Policy shocks as a source of endogenous growth

Marta Bengoa, Blanca Sanchez-Robles

Departamento de Economia, Universidad de Cantabria, Spain

Received 28 February 2004; received in revised form 31 October 2004; accepted 28 December 2004
Available online 21 January 2005

Abstract

Economic policy may play a prominent role in favoring transitions from scenarios of no growth to others in which growth is positive. One example of this sort of behavior is the removal of restrictions to the entrance of Foreign Direct Investment (FDI) in developing countries. This paper designs and discusses a simple model in which a change in policy favors the entrance of FDI. Foreign investment, in turn, generates endogenous, non-zero growth in a previously stagnated economy, since FDI is one of the channels, whereby developing countries may access more advanced technology. Next, we present some empirical evidence obtained by exploiting a panel data from 18 Latin American countries over the period 1970–2000. Regressions of the growth rate of GDP per capita on FDI and a set of control variables seem to confirm the hypothesis that FDI promotes growth. The correlation is rather stable and robust to the use of several techniques, to the introduction of alternative control variables and to the consideration of different subsamples.

© 2005 Society for Policy Modeling. Published by Elsevier Inc. All rights reserved.

JEL classification: O 40

Keywords: Endogenous growth; Foreign direct investment; Economic transitions

1. Introduction

In the last few years, some researchers have devoted close attention to the mechanisms that may favor the transition of countries from situations of no growth to other scenarios
in which growth is possible. Authors have pointed out to various candidates in order to explain these transitions: human capital (Lucas, 1998; Tamura, 2002), the protection of property rights (Jones, 2001), and exogenous technological change (Hansen & Prescott, 2002), among others. Instead, the potential role of economic policy in these episodes has not been explored, to our knowledge, so carefully. However, it seems reasonable to argue that alternative economic policies may foster or discourage such changes in the performance of a country. Within the framework of the New Growth Theory, openness and technology play a crucial role in the process of growth. Hence, the study of policies that affect the degree of outward orientation of a particular nation and its access to flows of new ideas and technology looks as an especially promising avenue that may shed some light on the feasibility of the aforementioned transitions.

We can think of different types of policy packages that, in one way or another, might introduce relevant changes in the economic scenario and bring about positive growth. There is, however, a specific category that is especially relevant for developing countries (LDCs): those measures that influence the amount of Foreign Direct Investment (FDI) that comes into a country.

Indeed, FDI has been regarded, both on the theoretical and empirical sides, as one potential drive engine of growth for LDC. Some countries have the infrastructure and human capital necessary to innovate and produce new technology. Others, usually LDC, are unable to generate technological advances and must recur to imitation or to the adaptation of the technology produced elsewhere (Barro & Sala-i-Martin, 1997). FDI is one of the channels whereby technology may be diffused from advanced to laggard countries, allowing the latter to grow at higher rates (Borensztein, De Gregorio, & Lee, 1998).

In addition, FDI may also increase the level of efficiency—and thus the rate of growth in the host economy by means of different externalities. One of these externalities is the so-called learning by watching effect (Bhagwati, 1994), which enables local firms to increase their efficiency by learning from and interacting with foreign companies.

On the empirical grounds, recent contributions have detected a positive link between FDI and growth. De Gregorio (1992) finds a positive and significant impact of FDI on economic growth in a panel of 12 Latin American countries over the period 1950–1985. Blomström, Lipsey, and Zejan (1992) pursue a cross-country analysis of a sample of 78 developing countries. They report that the (positive) impact of FDI on growth is larger in those countries that exhibit higher levels of per capita income. Borensztein et al. (1998) focus on a set of 69 LDC over the years 1970–1989. They also report a higher impact of FDI on growth than that of domestic investment. Balasubramanyam, Salisu, and Sapsford (1996) employ a cross-country procedure to analyze 46 LDC in 1970–1985. Their results suggest that FDI enhances growth in those cases in which the host country has adopted trade liberalization policies. Zhang (2001) documents a similar result. De Mello (1999) employs time series and panel data analysis over a sample of both OECD and non-OECD countries over the period 1970–1990. He claims that FDI has a positive impact on growth if

