

CORRUPTION AND FOREIGN DIRECT INVESTMENT INFLOWS IN EMERGING MARKET ECONOMIES

Yilmaz BAYAR

Usak University, Department of Economics, Usak, Turkey

yilmaz.bayar@usak.edu.tr

Naib ALAKBAROV

Usak University, Department of Economics, Usak, Turkey

naib.alakbarov@usak.edu.tr

Abstract

This study investigates the interaction between corruption and foreign direct investment inflows in 23 emerging market economies during the period 2002-2014 by employing Westerlund-Durbin-Hausman (2008) cointegration test. We found that control of corruption and rule of law had no statistically significant impact on attraction of foreign direct investments in overall panel.

Keywords: *Foreign direct investment inflows, control of corruption, rule of law, panel data analysis*

JEL Classification: *C33, D73, F21, F23*

I. INTRODUCTION

Foreign direct investment (FDI) inflows have become an important external financing source especially for the emerging market economies and developing countries as of mid-1980s. In this regard, global FDI inflows was about \$1.2 trillion in 2014 and about half of total FDI flows went to the emerging market economies (UNCTAD, 2015a). The significant increases in global FDI flows have many implications for the countries such as technology spillovers, improvements in human capital, facilitating the access to global markets, increasing the competitiveness. Therefore, determination of macroeconomic and institutional determinants of FDI inflows also gained importance for the countries to attract more FDI flows. One of the important institutional determinants has been found to be corruption. There are two main views on the impact of corruption on FDI inflows. One view suggests that corruption affects FDI inflows negatively, because corruption increases the costs and weakens transparency, property rights and competitive environment and prevents efficiently functioning of the governments. On the other hand the other view suggests that corruption affects FDI inflows positively, because corruption can eliminate the problems arising from poor institutions and regulations (Bellos and Subasat, 2011).

Many countries especially developing and emerging market economies see the FDI inflows as a key to development considering the benefits of FDI inflows. Therefore they have liberalized their economies and made many structural reforms to meet the requirements of foreign investors. In this regard, we investigated the interaction among corruption, rule of law and FDI inflows in emerging market economies during 2002-2014 period employing panel data analysis. The rest of the paper is organized as follows. The next section mainly outlines the empirical literature review on the nexus between corruption and FDI inflows. Section 3 introduces the data and method, Section 4 gives empirical findings. Finally Section 5 concludes the study.

II. LITERATURE REVIEW

A large number of studies have been conducted to see the impact and determinants of FDI flows. The studies about the determinants of FDI flows have focused on the macroeconomic and institutional determinants and the studies have revealed that market size, population, growth prospects, financial development, inflation, real exchange rate, openness, trade openness, human capital, institutional quality, infrastructure, political stability and taxes (Bayar and Ozel, 2014). In this study, we focused the literature on the institutional determinants of FDI inflows, because we investigated the relationship between corruption and FDI inflows in emerging market economies. The empirical literature showed that most of the studies have investigated the interaction between corruption and FDI flows by employing panel data analysis and reached mixed findings. However, most of the studies also revealed that corruption had negative impact on FDI inflows (Al-Sadig, 2009; Brada et al. 2012; Pupovic, 2012; Kersan-Škabić, 2013; Castro and Nunes, 2013; Quazi, 2014), while relatively few studies have found no statistically significant relationship between corruption and FDI inflows (Bellos and Subasat, 2011; Mudambi et al., 2013; Helmy, 2013).

Nilsson-Hakkala et al. (2008) examined the impact of corruption on horizontal and vertical FDI with data of Swedish firm level using panel regression and found that corruption had negative impact on FDI and the impact was bigger in case of horizontal FDIs relative to the vertical ones. On the other hand Al-Sadig (2009)

examined the impact of corruption on FDI inflows in 117 countries during 1984-2004 period using panel regression and found that corruption had negative impact on FDI inflows. But he also found that the impact of corruption eliminated when the institutional quality of host country was controlled. Woo (2010) also examined the impact of corruption on FDI inflows in 90 countries during 1984-2004 period using panel regression and found that corruption had negative impact on FDI inflows.

