ISSN 1020-5179

SERIES

PRODUCTION DEVELOPMENT

# Foreign direct investment and welfare

Olaf J. de Groot

UNITED NATIONS

ECLAC

SERIES

196

PRODUCTION DEVELOPMENT

# Foreign direct investment and welfare

Olaf J. de Groot

UNITED NATIONS

ECLAC

This document has been prepared by Olaf J. de Groot, Economic Affairs Officer of the Unit on Investment and Corporate Strategies, Division of Production, Productivity and Management of the Economic Commission for Latin America and the Caribbean (ECLAC). The author is grateful for the helpful feedback and comments received from Alvaro Calderon, Mario Cimoli, Cornelia Kaldewei, Jochen Mierau, Miguel Perez, Ana Sofia Rojo, Giovanni Stumpo, Juan A. Urgelles and others.



United Nations publication
ISSN 1020-5179
LC/L.3800

Printed at United Nations, Santiago, Chile

# Contents

**Abstract** ..... 5

**I. Introduction** ..... 7

**II. Existing Literature** ..... 9
A. GDP growth as a proxy for development ..... 10
B. FDI and other measures of development ..... 11

**III. Theory** ..... 13

**IV. Methodology** ..... 17

**V. Data** ..... 19

**VI. Results** ..... 21
A. Economic Growth ..... 21
1. Household consumption ..... 23
2. Gini coefficient ..... 25
3. Human Development Index ..... 27
4. Differences across countries ..... 28

**VI. Conclusions** ..... 31

**Bibliography** ..... 33

**Production Development Series: issues published** ..... 35

**Tables**

TABLE 1 DESCRIPTIVE STATISTICS ..... 20
TABLE 2 REGRESSION RESULTS WITH GDP GROWTH AS DEPENDENT VARIABLE ..... 22
TABLE 3 REGRESSION RESULTS WITH GDP GROWTH AS DEPENDENT VARIABLE AND A NUMBER OF ALTERNATIVE EXPLANATORY VARIABLES ..... 23
TABLE 4 REGRESSION RESULTS WITH THE GROWTH OF HOUSEHOLD CONSUMPTION AS DEPENDENT VARIABLE ..... 24

TABLE 5 REGRESSION RESULTS WITH THE GINI COEFFICIENT (1A-2B) OR THE CHANGE IN THE GINI COEFFICIENT (3A-4B) AS DEPENDENT VARIABLE....26
TABLE 6 REGRESSION RESULTS WITH THE HUMAN DEVELOPMENT INDEX (HDI) (1A-2B) OR THE CHANGE IN HDI (3A-4B) AS DEPENDENT VARIABLE....28
TABLE 7 REGRESSION RESULTS WITH GDP GROWTH (1A-2B) AND THE ABSOLUTE GINI COEFFICIENT (3A-4B) AS DEPENDENT VARIABLE....29

# Abstract

This paper addresses the question of how Foreign Direct Investment (FDI) affects different measures of economic welfare. It fits in an existing stream of research looking at the relationship between FDI and economic growth, but it introduces two variations. First, we explore what the differences are between Fixed Effects (FE) panel data estimations and Generalized Method of Moments (GMM) estimations. Second, we explore different aspects of economic welfare, and thus go beyond the simple measure of GDP growth. The other variables we consider are household consumption, inequality and the Human Development Index (HDI). The conclusions are striking. For GDP and household consumption growth, FDI does not have any significant impact. In all different types of estimations and despite different control variables, FDI continues not to have any impact whatsoever. On inequality, on the other hand, we find that there is a significant positive impact of FDI. This confirms some of the literature that argues that any benefits of FDI are not equally distributed, but rather are obtained by the relatively well-off. On HDI, FDI has a consistent and significant negative effect. While the channel for this is not immediately clear, we theorize that this is potentially the result of policy choices made by governments.

# I. Introduction

The question of the relationship between Foreign Direct Investment (FDI) and welfare has been extensively studied before, but there are still open questions. Particularly since the results of previous research have not always been consistent. For example, there is still a disconnect between the results of micro-level studies and those of macro-level ones. Microeconomic studies have found little relationship between FDI and firm productivity, spillovers or other potential benefits. Until recently, however, macroeconomic studies have found significant positive effects of FDI on indicators of development.

This started to change with Carkovic and Levine (2002) who argued that the methodologies employed in preceding studies suffered significant methodological challenges. Since their ground-breaking paper, others have introduced versions of those estimations, but have not always found the same results.

In this paper, the relationship between FDI and different measures of welfare is revisited. Different from Carkovic and Levine, it will look beyond only GDP growth, respecting the fact that there are different aspects of welfare that can be measured. While GDP growth has advantages in data availability and comparability across countries, it suffers from other challenges. Alternative indicators of national welfare include the Human Development Index (HDI), household consumption and the Gini coefficient. These are all addressed in this paper.

The organization of this paper is as follows. In the subsequent section, a general overview of the literature on FDI and development is discussed. Section three describes a number of hypotheses concerning the relationship between FDI and development. Section four shortly discusses the methodology to be employed in this paper, while section five describes the data used. Section six discusses the results and the final section concludes.

# II. Existing Literature

In the past, the majority of research on the relationship between FDI and welfare has discussed only its impact on economic growth. However, there are many other aspects of welfare that could be analyzed for their relationship with FDI. One alternative interpretation of development concerns the distribution of GDP. For example, if FDI is associated with both an increasing GDP and an increasing wealth gap, is that still beneficial for overall societal welfare? Or from a positive point of view: if FDI increases government tax income, thus either enabling the government to reduce other taxes, or to improve the services it provides, this would benefit the level of welfare, even if this may not become immediately obvious from the level of GDP.

Alfaro et al. (2004) discuss through which channels FDI benefits development. Their list includes productivity gains, transfers of technology, training of employees and managers, access to new domestic and international markets, access to production networks and the introduction of new processes. These channels can either occur directly through the introduction of new products or processes, but also because workers migrate from foreign to domestic firms. Dries and Swinnen (2004) elaborate on how these technological improvements can happen. They occur either horizontally, where they are countered by the increasing competition for market share, which may hurt domestic producers, or they occur vertically, which makes theoretical sense, but has little basis of empirical evidence.

In the majority of studies discussed in the following subsections, authors use underlying economic models to theorize about the relationship between FDI and development. However, there is also a strand of literature that accepts the general correlation between these two and addresses the more technical aspect of causality. This is the literature that uses primarily Granger causality to determine whether increases in FDI are associated with increases in development, or whether the directionality of the relationship is the other way around. For example, Hansen and Rand (2006) find that FDI and the FDI/GDP ratio bidirectionally Granger cause each other, but that a larger share of FDI in overall investment has a particularly positive impact on GDP. However, this result is not consistent across regions. Basu, Chakraborty, and Reagle (2003) agree to a point, but find that for more closed economies, there is only a relationship from GDP to FDI and not the other way around. Chowdhury and Mavrotas (2006) look at the causality between FDI and GDP growth for a sample of three countries. In the case of Chile, they find that GDP Granger causes FDI, rather than the other way around, whereas in both Malaysia and Thailand, they find a bidirectional causation.

# A. GDP growth as a proxy for development

When development is considered equal to GDP growth, there are some immediate arguments why FDI may have a positive impact. Simply following standard growth theory (e.g. Mankiw, Romer, and Weil 1992) suggests that increases in capital stock should benefit the growth rate of GDP. While this may seem intuitively true, this is not necessarily the case, for a number of reasons.