---

1 An interesting example is the Stabilization Plan that was implemented in Spain in 1959. This package opened the economy to external trade, devaluated the peseta and introduced some liberalization in specific spheres of the economic activity. In turn, these measures favored the imports of capital goods by Spanish firms. The high growth rates attained by the Spanish economy in the 60s may be partly attributed to this change in policy.
there is complementarily between foreign and domestic investment. Bengoa and Sanchez-Robles (2003a) explore the correlation among FDI and economic growth in Latin America over the period 1970–1999. They also find a positive and significant impact of FDI on the economic growth of the countries of this area.

The aim of this paper is two-fold. On the one hand, the authors intend to design a very simple model that illustrates how a shift in policy may alter the quantity of FDI that a country receives and thus change its performance in terms of growth. On the other, the paper intends to go one step beyond the results reported in Bengoa and Sanchez-Robles (2003a) and check the robustness of the link FDI-growth to different techniques and, in particular, to the possibility of FDI being an endogenous variable.

2. The model

2.1. Assumptions

1. There is only one consumption good in the economy, which is sold in competitive markets at a price normalized to one for simplicity. The production function of \( Y \) is of the form

\[
Y = AK^{\alpha}F^{1-\alpha}, \quad 0 < \alpha < 1
\]

where \( A \) is total factor productivity and captures various aspects related with the efficiency in the economy as, for example, the institutional framework (Basu & Weil, 1998). In other words, and following the terminology of Abramovitz (1986) \( A \) is a proxy of the social capacity of the host economy. \( K \) is domestic capital and \( F \) the stock of capital accumulated through FDI. Labor does not appear in the production function in order to keep the analysis tractable (as in Barro, 1990). For the same reason, there is no population growth. The elasticities of output with respect to \( K \) and \( F \) are \( \alpha \) and \( 1 - \alpha \), respectively. We omit the subscript \( t \) in order to alleviate notation. The production function described in (1) exhibits decreasing returns in each of the inputs, \( K \) and \( F \), and constant returns to scale in \( K \) and \( F \) considered together. This last feature is the key property that warrants the existence of growth, as it will be shown below.

Following Romer (1990), we can think of \( F \) as composed by \( N \) varieties of intermediate capital goods \( x_i \). In this regard, the entrance of new FDI entails an increase in the number of varieties of intermediate goods that are available in the host county. This feature of the model implies that FDI is the channel whereby the host country can access state-of-the-art technology. Technological progress is captured, therefore, by an increase in the number of available varieties of intermediate goods. However, in this paper we do not consider explicitly the disaggregation of \( F \) in different capital goods because it increases the complexity of the analysis substantially without altering the main conclusion\(^2\). More

\(^2\) For a model that explicitly considers FDI as made up by different varieties of capital goods, see Bengoa and Sanchez-Robles (2003b).
formally,

\[ F = \sum_{i=1}^{N} x_i \]  

(2)

where \( N \), the number of varieties available in the country, is a proxy of the state of technology in the host nation.

2. Capital mobility is imperfect due to the existence of capital controls or other regulations in the currency market. These restrictions, common in LDCs, entail that agents can not convert local asset in foreign currency at the official rate or, alternatively, that there are limits to this exchange\(^3\). An outcome of this assumption is that the world interest rates do not have to be the same, at every point of time, as those existing in local markets. This, in turn, provides a straightforward decision rule for multinationals. A foreign firm will have an incentive to undertake an investment project in a foreign country whenever its rate of return, net of the entry cost, exceeds the world interest rate \( r^w \).

