

Human Capital, Gender Education and Foreign Direct Investment

Constantina Kottaridi[♦] - Konstantinos Nikolopoulos[•] - George Pantelopoulos[⊗]

The objective of this proposal is to explore, and empirically investigate a more accurate and detailed picture of the relationship between FDI and human capital that can make up a foundation for policy and strategy implications for host country governments and MNCs. The research should document differences in human capital in various host countries of FDI, the role of the host country's human capital resources as a determinant of FDI and MNC operations.

To capture this complex interaction between FDI and human capital, it is necessary to formulate a research agenda that documents differences in human capital in various host countries of FDI, the role of the host country's human capital resources as a determinant of FDI and MNC operations.

Although the theoretical literature on FDI presumes human capital to be among the key ingredients of inward FDI (Dunning, 1988; Lucas, 1990; and Zhang and Markusen, 1999), there are only few cross-country analyses to identify some forms of human capital that act as robust driving forces for foreign investors.

Root and Ahmed show that among the 58 developing countries, none of their proxies for human capital, i.e., literacy, school enrolment, and the availability of technical and professional workers, are statistically significant determinants of inward FDI. Schneider and Frey, using data for 54 developing countries, find that the share of an age group with secondary education is a less significant determinant as compared with other economic and political influences. Hanson, using a sample of 105 developing countries, shows that the adult literacy rate was not an important determinant of FDI as compared with other socio-political variables. Finally, Narula demonstrates that the number of tertiary education per population was not a statistically significant explanatory variable for FDI inflows among the 22 developing countries. Thus, all four cross-country studies show that human capital is not necessarily an important input for inward FDI. This conclusion is consistent with the fact that

[♦] University of Peloponnese, Department of Economics, End of Karaiskaki Street, 22100 Tripolis, e-mail: kottarid@uop.gr

[•] University of Peloponnese, Department of Economics, End of Karaiskaki Street, 22100 Tripolis, e-mail:gnikol@uop.gr

[⊗] Corresponding Author – University of Peloponnese, Department of Economics, End of Karaiskaki Street, 22100 Tripolis, e-mail:

the period of the 1960s to 1970s for which the above studies have been carried out, was when FDI in the developing countries was concentrated on market and resource seeking and/or lower-end manufacturing types and those cheap labour and/or abundant natural resources were more important (Deyo, 1989; Ritchie, 2002; and Dunning, 2002). Thus, demand for higher-educated labour appears to be less crucial during this period.

More recent studies include Noorbakhsh et al. (2001), UNCTAD (2002a), and Nunnenkamp and Spatz (2002). Using a dataset that covers the 1980s to mid-1990s, Noorbakhsh et al. find that both the stock and flow measures of the human capital variable show statistically significant and positive effects on FDI inflows, and that the effects became more significant over time. The major difference in the results compared with the first group of studies, apart from the econometric precision, should come from the fact that they used a more recent dataset that contains relatively more high value-added manufacturing firms. Indeed most MNEs operating in developing countries during the late 1980s and 1990s tend to be efficiency-seeking types and/or subcontracting (Dunning, 2002; Nunnenkamp and Spatz, 2002) and high skilled labour force is expected to be crucial. UNCTAD also finds a high correlation between human capital proxies — tertiary gross enrolment ratio and science and engineering student ratio — and FDI inflows¹³ among 140 developed and developing countries (UNCTAD, 2002a). Nunnenkamp and Spatz uses Barro and Lee's (2000) average years of education of total population aged 15 and above in the 28 developing countries and finds that education becomes an increasingly important determinant from the mid-1980s to the late 1990s.

Thus, cross-country evidence indicates that human capital is an important determinant for inward FDI especially among efficiency-seeking MNEs, while not being an important determinant among market or resource-seeking MNEs. This is consistent with evidence that none of the Southeast Asian countries had institutions for industrial upgrading with skills development before the influx of FDI, at least in the low-end manufacturing sector (Deyo, 1989; Ritchie, 2002).

Although supported by limited evidence, education at the secondary school level appears to be the minimal level of education that is necessary for attracting relatively high value-added, efficiency seeking FDI. The evidence, however, does not inform us which type of human capital, be it level or types of education or firm-based training experience, is most effective in facilitating inward FDI. Most cross-section studies use secondary or tertiary level of schooling as a proxy of human capital. None of the studies compare different levels or types

of human capital to identify the most effective level/type of human capital.