In another study, Bellos and Subasat (2011) investigated the interaction between FDI inflows and corruption in 15 transition economies during 1990-2005 period using panel gravity model and found that corruption had no statistically significant impact on FDI inflows. On the other hand Samimi and Monfared (2011) examined the impact of corruption on FDI inflows in 16 Organisation of Islamic Cooperation countries during 2002-2008 period using panel regression and found a negative relationship between corruption and FDI inflows. Buchanan et al. (2012) also examined the interaction between FDI and institutional quality in 164 countries during 1996-2006 period using panel regression and found that institutional quality had positive impact on FDI.

Brada et al. (2012) examined the impact of corruption on FDI inflows in 84 host countries during 2000-2003 period and found that corruption had negative impact on FDI inflows. On the other hand Pupovic (2012) also examined the impact of corruption in FDI inflows in Montenegro using questionnaire method and concluded that corruption had negative impact on FDI inflows. Alemu (2012) also investigated the impact of corruption on FDI inflows in 16 Asian countries during 1995-2009 period using panel regression and found that corruption had negative impact on FDI inflows.

Saidi et al. (2013) investigated the relationship between institutional variables and FDI inflows in 20 developed and developing countries during 1998-2011 period employing panel regression and found that political stability and regulatory quality had positive impact on FDI inflows. On the other hand Kersan-Škabić (2013) also examined the institutional determinants of FDI inflows in 8 south east European countries during 2001-2010 period employing panel regression and found that corruption had significant impact on FDI inflows. On the other hand Castro and Nunes (2013) investigated the interaction among corruption and FDI inflows in 73 countries during 1998-2008 period employing panel regression and found that countries with lower corruption attracted more FDI flows. Mudambi et al. (2013) also investigated the interaction among government regulation, corruption and FDI in 55 countries during 1985-2000 period using panel regression and found that corruption had no independent impact on FDI inflows.

Helmy (2013) investigated the impact of corruption on FDI inflows in 21 Middle East and North African countries during 2003-2009 period using panel regression and found that corruption had no significant impact on FDI inflows. On the other hand Quazi (2014) examined the impact of corruption on FDI inflows in 14 East and South Asian countries during 1995-2011 period using panel regression and found that corruption had negative impact FDI inflows. Finally Lucke and Eichler (2016) investigated the institutional determinants of FDI in 94 countries during 1995-2009 period employing panel regression and found that regulatory quality and economic freedom had positive impact on FDI inflows.

III. DATA AND ECONOMETRIC METHODOLOGY

We investigated the relationship among FDI inflows, control of corruption and rule of law in 23 emerging market economies (Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey, United Arab Emirates) during 2002-2014 period using Westerlund-Durbin-Hausman (2008) cointegration test. The countries and the data period in our study were determined by data availability.

3.1. Data

We used the annual data of FDI net inflows as percent of GDP as a proxy for FDI inflows. Additionally, we used control of corruption as a proxy for corruption and rule of law from WGI (World Governance Indicators). The indicators in question are based on 31 data sources reporting the perceptions of governance held by a large number of survey respondents and expert assessments worldwide (see Kaufmann et al. (2010) for detailed information). The indexes of the each indicator vary between -2.5 (weak) and 2.5 (strong) governance performance. The variables used in the econometric analysis, their symbols and data sources are presented in Table 1. We used Stata 14.0 and Gauss 11.0 software packages for the econometric analysis.