The entry cost may be understood in a rather broad sense. It can represent the payment of fees, licenses, legal procedures and the cost of the paperwork required to start operating in a particular country, or other outlays entailed by the adaptation of the managers of the firms to the local environment of the host country. Alternatively, \( \phi \) may represent the degree of political instability in the host country or even the risk of being expropriated. The entry cost will be assumed to be a percentage \( \phi \) of the profits of the firm. It will crucially depend on the attitude of the host country to the entrance of new firms: more outward oriented country will fix smaller values of \( \phi \).

More formally, a new firm will entry into the local economy whenever:

\[ (1 - \phi) \frac{\partial y}{\partial F} > r^w \]  

(3)

If condition (3) is fulfilled, new firms will come into this country, therefore raising the number of available varieties of capital goods. The increase in \( F \), in turn, decreases the marginal productivity of new varieties of capital up to the point in which the marginal productivity of a new type of good (net of the entry cost) equals the world interest rate (Eq. \(3'\)). Notice that this kind of arbitrage condition prevents a massive entry of foreign firms in the local economy.

\[ (1 - \phi) \frac{\partial y}{\partial F} = r^w \]  

\(3'\)

3. The law of motion of domestic capital has the standard form

\[ \dot{K} = sY - \delta K \]  

(4)

where a dot over a variable represents its derivative with respect to time, \( \delta \) the depreciation rate in the economy, and \( s \) the saving rate, exogenous and constant for simplicity.

\(^3\) Similarly, it could be assumed that the country gets funds from abroad to finance just one part of its stock of capital, whereas the rest (the domestic component) is financed with local saving (Barro, Mankiw, & Sala-i-Martin, 1995).
2.2. The model in the closed economy

In order to grasp the main messages conveyed by the model it can be useful to describe first the case of a closed economy. Consider a particular country whose policymakers are reluctant to the entrance of FDI. They will set a higher value of $\phi$; in the extreme case, $\phi$ will be equal to one. Therefore, the rate of return of potential foreign firms, net of the entry cost, will be equal to zero. Assuming an initial level of $F$, $F_0$, to ease the comparison with the open economy version of the model, the production function can be written now as:

$$Y = \tilde{A}K^\alpha, \quad 0 < \alpha < 1$$

(1')

$$\tilde{A} = AF_0$$

Since no FDI will enter into the country, notice that the only input growing in the model is $K$. Domestic capital, however, exhibits decreasing marginal productivity. Hence, the economy will behave like the Solow (1956) model and will eventually settle down in a steady-state with zero growth.

2.3. The model in the open economy

This situation can be changed, though, by a policy shock. If the economic authorities decide to reduce the value of $\phi$, some multinationals will find the country appealing because the expected rate of return, net of the entry cost, is now higher than the world interest rate. The country will start to attract new inflows of FDI and to grow. Decreasing returns in $F$, however, will reduce the rate of return of an additional variety of intermediate good supplied by a multinational until this rate of return coincides with the world interest rate.

To compute the rate of growth in the steady-state, first we have to find out the ratio of domestic to foreign capital in equilibrium. This ratio can be obtained by operating in (Eq. (3')) and is as follows:

$$\frac{K}{F} = \left(\frac{r_w}{(1-\phi)(1-\alpha)A}\right)^{1/\alpha}$$

(5)

Next we divide expression (4) over $K$. The result is Eq. (6). Plugging in the ratio $K/F$ as stated by Eq. (5), we get an expression of the rate of growth of the economy in terms solely of the parameters of the model, (7)

$$\frac{K}{K} = sA K^{\alpha-1} F^{1-\alpha} - \delta = sA \left(\frac{K}{F}\right)^{a-1} - \delta$$

(6)

$$\frac{K}{K} = sA^{1/\alpha} \left[\frac{(1-\phi)(1-\alpha)}{r_w}\right]^{(1-\alpha)/\alpha} - \delta$$

(7)
The production function is homogeneous of degree 1 in $F$ and $K$, and therefore the model behaves like an AK model. Thus, $Y$, $K$ and $F$ will grow at the same rate\textsuperscript{4} in the steady-state. This rate is constant, positive, and its expression is given by Eq. (7).