Firstly, FDI may affect other forms of capital accumulation. If increases in FDI replace other forms of capital investment from domestic sources, the net benefit of FDI to the overall capital stock could be zero. In that case, the impact of FDI should not be identifiable in the size of the overall capital stock. However, following Mankiw, Romer, and Weil (1992), one could theorize that an interaction takes place with other elements of the neoclassical growth model. For example, it could be argued (Dries and Swinnen 2004; Havranek and Irsova 2011) that increases in FDI stimulate improvements in technology and human capital. In that case, the positive spillovers of FDI on other inputs of the growth equation would be a channel through which FDI positively affects growth. However, the existence of such spillovers is debatable (Aitken and Harrison 1999). In fact, spillovers may even be negative when FDI inflows create jobs that are low-skilled. It is thus not ex-ante clear whether these non-capital interactions have a positive or a negative effect. Secondly, FDI flows do not necessarily imply new capital investment in a country. In fact, a large share of what is generally qualified as FDI consists of the transfers of ownership of existing capital, rather than the creation of new capital in an economy. The belief that FDI actually creates new capital is one of the fallacies to be avoided when researching the relationship between FDI and development. Finally, and this is partly a moral question, the fact that FDI may have a positive impact on economic growth, does not necessarily mean that attracting FDI is a worthwhile investment. Some countries spend large sums in attracting FDI without the potential impact thereof being sufficiently quantified. For example, Goyal and Chai (2008) study several Caribbean economies and find that governments spend between 9.5 and 16 per cent of annual GDP on tax incentives, arguing that their removal would yield a potential revenue of 7-13 per cent of GDP.

Nunnenkamp (2004) provides a broad overview of the interaction of FDI with development. Importantly, he does acknowledge that those conditions that favor FDI also stimulate domestic investment, but that government action plays a role in either encouraging or discouraging FDI. He uses the example of India and Brazil, which have a similar level of gross capital formation, but of which Brazil receives far more FDI, since India discourages it. On the other hand, between China, Malaysia and Korea, the first two positively discriminate foreign investors, thus leading to much higher levels of FDI than in Korea. Yet gross capital formation remains at similar levels. Zhang (2001) brings up the point that different types of FDI have different relationships with GDP growth. Whereas *market-seeking FDI* responds to GDP growth, *export-oriented FDI,* which aims to exploit differences in factor prices, is a cause of GDP growth.

Ito and Krueger (2000) argue for the positive aspects of FDI. In particular, it has in the past been shown that FDI is less quickly withdrawn than, for example, portfolio investment, which makes it a force of macroeconomic stabilization. This argument is supported by the role this played during the Asian crisis of the 1990s. Nourzad (2008) also finds some evidence that increased FDI increases potential output. However, this is qualified by the fact that this effect is significantly more pronounced in developed than in developing countries. In particular, he considers technical inefficiencies, which are reduced by FDI, but primarily in open and/or developed economies.

Since the general impact of FDI appears to be relatively small from the preceding studies, authors then went on to find out whether there were certain conditions that improve the potential benefits of FDI inflows. Different authors have since focused on different aspects and appear to have identified some of these conditions. Zhang (2001), for example, argues that countries need to adhere to a range of conditions, including trade openness and a minimum level of human capital, to be able to benefit from the inflows of FDI. Alfaro et al. (2004), on the other hand, argue that it is the role of financial markets that enable a positive impact of FDI inflows. A somewhat older, but much cited study (Borensztein, De Gregorio, and Lee 1998) identifies a minimum stock of human capital as the unique bottleneck. They argue that this stock of human capital is representative of the absorptive capability of the host economy.

When proceeding to estimate the level of this threshold, it turns out to be relatively low, implying that the benefits of FDI ought to be widespread.

The most convincing arguments, however, have come from those authors who believe that there is limited or no impact of FDI on the domestic economy. An early contribution is a very extensive micro-level analysis of plant-level panel data from Venezuela (Aitken and Harrison 1999). They analyze whether there are spillovers from foreign-owned plants on domestic-owned plants through any of the channels commonly theorized. They find that those plants that are co-owned by foreigners do become somewhat more efficient, albeit more strongly when the firms in question are smaller. Other firms that are not owned by foreigners, on the other hand, actually suffer and become less productive. The net effect of these two opposing forces for the domestic economy may be marginally positive, but is very small. Other micro-level studies actually obtain similar results. Carkovic and Levine (2002) point out that this contrasts with many macroeconomic studies which find positive results. However, as discussed above, these results depend on certain conditions, and different authors even identify different types of necessary conditions. This, Carkovic and Levine argue in a very convincing way is because the preceding studies are methodologically flawed (simultaneity bias, country-specific effects, etc). Using a new macro-level dataset and GMM estimators, they show that, once you correct for such flaws, there is no robust evidence of a causal link between FDI and economic growth.[1] Herzer, Klasen, and Nowak-Lehmann (2008) agree to this general point, and using a different methodology, which also corrects the flaws from previous contributions, they find that there is no evidence of a positive impact of export-led FDI on GDP growth. In fact, using their country-specific estimates, they find a relationship only for Ecuador, and it is negative, rather than positive.

Considering some of the evidence that has been presented in the literature makes it clear that the relationship between FDI and GDP growth does not seem to be very strong. However, this belittles an important point, namely that the causality may be running in the other direction. This also explains why previous authors may have spuriously found positive impacts. Successful economic policy leads to economic growth, which either in turn, or simultaneously, attracts FDI. This is why both Carkovic and Levine (2002) and Nunnenkamp (2004) argue that economic reforms (good institutions, trade openness, etc) are indeed very important and should be continued. Providing financial incentives purely to attract FDI, on the other hand, should not be undertaken too easily. Particularly since such policies may come to substitute economic reforms and thus hold back the domestic economy from developing further.

## B. FDI and other measures of development

When considering other interpretations of development or welfare, there is some more work that is worth discussing. Nunnenkamp (2004), for example, argues that FDI creates employment for low-skilled workers, thus increasing the demand for labor. On top of that, foreign employers are argued to pay higher wages for such labor than prevail at the local level. This way, FDI can thus be a force for aiding the very poor, reducing income inequality. Agénor (2004), on the other hand, warns that the kinds of spillovers envisaged by the proponents of the spillover theory are more likely to benefit the well-off. According to Agénor, this will be the case on both a macro level (with spillovers more likely to benefit developed countries, rather than developing) and at a micro level (where most benefits accrue to highly educated workers). His theory applies to all sorts of globalization, including trade and investment though, so they are not specific to investment only. In Latin America, he argues that the openness to trade may have led to the increase in wage inequality during the 1980s and 1990s.

Harrison and Rodríguez-Clare (2009) extensively study the role of industrial policy in developing countries. They conclude that there are instances where the protection of infant industries justifies such policies, but the circumstances where this is indeed optimal are extremely rare.[2] They do note, however, that FDI promotion policies may be more productive than trade policies, since these focus on new

[1] To be sure, Carkovic and Levine (2002) do not argue that there is no positive impact of investment. They argue that there is no positive impact of Foreign Direct Investment over and beyond the positive impact that comes from investment in general.

[2] To be precise, these circumstances may have occurred at the beginning of the twentieth Century, but do not do so anymore.

activities rather than existing ones. Still, they follow the arguments from Blomström and Kokko (2003), as well as Chandra and Kolavalli (2006), to argue that a government is better off supporting the receptiveness of domestic industries to potential knowledge spillovers than to directly stimulate the flow of FDI itself.

Finally, Kosack and Tobin (2006) compare the impact of FDI and aid on both economic growth and an index of human development. Their results indicate that FDI has no effect on economic growth. With regards to human development,[3] they find that under particular circumstances, the impact is actually negative, since FDI can become exploitative in the least developed of nations. According to the authors, aid, on the other hand, has a more positive effect, albeit under specific circumstances too.

[3] They use the United Nations' Human Development Index to measure human development.

# III. Theory

Before delving into some of the background behind FDI, it is important to consider the question of what FDI actually is, since this is pivotal to our analysis. According to UNCTAD (2013), "*FDI refers to an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor*". The important points here are 1) that the operations are abroad, 2) that the investment is lasting, which is usually defined as consisting of a stake of more than 10%, below which an investment is referred to as portfolio investment and 3) that an investment is made. That last point is very important, since it implies that there are different types of FDI. The type that is traditionally thought of as FDI, where a company invests abroad to start a factory or some other sort of subsidiary (known as Greenfield investment) is only of the types of investment. Another one consists of expansions of existing subsidiaries (Brownfield), but the final one, which is arguably the largest, consists of Mergers & Acquisitions (M&As). In that case, a foreign investor purchases or merges with (part of) an existing company. In other words, there is no creation of new physical capital, but rather a simple transfer of ownership from a domestic investor to a foreign investor. Obviously, Greenfield, Brownfield and M&As have very different effects, but conventional data sources do not allow us to separate these types and we therefore have to work with only the headline figure of "FDI".

