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Institutions, Foreign Direct Investment, and Domestic Investment: Crowding Out or Crowding In?

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Summary. — Studies of the relationship between FDI and domestic investment reach contradictory findings. We argue that some of the conflicting evidence may be explained by the use of poor proxies for the theoretical concepts and questionable methodological choices. We review the paper of Morrissey and Udomkerdmonkol published in this journal in 2012. Improvements in the construction of the proxies and refinements in the estimation methodology reverse the finding of Morrissey and Udomkerdmonkol that FDI inflows crowd out domestic investment. Furthermore, there is no strong evidence that "good governance" actually encourages domestic investment.

Key words — investment, FDI, governance, technology spillovers, rent seeking, developing countries

1. INTRODUCTION

The effect of foreign direct investment (FDI) on growth and development in relatively poor countries through the transfer of know-how, the accrual of investment funds, and even the improvement of labor standards, is often seen as one of the potential benefits of globalization. According to Kosovà (2010, p. 861), "since the mid-1990s, FDI has become the main source of external finance for developing countries and is more than twice as large as official development aid." In order to build domestic capacity, some countries have adopted special policies targeting foreign investors, including investment treaties, preferential taxation schemes, and preferential loans. Examples are Singapore (Wong, 2003) and more recently China.

Nevertheless, the role of FDI is not uncontroversial. FDI implies control of foreign firms over the domestic productive capacity, including technological knowledge. For some of the dynamic Asian economies that were growing rapidly in the second half of the 20th century, this was a reason to limit inward FDI, and instead focus on other channels for technology transfer (e.g., licensing or "arms-length" relationships with foreign firms). This seems to have been the case for Japan (Goto & Odagiri, 2003), Korea (Kim, 1997, 2003) and Taiwan (Aw, 2003).

The academic debate does not show more consensus on the benefits of FDI than the actual policy choices. Here, two issues are central to the debate: whether or not FDI has positive productivity spillovers (through transfer of know-how) on domestic firms, and which effect FDI has on (private) domestic investment. [1] With regard to the latter, two opposite outcomes are possible: either "crowding in," which means that FDI will lead to more investment from (private) domestic sources, or "crowding out," which is the opposite, i.e., FDI leads to less domestic (private) investment. Crowding in is generally seen as beneficial for economic growth, but the effect of crowding out on economic growth is ambiguous. On this dichotomy of crowding in or crowding out, it is sometimes argued that market entry of foreign-owned firms pushes less efficient domestically owned firms out of the market, which may be beneficial for productivity, but implies a negative (short-term) effect on investment and productive capacity. Furthermore, if foreign firms acquire dominance, markets become less efficient, with a potentially negative effect on growth and investment. Crowding out is more likely to occur in markets with limited investment opportunity such as markets where competition is dependent on firm-specific assets, i.e. medium-tech and high-tech industries (Amsden, 2011). Moreover, crowding out is more likely when domestic firms have limited absorptive capacity and foreign firms are relatively more productive, thanks to better know-how, experience, innovation capacity, monitoring skills, or access to finance or skilled labor.

An important recent contribution to the literature is the work of Morrissey and Udomkerdmongkol (2012), in this journal, henceforth M&U. The authors construct a panel of 46 developing countries over the period 1996–2009, providing information both on different types of investments and on different aspects of public governance. They implement an advanced system generalized method of moments (GMM) method for dynamic panels (Blundell & Bond, 1998) to estimate an equation for domestic private investment. The explanatory variables include FDI, a number of governance variables, and an interaction term between governance and FDI. M&U find negative marginal effects of FDI on domestic private investment, which are about twice stronger in countries scoring better than average on the governance indicators. This leads them to conclude that FDI crowds out domestic private investment, and that it does so in a stronger way in countries with "good governance." In the empirical work looking at the effect of FDI on domestic investment, the acknowledgment of the mediating effect of governance turns out to be a major step forward.

Along with M&U, Mutenyo, Asmah, and Kalio (2010) and Titarenko (2005) similarly find that increases in FDI crowd out domestic investment. Other scholars find that FDI

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stimulates (or crowds in) private domestic investment (Al-Sadig, 2013; Borensztein, De Gregorio, & Lee, 1998; Bosworth & Collins, 1999; de Mello, 1999; Ndikumana & Verick, 2008; Ramirez, 2011; Tang, Selvanathan, & Selvanathan, 2008). Several scholars find mixed evidence when using several lags for FDI or when splitting the country sample according to geographic region (Adams, 2009; Agosin & Machado, 2005; Agosin & Mayer, 2000; Apergis, Katrakilidis, & Tabakis, 2006; Misun & Tomsik, 2002), or find no effect of FDI on domestic investment (Lipsey, 2000).

This study interrogates the data compiled and made available by M&U to find out which of the effects that are hypothesized in the literature dominates. In formulating our regressions models, we will ask critical questions about the variable definition for domestic private investment, and experiment with an alternative definition to investigate whether the results in the literature are robust to such definitional change. Additionally, we question the details of the implementation of system GMM and experiment with adjustments of the method, again with the aim to test the robustness of the results found in the literature.