The main messages conveyed by Eqs. (6) and (7) are the following:

1. The combination of FDI and the stock of domestic capital warrants the existence of positive and endogenous rates of growth in the host country. The model is linear in $F$ and $K$, and this property ensures the existence of endogenous growth by means of offsetting the decreasing returns to scale exhibited by $K$ and $F$ alone.

2. The rate of growth in the economy is inversely related to the opportunity cost of investing in international capital markets ($r^w$). Thus, higher world interest rates will discourage the flows of direct investment among countries, hence reducing the rate of growth in LDCs.

3. The rate of growth is also negatively correlated with the cost that the foreign firm has to pay in the host country, $\phi$. Economic policy may thus influence the amount of inflows coming into the country by means of altering this cost. The parameter $\phi$ will be lower in outward oriented countries, which remove regulations to the entrance of FDI and ease the paperwork necessary for foreign firms to settle down into the country. The attraction of FDI will be encouraged in these nations and these economies will be able to grow at faster rates. Inward oriented countries, instead, will exhibit higher values of $\phi$; they will be less appealing to FDI as a potential destiny and, therefore, will grow at a slower pace.

### 3. Empirical results

The conclusions of the model can be backed up with some empirical evidence showing a positive nexus between FDI and growth. Our sample is composed of a selection of 18 Latin American countries\textsuperscript{5}, and the temporal horizon is 1970–2000. Data sources are standard in the literature (i.e. the Summers–Heston data basis, completed when necessary with data from the International Monetary Fund (IMF) and the World Bank).

The reasons why we have focused in the analysis of the Latin American countries are several. First, the nations belonging in this area are developing countries, but have already a certain level of social capacity, in terms of human capital, financial intermediaries and institutional stability as compared, for example, with Africa—that endows the continent with a concrete degree of attractiveness for FDI: Notwithstanding this fact, the sample offers enough variability in order to capture the impact of different degrees of the aforementioned variables.

Second, the criticisms against FDI in the 1950s and 1960s came basically from Latin American economists belonging to the structuralist school of thought, and had a noticeable

\textsuperscript{4} Intuitively, a foreign firm that settles down in the host country to provide, for example, phone facilities, will require the support of domestic capital (offices, machines to construct the network, and so forth) thus contributing to the increase of domestic $K$.

\textsuperscript{5} The countries that encompass the sample are Argentina, Bolivia, Brasil, Chile, Colombia, Costa Rica, R. Dominica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panamá, Paraguay, Perú, Uruguay and Venezuela.
impact on the policymakers and other agents of the area. Although the unfriendly approach against multinationals that stemmed from this school extended to other countries, it was perhaps more acute in Latin America. In our view, it is important to have specific evidence regarding the impact of FDI on growth for Latin American countries. This evidence, in turn, may be helpful for policy makers and social agents of these nations, inducing them to exploit the benefits that foreign flows may entail.

In the empirical exercise we have estimated a linearized version of Eq. (7). The dependent variable is the rate of per capita growth in real terms (computed over five year’s averages, in order to remove the influence of the business cycle from the data). The regressors are:

1. FDI (in percentage of GDP). We have not included domestic investment to avoid collinearity with FDI (the data available of investment already include the flows of FDI, without distinguishing between both categories).
2. Alternative control variables that proxy for $A$ and the rest of the parameters in Eq. (7).

We are especially interested in checking the robustness of our results concerning three aspects: the techniques employed, the control variables included in the equation and the countries that encompass the sample.

3.1. Techniques

Table 1 displays the results obtained from alternative techniques. The first column reports the results we got from the simplest estimation: i.e. a regression of the growth rate on FDI and a collection of dummy variables. According to this preliminary result, FDI is positively and significantly correlated with economic growth. The dummies have the expected signs (negative in the 1970s and 1980s, when the debt crisis hit these countries, and positive in the 1990s, when the performance in terms of growth was better). The test for second order serial correlation$^6$, however, suggests the presence of autocorrelation in the residuals, since we cannot reject at conventional levels the null hypothesis of this sort of correlation existing. We have tried to remove this autocorrelation by means of estimating the model in first differences. These results are reported in column 2. FDI is again positively and significantly correlated with economic growth. The test for second order serial correlation suggests that the null hypothesis of autocorrelation can be rejected now at conventional levels$^7$. Therefore, the model in first differences appears as preferably on econometric grounds.

