Quarterly Journal of Quantitative Economics(JQE) **(2023) 20(3) 35-77**

Shahid Chamran University of Ahvaz

Quarterly Journal of Quantitative Economics

Journal Homepage: www.jqe.scu.ac.ir
Print ISSN: 2008-5850
Online ISSN: 2717-4271

Assessing the short run and long run effects of foreign direct investment, human capital and financial development on the economic growth of different income groups in developing countries (application of the panel cointegration approach)

Neda Leylian *, Mehrzad Ebrahimi **, Hashem Zare ***, Ali Haghighat ****

** Ph.D. of Economics, Department of Economics, Faculty of Economics and Management, Shiraz Branch, Islamic Azad University, Shiraz, Iran. (Corresponding Author)*
Email: *neda.leylian@gmail.com*
Postal address: *Iran, Shiraz, Sadra City, Islamic Azad University of Shiraz Branch, Faculty of Economics and Management.*
0000-0001-8413-4580

*** Assistance professor of Economics, Department of Economics, Faculty of Economics and Management, Shiraz Branch, Islamic Azad University, Shiraz, Iran.*
Email: *mhrzad@yahoo.com*

**** Assistance professor of Economics, Department of Economics, Faculty of Economics and Management, Shiraz Branch, Islamic Azad University, Shiraz, Iran.*
Email: *hashem.zare@gmail.com*

***** Assistance professor of Economics, Department of Economics, Faculty of Economics and Management, Shiraz Branch, Islamic Azad University, Shiraz, Iran.*
Email: *alihaghighat91@yahoo.com*

ARTICLE HISTORY	JEL CLASSIFICATION	KEYWORDS
Received: 09 February 2021 ***Revision: 02 July 2021*** ***Acceptance: 25 July 2021***	***J24 ،I20 ،O47 ،O13***	***Foreign direct investment, Human capital, Financial development, Economic growth, Developing countries***

Acknowledgments: Acknowledgments may be made to individuals or institutions that have made an important contribution.
Conflict of Interest: The authors declare no conflict of interest.
Funding: The authors received no financial support for the research, authorship, and publication of this article.

How to Cite:
Leylian, Neda., Ebrahimi, Mehrzad., Zare, Hashem & Haghighat, Ali. (2023). Assessing the short run and long run effects of foreign direct investment, human capital and financial development on the economic growth of different income groups in developing countries (application of the panel cointegration approach). *Quarterly Journal of Quantitative Economics (JQE)*, 20(3), 35-77.
10.22055/jqe.2021.36604.2339

EXTENDED ABSTRACT

INTRODUCTION

One of the most important goals of the countries, especially developing countries, is economic growth and development. Foreign direct investment along with human capital and financial development are important factors that can have a significant impact on economic growth. Human capital can be used as a facilitator for the transfer of technology related to foreign direct investment. In addition, evidences show that human capital plays a complementary role to the impact of foreign direct investment on economic growth. Technology overflow into domestic companies is also more efficient when financial markets in the host economy are more developed. Therefore, the purpose of this study is to evaluate the short-run and long-run effects of foreign direct investment, human capital and financial development on the economic growth of various income groups in developing countries.

METHODOLOGY

The model used for unsustainable economies (developing countries) is designed to be appropriate for the current study. In this model, the effect of population growth rate and technology, physical capital, human capital, financial development, foreign direct investment, foreign direct investment interaction and financial development and the interaction of foreign direct investment and human capital on economic growth is examined. The statistical population is developing countries in the period 2000-2019. For the study, developing countries were divided into four categories: low-income, lower-middle-income, upper-middle-income, and high-income, which included a total of 27 countries (9 Asian countries, 9 African countries, and 9 South American countries). In this study, first, the significance of variables for developing countries by income groups was investigated. Then, based on the Kao test, the existence of long-run equilibrium relationships among the variables related to the income groups of developing countries was confirmed. FMOLS and DOLS methods were used to investigate the integration.