Our results suggest that the accuracy of the results of M&U is severely compromised by the empirical difficulty of disentangling foreign capital formation from domestic capital formation, and by methodological problems related to the implementation of the GMM method. Using an alternative variable and adjusted estimation methods, we find no robust evidence that FDI crowds out private investment. Instead, we are led to the conclusion that foreign investment has a positive effect on investment.

2. MACROECONOMIC EVIDENCE ON CROWDING IN AND CROWDING OUT

The empirical analysis of M&U is based on the following regression equation (that is inspired by the work of Agosin & Machado, 2005), for country i in year t:

$$DPI_{i,t} = \beta_0 + \beta_1 DPI_{i,t-1} + \beta_2 FDI_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 PUBLIC_{i,t} + \beta_5 WGI_{i,t} + \beta_6 WGI_{i,t} \times FDI_{i,t} + \epsilon_{i,t}$$

Here, *DPI* is domestic private investment as a fraction of GDP, *FDI* is FDI as a percentage of GDP, *PUBLIC* is public investment as a percentage of GDP, *GROWTH* is past GDP growth, and *WGI* is one of several indicators on governance and institutions. The βs are parameters (to be estimated), and ϵ is a disturbance term with the usual characteristics. Our interest is in the β_2 parameter (at zero WGI, positive for crowding in and negative for crowding out), the β_5 parameter (expected to be positive at zero FDI, indicating a relation between investment and "good governance"), and the β_6 parameter (which may be either negative or positive, depending on the nature of the mediating effect). We use the dataset that was constructed by M&U, and which was kindly provided to us by the authors.

Below, we first discuss some estimation issues raised by the above equation, and related approaches found in the literature. We then discuss some issues related to the data, including definitional issues that lead us to propose an alternative proxy for the dependent variable. Finally, we present the empirical estimations with alternative specifications.

(a) *Methodology*

The dataset constructed by M&U, and used again here, consists of a balanced 12-year panel of 46 countries, which is a relatively small number of countries for GMM.[2] The proper justification of the GMM method in this context is based on asymptotic properties in large cross-sections. In this respect, 46 countries is a relatively small sample (constrained mainly by the limited availability of public investment data). In addition, M&U use *system* GMM, which requires additional moment conditions as compared to the more standard difference GMM (see Blundell & Bond, 1998). M&U (2012, p. 441) mention that "system GMM can exhibit the problem of too many instruments if the number of instruments is greater than the number of cross-section observations." Indeed, the dangers of instrument proliferation are discussed in Roodman (2009a), leading to the rule of thumb that the number of instruments used in GMM estimation should remain below the cross-sectional sample size (in our case 46).

M&U do not report the exact number of instruments used in their analysis. Other authors in the field similarly fail to report the full GMM results. For example, Agosin and Machado (2005) apply one-step difference GMM analysis (with a robust estimator of the covariance matrix) to a panel of 12 countries over the years 1971–2000, and also do not report the number of instruments.[3]

We replicate the M&U estimations, using two-step system GMM (see Roodman, 2009b). The variables *FDI*, *GROWTH*, and *PUBLIC* are treated as endogenous, only the second lags are used as instruments in the transformed equation and only the first differences are used as instruments in the levels equation. To replicate the M&U estimations, the *WGI*s and the interaction terms are assumed strictly exogenous and therefore serve as standard instruments, in spite of this assumption being at odds with the endogenous nature of FDI. Although M&U limit the number of lags used for the instrumental variables to two, the instrument count remains high. In particular, in our replication of the M&U estimations, the instrument count runs up to around 90, far exceeding the number of countries (46). This count raises doubts about the authors' statement that "the number of instruments is fewer than the cross-section dimension so the excess instruments problem does not apply" (M&U, 2012, p. 441). Moreover, the Hansen test statistics reported by the authors and those documented on the basis of our replication exercise below have a p-value of 1, which indicates that the results suffer from instrument proliferation which M&U do not recognize. Numerous instruments can cause over-fitting of the instrumented variables, biasing the coefficient "estimates towards those from non-instrumenting estimators" (Roodman, 2009a, p. 139).

A next methodological issue lies in the fact that the two-step system GMM estimator uses a weighting matrix that is more asymptotically efficient than the one-step estimator but produces coefficient standard errors that "tend to be severely downward biased when the instrument count is high" (Roodman, 2009a, p. 141). Windmeijer (2005) proposes a correction for this problem but, as far as we can see, the Windmeijer correction was not applied by M&U. Finally, as described by Roodman (2009a, p. 128), "the autocorrelation test and the robust estimates of the coefficient standard errors assume no correlation across individuals in the idiosyncratic disturbances." By including time dummies in the estimation, this assumption can be made more plausible. Yet M&U omit time dummies in their estimations. As a result, however precisely the conclusions of M&U are formulated, we fear that these are drawn on the basis of biased results.

In order to overcome these methodological problems, we propose several modifications to the system GMM specification. First, in order to avoid contemporaneous correlation, time dummies are included removing time-related shocks from