The next question we addressed in the econometric analysis was to consider FDI as an endogenous variable. Recent contributions, as Basu, Chakraborty, and Reagle (2003), have found a bi-directional causality between GDP and FDI. Moreover, FDI is endogenous in the model presented above since larger levels of $K$ increase the marginal productivity of FDI, thus making the country more appealing for foreign investors.

$^6$ Under the null hypothesis of second order autocorrelation in the residuals, the test is distributed as a $N(0,1)$.

$^7$ First order serial correlation appears in estimation in first differences by construction. It should not be regarded as a symptom of poor specification of the model.
Arellano and Bond (1991) have proposed a suitable technique to estimate panel data models with endogenous variables: the Two Stage Generalized Methods of Moments (GMM2). This procedure instruments the endogenous variable by its own lags. Results obtained by using GMM2 are displayed in column 3. As it can be seen, the point estimate of FDI is again positively and significantly correlated with growth. The Sargan test for the validity of instruments suggests that FDI is adequately instrumented by its own lags. Notice that the magnitude of the coefficient does not change substantially when compared with the previous estimations.

Finally, we have also included a dynamic version of the model, in which the growth rate in one period is assumed to depend on the growth rate in the previous period (column 4). Both the \( t \)-Statistic and the Wald-test of the lagged growth rate suggest that this variable is not significantly different from zero. This result can be attributed to the fact that we are working with averages over five years. Thus it is plausible that growth at date \( t \) is not influenced noticeably by growth at date \( t-5 \). Summing up, our first battery of es-

---

**Table 1**

FDI and economic growth, Latin America 1970–2000

<table>
<thead>
<tr>
<th>Alternative specifications</th>
<th>Levels</th>
<th>First differences</th>
<th>GMM2</th>
<th>Dynamic GMM2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.02</td>
<td>−0.008</td>
<td>−0.0075</td>
<td>−0.031</td>
</tr>
<tr>
<td></td>
<td>3.69**</td>
<td>1.35</td>
<td>1.95*</td>
<td>9.35**</td>
</tr>
<tr>
<td>FDI</td>
<td>0.43</td>
<td>0.41</td>
<td>0.5</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>2.45**</td>
<td>3.19**</td>
<td>5.02**</td>
<td>2.77**</td>
</tr>
<tr>
<td>First lag of growth rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy 1976–1980</td>
<td>−0.008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy 1981–1985</td>
<td>−0.03</td>
<td>−0.02</td>
<td>−0.02</td>
<td>−0.05</td>
</tr>
<tr>
<td></td>
<td>5.17**</td>
<td>1.96</td>
<td>3.7**</td>
<td></td>
</tr>
<tr>
<td>Dummy 1986–1990</td>
<td>−0.02</td>
<td>−0.02</td>
<td>−0.02</td>
<td>−0.05</td>
</tr>
<tr>
<td></td>
<td>3.48**</td>
<td>2.83**</td>
<td>4.17**</td>
<td>4.78**</td>
</tr>
<tr>
<td>Dummy 1991–1995</td>
<td>0.009</td>
<td>0.02</td>
<td>0.01</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>1.31</td>
<td>2.48</td>
<td>5.04**</td>
<td>8.78**</td>
</tr>
<tr>
<td>Dummy 1996–2000</td>
<td>0.024</td>
<td>0.006</td>
<td>0.007</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>2.82**</td>
<td>0.57</td>
<td>1.06</td>
<td>0.31</td>
</tr>
<tr>
<td>Wald-test of joint sign</td>
<td>6.02</td>
<td>10.17</td>
<td>25.29</td>
<td>20.51</td>
</tr>
<tr>
<td></td>
<td>0.014*</td>
<td>0.001**</td>
<td>0**</td>
<td>0**</td>
</tr>
<tr>
<td>Wald-test of sign of time dummies</td>
<td>36.5</td>
<td>95.83</td>
<td>3664</td>
<td>274.4</td>
</tr>
<tr>
<td></td>
<td>0**</td>
<td>0**</td>
<td>0**</td>
<td>0**</td>
</tr>
<tr>
<td>m2</td>
<td>1.68</td>
<td>0.946</td>
<td>0.96</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>0.092</td>
<td>0.344</td>
<td>0.33</td>
<td>0.84</td>
</tr>
<tr>
<td>No. of observations</td>
<td>108</td>
<td>90</td>
<td>90</td>
<td>72</td>
</tr>
</tbody>
</table>