FINDINGS

The results of long-run estimates show that foreign direct investment alone is 0.27 effective on the economic growth of high-income countries, and when combined with human capital and financial development, its impact on economic growth is 0.42 and It will be 0.104. Thus, the effect of the interaction of foreign direct investment and human capital is greater than the effect of foreign direct investment alone on the economic growth of high-income countries. But in other income groups of developing countries, the interaction of foreign direct investment with human capital and financial development has not had a positive effect on economic growth. Also, the results of short-run estimates showed that foreign direct investment alone does not affect the economic growth of high-income countries, but the interaction of foreign direct investment and financial development and the interaction of foreign direct investment and human capital by 0.48 and respectively. 2.13 affects economic growth. This result shows that in the short run, foreign direct investment alone has no effect on economic growth, but along with human capital and financial development have a positive effect on economic growth in these countries. In other income groups of developing countries, the interaction of foreign direct investment with human capital and financial development has not had a positive effect on economic growth. Also, the correct component of the error of foreign direct investment interaction with financial development and human capital shows that in each period, 78% and 95% of the imbalances in the system are eliminated to achieve long-run equilibrium, respectively. But in other income groups, the speed of adjustment is very low or non-existent.

CONCLUSION

These results show that high-income countries have realized that it is possible to increase productivity due to the high level of human capital and skilled labor through the transfer of new technologies and technology overflows, and this is a positive factor in Economic growth works. Also in high-income developing countries, due to the high institutional capacity in the economic structure that has led to comprehensive efficiency in the mechanism of credit allocation of these countries, the interactive effect of foreign direct investment and financial development on economic growth in the short-run and long –run is positive.

Reference

Ahmed, K.T., Ghani, G.M., Mohamad, N. & Derus, A.M. (2015). Does inward FDI crowd-out domestic investment? Evidence from, *Procedia- Social and Behavioral Sciences*, 172, 419-426. https://doi.org/10.1016/j.sbspro.2015.01.395

Alfaro, L., Chanda, A., Kalemli-Ozcan, S. & Sayek, S. (2004). FDI and economic growth: the role of local financial markets, *J. Int. Econ*. 64 (1), 89–112. https://doi.org/10.1016/S0022-1996(03)00081-3

Alfaro, L., Chanda, A., Kalemli-Ozcan, S. & Sayek, S. (2010.) Does foreign direct investment promote growth? exploring the role of financial markets on linkages. *J. Dev. Econ.* 91 (2), 242–256. https://doi.org/10.1016/j.jdeveco.2009.09.004

Alvarado, R., Iñiguez, M. & Ponce, P. (2017). Foreign direct investment and economic growth in Latin America. *Economic Analysis and Policy*, 56, 176-187. https://doi.org/10.1016/j.eap.2017.09.006

Arcand, J.L., Berkes, E. & Panizza, U. (2015). Too much finance? *J. Econ. Growth*, 20(2), 105–148. https://doi.org/10.1007/s10887-015-9115-2

Arvin, M.B., Pradhan, R.P. & Nair, M. (2021). Uncovering Interlinks Among ICT Connectivity and Penetration, Trade Openness, Foreign Direct Investment, and Economic Growth: The Case of the G-20 Countries, *Telematics and Informatics*, 60. https://doi.org/10.1016/j.tele.2021.101567

Azman-Saini, W.N.W., Law, S.H. & Ahmad, A.H. (2010). FDI and economic growth: new evidence on the role of financial markets. *Econ. Lett*. 107 (2), 211–213. https://doi.org/10.1016/j.econlet.2010.01.027

bahrambeigi, F., fotros, M. H., haji, G., & torkamani, E. (2023). The Effect of Financial Development Regimes on Energy Intensity in Iran: Markov-Switching Approach. *Quarterly Journal of Quantitative Economics(JQE), 20*(2), 32-71. doi: 10.22055/jqe.2021.36681.2345

Barkhordari, S., Abrishami, H. & Zolfaghari, M., (2019). The impact of financial development on human development in developing countries with a focus on institutional, social and economic characteristics, *Journal of Financial Economics*, 48, 217-237. (In Persian) https://dorl.net/dor/20.1001.1.25383833.1398.13.48.8.3

