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Does capital mobility promote economic growth? The link to education

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Does capital mobility promote economic growth? The link to education

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We provide a brief account of the ongoing debate on the relationship between international capital flows and economic growth. In particular, we argue that the current debate may be enriched by looking more closely at the relationship between these key variables and educational choice and public education policy.

The sharp reduction of barriers to cross-border investments during the last few decades has led to a breathtaking increase in international capital flows. For instance, this development becomes evident in the sheer number of bilateral investment treaties, more than 2000 by 2005 [UNCTAD (2006)], that are designed to protect foreign investors against expropriation. Valued at current prices, foreign direct investment (FDI) inflows at the global level have risen from U.S.$59 billion in 1982 to U.S.$1,271 billion in 2000, although declining thereafter to U.S.$648 billion in 2004 [UNCTAD (2001, 2005)]. This corresponds to an increase in the FDI stock from U.S.$628 billion to U.S.$8,902 billion between 1982 and 2004 [UNCTAD (2005)].

International capital market integration raises at least three important questions: Firstly, who are the recipient countries of international capital? Secondly, what determines whether or not a country attracts foreign capital? And finally, what are the effects of international capital flows on the macroeconomic performance of both host and source countries?

Related to the first question, Nobel laureate Robert E. Lucas famously asked, less than two decades ago, 'Why doesn't capital flow from rich to poor countries?' [Lucas (1990)]. Since then, however, capital inflows to developing countries have

surged (including FDI, on which we should mostly focus here) – and they mainly came from developed countries. It is true that the U.S. is still – at least, until recently it was – the largest recipient of FDI (followed by the U.K.), with an inflow of over U.S.$95 billion in 2004 (about 15 percent of world FDI inflows), now hosting about one sixth of the world's FDI inward stock [UNCTAD (2005)]. But in 2004 developing countries received the considerable amount of U.S.$233 billion (36 percent of world FDI inflows). Between 1981-85, the annual average inflows into these countries was only U.S.$13 billion. For example, FDI inflows into China and Hong Kong combined amounted to almost U.S.$95 billion in 2004 [UNCTAD (2005)], which is roughly similar to the U.S. figure. And by 2005/06 China is said to have taken the leading position of being the largest recipient of FDI from the world economy.

On the second issue, the determinants of the direction of international capital flows, one may again refer to the analysis of Lucas (1990). Given that capital flows into a country when its marginal product of capital (or the return to capital, respectively) is relatively high, Lucas has pointed out that due to typically low levels of human capital and low productivity in poor countries, capital returns may be low in spite of the low capital stock[1]. Moreover, the costs of financing capital inputs in a host country also depend on possible business risks and legal barriers to investment (i.e., on various economic and political institutions).

Regarding the third question, an important ongoing debate is the impact of FDI flows on an economy's rate of GDP growth. The question is not as much about whether FDI inflows positively affect growth, since according to the standard neoclas-

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1   Note that a small capital stock ceteris paribus should imply a high marginal product of capital, such that all other things being equal capital should flow to poor countries.

sical growth model any increase in investment at some period (whether foreign or domestic) should raise subsequent growth via a larger capital stock, but whether they help improve productivity and/or the growth potential via spillover effects, such as from adoption of new technology or increased management know-how associated with FDI.

Empirical results on technology spillovers from financial integration are mixed. For the period 1980-2000, Edison et al. (2002) do not find a robust positive effect from various measures of the degree of international financial integration on per capita income growth[2]. Borensztein et al. (1998) examine the impact of FDI from industrial to developing countries on growth in host countries in a panel estimation (with two time periods, 1970-79 and 1980-89) and find that the contribution of FDI to growth is greater than that of domestic investment[3]. This is indirect evidence for a technological spillover. Interestingly, the paper suggests a positive interaction between FDI and human capital for growth and argues that technology spillovers occur only if human capital in a host country exceeds some minimal level. This lends support to the idea that human capital in the host country is needed to render it capable of absorbing knowledge embodied in FDI inflows. Moreover, human capital seems to be important for attracting foreign investment in the first place, as argued by Lucas (1990).

Focusing on FDI effects at the firm level within specific developing countries, the evidence on knowledge transfers is, at best, weak. For example, in a widely-recognized study, which employs plant-level data from Venezuela, Aitken and Harrison (1999) find that the net effect of FDI inflows on productivity is small, being negative for domestically owned plants. As

summarized by Rodrik (1999), 'today's policy literature is filled with extravagant claims about positive spillovers from FDI but the evidence is sobering.' Alfaro et al. (2004) argue in a cross-country study that the growth effect of FDI interacts with the degree of development of local financial markets. Their evidence suggests that domestic firms are unable to reap the benefits of knowledge spillovers triggered by FDI without being able to finance outlays for organizational changes required to raise productivity. Hu and Jefferson (2006) find that Chinese firms' own research and development (R&D) complements the technology transfer from both domestic and foreign firms, but foreign direct investment does not facilitate foreign technology spillovers.