In general, this paper does not aim to derive formal theory, but before going to the estimations of the interaction between FDI and different measures of welfare, it is worth thinking about the kinds of effects that one may expect. In order to form expectations about the impact of FDI, we should start by considering the fact that FDI plays a different role for the different actors involved.

> *Foreign investors*. The first category is the (potential) foreign investor. This group aims to maximize (long term) profit by choosing whether to invest at home or to invest in a foreign country. Obviously, this is not a homogenous group. On the one hand, there could be enterprises which are able to spot opportunities to increase the immediate rate of return on their investment by investing abroad. However, in an ideal world, not only would these companies increase their own return, they would also be able to obtain a higher return than the domestic companies already serving a particular market. On the other hand, there may be strategic motives underlying a particular investment, even if these do not yield an immediate return on investment. Such strategic motives could originate from a desire to enter a market for its future potential, the need to obtain access to specific natural resources or other sources.

*Domestic producers*. For domestic producers, the prospect of foreign investment in an industry may form a double-edged sword. On the one hand, this is an opportunity to cash in existing production facilities (particularly when FDI is taking place through M&As). Furthermore, if the entry of a foreign rival increases overall market size or even encourages an entirely new industry, this may create new opportunities for domestic producers. On top of that, foreign investors may need down- or upstream products in their production cycle from local producers that can thus benefit. On the other hand, seeing the entry of foreign producers may increase competition and thus drive some of the local producers out of market. Realistically, it depends a lot on the type of investment and the type of market, so it is not clear ex ante whether domestic producers benefit or suffer from an inflow of investment.

*Domestic government*. Governments sometimes have a tendency to provide generous incentives for foreign investors. It is not necessarily clear how they benefit from such generosity, however, particularly in cases where the terms being provided to foreign investors are extremely costly (see Goyal and Chai (2008) for some pertinent examples). On the other hand, it may be the case that some sort of market failure prevents markets from being successfully exploited. A prime example of that would be in the case of natural resources, which are difficult to exploit, due to both costs and capacity, in small countries. In that case, the alternative to FDI would be an absence of investment, and investment would thus be highly beneficial. On the other hand, foreign investors may be reducing employment in domestic competitors and may not be significantly contributing to the tax base. In those cases, it is not as clear-cut that a foreign investor makes a significant contribution to the overall economic environment. The role of FDI incentives is also important because of the role of expenditure substitution. Since a USD can only be spend once, any (fiscal) expenditures on the attraction of FDI, if it is not associated with an increase in the tax base, has to be compensated by a decrease in expenditures elsewhere. As a result, one could argue that the implementation of FDI incentives may reduce expenditures in more productive areas (e.g. education, health).

*Domestic consumers/workers*. Once more, there are different scenarios that could play out. In the case of a poorly developed industry, a foreign investor may be able to improve competition leading to better product provision to consumers. Alternatively, an increase in competition, particularly if FDI has a long-run strategic perspective, may drive alternative producers out of the market, thus in the long term reducing competition. For workers, the impact depends a lot on the type of investment as well. In the case of M&A activity with a short-run profit motive, a foreign investor may see opportunities for increasing efficiency, for example through automation and reducing the number of low-skilled workers in an organization. In that case, the workers may not benefit from this investment at all.

An important point that comes back in the analysis of each of these different groups is the fact that there may be a difference in the return to capital between domestic and foreign producers, despite facing principally the same environment. It is difficult to give a generally applicable reason for the differences in the rates of return, but it may be worth exploring some examples that illustrate why this may be the case:

- A foreign investor may not know the market as well, or may not have the necessary supply and distribution networks, thus making their investment less profitable than a native investor.
- Alternatively, a foreign investor may have more advanced technology thus being able to better utilize available resources and thus able to obtain a higher rate of return.
- A foreign investor may benefit from economies of scale, by integrating production in a larger international supply chain, and is thus able to yield a higher return on investment that is unavailable for local investors resulting from their relatively smaller scale.
- If due to some sort of market failure (low capacity, illiquid capital markets, etc), the native investors were not able/willing to make a similar investment as foreign investors. In principle, the outside investor thus contributes to the economy by making the (profitable) investment

possible. However, if this investment strongly increases competition, driving local companies out of the market, this may not necessarily benefit the overall welfare of the population.

These three simple examples show what the reasons may be behind a differentiation in the rates of return for different types of investors within the same economy. In practice, the different rates of return that we have identified will determine the state of an economy. Of course, this is further complicated by the fact that rates of return are not autonomously determined, but may be influenced by government policy.

Overall, the impact of FDI on the GDP (or other measures of welfare) strongly depends on the type of FDI, with Greenfield investments more likely to be beneficial than M&As. Unfortunately, this typology is not as clear as one may hope for in internationally comparable databases. It is thus impossible to test whether this observation is true overall and we are left with the necessity to look at only compounded FDI flows. Other dichotomies that are theoretically possible and that may be possible at a national level are also not usable in an international comparison. For example, one can distinguish between export-seeking and market-seeking FDI, where the latter is more likely to disturb local competition thus potentially implying negative effects, whereas the first is more likely to have a positive impact. Clearly, it is difficult to give an overall assessment of whether FDI is more likely to have a positive or negative effect on welfare.

The preceding thoughts and analysis can be summed up in a series of hypotheses that are tested in the empirical section of this contribution.

**H1: There is no significant, discernable impact of FDI on GDP growth.**

There are several reasons why it is worth hypothesizing absence of any impact of overall FDI on overall GDP growth. The most important does not actually follow from the preceding analysis, but from the fact that measures of FDI are very broad and include many different elements with different potential effects. We know that M&As make up a significant portion of total FDI and the impact of M&As is more likely to be negligible. Greenfield investment may have a more positive impact on GDP than M&As do, but even with respect to that type of FDI, the expected impacts are uncertain. The second reason for the hypothesized absence of an impact relates to the fact that it is simply unclear in which direction an impact may go. While FDI is likely to have a positive impact for the investing company, this does not necessarily translate into higher GDP growth figures. Crowding out of domestic investment may reduce the share of producer surplus staying within an economy and increased competition may hurt domestic producers. Overall, it is simply not clear whether FDI has any impact whatsoever. Having said that, there are obviously specific cases in which FDI clearly has a positive impact on an economy. In addition to the example of natural resources, as previously discussed, one could imagine that export-oriented FDI has fewer negative spillovers than market-oriented FDI.

*Corollary: If there is no significant effect of FDI on GDP growth, at least one of the following conditions is not met:*

i) Foreign investors are more productive than domestic ones

ii) The expansionary effect of FDI-affected companies exceeds the contractionary effect on native producers

iii) Domestic stakeholders (labor, government, domestic investors) enjoy a net increase in income parallel to the profits accruing foreign investors

This second statement is not in fact a hypothesis, but a corollary that follows from the first hypothesis. The three elements mentioned are the conditions under which FDI has a positive impact on GDP growth. These conditions concern both the actual investor, the market that is being invested in and the overall environment (consisting of both the government and the consumers in that market) and each one of them must be satisfied to be able to warrant positive conclusions concerning FDI.

**H2: If there is no discernable effect of FDI on GDP growth, there will be no discernable effect of FDI on household consumption either.**

The second hypothesis follows from the first hypothesis with an additional assumption: since households are able to use credit markets and saving to smooth their consumption patterns, fluctuations in household

consumption are flatter than that of the underlying GDP growth. Of course it is questionable whether consumers in developing countries are able to practice complete consumption smoothing, in the light of imperfect capital markets, but that is a question addressed in many other studies.

We are primarily interested in GDP for its impact on consumption, so it is valid to consider this element separately. Since we hypothesize that FDI will not even be picked up by GDP growth, it will certainly be more muted in consumption patterns. In effect, H2 is a stricter version of H1, so even if H1 were disproven, we could still expect to find that H2 is found to be true.