Beck, R., Georgiadis, G., & Straub, R. (2014). The finance and growth nexus revisited. Econ.Lett. 124 (3), 382–385. https://doi.org/10.1016/j.econlet.2014.06.024

Bilir, K., Chor, D., Manova, K. (2014). Host-country Financial Development and Multinational Activity. *National Bureau of Economic Research Working Paper Series* No. 20046. https://doi.org/10.1016/j.euroecorev.2019.02.008

Blomstrom, M., Lipsey, R.E., & Zejan, M. (1992). What Explains Developing Country Growth*? National Bureau of Economic Research Working Paper Series* No. 4132. http://www.nber.org/papers/w4132

Blomstrom, M., Kokko, A. & Globerman, S. (2001). The Determinants of Host Country Spillovers from Foreign Direct Investment: Review and Synthesis of the Literature. *Inward Investment Technological Change and Growth*, 239, 34-65. http://dx.doi.org/10.1057/9780230598447_2

Bluedorn, J., Duttagupta, R., Guajardo, J. & Topalova, P. (2013). Capital Flows Are Fickle: Anytime, Anywhere. *International Monetary Fund*, Research Department. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Capital-Flows-are-Fickle-Anytime-Anywhere-40885

Borensztein, E., De Gregorio, J. & Lee, J.W. (1998). How does foreign direct investment affect economic growth?, *J. Int. Econ*. 45 (1), 115–135. https://doi.org/10.1016/S0022-1996(97)00033-0

Brida, J.G., Carrera, E. & Segarra, V. (2020). Clustering and regime dynamics for economic growth and income inequality. *Structural Change and Economic Dynamics*, 52, 99-108. https://doi.org/10.1016/j.strueco.2019.09.010

Ciesielska, D. & Kołtuniak, M. (2017). Outward foreign direct investments and home country's economic growth. *Physica A: Statistical Mechanics and its Applications*, 482: 127-146. https://doi.org/10.1016/j.physa.2017.04.057

Creane, S., A. Rishi Goyal, M. Moshfigh & S. Randa (2004). Financial Sector Development in the Middle East and North Africa, *IMF Working Paper*, 04/201 (Washington: International Monetary Fund). https://www.imf.org/external/pubs/ft/med/2003/eng/creane/

Dadgar, Y. & Nazari, R. (2009). Evaluation of Financial Development Indicators in Iran, International Conference on Financing System Development in Iran (with Financial Innovation Approach), *Sharif University of Technology Studies Center*. 1. (In Persian) https://civilica.com/doc/72379/

Fotros, M., Aghazadeh, A. & Jabraili, S. (2011). The effect of economic growth on renewable energy consumption Comparative comparison of selected member countries of the Organization for Economic Cooperation and Development and non-members (including Iran). *Quarterly Journal of Research and Policy Economic*, 60, 98-81. (In Persian) http://qjerp.ir/article-1-187-en.html

Ford, T.C., Rork, J.C. & Elmslie, B.T. (2008). Foreign direct investment, economic growth, and the human capital threshold: evidence from us states. Rev. *Int. Econ*. 16 (1), 96–113. 10.1111/j.1467-9396.2007.00726.x

Ghafari, H., Jalooli, M., & Changi Ashtiani, A. (2015). Social instability and economic growth, Analysis based on ARDL Model, *Quarterly Journal of Economic Reseach (Sustainable Growth and Development)*, 15(4): 25-50. (In Persian) http://ecor.modares.ac.ir/article-18-10064-fa.html

Griliches, Z. (1964). Research expenditures, education, and the aggregate agricultural production function. *The American Economic Review*, 961-974. https://www.jstor.org/stable/1809481

Gui-Diby, S.L. (2014). Impact of foreign direct investments on economic growth in Africa: Evidence from three decades of panel data analysis, *Research in Economics*, 68, 248-256. https://doi.org/10.1016/j.rie.2014.04.003

Han, J. & Lee, J. (2020). Demographic change, human capital, and economic growth in Korea, *Japan and the World Economy*, 53. https://doi.org/10.1016/j.japwor.2019.100984

Hosseini, S.M., Ashrafi, Y., Siami araqi, E. (2011). Investigating the Relationship between Financial Development and Economic Growth in Iran with the Introduction of New Variables, *Journal of Economic Research and Policy*, 19(60), 126-113. (In Persian) http://qjerp.ir/article-1-184-fa.html

Hosseini, S.S. & Molaei, M. (2006). The Impact of Foreign Direct Investment on Economic Growth in Iran. *Economic Research Journal*, 6(2), 57-80. (In Persian) https://joer.atu.ac.ir/article_3367.html

Iamsiraroj, S. (2016). The Foreign direct investment -economic growth nexus. *International Review of Economic & Finance*, 42, 116-133.