\( t \)-statistics under coefficients, standard errors robust to heteroskedasticity.

* Significant at 95%.

** Significant at 99%.

---

Under the null hypothesis of validity of instruments, the test is distributed as a \( X_p-k^2 \), where \( p \) is the number of instruments and \( k \) the number of (non-endogenous) regressors in the estimation.
timations suggests that the best specification is a (non-dynamic) GMM2 model in first differences.

3.2. Alternative control variables

Table 2 summarizes the main findings obtained when introducing in the equation alternative control variables. In accord with the findings reported above, all the estimations have been carried out in first differences and by means of GMM2. To ease comparisons we replicate in Table 2, column 1, the results from the baseline GMM2 specification (that were already reported in column 3 of Table 1).

Table 2
FDI and economic growth, L. America 1970–2000

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0075</td>
<td>0.0004</td>
<td>0.02</td>
<td>0.01</td>
<td>0.018</td>
<td>0.0008</td>
<td>2.19</td>
<td>3.73</td>
<td>0.02</td>
<td>0.02</td>
<td>0.006</td>
<td>0.007</td>
<td>1.06</td>
<td>3.21</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>1.95**</td>
<td>0.11</td>
<td>5.01***</td>
<td>2.07**</td>
<td>0.56</td>
<td>0.04</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.01</td>
<td>0.006</td>
<td>0.007</td>
<td>1.06</td>
<td>3.21***</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.34</td>
<td>0.56</td>
<td>0.64</td>
<td>0.49</td>
<td>0.26</td>
<td>4.83</td>
<td>2.79</td>
<td>0.02</td>
<td>0.02</td>
<td>0.03</td>
<td>0.007</td>
<td>1.06</td>
<td>3.21***</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>5.02****</td>
<td>2.26</td>
<td>4.83***</td>
<td>2.79***</td>
<td>3.68</td>
<td>0.67</td>
<td>3.73</td>
<td>3.73</td>
<td>0.02</td>
<td>0.02</td>
<td>0.03</td>
<td>0.007</td>
<td>1.06</td>
<td>3.21***</td>
<td>0.67</td>
</tr>
</tbody>
</table>

GMM2 estimations in first differences. S.E. robust to heteroskedasticity; t-statistics under coefficients; number of observations: 90.

* Significant at 90%.
** Significant at 95%.
*** Significant at 99%.
Table 3
FDI and economic growth, Latin America 1970–2000