Table 1: Data description

| Variables | Symbol | Source |
|---|--------|---------------------------------------|
| Foreign direct investment, net inflows (% of GDP) | FDI | World Bank (2015a) and UNCTAD (2015b) |
| Rule of law | ROL | World Bank (2015b) |
| Control of corruption | COC | |

3.2. Econometric methodology

Cross-sectional dependency and homogeneity among the variables exhibit importance for selection of further econometric tests used in the analysis such as unit root test and cointegration test. Therefore, first we tested cross-sectional independency among the series with LM CD test of Pesaran (2004) because N (cross-section dimension) =23 is higher than T(time dimension)=13 and tested homogeneity with adjusted delta tilde tests by Pesaran and Yamagata (2008). Later we analyzed integration levels of the variables with CIPS unit root test of Pesaran (2007) that regards cross-sectional dependence. Then we investigated long run relationship among unemployment, financial sector development and gross capital formation with Westerlund-Durbin-Hausman (2008) cointegration test, because heterogeneity and cross-sectional dependency were found in econometric analysis of dataset. Finally we estimated long run cointegrating coefficients with Augmented Mean Group (AMG) estimator (Eberhardt and Bond, 2009; Eberhardt and Teal, 2010, 2011).

IV. EMPIRICAL ANALYSIS

4.1. Cross-sectional dependency and homogeneity tests

We employed LM CD test of Pesaran (2004) because T (time dimension)=13 is lower than N (cross-sectional dimension)=23 in the dataset and suggests the following test statistic exhibiting an asymptotically normal distribution (H_0 : there is cross-sectional independency):

$$LM\ CD = \sqrt{\frac{1}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^N (2\rho_{ij}^2 - 1) \right) \quad (1)$$

We tested cross-sectional independency among the series with LM CD test of Pesaran (2004) and the results were introduced in Table 2. The null hypothesis, there is cross-sectional independence, was rejected at 1% significance level, because p value was found to be 0.0003. So we revealed a cross-section dependence among the series. Furthermore, we analyzed homogeneity with delta tilde test and adjusted delta tilde test of Pesaran and Yamagata (2008) and our findings revealed that null hypothesis, there is homogeneity, was rejected and the coefficients were found to be heterogenous.

Table 2. Results of cross-sectional dependence and homogeneity tests

| Cross-sectional dependency tests | | |
|---|------------------|----------------|
| Test | Statistic | p-value |
| LM (Breusch and Pagan (1980)) | 302.5 | 0.0178 |
| LM adj* (Pesaran et al. (2008)) | 0.5611 | 0.5748 |
| LM CD* (Pesaran (2004)) | 3.597 | 0.0003 |
| Homogeneity tests | | |
| Test | Statistic | p-value |
| Delta_tilde | 3.396 | 0.000 |
| Delta_tilde_adj | 4.236 | 0.000 |

*two-sided test

Source: own calculations in STATA v. 14.

4.3. Panel unit root test

We analyzed integration levels of the variables by CIPS (Cross-sectionally augmented IPS) (Im- Pesaran-Shin, 2003) unit root test of Pesaran (2007), because we revealed a cross-sectional dependency among the series. The test exhibits an asymptotically normal distribution and is calculated as follows:

$$CIPS = N^{-1} \sum_{i=1}^N CADF_i \quad (2)$$

We conducted CIPS test and the results were given in Table 3. The findings indicated that fdi, coc and rol were I(1).

Table 3. CIPS unit root test results

| Variables | Constant | Constant + Trend |
|------------------|-----------------|-------------------------|
| fdi | -0.652 (0.257) | -0.515 (0.303) |
| d(fdi) | -6.827 (0.000)* | -4.803 (0.000)* |
| coc | 1.270 (0.898) | 0.253 (0.600) |
| d(coc) | -3.728 (0.000)* | -2.257 (0.012)** |
| rol | 3.356 (1.000) | 1.683 (0.954) |
| d(rol) | -5.199 (0.000)* | -2.579 (0.005)* |

*, ** respectively significance at 1% and 5% level

Source: own calculations in STATA v. 14.

