Journal of International Money and Finance 37 (2013) 161–186

Contents lists available at SciVerse ScienceDirect

Journal of International Money and Finance

journal homepage: www.elsevier.com/locate/jimf

Financial globalization, convergence and growth: The role of foreign direct investment☆

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JEL classifications:
F21
F36
F43
O47

Keywords:
Foreign direct investment
Composition of foreign capital
Diffusion of technology
Catch-up
Convergence
Growth

A B S T R A C T

Using a panel dataset covering 139 countries over the 1970–2009 period, we empirically investigate the role of foreign direct investment on growth through diffusion of technology and innovation. Using an otherwise standard growth regression and regressions on productivity growth, we introduce a direct effect of foreign direct investment, which may be proxying for innovation, and an indirect effect, to capture the role of technological catch-up. We find that these two mechanisms have a positive effect on productivity growth and on GDP growth. These results are consistent with an open economy model, in which foreign direct investment affects growth through diffusion of technology and innovation.

1. Introduction

The ratio of international financial integration (the sum of the stocks of foreign assets and liabilities) over GDP gives an idea of the dramatic increase of financial globalization in the last decades. Following Lane and Milesi-Ferretti (2007), this ratio increased by a factor of 7, from 45% in 1970 to over 300% in

☆ We are grateful to Philippe Bacchetta, Henry Chappell, Jean Imbs, Rafael Lalive, Alexander Monge-Naranjo, Ricardo Reis, Frédéric Robert-Nicoud, Mark Wright, to seminar participants at Universidade do Minho, Université de Lausanne, Université de Cergy, Université de Genève and to participants at the 15th World Congress of the International Economic Association, and at the 2008 LACEA meeting, for very helpful comments. Delfim Gomes Neto thanks the Spanish Ministry of Education and FEDER for financial support (grant SEJ2005-03753/ECO). Francisco Veiga thanks the financial support of the Portuguese Foundation for Science and Technology (FCT) under research grant PTDC/EGE-ECO/112169/2009 (partially funded by FEDER). Luísa Benta and Susana Martins provided excellent research assistance.

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http://dx.doi.org/10.1016/j.jimonfin.2013.04.005

2004. The theory suggests that financial globalization would lead to a better allocation of resources, implying an increase of growth, with capital going from industrial to developing countries. But there is no conclusive and robust empirical evidence of a positive effect of financial globalization on growth, as stated by Kose et al. (2009a,b) after surveying this literature.

In this paper, we empirically investigate the role of foreign direct investment on growth through diffusion of technology and innovation. Using standard GDP growth regressions and regressions on productivity growth, we introduce a direct effect of foreign direct investment, which may be proxying for innovation, and an indirect effect of FDI that works by accelerating technological catch-up. Specifically, in these regressions there is an interaction of foreign direct investment with the extent of the country's current technological gap. We find that FDI has a positive effect on productivity growth and on GDP growth through these mechanisms.

To motivate and guide the empirical analysis, we present in Section 3 a small open economy model, based on Barro et al. (1995), where only a portion of the capital serves as collateral in international markets. We introduce productivity growth in this model as an endogenous variable, assuming an effect of foreign direct investment on diffusion of technology and innovation and, thus, also on GDP growth. The diffusion of technology depends on the lag of technology relative to the world frontier, following the idea of Nelson and Phelps (1966), and also on foreign direct investment. On the one hand, the more backward a country is, the greater the room it has to absorb technology and, thus, the higher its growth rate of technology will be. On the other hand, the higher foreign direct investment is, the higher will be the capacity to close a given technological gap. This assumption on foreign direct investment is also adopted by Findlay (1978) and has received empirical support at the micro level. In the next Section we will discuss the related literature.

The stock of foreign direct investment is related to the control of factors of production and management by the firm.[1] Countries relying relatively more on foreign direct investment may have higher diffusion of technology. Moreover, FDI may stimulate research in the country and thus improve on its innovation rate. Other forms of foreign capital, such as external debt, do not have these characteristics, or at best have a tenuous direct effect on transfer of technology, when compared with FDI.

We use two measures of foreign direct investment. First, the most common in macro growth regressions, the stock of foreign direct investment over GDP. Second, the stock of FDI over total foreign capital, our preferred measure. Both measures of FDI are obtained from the 2009 update of Lane and Milesi-Ferretti (2007). The second measure is related to the first one in a small open economy model, as the international interest rate is equal to the marginal product of physical capital. Using a Cobb–Douglas production function, there is a linear relationship between total physical capital and GDP and, thus, between FDI over GDP and FDI over total physical capital. Taking other factors as given, total capital is equal among economies and it differs only in the composition of foreign capital.

The empirical implications of our open-economy growth model are tested using system-generalized method of moments (system-GMM) estimations on a dataset comprising eight consecutive and non-overlapping 5-year periods from 1970 to 2009, and 139 countries. After controlling for initial GDP per capita or initial technology level, investment, initial education,[2] population growth, and trade openness, we find that economies with relatively more foreign direct investment have higher catch-up and a higher direct effect on productivity growth and on GDP growth. Our results are robust to (1) restricting the sample to the period 1985–2009, over which financial globalization grew considerably; (2) restricting the sample to the developing countries, to non-OPEC members, or to countries dependent on natural resources related exports; (3) controlling for macroeconomic stability and institutions; (4) considering alternative explanations for catch-up, such as diffusion of technology through human capital, openness to international trade, and financial development; (5) using total factor productivity instead of GDP per capita as the dependent variable; and (6) to using FDI flows rather than stocks.

[1] Foreign direct investment gives the foreign investors a lasting interest (10% or more of the voting stock) in firms operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital.

[2] Investment and education (years of schooling) are used in the computation of TFP. Therefore, they are not included as controls in the estimations for productivity.