of Brussels*.

Rugman, A. M. (1980). Internalization as a general theory of foreign direct investment: A re-appraisal of the literature. *Review of World Economics*, *116*(2), 365-379.

Sadorsky, P. (2011). Financial development and energy consumption in Central and Eastern European frontier economies. *Energy Policy*, *39*(2), 999-1006.

Schneider, F., & Frey, B. S. (1985). Economic and political determinants of foreign direct investment. *World development*, *13*(2), 161-175.

Sekkat, K., & Veganzones-Varoudakis, M. A. (2004). *Trade and foreign exchange liberalization, investment climate, and FDI in the MENA countries*. Working Papers CEB 04-023.RS, ULB -- Universite Libre de Bruxelles. Retrieved from https://ideas.repec.org/p/sol/wpaper/04-023

Shiu, A., & Lam, P. L. (2004). Electricity consumption and economic growth in China. *Energy policy*, *32*(1), 47-54.

The Jakarta Post. (Jun 16, 2015). Power Supply shortage still major problem for foreign investors. Retrieved on 27 Nov 2017 from, http://www.thejakartapost.com/news/2015/06/16/power-supply-shortage-still-major-problem-foreign-investors.html

Tsai, P. L. (1994). Determinants of foreign direct investment and its impact on economic growth. *Journal of economic development*, *19*(1), 137-163.

UNCTAD, 2000. The Competitiveness Challenge: Transnational Corporations and Industrial Restructuring in Developing Countries, 19-20. United Nations, Geneva.

Wafure, G. O. & Nurdeen, A. (2010). Determinants of foreign direct investment in Nigeria. *Journal of Global Human Social Science*, Vol 30 No 1, pp. 1502 1504.

Waldkirch, A. (2003). The 'new regionalism'and foreign direct investment: The case of Mexico. *J. Int. Trade & Economic Development*, *12*(2), 151-184.

Wheeler, D., & Mody, A. (1992). International investment location decisions: The case of US firms. *Journal of international economics*, *33*(1-2), 57-76.

Wilhelms, S. K., & Witter, M. S. D. (1998). *Foreign direct investment and its determinants in emerging economies*. Washington DC: United States Agency for International Development, Bureau for Africa, Office of Sustainable Development.

Yasin, M. (2005). Official development assistance and foreign direct investment flows to Sub-Saharan Africa. *African Development Review*, *17*(1), 23-40.

Zaman, K., Khan, M. M., Ahmad, M., & Rustam, R. (2012). Determinants of electricity consumption function in Pakistan: Old wine in a new bottle. *Energy Policy*, *50*, 623-634.

Zhang, K. H., & Markusen, J. R. (1999). Vertical multinationals and host-country characteristics. *Journal of Development Economics*, *59*(2), 233-252.