**H3: Increases in FDI increase the level of inequality in a society.**

The next aspect of welfare included in this study is inequality. The way FDI may influence inequality is difficult to capture in the same kind of mold as the preceding welfare aspects. On the one hand, you could argue that as long as H1 is true, the impact of FDI on inequality should be absent too, in a variation of the "rising boat" argument: In the absence of a tide, boats will neither rise nor sink. However, this is not necessarily true when taking a different perspective. According to the corollary above, one of the conditions for profitable FDI to take place is that foreign investors will be more productive than domestic ones. One of the arguments encountered most often is that foreign investors are able to use their technological advantage to increase the efficiency of companies taken over. If such efficiency increases are achieved through automation, the primary employees to suffer from that are the low-paid (low-skilled), who may be more easily replaced than the higher paid (skilled) employees. Similarly, if there is an impact through the competition effect that may cause native competitors to fail, the most likely to fail are those who are least competitive, thus the least automated. On the other hand, in the case of export-seeking FDI, an increasingly successful company with added output will not likely be benefiting the lowest-paid employees. Rather, it is the higher-level employees that would financially benefit from such increases in scale. An opposite argument has been made in the past (Nunnenkamp 2004), arguing that foreign investors are willing to pay higher wages, particularly for the lowest skilled. In the case of advanced automation, this could be the case when employees are paid a wage that is respectful of their individual productivity. However, in markets where there is an oversupply of low-skilled wages, the producer surplus resulting from such automation do not accumulate to the workers, but rather to the owners of capital.

**H4: Increases in FDI are associated with decreases in HDI as a result of deteriorating government policy.**

The final measure of welfare that we are looking at is the Human Development Index (HDI). There are two things at play. First, there is the impact of FDI on GDP growth, which we theorize in H1 to have no effect. However, this hypothesis may be faulty, thus leading to either a positive or a negative impact. In the second place, there is the role of government policy. While it is not made explicit in the current model, one could argue that governments have two possibilities: invest in FDI promotion policies or invest in other public expenditures. This implies that such FDI promotion policies by definition reduce other public expenditures. It is not a great stretch to argue that public expenditures are (at least partially) aimed at improving HDI. In the first stage, we thus know that such promotion policies worsen HDI. Obviously, in certain situations, the impact of increased FDI resulting from these promotion policies would have a beneficial impact outweighing the original cost of the promotion policies. However, since governments are not necessarily benevolent planners that implement economically rational policy, it is not unreasonable to believe that in a significant number of countries welfare is actually worsened as a result of such promotion policies. Even if governments do not use direct FDI promotion policies, it may still be the case that governments invest in other assets than they would in the absence of FDI. As an example, foreign investors may require extensions of infrastructure which governments pay for by reducing expenditures in education of health, which would have deteriorating effect on HDI.

The overall problem with measuring the impact of FDI is that it is too broadly defined and includes opposing forces within a single measure. If one were able to distinguish the different elements that make up FDI, it would be possible to determine which of the elements have which impacts. However, since the data is not available at that level of disaggregation, we are not able to identify such smaller effects that may disappear in the grander scheme of things.

# IV. Methodology

In this paper, the results of different methodologies are compared. That is, in order to see what the effect is of the potential endogenous nature of the data, we make a comparison between ordinary fixed-effects (FE) panel data and dynamic system GMM estimators. Carkovic and Levine (2002) take a similar approach in their analysis of the relationship between FDI and economic growth: they compare baseline OLS results with system GMM results. Since it should be ex ante clear that OLS estimations are not going to be valid in such a complicated environment, these will not be replicated. However, if the reader is interested, the GDP-related OLS estimates are available from those authors.

In this paper's case, the primary focus is on the difference between FE and GMM estimates. The Generalized Method of Moments (GMM) method was thought up to allow controlling for endogeneity. The primary references are associated with Arellano and Bond (1991), Arellano and Bover (1995), Roodman (2009) and Windmeijer (2005). The Arellano-Bond (AB) estimator uses moment conditions to derive an alternative set of instruments from the data to instrument for potentially endogenous variables. It does so by using time differenced absolute and difference values of the variables of interest.

In principle, the standard growth model looks as follows:

$$\Delta y_{it} = \gamma_t + (\alpha - 1) y_{i,t-1} + x'_{it}\beta + \eta_i + \nu_{it} \text{ for } i = 1, \dots, N \text{ and } t = 2, \dots, T$$

Where $\Delta y_{it}$ is the log difference in GDP levels during a five-year period, $y_{i,t-1}$ is a convergence term equal to the logged level of GDP at the beginning of each period and $x_{it}$ is a vector containing a number of explanatory variables that can affect economic growth (capital investment, population growth, educational investment, for example). In addition to these specific and variant variables, there are also period-fixed effects ($\gamma_t$) and country-fixed effects ($\eta_i$) included in the estimation (Bond, Hoeffler, and Temple 2001).

This basic equation represents what is done in the panel data FE model. The fixed effects for both time and location control for effects that are not common to all observations. What is left is an estimation of the impact of all included variables, once controlling for this. Obviously, this does assume that the impact of a particular variable is common between observations, so in other words: the effect of capital investment in one country will lead to an equal amount of economic growth as capital investment in another country. Having said that, it is not implied that a dollar invested in capital in the United States

is assumed to have the same impact as a dollar invested in Haiti. Rather, by using the logs of most relevant variables, it is assumed that the same relative increase in such variables has the same impact in different countries.

However, this type of estimation can be problematic in the case when explanatory variables are not strictly exogenous and may depend on the realizations of the dependent variable. Furthermore, this does not take into account that the value of the dependent variable may also depend on its own past realizations and a set of other econometric complications. Moving from the FE estimator to the systems GMM requires replacing the model above with:

$$y_{it} = \gamma_t + \alpha y_{i,t-1} + x'_{it}\beta + \eta_i + \nu_{it} \text{ for } i = 1, \dots, N \text{ and } t = 2, \dots, T$$

In a following step, we consider this equation in differences:

$$\Delta y_{it} = \gamma_t - \gamma_{t-1} + \alpha \Delta y_{i,t-1} + \Delta x'_{it}\beta + \Delta \nu_{it} \text{ for } i = 1, \dots, N \text{ and } t = 2, \dots, T$$

The basic idea of the GMM estimator is that this equation can be estimated by using the exogenous lags of the both the levels and differences of the variables itself. That is, even when there is an auto-regressive process that partially drives the determination of the values, one can still use the differenced lags as instrumental variables. The references above explain the methodology in more detail, but suffice it to say that there are a number of necessary tests that are able to determine whether the estimation is valid.

One potential worry is the role of multicollinearity, which is a subject of much debate but difficult to actually estimate. However, following Roodman (2008), it is possible to explore whether there are specific variables that one could expect to cause multicollinearity problems (interactions, for example). We do not include any of the types of data that Roodman identifies. Furthermore, dropping single variables does not seem to have a large impact on the overall estimations and finally, the correlation coefficients between individual variables are not problematically high.

Finally, Windmeijer (2005) realized that the estimated coefficients from difference GMM regressions are sometimes associated with biased standard errors. He finds that a two-step EGMM procedure has moderately superior standard errors. This so-called Windmeijer correction is thus applied throughout this paper's estimations.

# V. Data

In order to keep things straightforward, the data used in this paper are mostly taken straight from existing databases. While in certain cases, the implication of this is a more limited sample and a significant loss of information, its advantage is that there is no need for a discussion on the origins of the data. As a result, in this paper the imputation of missing data is limited to the truly necessary, with the exception of Gini Index estimations, as discussed below. The result is that valuable information is not included (for example in the case of countries where only a single secondary control variable on, say, education is missing, the entire country-year observation is deleted).

Having said that, the study uses five-year periods from 1970 to 2010, with up to 214 countries out of those 1712 potential country-year observations, 20 do not contain any data. A further 149 only have data points concerning the growth of their population, thus leaving 1563 potential country-year observations during the relevant period.