Kao, C. & Chiang, M.H. (2000). On the estimation and inference of a cointegrated regression in panel data. *Advances in Econometrics*, 15, 179–222. https://www.emerald.com/insight/content/doi/10.1016/S0731-9053(00)15007-8/full/html

Karimi, M. & Heidarian, M. (2017). A Study of Short-Term and Long-Term Effects of Electricity Consumption on Economic Growth in Iranian Provinces (Analysis of FMOLS-PMG and VECM Causality Models). *Econometric Modeling Quarterly*, 2(2), 149-117. (In Persian) https://doi.org/10.22075/jem.2018.2881

Khalili araqi, M. & Salimi Shendi, R. (2014), The Relationship between Foreign Direct Investment, Financial Development and Economic Growth: A Case Study of Selected Asian Countries. *Journal of Economic Research and Policy*, 22(71), 156-143. (In Persian)

Kong, Q., Guo, R., Wang, Y., Sui, X. & Zhou, S. (2020). Home-country environment and firms’ outward foreign direct investment decision: evidence from Chinese firms. *Economic Modelling*, 85, 390–399. https://doi.org/10.1016/j.econmod.2019.11.014

Kottaridi, C. & Stengos, T. (2010). Foreign direct investment, human capital and non-linearities in economic growth. *Journal of Macroeconomics*, 32(3), 858-871. https://doi.org/10.1016/j.jmacro.2010.01.004

Law, S.H. & Singh, N. (2014). Does too much finance harm economic growth? *J. Bank. Finance*, 41 (Suppl. C), 36–44. https://doi.org/10.1016/j.jbankfin.2013.12.020

Levine, R., (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35 (2), 688–726. https://doi.org/10.1596/1813-9450-1678

Leylian, N., Ebrahimi, M., Zare, H., & Haghighat, A. (2021). Investigating the Effect of Foreign Direct Investment and Human Capital on Agricultural Economic Growth in Selected Asian Developing Countries, *Journal of Agricultural Economics Research*, 13(2), 109-

126. (In Persian) https://dorl.net/dor/20.1001.1.20086407.1400.13.2.6.7

Li, X. (2001). Government revenue, government expenditure, and temporal causality: Evidence from China. *Applied Economics*, 33(4), 485-497. https://doi.org/10.1080/00036840122982

Li, G. & Wei, W. (2021). Financial development, openness, innovation, carbon emissions, and economic growth in China. *Energy Economics*, 97. https://doi.org/10.1016/j.eneco.2021.105194

Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22: 3-42. https://doi.org/10.1016/0304-3932(88)90168-7

Makiela, K. & Ouattara, B. (2018). Foreign direct investment and economic growth: exploring the transmission channels. *Economic Modelling*, 72, 296–305. https://doi.org/10.1016/j.econmod.2018.02.007

Mohamandzadeh Asl, N. (2002). Testing the theory of neoclassical growth, *Economic Reseach*, 14. (In Persian). https://joer.atu.ac.ir/article_3185.html

Molaei, H., Golkhandan, A. & Golkhandan, D. (2014). Asymmetry of the effects of oil shocks on the economic growth of oil exporting countries: An application of the nonlinear approach of hidden panel integration. *Iranian Journal of Energy Economics*, 3(10). 229 -201. (In Persian) https://jiee.atu.ac.ir/article_539.html

Moosavi Jahromi, Y. (2018*). Economic Development and planning*. Payame noor University Press, Tehran. (In Persian).