4.4. Westerlund-Durbin-Hausman (2008) cointegration test

We employed Westerlund-Durbin-Hausman (2008) cointegration test to investigate the cointegrating relationship among the series with different integration levels as long as dependent variable is not I(0) and also test regards heterogeneity and cross-sectional dependency. The test calculates two statistics called as Durbin-Hausman group statistic based on panel heterogeneity and Durbin-Hausman panel statistic based on panel homogeneity. We analyzed the cointegrating relationship among the variables by Westerlund-Durbin-Hausman (2008) cointegration test regarding heterogeneity and cross-sectional dependence and our findings were given in Table 4. We regarded group statistic, because our panel was heterogeneous and it indicated that the null hypothesis (H_0 : there is not any cointegration for all variables) was rejected and there was cointegration for some units.

Table 4 – Results of Westerlund-Durbin-Hausman (2008) cointegration test

| | Statistic | p-value |
|--------------------------------|-----------|---------|
| Durbin-Hausman Group Statistic | 1.078 | 0.004 |
| Durbin-Hausman Panel Statistic | 2.493 | 0.006 |

Source: own calculations in Gauss v. 11.

4.5 Long run cointegrating coefficients

We estimated long run cointegrating coefficient by AMG estimator which regards heterogeneity and cross-sectional dependency and the results were presented in Table 5. The results indicated that both control of corruption and rule of law had no significant impact on FDI inflows in overall panel. However, individual cointegrating coefficients indicated that control of corruption had positive impact on FDI inflows in Philippines and Qatar, while control of corruption had negative impact on FDI inflows in Indonesia and Poland. On the other hand rule of law had positive impact on FDI inflows in Brazil, Chile and Indonesia, while rule of law had negative impact on FDI inflows in Greece and Qatar.

Table 5: Results of long run cointegrating coefficients estimation

| Country | COC | | ROL | |
|----------------------|-------------|----------|-------------|--------------|
| | Coefficient | P value | Coefficient | P value |
| Brazil | 0.3304266 | 0.896 | 6.023693 | 0.002*** |
| Chile | -6.223355 | 0.319 | 34.9968 | 0.000*** |
| China | -2.713021 | 0.475 | -2.08093 | 0.694 |
| Colombia | -4.026392 | 0.359 | -0.6990449 | 0.830 |
| Czech Republic | 8.315086 | 0.458 | -4.567332 | 0.593 |
| Egypt | -9.030506 | 0.135 | 4.000646 | 0.159 |
| Greece | 2.687588 | 0.249 | -6.173745 | 0.069* |
| Hungary | -30.29081 | 0.586 | 73.49066 | 0.244 |
| India | 0.8719697 | 0.913 | -7.122544 | 0.263 |
| Indonesia | -7.992687 | 0.034** | 11.42704 | 0.005*** |
| Korea | 2.234415 | 0.668 | -0.8769095 | 0.887 |
| Malaysia | 0.9213396 | 0.810 | 8.055032 | 0.436 |
| Mexico | -1.375251 | 0.611 | 6.05651 | 0.106 |
| Peru | -1.4959 | 0.685 | 6.669247 | 0.215 |
| Philippines | 4.917141 | 0.091* | -0.3448438 | 0.939 |
| Poland | -14.43515 | 0.070* | 9.932988 | 0.196 |
| Qatar | 10.30169 | 0.000*** | -17.20858 | 0.000*** |
| Russia | -1.050262 | 0.653 | 4.862663 | 0.171 |
| South Africa | -1.997897 | 0.170 | -7.139258 | 0.274 |
| Taiwan | 0.3891324 | 0.907 | 3.154189 | 0.357 |
| Thailand | 5.318322 | 0.229 | 1.066509 | 0.663 |
| Turkey | 0.3092084 | 0.790 | 1.615465 | 0.722 |
| United Arab Emirates | -1.453999 | 0.811 | -2.136438 | 0.736 |
| Panel | -1.977779 | 0.250 | 5.347905 | 0.760 |

***, ** and * respectively denotes that they are significant at 1%, 5% and 10%

Source: own calculations in STATA v. 14.