Table 1 contains the descriptive statistics for the data used in this study. The dependent variables of GDP growth and household consumption come from the World Development Indicators (World Bank 2013), while the Human Development Index is compiled by UNDP.[4] The Gini coefficient is provided by Bircan, Brück, and Vothknecht (2010), who obtain their data from UNU-Wider (2008). This is the most complete collection of indicators of inequality collected from different sources. Bircan, Brück, and Vothknecht elect to ignore inequality estimates whose quality is ranked 4 out of 4 and then use a set of selection criteria to determine which estimates to use for country-years for which several estimates are available.[5] However, since we use five-yearly data (rather than the annual observations), we extrapolated

[4] The HDI is a measure that is exposed to some criticism as being rather ad hoc. In order to relieve this, here is a description of how the HDI is determined: $HDI = \sqrt[3]{LEI \cdot EI \cdot II}$, where the Life Expectancy Index LEI is defined as $\frac{LE-20}{82.3-20}$, the Education Index (EI) is defined as $\frac{\sqrt{\left(\frac{MYS}{13.2}\right)\cdot\left(\frac{EYS}{20.6}\right)}}{0.951}$ and the Income Index (II) is defined as $\frac{\ln(GNIpc)-\ln(100)}{\ln(107{,}721)-\ln(100)}$. The variables included are thus life expectancy (LE), Mean Years of Schooling (MYS), Expected Years of Schooling (EYS) and the Gross National Income per capita at purchasing power parity (GNIpc).

[5] They use the following retention rules: a) the highest-rated observation, b) data that cover the entire country, c) data based on gross or disposable income, d) data with the person as unit of analysis, e) those data that were adjusted for household size, f) data that use the household as an income sharing unit, g) data covering the whole population and all age groups. If there still several observations left in a particular country-year, the average is used.

and interpolated the data. When a year ending with a 5 or a 0 has observations on each side, with no more than six years in between, a linear interpolation is used. When there is only one-sided information, and a data point is available in an immediately contingent year, the observation of that year is used.[6] Using the data of Bircan, Brück, and Vothknecht, rather than those provided by the World Development Indicators, increases the number of observations from 461 to 638.

**TABLE 1**
**DESCRIPTIVE STATISTICS**

| Variable | Unit | N | Average | Standard deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Dependent Variables | | | | | | |
| GDP growth | Average annual growth (%) | 1 277 | 0.034 | 0.040 | -0.255 | 0.307 |
| HH consumption | Average annual growth (%) | 819 | 0.046 | 0.041 | 0.000 | 0.760 |
| GINI | Coefficient | 638 | 0.415 | 0.118 | 0.175 | 0.776 |
| HDI | Index | 807 | 0.598 | 0.187 | 0.176 | 0.948 |
| Primary control variables | | | | | | |
| FDI | Average share of GDP (%) | 1 139 | 0.034 | 0.061 | 0.000 | 1.217 |
| Real GDP/capita | USD in year 0 of period | 1 294 | 9 395 | 15 532 | 50 | 126 599 |
| Education | Tert. enrolment (% of age group) | 686 | 0.094 | 0.203 | 0.000 | 4.867 |
| Pop growth | Average annual growth (%) | 1 692 | 0.018 | 0.017 | -0.052 | 0.167 |
| Other controls | | | | | | |
| Government size | Average share of GDP (%) | 1 210 | 0.165 | 0.069 | 0.023 | 0.583 |
| Inflation | Average annual growth (%) | 1 107 | 0.005 | 0.039 | 0.000 | 0.860 |
| Trade intensity | Average share of GDP (%) | 1 257 | 0.804 | 0.483 | 0.007 | 4.162 |
| Domestic credit | Average share of GDP (%) | 1 199 | 0.006 | .040 | 0.000 | 0.966 |

Source: Described in the text.

The primary control variables, including FDI as a share of GDP, further include the real GDP per capita, the tertiary enrolment rate and the rate of population growth. Finally, other controls include government size, inflation, trade intensity (measured as the sum of imports and exports divided by GDP) and the provision of domestic credit. All these data are derived from the World Development Indicators. As discussed above, the measure of FDI includes lots of different elements that one could expect to have opposing effects. Greenfield and M&A activity are very different things. So are the impacts of export-seeking and market-seeking investment. But since more disaggregated data is not widely available, we analyze only the impact of overall FDI on welfare.

[6] As an example, if for a country, the values of 1988 and 1991 are available, the value of 1990 is interpolated. If a country's final observation is in 2004, the value of 2005 is set as equal to that of 2004.

# VI. Results

This paper addresses two things: First, it analyzes whether FDI has different effects on different elements of welfare, rather than just looking at GDP growth. Second, it clarifies whether there is a difference in using FE panel data estimations and the GMM estimator that controls for potential endogeneity problems. If it turns out that there is no difference between FE and GMM estimations, then we can reject endogeneity playing a role. If there is a difference between those estimators, we should recognize that FE estimations are biased and should thus not be used to draw conclusions from.

## A. Economic Growth

The first (and most standard) measure of welfare is the growth rate of GDP. As discussed above, both period- and country-fixed effects are included, in order to come up with a feasible estimation. The most basic estimation includes only the variables suggested by the neoclassical growth model (Mankiw, Romer, and Weil 1992): capital growth, investment in education and the growth of population, in addition to a convergence term. The results of that estimation are shown in column 1a of table 2. The results are as expected, although education does not obtain any significant results. Obviously, this FE estimation, and all others that follow use robust error terms and include year dummies in addition to the country fixed effects. Column 1b replicates this result, but uses the GMM estimator. In order to correct for the serial correlation in the dependent variable, one or more lags of it are included in the estimations with the decision of how many lags to include based on by the degree of residual serial correlation in the series. Year-fixed effects are included and the Windmeijer small-sample correction is also included. The primary difference between 1a and 1b is that the scale of some of the effects changes. It should be noted that, due to the inclusion of lags of the dependent variable, the point estimates of the convergence variable is not directly comparable any longer.

Column 2a includes FDI as an explanatory variable and one can see that, as was traditionally found, FDI has a positive effect on the growth of GDP. However, when we estimate the same equation using the AB-estimator (column 2b), we see that in reality, there is no significant impact of FDI on growth. Education continues to have a positive effect but a level of significance that does not meet the 10% threshold. Following Carkovic and Levine (2002), it is possible to see what happens with other potential explanatory variables. Columns 3a and 3b consider the impact of inflation (negative in both

estimations) while columns 4a and 4b include ln(govtexp), which also displays a negative impact, independent of the estimation technique. This implies that for each of these variables, endogeneity does not seem to affect the results. While adding these other variables, FDI continues to behave in the same manner: significant with FE analysis, but insignificant with GMM, correcting for potential endogeneity bias.

**TABLE 2**
**REGRESSION RESULTS WITH GDP GROWTH AS DEPENDENT VARIABLE**

| | 1a | 1b | 2a | 2b | 3a | 3b | 4a | 4b |
|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| Ln(gdpcap) | -0.063*** | -0.004*** | -0.068*** | -0.004** | -0.055*** | -0.004*** | -0.067*** | -0.003* |
| | (0.107) | (0.001) | (0.010) | (0.002) | (0.010) | (0.001) | (0.010) | (0.002) |
| Education[a] | 0.030 | 0.020 | 0.038* | 0.019 | 0.027 | 0.020* | 0.052** | 0.019 |
| | (0.024) | (0.012) | (0.022) | (0.013) | (0.233) | (0.011) | (0.021) | (0.013) |
| Δpopulation[a] | 0.904*** | 0.771*** | 0.949*** | 0.740*** | 0.940*** | 0.670*** | 0.950*** | 0.750*** |
| | (0.163) | (0.194) | (0.163) | (0.205) | (0.190) | (0.229) | (0.168) | (0.200) |
| GFCF[a] | 0.193*** | 0.267*** | 0.145*** | 0.235*** | 0.125*** | 0.208*** | 0.154*** | 0.240*** |
| | (0.039) | (0.049) | (0.040) | (0.064) | (0.042) | (0.066) | (0.039) | (0.062) |
| FDI[a] | | | 0.122** | 0.025 | 0.095* | 0.035 | 0.109** | 0.030 |
| | | | (0.057) | (0.048) | (0.056) | (0.046) | (0.050) | (0.046) |
| Inflation[a] | | | | | -0.279*** | -0.102** | | |
| | | | | | (0.077) | (0.040) | | |
| Government expenditures[a] | | | | | | | -0.186*** | -0.087*** |
| | | | | | | | (0.062) | (0.031) |
| Obs | 944 | 826 | 843 | 748 | 756 | 681 | 841 | 746 |
| Instruments | | 111 | | 146 | | 147 | | 147 |
| Within $R^2$ | 0.366 | | 0.405 | | 0.427 | | 0.424 | |
| Serial correlation test | | 0.288 | | 0.854 | | 0.875 | | 0.978 |
| Hansen test | | 0.462 | | 0.510 | | 0.469 | | 0.469 |

Source: Author's own calculations.
Note: FE indicates Fixed Effects panel data estimation, while GMM indicates the Arellano-Bond dynamic system Generalized Method of Moments technique. Year dummies and GMM lags of the dependent variable not shown. *, ** and *** indicate statistical significance with 10%, 5% and 1% respectively.
[a] Variable is included as log(1+variable).