While cross-country analyses provide a general idea of the importance of human capital on inward FDI, inconsistencies in the definitions of each explanatory variable are likely to plague their results. In this sense, country-specific studies are likely to reduce this bias. Unfortunately, there are equally less country-specific studies that delve into the role of human capital. Broadman and Sun (1997), and Coughlin and Segev (2000) provide evidence for China in the early 1990s, where they show that adult literacy is one of the key determinants for geographic determinants of FDI. Mody et al. (1998), identify the determinants of Japanese MNEs' expected investment in Asia. A variable representing labour quality shows strong impact on expected investment for China, India, Indonesia, Malaysia, Philippines, Thailand and Vietnam. While a limited amount of evidence exists for other Asian countries, to the author's best knowledge, none exists for the Latin American and African regions. Thus, the experience in limited country case studies is consistent with the importance of human capital on inward FDI, while giving no clear picture of the minimal level of human capital that is essential nor the level/type of human capital that is most effective.

More recently, a number of international organisations and bilateral donors have initiated surveys related to FDI and the host-country investment climate. They include the *World Business Environment Survey* by the World Bank in the year 2000, *Foreign Direct Investment Survey* by the Multilateral Investment Guarantee Agency in 2001, and *JBIC FY2001 Survey* by the Japan Bank of International Cooperation (JBIC, 2002). The attractiveness of these surveys is the wide coverage of countries in developing countries, the relatively large sample size, and the recentness of survey years. The latter two surveys contain direct questions regarding the firm's motive of location selection. Although detailed analyses on location determinants have not yet been undertaken, preliminary analyses using these surveys show that the quality of human resources is an important criteria for MNEs investment decisions. The *Foreign Direct Investment Survey* shows "ability to hire technical/managerial staff, and skilled labourers" to be among the critical factors of location choice. *JBIC FY2001 Survey* show that many Japanese MNEs considered "availability of superior plant workers and managerial personnel" to be an important factor for future investment choice of production bases.

Summarizing, the literature on human capital and FDI indicates that human capital is an important determinant of FDI, especially among efficiency-seeking FDI that requires a skilled workforce as one of its key inputs. Although higher human capital does not appear to affect

inflows of resource/market seeking FDI directly, it can indirectly affect FDI by improving civil liberties, health and crime rates. Basic schooling (until lower-secondary school level) appears to be the minimal level of schooling required for FDIs after the mid-1980s. Given that the tendency of FDI in recent years is towards relatively skill-intensive production and services, and less towards primary and resource-based manufacturing, basic schooling should be the absolute minimum level of education the developing countries must provide.

Thus, so far there is no study to explore in depth whether alternative types of human capital exert different effects on FDI attraction of various countries. Hence, future cross-country growth studies should attempt to model these nonlinearities.

This paper attempts to fill this gap by assessing the role of various types of human capital as well as gender disparity with respect to host countries' attractiveness for FDI. At the same time education related policies are going to be explored in order to check whether policies by themselves could make a difference for countries' competition for foreign investors. The focus will be on the effects of the above on FDI flows to developed countries, in particular OECD countries and EU 27. The aim is to be able to discern specific patterns for these two broadly defined regions and place particular emphasis on EU policies compared with OECD. At the same time, EU27 will be decomposed into EU15 as opposed to the remaining lately accessed countries of Central and Eastern Europe (apart from Cyprus and Malta). Also, a sub group of the EU-6 countries, the main core countries of the EU will be investigated in order to test for particular effects.

We employ a fairly standard set of controls, including total host country population and real GDP growth for market-seeking FDI (labeled population and growth, respectively), host country inflation (inflation), host country openness to trade (openness), GDP per capita of host country.

Our analysis covers the period 1970–2010. UNCTAD's Data Extract Service provides FDI data since 1970.

The fixed-effects (FE) least squares also known as least squares dummy variables (LSDV) specification is incorporated, appropriate for inferences conditional on a specific set of N countries. In order to take into account problems arising from heteroscedastic residuals, common phenomenon when dealing with macroeconomic variables, the robust standard errors technique is used to obtain corrected estimates. Also, more advanced techniques as the Generalized Method of Moments (GMM) is

incorporated to account for possible endogeneity effects. This allows for the inference of more robust results. For robustness, we also use alternative data sets.

Multicollinearity diagnostics are also calculated to check for possible multicollinearity problems, using the variance-inflation factor (VIF) and the condition number (CN) (Greene, 2000).

Turning now to potential problems in making inferences from non-stationary data, Phillips and Moon (1999) prove the consistency of estimates obtained in panel data estimations, thus avoiding the problem of spurious regression, since the cross-section dimension absorbs any non-stationarity arising from the time-series dimension.