V. CONCLUSION

FDI inflows have become an important external financing source for emerging market economies and developing countries. Therefore, emerging market economies and developing countries have made many structural reforms to attract more FDI inflows and in turn implement economic development considering possible positive effects of FDI inflows on their economy. Corruption and rule of law have been revealed as the main determinants of FDI inflows in host country from the theoretical and empirical studies. In this study, we examined the interaction among corruption, rule of law and FDI inflows in emerging market economies during 2002-2014 period by employing Westerlund-Durbin-Hausman (2008) cointegration test. The results suggested that there was long run relationship among the variables, but both control of corruption and rule of law had no statistically significant impact on FDI inflows in overall panel. However, individual cointegrating coefficients indicated that control of corruption had positive impact on FDI inflows in Philippines and Qatar, while control of corruption had negative impact on FDI inflows in Indonesia and Poland. On the other hand rule of law had positive impact on FDI inflows in Brazil, Chile and Indonesia, while rule of law had negative impact on FDI inflows in Greece and Qatar.

Our findings were found to be consistent with the findings of Bellos and Subasat (2011), Mudambi et al. (2013) and Helmy (2013), but inconsistent with the findings of most of the studies in the literature. We evaluated that this can be resulted from the country specific properties and also the impact of corruption and rule of law on FDI inflows can be varied depending on the types of FDI inflows (vertical and horizontal). Therefore, future studies can be conducted to see the impact of corruption and rule of law on vertical and horizontal FDI inflows.

VI. REFERENCES

1. Alemu, A.M. (2012) *Effects of Corruption on FDI Inflow in Asian Economies*, Seoul Journal of Economics, vol. 25, no. 4:387-412.
2. Al-Sadiq A. (2009) *The Effects of Corruption on FDI Inflows*, Cato Journal, vol. 29, no.2:267-294.
3. Bayar, Y., Ozel, H.A. (2014) *Determinants of Foreign Direct Investment Inflows in the Transition Economies of European Union*, International Journal of Research in Commerce, Economics & Management, vol. 4, no. 10:49-53.
4. Bellos, S., Subasat, T (2011) *Corruption and Foreign Direct Investment: A Panel Gravity Model Approach*, Bulletin of Economic Research, vol. 64, no.4:565-574.
5. Breusch, T. S., Pagan, A.R. (1980) *The Lagrange Multiplier Test and Its Applications to Model Specification Tests in Econometrics*, Review of Economic Studies, vol 47, no. 1:239-253.
6. Brada, J.C., Drabek, Z., Perez, M.F. (2012) *The Effect of Home-country and Host-country Corruption on Foreign Direct Investment*, Review of Development Economics, vol.16, no. 4:640-663.
7. Buchanan B. G., Le Q. V., Rishi M. (2012) *Foreign Direct Investment and Institutional Quality: Some Empirical Evidence*, International Review of Financial Analysis, vol. 21, 81-89.
8. Castro, C., Nunes, P. (2013) *Does Corruption Inhibit Foreign Direct Investment?* Politica/Revista de Ciencia Politica, vol. 51, no. 1:61-83.
9. Im, K.S., Pesaran, M.H. Shin, Y. (2003) *Testing for Unit Roots in Heterogeneous Panels*. Journal of Economics, vol.115, 53-74.
10. Eberhardt, M., Bond, S. (2009) *Cross-Section Dependence in Nonstationary Panel Models: A Novel Estimator*, <https://mpra.ub.uni-muenchen.de/17870/>, accessed February 26, 2016.
11. Eberhardt, M., Teali F. (2010) *Productivity Analysis in Global Manufacturing Production*, University of Oxford Department of Economics Discussion Paper Series Number 515, <http://www.economics.ox.ac.uk/materials/papers/4729/paper515.pdf>, accessed February, 26 2016.
12. Eberhardt, M., Teali F. (2011) *Econometrics for Grumblers: A New Look at the Literature on Cross-country Growth Empirics*, Journal of Economic Surveys, 25, 109-155.
13. Helmy, H.E. (2013) *The Impact of Corruption on FDI: Is MENA an Exception?*, International Review of Applied Economics, vol. 27, no. 4:491-514.
14. Kaufmann, D., Kraay, A., Mastruzzi, M. (2010) *The Worldwide Governance Indicators: Methodology And Analytical Issues*, Policy Research Working Paper Series 5430, The World Bank.
15. Kersan-Škabić, I. (2013) *Institutional Development as a Determinant of FDI Attractiveness in Southeast Europe*, Društvena Istrazivanja, vol. 22, no. 2:215-235.
16. Lucke, N., Eichler, S. (2016) *Foreign Direct Investment: The Role of Institutional and Cultural Determinants*, Applied Economics, vol. 48, no. 11:935-956.
17. MSCI (2015) *MSCI Emerging Markets Index-Emerging Markets*, <https://www.msci.com/emerging-markets>, accessed December 02, 2015.
18. Mudambi, R., Navarra, P., Delios, A. (2013) *Government Regulation, Corruption and FDI*, Asia Pacific Journal of Management, vol.30, 487-511.
19. Nilsson-Hakkala, K., Norback, P.J., Svaleryd, H. (2008) *Asymmetric Effects of Corruption on FDI: Evidence from Swedish Multinational Firms*, Review of Economics and Statistics, vol. 90, no. 4: 627-642.
20. Pesaran, M. H. (2004) *General Diagnostic Tests for Cross-section Dependence in Panels*, CESifo Working Papers No.1233, 255-260.
21. Pesaran, M. H. (2007) *A Simple Panel Unit Root Test in the Presence of Cross-section Dependence*, Journal of Applied Econometrics, vol. 22, no.2:265-312
22. Pesaran, M. H., Yamagata, T. (2008) *Testing Slope Homogeneity in Large Panels*, Journal of Econometrics, vol. 142, no. 1:50-93
23. Pesaran, M.H., Ullah, A., Yamagata, T. (2008) *A Bias-adjusted LM Test of Error Cross-section Independence*, Econometrics Journal, vol. 11, 105-127.