In table 3, we continue exploring what happens when including alternative explanatory variables. Columns 5a and 5b both include trade, while 6a and 6b include private credit as alternative explanatory variables. The effect of these inclusions is similar to that of FDI. Once controlling for endogeneity by using the GMM approach, their levels of significance actually disappear. This should make clear that the FE-estimated values of these variables should not be taken at face value either. Consistently, FDI loses its level of significance as well.

Columns 7a and 7b include all of the previously tested variables at the same time. It now appears that trade openness remains consistent between estimations, but FDI is clearly not. In fact, according to the GMM estimates even the point estimate of the effect of FDI on GDP growth is zero. The oddly negative impact of domestic credit on economic growth also disappears entirely. Finally, columns 8a and 8b exclude inflation from the previous estimation, since this forms somewhat of a bottleneck for the number of observations available. Removing inflation does not significantly alter any of the other variables.

One possible explanation for a lack of significant effect is because of the interaction between GFCF and FDI, although as explained above, these variables do not in fact measure similar things.

Including an interaction term between those variables in order to test any possible effect does not yield any significant effect (not shown). An interaction between the measures of FDI and education, arguing that FDI may increase the impact of education, also yields no results (not shown). From these results, we can conclude that, once controlling for endogeneity bias, there is no significant impact of FDI on economic growth. This confirms the first hypothesis (H1) that is discussed in previous section. These results do not give an indication as to which of the necessary conditions for FDI to have a positive impact (see corollary) is violated. In the following subsections, we explore what happens to other measures of welfare and their relationship with FDI.

**TABLE 3**
**REGRESSION RESULTS WITH GDP GROWTH AS DEPENDENT VARIABLE AND A NUMBER OF ALTERNATIVE EXPLANATORY VARIABLES**

| | 5a | 5b | 6a | 6b | 7a | 7b | 8a | 8b |
|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| Ln(gdpcap) | -0.068*** | -0.004** | -0.054*** | -0.003* | -0.048*** | -0.003* | -0.055*** | -0.002 |
| | (0.103) | (0.002) | (0.010) | (0.002) | (0.009) | (0.001) | (0.010) | (0.002) |
| Education[a] | 0.034 | 0.021 | 0.066*** | 0.021 | 0.069*** | 0.028** | 0.069*** | 0.026* |
| | (0.023) | (0.013) | (0.021) | (0.013) | (0.216) | (0.011) | (0.021) | (0.013) |
| Δpopulation[a] | 0.992*** | 0.739*** | 0.984*** | 0.731*** | 1.020*** | 0.689*** | 1.013*** | 0.761*** |
| | (0.159) | (0.206) | (0.170) | (0.211) | (0.191) | (0.223) | (0.171) | (0.204) |
| GFCF[a] | 0.105*** | 0.219*** | 0.146*** | 0.227*** | 0.113*** | 0.203*** | 0.124*** | 0.218*** |
| | (0.039) | (0.064) | (0.041) | (0.064) | (0.041) | (0.064) | (0.040) | (0.062) |
| FDI[a] | 0.099* | 0.003 | 0.121** | 0.034 | 0.075 | 0.000 | 0.094* | -0.001 |
| | (0.055) | (0.051) | (0.054) | (0.048) | (0.046) | (0.048) | (0.049) | (0.049) |
| Inflation[a] | | | | | -0.284*** | -0.103*** | | |
| | | | | | (0.082) | (0.037) | | |
| Government expenditures[a] | | | | | -0.123* | -0.107*** | -0.148*** | -0.113*** |
| | | | | | (0.068) | (0.034) | (0.055) | (0.033) |
| Trade[a] | 0.067*** | 0.008 | | | -0.052*** | -0.017** | 0.057*** | 0.016* |
| | (0.018) | (0.009) | | | (0.016) | (0.009) | (0.019) | (0.009) |
| Credit[a] | | | -0.047*** | -0.007 | -0.055*** | -0.007 | -0.041*** | -0.007 |
| | | | (0.013) | (0.005) | (0.012) | (0.005) | (0.012) | (0.005) |
| Obs | 841 | 747 | 821 | 737 | 746 | 675 | 818 | 735 |
| Instruments | | 147 | | 147 | | 150 | | 149 |
| Within $R^2$ | 0.425 | | 0.393 | | 0.474 | | 0.421 | |
| Serial correlation test | | 0.952 | | 0.683 | | 0.729 | | 0.452 |
| Hansen test | | 0.496 | | 0.526 | | 0.416 | | 0.466 |

Source: Author's own calculations.
Note: Year dummies and GMM lags of the dependent variable not shown. *, ** and *** indicate statistical significance with 10%, 5% and 1% respectively.
[a] Variable is included as log(1+variable).

## 1. Household consumption

The growth of household consumption is closely related to GDP growth, but it does not measure quite the same thing. In fact, the correlation coefficient between GDP growth and household consumption growth in our sample is only 0.4438. Through consumption smoothing, households are able to guarantee a smoother consumption pattern than a national economy's growth rates, with much rarer sustained decreases of consumption than of GDP. One practical reason why one may see a difference between the previous results on GDP growth and those related to household consumption is because of more limited data availability of household consumption data. The number of observations is only 819, rather than 1277 for GDP growth.

A challenge for the analysis of household consumption is the lack of a clear theoretical model about which variables to include. For that reason, we take an approach that differs from the previous one. We start with all the previously included data, and add GDP growth to that (columns 1a and 1b in table 4), which actually show that very few of the variables come out significantly. In column 1a, rather surprisingly, inflation appears to exercise a positive influence, but once controlling for endogeneity in 1b, we see that the effect is indeed negative. From this initial estimation, we then continue to serially remove individual variables that are insignificant (with the exception of FDI and year dummies) to arrive at a more sparse model as displayed in 2a and 2b. In both of these, FDI continues not to exercise a significant influence. Rather surprisingly, in 2b, the availability of domestic credit appears to exercise a (marginally) significant negative effect on household consumption growth, whereas the impact of trade intensity disappears.