Morrissey, O. & Udomkerdmongkol, M. (2016). Response to Institutions, Foreign Direct Investment, and Domestic Investment: Crowding Out or Crowding In?. *World Development*, 88, 10-11. https://doi.org/10.1016/j.worlddev.2016.08.001

Nair-Reichert, U. & Weinhold, D. (2001). Causality tests for cross-country panels: a new look at FDI and economic growth in developing countries. Oxf. Bull, *Econ. Stat*. 63(2), 153–171. 10.1111/1468-0084.00214

Najarzadeh, R. & Maleki, M. (2005). Investigating the Impact of Foreign Direct Investment on Economic Growth with Emphasis on Oil Exporting Countries. *Iranian Journal of Economic Research*, 7(23), 163-147. (In Persian) https://ijer.atu.ac.ir/article_3769.html

Osei, M.J. & Kim, J. (2020). Foreign direct investment and economic growth: Is more financial development better?. *Economic Modelling*, 93, 154-161. https://doi.org/10.1016/j.econmod.2020.07.009

Phillips, P. C. B. & Hansen, B.E. (1990). Statistical inference in instrumental variable regression with I (1) processes, *Review of Economic Studies*, 57, 99–125. https://doi.org/10.2307/2297545

Poorshahabi, F. & Esfandiyari, M. (2017). The role of financial development in attracting foreign direct investment and promoting economic growth, *Journal of Economic growth and development research*. 7(28), 113-126. (In Persian) https://dorl.net/dor/20.1001.1.22285954.1396.7.28.7.1

Romer, D. (1986). *Advanced macroeconomics*, McGraw Hill.

Sajadieh, F., Bakhtiari, S., & ghobadi, S. (2022). Evaluation the Role of Household Risk Management on Economic Growth: Case Study of Selected OIC Member Countries with emphasis on Iran. *Quarterly Journal of Quantitative Economics(JQE)*, *19*(3), 93-124. doi: 10.22055/jqe.2020.32698.2219

Samargandi, N., Fidrmuc, J. & Ghosh, S. (2015). Is the relationship between financial development and economic growth monotonic? evidence from a sample of middle-income countries. *World Dev*. 68, 66–81. https://doi.org/10.1016/j.worlddev.2014.11.010

Schultz, T. W. (1961). Investment in human capital. *The American economic review*, 51(1): 1-17. https://www.jstor.org/stable/1818907

Singh, T. (2007). Financial development and economic growth nexus: time series evidence from India. *Applied economics*, 1, 13. https://econpapers.repec.org/scripts/redir.pf?u=https%3A%2F%2Fdoi.org%2F10.1080%252F00036840600892886;h=repec:taf:applec:v:40:y:2008:i:12:p:1615-1627

Souri, A. (2015). *Econometrics*. 2nd edition, Cultural Studies Publishing. (In Persian)

Stock, J.H. & Watson, M.W. (1993). A simple estimator of co-integrating vectors in higher order integrated systems, *Econometrica*, 61, 783-820. https://doi.org/10.2307/2951763

Su, Y. & Liu, Z. (2016). The impact of foreign direct investment and human capital on economic growth: Evidence from Chinese cities. *China Economic Review*, 37, 97-109. https://doi.org/10.1016/j.chieco.2015.12.007

Sunde, T. (2017). Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa. *Research in International Business and Finance*, 41, 434-444. https://doi.org/10.1016/j.ribaf.2017.04.035

Vischer, T. (2012). *Individual preferences, Human capital, and economic development*, Dissertation of the University of St. Gallen.

Walters, P. B. & Rubinson, R. (1983). Educational expansion and economic output in the United States, 1890-1969: A production function analysis. *American Sociological Review*, 480-493. https://doi.org/10.2307/2117716

Wang, J. Y. (1990). Growth, Technology Transfer and the Long-Run Theory of International Capital Movements. *Journal of International Economics*, 29, 255-71. https://doi.org/10.2307/2117716

Xu, Y. & Li, A. (2019). The relationship between innovative human capital and interprovincial economic growth based on panel data model and spatial econometrics. *Journal of Computational and Applied Mathematics*, 365. https://doi.org/10.1016/j.cam.2019.112381