24. Pupovic, E. (2012) *Corruption's Effect on Foreign Direct Investment: The Case of Montenegro*, Economic Review-Journal of Economics and Business, vol.10, no. 2:13-28.
25. Quazi R. M. (2014) *Corruption and Foreign Direct Investment in East Asia and South Asia: An Econometric Study*, International Journal of Economics and Financial Issues, vol.4, no. 2:231-242.
26. Saidi Y., Ochi A. and Ghadri H. (2013) *Governance and FDI Attractiveness: Some Evidence from Developing and Developed Countries*, Global Journal of Management and Business Research Finance, vol. 13, no. 6:s14-24.
27. Samimi, A.J., Monfared, M. (2011) *Corruption and FDI in OIC Countries*, Information Management and Business Review, vol. 2, no. 3:106-111.
28. Subasat T. and Bellos S. (2013) *Governance and Foreign Direct Investment in Latin America: A Panel Gravity Model Approach*, Latin American Journal of Economics, vol. 50, no. 1:107–131.
29. UNCTAD (2015a) *World Investment Report 2015: Reforming International Investment Governance*, Geneva: United Nations.
30. UNCTAD (2015b) *Foreign Direct Investment*, <http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx>, accessed December 05, 2015.
31. Westerlund, J. (2008) *Panel Cointegration Tests of the Fisher Effect*, Journal of Applied Econometrics, vol. 23, no.2:193-223.
32. Woo, J.Y. (2010) *The Impact of Corruption on a Country's FDI Attractiveness: A Panel Data Analysis, 1984-2004*, Journal of International and Area Studies, vol. 17, no. 2:71-91.
33. World Bank (2015a) *Foreign Direct Investment, Net Inflows (% of GDP)*, <http://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS>, accessed December 05, 2015.
34. World Bank (2015b) *Worldwide Governance Indicators*, <http://data.worldbank.org/data-catalog/worldwide-governance-indicators>, accessed December 05, 2015.