**TABLE 4**
**REGRESSION RESULTS WITH THE GROWTH OF HOUSEHOLD CONSUMPTION AS DEPENDENT VARIABLE**

| | 1a | 1b | 2a | 2b | 3a | 3b | 4a | 4b |
|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| ΔGDP[a] | 0.563*** | 0.382*** | 0.672*** | 0.442*** | | | | |
| | (0.075) | (0.091) | (0.088) | (0.091) | | | | |
| Ln(gdpcap) | 0.011* | -0.003 | 0.008* | -0.002* | -0.015** | -0.012*** | | -0.013*** |
| | (0.006) | (0.002) | (0.005) | (0.001) | (0.007) | (0.003) | | (0.003) |
| Education[a] | -0.007 | 0.010 | | | 0.024 | 0.044** | | 0.042** |
| | (0.234) | (0.013) | | | (0.021) | (0.019) | | (0.013) |
| Δpopulat[a] | 0.077 | 0.097 | | | 0.323 | -0.345 | | -0.375* |
| | (0.234) | (0.156) | | | (0.225) | (0.223) | | (0.218) |
| GFCF[a] | 0.021 | 0.065 | | 0.086* | 0.079 | 0.105** | 0.120*** | 0.102** |
| | (0.040) | (0.045) | | (0.050) | (0.049) | (0.045) | (0.042) | (0.048) |
| FDI[a] | 0.006 | -0.002 | 0.058 | 0.042 | 0.054 | 0.013 | 0.144 | 0.023 |
| | (0.049) | (0.040) | (0.066) | (0.038) | (0.058) | (0.061) | (0.097) | (0.062) |
| Inflation[a] | 0.067* | -0.192*** | 0.120** | -0.162*** | 0.019 | -0.254** | | -0.230** |
| | (0.040) | (0.056) | (0.051) | (0.051) | (0.038) | (0.103) | | (0.098) |
| Government expenditures[a] | -0.040 | -0.040 | | | -0.078 | -0.059 | | |
| | (0.052) | (0.034) | | | (0.060) | (0.044) | | |
| Trade[a] | 0.030* | 0.027*** | 0.034** | | -0.056*** | -0.035*** | | 0.031*** |
| | (0.017) | (0.007) | (0.015) | | (0.018) | (0.010) | | (0.011) |
| Credit[a] | -0.010 | -0.008* | | -0.006* | -0.037*** | -0.004 | -0.033*** | |
| | (0.008) | (0.004) | | (0.003) | (0.010) | (0.003) | (0.009) | |
| Obs | 580 | 489 | 647 | 432 | 582 | 490 | 713 | 492 |
| Instruments | | 110 | | 113 | | 143 | | 141 |
| Within $R^2$ | 0.338 | | 0.374 | | 0.195 | | 0.118 | |
| Serial correlation test | | 0.173 | | 0.454 | | 0.163 | | 0.111 |
| Hansen test | | 0.473 | | 0.547 | | 0.751 | | 0.670 |

Source: Author's own calculations.
Note: Year dummies and GMM lags of the dependent variable not shown. *, ** and *** indicate statistical significance with 10%, 5% and 1% respectively.
[a] Variable is included as log(1+variable).

Of course a significant difference between these models and the models from tables 2 and 3 concerns the inclusion of the growth of GDP as an explanatory variable. For that reason, in 3a, 3b, 4a and 4b, the preceding exercise is repeated, but without the inclusion of the GDP growth rate. 4b yields interesting results, with the convergence term being highly significant, and all of the other neoclassic growth variables significant as well. They do not all have the expected sign however, with population growth a negative, rather than a positive impact. One could theorize at a micro-

level that (at least in developed economies) an increase in the birth rate may induce people to save for future family-related expenditures. In developing economies, on the other hand, the classic literature (Becker 1988) would argue that having children discourages saving behavior. Important to note in all of these results is that FDI continues not to exercise a significant influence on the growth of household consumption. With regards to the hypotheses laid out in section III, the preceding findings concerning GDP growth implied that FDI should indeed have no effect on household consumption patterns (H2). This is confirmed in this section.

## 2. Gini coefficient

Another measure of welfare is a country's wealth distribution and this is a particular variable where FDI may theoretically have a significant impact. On the one hand, it could be theorized that FDI creates profitable job opportunities for low-skilled workers and that foreign investors are more likely to pay higher-than-average wages (Nunnenkamp 2004), while on the other hand, the benefits of FDI may be limited to only a small number of people, resulting in increases in inequality (Agénor 2004).

Estimating the relationship between the Gini coefficient and FDI is hampered by the same challenge as the previous subsection on household consumption: there is no obvious theoretical model that would argue for particular variables to be included. While we could logically argue that certain variables are more likely to exercise influence, it may be worthwhile to use an open mind to estimate the impact of the different variables, so we follow a similar method as in the previous subsection. The variables we include may be the same as we used above, but they largely overlap with the variables suggested in the existing literature. For an overview of the literature and possible contributing variables, consult Bircan, Brück, and Vothknecht (2010).

The next challenge that is specific to the Gini is that it is principally a different type of variable than GDP growth or the growth of household consumption: the Gini is a stock variable, rather than a flow one. When trying to explain a stock variable, it is necessary to include a lagged value of itself, since this is an obvious relationship.

Columns 1a-2b in table 5 use absolute levels of the dependent variable, whereas columns 3a-4b use the change in Gini, rather than the value thereof. The difference between 1a (FE) and 1b (GMM) is remarkable, with the FE estimation not finding any significant variables, whereas the GMM estimates find a number of relevant variables. In 2a, the reduced form of the first estimation, it turns out that the growth rate of GDP is borderline significant in FE, but that the GMM results are again very different. An increase in GDP per capita is associated with a decrease in the Gini, which makes sense when acknowledging that these are the within-country estimated values, rather than estimations across countries. Population growth is associated with an increase in inequality, which could be driven by the fact that particularly high population growth rates can exacerbate poverty, particularly in countries where reproductive behavior differs a lot between poor and rich. Inflation also leads to higher levels of inequality, which can be explained by the ability of the rich to shield themselves better from the impact of inflation. Finally, the availability of credit reduces inequality, which is also sensible since an extension of the availability of credit makes the financial system more inclusive and thus able to help alleviate poverty.

Interestingly enough, there is strong evidence that FDI encourages inequality. While this result is not identifiable in the FE estimations, the GMM estimations clearly indicate a significant effect. This is an interesting contribution to the existing debate about the beneficiaries of FDI inflows (if there are any). These results appear to indicate that the wealthy do indeed benefit from FDI inflows, whereas the poor benefit less (or not at all), thus leading to an increase in inequality, confirming the theories of Agénor (2004). In addition to Agénor's arguments, one possible channel through which this may play out is through governments using labor market reforms to attract investors. Such labor market reforms may reduce lower-skilled workers' bargaining capacity.

**TABLE 5**
**REGRESSION RESULTS WITH THE GINI COEFFICIENT (1A-2B) OR THE CHANGE IN THE GINI COEFFICIENT (3A-4B) AS DEPENDENT VARIABLE**

| | 1a | 1b | 2a | 2b | 3a | 3b | 4a | 4b |
|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| Lagged Gini | -0.301 | 0.364*** | | 0.305*** | -1.030*** | -0.442*** | -0.939*** | -0.407*** |
| | (0.077) | (0.115) | | (0.098) | (0.077) | (0.125) | (0.057) | (0.109) |
| ΔGDP[a] | 0.117 | -0.162 | 0.163* | | 0.117 | -0.219* | | |
| | (0.219) | (0.117) | (0.084) | | (0.219) | (0.121) | | |
| Ln(gdpcap) | -0.035 | -0.016*** | | -0.018*** | -0.035 | -0.016*** | | -0.146*** |
| | (0.047) | (0.006) | | (0.005) | (0.047) | (0.005) | | (0.004) |
| Education[a] | -0.024 | 0.035 | | | -0.024 | 0.051 | | |
| | (0.081) | (0.059) | | | (0.081) | (0.049) | | |
| Δpopulation[a] | -0.423 | 2.131*** | | 2.352*** | -0.423 | 1.361* | | |
| | (0.755) | (0.718) | | (0.656) | (0.755) | (0.737) | | |
| GFCF[a] | 0.124 | 0.046 | | | 0.124 | 0.075 | | |
| | (0.163) | (0.139) | | | (0.163) | (0.098) | | |
| FDI[a] | 0.281 | 0.580*** | -0.289 | 0.355** | 0.281 | 0.398*** | 0.214 | 0.308*** |
| | (0.189) | (0.175) | (0.183) | (0.146) | (0.189) | (0.145) | (0.166) | (0.096) |
| Inflation[a] | 0.043 | 0.189* | | 0.265** | 0.043 | 0.148 | | |
| | (0.090) | (0.114) | | (0.109) | (0.090) | (0.122) | | |
| Government expenditures[a] | -0.194 | -0.228* | | | -0.194 | -0.180 | | -0.248* |
| | (0.148) | (0.118) | | | (0.148) | (0.110) | | (0.135) |
| Trade[a] | -0.057 | -0.021 | | | -0.057 | -0.024 | | |
| | (0.046) | (0.032) | | | (0.046) | (0.024) | | |
| Credit[a] | -0.006 | -0.021** | | -0.022** | 0.006 | -0.020* | | |
| | (0.029) | (0.010) | | (0.009) | (0.029) | (0.012) | | |
| Obs | 297 | 297 | 429 | 327 | 297 | 250 | 373 | 296 |
| Instruments | | 84 | | 78 | | 85 | | 78 |
| Within $R^2$ | 0.166 | | 0.124 | | 0.714 | | 0.644 | |
| Serial correlation test | | 0.377 | | 0.468 | | 0.439 | | 0.399 |
| Hansen test | | 0.444 | | 0.548 | | 0.678 | | 0.221 |

Source: Author's own calculations.
Note: Year dummies and GMM lags of the dependent variable not shown. *, ** and *** indicate statistical significance with 10%, 5% and 1% respectively.
[a] Variable is included as log(1+variable).