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Medium income countries&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>−0.02</td>
<td>−0.05</td>
<td>−0.03</td>
<td>−0.02</td>
<td>−0.06</td>
<td>−0.04</td>
<td>−0.07</td>
</tr>
<tr>
<td></td>
<td>2.56&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>2.62&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>1.85&lt;sup&gt;†&lt;/sup&gt;</td>
<td>1.21</td>
<td>3.20</td>
<td>1.60</td>
<td>1.77</td>
</tr>
<tr>
<td>FDI</td>
<td>0.80</td>
<td>0.6116</td>
<td>0.5957</td>
<td>0.4727</td>
<td>0.6709</td>
<td>0.4730</td>
<td>0.4011</td>
</tr>
<tr>
<td></td>
<td>4.09&lt;sup&gt;∗∗∗&lt;/sup&gt;</td>
<td>2.83&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.93&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.32&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>3.15&lt;sup&gt;∗∗∗&lt;/sup&gt;</td>
<td>2.22&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.12&lt;sup&gt;∗∗&lt;/sup&gt;</td>
</tr>
<tr>
<td>Index of economic freedom</td>
<td>0.00527</td>
<td>0.00363</td>
<td>0.00176</td>
<td>0.005708</td>
<td>0.00817</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.74&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>1.17</td>
<td>−0.50</td>
<td>1.93&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>2.82&lt;sup&gt;∗∗∗&lt;/sup&gt;</td>
<td>2.63&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Primary enrolment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0201</td>
<td>0.1163</td>
<td>0.1024&lt;sup&gt;†&lt;/sup&gt;</td>
<td>−0.69</td>
<td>1.93&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>−1.39</td>
<td></td>
</tr>
<tr>
<td>Literacy rate</td>
<td>−0.00258</td>
<td>2.14&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>1.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>−0.2777</td>
<td>−0.3865</td>
<td>2.50&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>3.43&lt;sup&gt;∗∗∗&lt;/sup&gt;</td>
<td>−0.0734</td>
<td></td>
<td>2.28&lt;sup&gt;∗∗&lt;/sup&gt;</td>
</tr>
<tr>
<td>Public consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy 1980−1985</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.29</td>
<td>0.36</td>
<td>0.43</td>
<td>0.32</td>
<td>0.39</td>
<td>0.49</td>
<td>0.51</td>
</tr>
<tr>
<td>No. of observations</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>(b) Low income countries&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>−0.0092</td>
<td>−0.0348</td>
<td>−0.0216</td>
<td>−0.0266</td>
<td>−0.0201</td>
<td>−0.0375</td>
<td>−0.0286</td>
</tr>
<tr>
<td></td>
<td>1.56</td>
<td>2.80&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>1.56</td>
<td>0.85</td>
<td>0.92</td>
<td>1.31</td>
<td>1.02</td>
</tr>
<tr>
<td>FDI</td>
<td>0.5651</td>
<td>0.4126</td>
<td>0.4307</td>
<td>0.5827</td>
<td>0.4729</td>
<td>0.4895</td>
<td>0.6606</td>
</tr>
<tr>
<td></td>
<td>3.08&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.18&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.31&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.025&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.57&lt;sup&gt;∗∗&lt;/sup&gt;</td>
<td>2.72&lt;sup&gt;∗∗∗&lt;/sup&gt;</td>
<td>3.78&lt;sup&gt;∗∗&lt;/sup&gt;</td>
</tr>
<tr>
<td>Index of economic freedom</td>
<td>0.00506</td>
<td>0.00316</td>
<td>0.00378</td>
<td>0.00310</td>
<td>0.002815</td>
<td>0.0013</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.31&lt;sup&gt;∗∗∗&lt;/sup&gt;</td>
<td>1.341</td>
<td>1.346</td>
<td>1.70&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>1.75&lt;sup&gt;†&lt;/sup&gt;</td>
<td>1.80&lt;sup&gt;†&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Primary enrolment</td>
<td>0.0340</td>
<td>0.03194</td>
<td>0.0338</td>
<td>1.76&lt;sup&gt;∗&lt;/sup&gt;</td>
<td>1.55</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td>Secondary enrolment</td>
<td>0.0331</td>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>−0.00084</td>
<td>1.91&lt;sup&gt;†&lt;/sup&gt;</td>
<td>−0.0096</td>
<td>2.29&lt;sup&gt;†&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public consumption</td>
<td>−0.1718</td>
<td>−0.1716</td>
<td>−0.1934</td>
<td>2.52&lt;sup&gt;**&lt;/sup&gt;</td>
<td>2.54&lt;sup&gt;**&lt;/sup&gt;</td>
<td>2.92&lt;sup&gt;***&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Dummy 1980−1985</td>
<td>−0.00734</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.302</td>
<td>0.3423</td>
<td>0.3328</td>
<td>0.2792</td>
<td>0.3302</td>
<td>0.3334</td>
<td>0.4164</td>
</tr>
<tr>
<td>No. of observations</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