There is convincing evidence, however, that FDI flows between developed countries can exert positive spillovers. For instance, Bernstein and Mohen (1998) show that a higher stock of R&D capital by Japanese firms in the U.S. raises productivity in Japan and lowers unskilled labor intensities there. However, there seems to be no significant spillover effect to the benefit of U.S. firms holding R&D capital in Japan. Also addressing spillovers from FDI inflows to the U.S., Roy and van den Berg (2006) provide time-series evidence on a bi-directional relationship between U.S. growth and FDI inflows. In another recent study, Branstetter (2006) attempts to identify technological spillovers from FDI more directly. He exploits data on citations of patents held by U.S. firms which are made by Japanese firms when applying for a patent in the U.S. By regressing the (log of) number of patent citations of Japanese firms on their FDI stock in the U.S., he finds considerable evidence that Japanese firms which hold FDI capital in the U.S. indeed cite U.S. patents more frequently.

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2 Focusing on FDI plus portfolio investment inflows over GDP as measure of financial integration, Schularick and Steger (2006) reproduce this result for a similar time period. Interestingly, however, they find a positive impact for the globalization era before World War I.

3 Including also outward investment of developing countries, Khawar (2005) finds a similar result in a cross-section analysis for the period 1970-91.

Abstracting from the issue of spillover effects, recent studies on capital market integration have emphasized a further channel through which FDI flows may affect economic growth: human capital formation. The key assumption, which gives rise to a link between capital flows and education and therefore to human-capital driven growth, is the empirically well-supported capital-skill complementarity. To fix ideas, consider a three factor model of a perfectly competitive economy, where skilled labor (S), unskilled labor (L), and physical capital (K) enter an aggregate production function. That is, output Y is produced according to $Y = AF(K,S,L)$, where A is a total factor productivity parameter which captures the state of technology and F is a linearly homogeneous, increasing, and concave production function. Capital-skill complementarity may be defined to exist if the following two conditions are met: firstly, the marginal product of capital, AF_K, is increasing in skilled labor S (but not in L) and, secondly, the relative marginal product of skilled to unskilled labor, F_S/F_L, is increasing in K.

Building upon the assumption of capital-skill complementarity, Gradstein and Justman (1995) and Viaene and Zilcha (2002) investigate the incentives to increase public expenditures if a better skill supply leads to a capital inflow with positive effects on national income. In such a setting, locational competition for mobile capital gives rise to an over-provision of public education expenditures, calling for policy coordination. Egger et al. (2005) complement this literature by elaborating on the individual incentives to participate in non-compulsory, though publicly financed, higher education. In their analysis, they distinguish between the share of educated workers, determined by private incentives, and the quality of human capital, which depends on public education policy. The model predicts that capital market integration induces positive net capital inflows if human capital S is sufficiently abundant, if productivity A is sufficiently high, or if (institutional) impediments to investment are low. That is, the direction of capital flows depends on the economy's initial conditions (relative to the rest of the world) at the time capital markets open up. Due to capital-skill complementarity, as just defined,

for given public education expenditures, an increase in net capital inflow raises the incentives to acquire education by raising the relative marginal product of skilled labor, F_S/F_L. To the extent that a higher share of skilled labor promotes the growth rate of total factor productivity, A, this provides novel insights in how capital market integration can impact the growth rate of GDP per capita. Moreover, public education expenditures raise the share of skilled labor in an integrated economy primarily through attracting foreign capital investment. Finally, treating education expenditure as endogenous, the analysis suggests that, under optimal adjustment of public education policy, educational attainment typically rises after capital market integration unless unfavorable initial conditions induce large capital outflows after integration. These predictions are then tested by using data for the period 1960-2000 from 87 countries, focusing on FDI as a measure of international capital flows. Net capital flows are instrumented by a measure of international investment barriers, provided by the Business Environment Risk Intelligence. The empirical analysis largely confirms the main hypotheses derived by Egger et al. (2005): firstly, net capital inflows – whether or not they are treated as endogenous – significantly affect participation in higher schooling (using various measures thereof). Secondly, changes in investment barriers and public education spending are important determinants of net capital flows and through this channel affect the participation in higher education. Thirdly, capital flows significantly affect economic growth through their effect on higher education.

These promising results should motivate further research on the links between FDI and growth to education. While the literature has mainly focused on technological spillovers from gross FDI inflows so far, the impact of financial integration on education incentives and human capital-based growth depends on the size of net capital inflows and how governments use education policy in order to attract foreign capital. These insights may be used in future studies to reconcile the conflicting evidence on the relationship between capital mobility and growth.

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