

The Relationship between Foreign Direct Investment and Economic Growth: Evidence from “Second Generation” Panel Cointegration Techniques

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Abstract

Countries which need to finance their infrastructure investments and to ensure economic stability and growth are taking measures to increase domestic savings. However low saving rates especially in developing countries lead these countries to foreign direct investment. Globalization accelerates this process. Foreign direct investment coming to the country has an impact on many macroeconomic variables, especially on gross domestic product. Therefore, the aim of this study is to investigate the relationship between foreign direct investment and economic growth according to the income levels classification of World Bank.

Analyzing the relationship between foreign direct investment and economic growth occupies a large place in the economic literature. There are two fundamental theories, which explain the influence of the foreign direct investment to the host countries. According to the modernization theories which relying on the endogenous growth theories countries need capital for the economic growth and on the other hand in comparison with the modernization theories, dependence approach emphasizes that relying heavily on outside financial sources influence adversely of the countries' income distribution (Adams, 2009, 940).

Many theoretical and empirical works reveal different aspects of foreign direct investment and economic growth relationship. Adams (2009) investigates not only the effect of foreign direct investment but also domestic investment on economic growth for forty-two Sub Saharan African countries from 1990 to 2003. He shows that foreign and domestic investments influence the economic growth in different way. Agosin and Machado (2005) which examining the developing countries from Africa, Asia and Latin America search for the crowding-out effect of foreign direct investment to the domestic investment. They said that there is no positive influence of FDI to the host countries' domestic investment. According to the Hermes and Lensing (2003), effect of FDI to economic growth has closely related to the economic conditions of the host countries. If countries have deep financial market FDI effect positively economic growth at that case.

These different results motivate us to analyze the issue by applying the most recent econometric test procedures to obtain more consistent and robust results. The source for data is the World Bank's World Development Indicators database. The dataset contains annual data of foreign direct investments net inflows and GDP (both are in current US dollars) for 35 years' period (from 1980 to 2014) for 127 countries. In purpose to see how foreign direct investment - economic growth relationship changes depending on development level, we divided countries according to the World Bank income level classification to 5 groups: High income: OECD group, High Income: non-OECD, Upper Middle Income, Lower Middle Income and Low Income. At the same time to take into consideration whole sample we used group named “World” that contains all countries.

As empirical method, second-generation panel cointegration analysis is used. This method allows for cross-sectional variation among countries so results are more consistent and robust. In this framework, for each panel we applied the following four step panel techniques: Cross-section

dependency tests, panel unit root tests, panel cointegration tests and, to measure the long-term relationship, estimation the magnitude of the cointegration coefficient. According to the Pesaran (2004), CD test for cross-section dependence in each panel, both for FDI and GDP, there is cross-dependence. For this reason, on the next step of analysis we employed the CADF test suggested by Pesaran (2007) which is the second-generation panel unit root test allowing for cross-dependence. Results for the test calculated for both “intercept” and “intercept and trend” specifications suggest that all series are stationary in first differences. On the third stage of analysis, we examined whether there exists a cointegration relationship between FDI and GDP by applying second-generation panel cointegration tests developed by Westerlund (2007). According to the test results, we conclude that for all sample groups, the no cointegration null is always rejected at least at the 5% level. Because FDI and GDP are cointegrated we estimated magnitude of cointegration coefficient by using the Common Correlated Effects Mean Group (CCE-MG) estimation procedures, that take into account the presence of cross-section dependency (Table 1).

Table 1
Common Correlated Effects Mean Group Estimates (Pesaran, 2006)

| | Coef. | Std. Err. | Prob. |
|-----------------------|----------|-----------|-------|
| World | 1.897*** | 0.523 | 0.000 |
| High income: OECD | -1.424 | 1.308 | 0.276 |
| High income: non-OECD | 0.077 | 0.475 | 0.870 |
| Upper middle income | 2.354** | 0.753 | 0.002 |
| Lower middle income | 0.869* | 0.534 | 0.100 |
| Low income | 1.287** | 0.515 | 0.013 |

Note: ***, **, and * denote significance at the 1, 5, and 10% level, respectively.

The results for estimating of long-term cointegration coefficient are significant and positive for all groups except “High Income” groups. Therefore, we can conclude that higher developing level attracts more investment. However, the size of magnitude of cointegration coefficient indicates that for more rich country groups it smaller than for that with lower income. Analysis results reveal that the effect of foreign direct investment to economic growth vary among country groups with the income level in line with expectations.

Keywords : Panel Data Models, International Investment, Economic Growth of Open Economies, Macroeconomic Analyses of Economic Development.

JEL Classification Codes : C23, F21, F43, O11.

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