<sup>r</sup>-Statistics under coefficient.
<sup>a</sup> Countries: Argentina, Brazil, Costa Rica, Chile, Mexico, Panama, Uruguay, Venezuela. Middle-income countries: average per capita income greater than $2,770.
<sup>b</sup> Countries: Bolivia, Colombia, Rep. Dom., Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Peru.
<sup>∗</sup> Significant at 90%.
<sup>∗∗</sup> Significant at 95%.
<sup>∗∗∗</sup> Significant at 99%.
One of the variables included is the index of economic freedom of the Fraser Institute, which can be understood as a proxy both of the social capacity of the country and of its attitude towards FDI. A larger value of the index means that the country is more outward oriented, less regulated and thus keener to the entrance of FDI. It is positively and significantly correlated with growth (Table 2, column 2).

Two variables capture the level of human capital, secondary enrolment and primary enrolment. Secondary enrolment displays a positive sign and is significant in one case (column 3) but its significance is not robust to the introduction of inflation (column 4). Primary enrolment is positively correlated with growth (column 5) although the point estimate is smaller than in the case of secondary enrolment. The ratio of public consumption to GDP displays a negative correlation with growth (column 3), which is not a surprise since a high value of this indicator is generally associated with larger degrees of intervention of the public sector in the economy, and lower inputs’ productivity. Inflation is also negatively correlated with growth. This result is also plausible since a high value of this value indicates a lack of discipline and commitment of the policymakers with the stability of the economy, which is deleterious for the efficiency of resources.

Finally, we have included an indicator of debt conditions, the debt service ratio (column 5). Its correlation with growth is negative and significant, as it would also be expected. The point estimate of FDI remains positive and significantly correlated with growth in all cases. We can tentatively conclude, then, that FDI is quite robust to the introduction of different control variables.

3.3. Subsamples

It could be the case that the sign of the impact of FDI on growth were to be different according to the income level of the country considered. To test for this possibility we have split the sample in two categories, grouping the countries by their level of per capita income. Low-income countries are those in which the average per capita income over the period considered was smaller than US$ 2770. Results are reported in Table 3 (a) and (b). As it is apparent from the inspection of the table, the correlation of FDI with growth is positive and significant in both cases. Thus, FDI may be considered an engine of growth not only for middle income countries but also for those nations that enjoy lower levels of welfare.

4. Concluding remarks

The economic policy implemented in a country has influence in its growth performance. This paper has tried to shed some light on this issue, both at the theoretical and the empirical levels.

First, this paper describes and discusses a simple model in which a policy shock that alters the economic scenario may entail a shift from a situation of zero growth to another of positive, endogenous growth. In particular, the change in policy is reflected in a more sympathetic attitude towards FDI, which lowers entry costs for this sort of investment and induces the reception of foreign flows. In turn, FDI warrants the entrance of more advanced
technological intermediate goods in the economy, hence bringing about increases in the stock of domestic capital and in the total level of output.

Next, the paper analyzes a panel data of 18 Latin American countries. According to our results, FDI is positively and significantly correlated with economic growth. This basic finding carries over when different techniques, control variables or subsamples are considered in the estimations. In particular, the potential endogeneity of FDI does not alter the main results.

This framework of analysis can be extended from the case of FDI covered here to address other situations in which economic policy may facilitate a more outward oriented scenario or the adoption of more efficient techniques in the economy. In our view, this provides an interesting avenue for future research.

Policy considerations are relevant, in our opinion: by favoring the entrance of FDI, governments may have a decisive influence on the economic growth performance of their countries, thus contributing substantially to the welfare of their fellow citizens.

References