In columns 3a and 3b, we adjust the dependent variable to the change in the Gini coefficient. That is, rather than a stock variable, the dependent variable can now be compared to a flow variable. Obviously, this changes the implication for the value of lagged Gini, which thus becomes a driver of conditional convergence in the Gini and should therefore have a negative, rather than a positive impact. The FE results, whether complete (3a) or reduced (4a) do not show any impact of any of the variables. The GMM results, on the other hand, obtain results that are largely similar to the absolute Gini estimates. Neither population growth, nor the availability of domestic credit was significant any longer, whereas government expenditure now has a significant and negative impact. This can be explained by the fact that government expenditures are generally redistributive, thus leading to a more equal economy. Interestingly enough, the measure for FDI is again significant and positive, thus confirming the fact that any possible benefits of FDI are not equally distributed. This confirms the fourth hypothesis from the theory section (H3), which states that FDI is expected to encourage inequality.

The conclusion that FDI encourages inequality is an unambiguous statement, but the fact that this should be considered a negative impact for welfare is not. Many would argue that inequality may have positive side effects, particularly in the case of a rising tide that lifts all boats. However, we have already previously concluded that FDI does not lead to a rising tide. If the average (measured by

GDP) does not benefit from FDI, while inequality increases, by definition that implies that the poor are indeed worse off as a result of FDI. It is that result that indicates that FDI's positive impact on inequality is indeed bad for welfare.

## 3. Human Development Index

Like in the previous analyses, there are no obvious models that could be used for this estimation, and like with the Gini coefficient, the HDI coefficient is in fact a stock variable. For that reason, we follow the same type of estimation strategy as in section VI.3. While we could logically argue that certain variables are more likely to exercise influence (the level of GDP is likely to be positive, while inflation could be expected to have a negative influence, for example), this way we can keep an open mind.

In columns 1a and 1b of table 6 we include all previous variables, and the lag of HDI, while using HDI as a dependent variable. Regarding most explanatory variables, there is not much surprise. If anything, the significant positive effect of GDP per capita in 1a could be considered surprising, but it disappears in the more advanced GMM estimation (1b). Population growth has a significant negative effect on HDI, independent of the type of estimation, but there is an immediately obvious explanation for that. FDI, the variable we are most interested in, has a consistently negative effect as well. This preliminarily finding implies that FDI indeed has a negative effect, thus confirming the results of Kosack and Tobin (2006). In columns 2a and 2b, insignificant variables have been sequentially dropped. The differences between the FE and GMM results are striking. FE's significant effects for population growth, inflation and domestic credit are not supported by the GMM results, while GMM identifies a negative and significant effect of government expenditures. The FE and GMM results agree, however, that GDP growth and the level of GDP per capita both have a significant impact, and more interestingly, they both find that FDI has a significant and negative impact.

Looking at the change in HDI, the results are not substantially different. In 3a and 3b, we find that the results do not differ strongly between the FE and GMM models and that FDI again has a negative and significant impact.

Finally, columns 4a and 4b sequentially drop the insignificant variables to end up with a smaller set of explanatory variables. Population growth continues to be negative according to the GMM estimator, while conditional convergence is found in both lagged HDI (both estimators) and GDP per capita (GMM only). Once more, the variable that we are particularly interested in, FDI, has a negative and significant impact.

The implication of the results found in table 6 seem to be that FDI negatively affects HDI, but while this may be empirically true,[7] it is difficult to envisage a logical explanation behind it, particularly after controlling for other important variables related to growth and conditional convergence of HDI levels. More importantly, it is difficult to square these results with the results previously obtained (tables 2 and 4) that indicate no relationship between FDI and economic growth. Beyond what has been offered before, a potential explanation could be that this is driven by OECD countries, which is unlikely since we are controlling for country-fixed effects in all estimations. Including an OECD membership dummy does not significantly affect the results, and neither does excluding OECD countries from the estimations. Specific regions that may be subject to different kinds of pressures may be another possible source of the result, but excluding either Asian or Latin American countries does not significantly alter the findings.

[7] Please note that this is not the first time this result is found. Kosack and Tobin (2006) reach the same conclusion.

**TABLE 6**
**REGRESSION RESULTS WITH THE HUMAN DEVELOPMENT INDEX (HDI) (1A-2B) OR THE CHANGE IN HDI (3A-4B) AS DEPENDENT VARIABLE**

| | 1a | 1b | 2a | 2b | 3a | 3b | 4a | 4b |
|---|---|---|---|---|---|---|---|---|
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| Lagged HDI | 0.690*** | 0.945*** | 0.694*** | 0.990*** | -0.214*** | -0.053** | -0.225*** | -0.067*** |
| | (0.043) | (0.045) | (0.040) | (0.019) | (0.028) | (0.022) | (0.025) | (0.015) |
| ΔGDP[a] | 0.219*** | 0.307*** | 0.250*** | 0.281*** | 0.127*** | 0.202*** | 0.129*** | 0.215*** |
| | (0.025) | (0.044) | (0.025) | (0.024) | (0.016) | (0.033) | (0.017) | (0.028) |
| Ln(gdpcap) | 0.014** | -0.005 | 0.018*** | 0.035* | 0.075* | 0.004** | 0.009*** | -0.006*** |
| | (0.07) | (0.004) | (0.006) | (0.002) | (0.004) | (0.002) | (0.004) | (0.001) |
| Education[a] | -0.027 | 0.002 | | | -0.001 | 0.003 | | |
| | (0.013) | (0.013) | | | (0.008) | (0.006) | | |
| Δpopulation[a] | -0.240*** | -0.320*** | -0.244*** | | -0.124* | -0.258*** | | -0.266*** |
| | (0.013) | (0.123) | (0.029) | | (0.064) | (0.083) | | (0.083) |
| GFCF[a] | 0.028 | 0.024 | | | 0.021 | -0.016 | 0.025* | |
| | (0.020) | (0.028) | | | (0.014) | (0.016) | (0.013) | |
| FDI[a] | -0.064*** | -0.086*** | -0.053** | -0.079*** | -0.041*** | -0.026*** | -0.040*** | -0.033*** |
| | (0.021) | (0.023) | (0.022) | (0.017) | (0.015) | (0.010) | (0.014) | (0.011) |
| Inflation[a] | 0.015 | 0.010 | -0.053** | | 0.006 | -0.025*** | | |
| | (0.018) | (0.028) | (0.022) | | (0.014) | (0.009) | | |
| Government expenditures[a] | -0.029 | -0.035 | | -0.044*** | -0.021 | -0.012 | | |
| | (0.049) | (0.024) | | (0.017) | (0.032) | (0.012) | | |
| Trade[a] | 0.012 | -0.000 | | | 0.008 | -0.000 | | |
| | (0.011) | (0.005) | | | (0.007) | (0.003) | | |
| Credit[a] | -0.008 | 0.001 | -0.011** | | -0.004 | 0.000 | -0.009*** | |
| | (0.005) | (0.002) | (0.005) | | (0.003) | (0.001) | (0.003) | |
| Obs | 576 | 576 | 663 | 703 | 576 | 479 | 689 | 576 |
| Instruments | | 109 | | 146 | | 110 | | 139 |
| Within $R^2$ | 0.954 | | 0.950 | | 0.419 | | 0.441 | |
| Serial correlation test | | 0.767 | | 0.450 | | 0.646 | | 0.399 |
| Hansen test | | 0.128 | | 0.331 | | 0.194 | | 0.221 |

Source: author's own calculations.
Note: Year dummies and GMM lags of the dependent variable not shown. *, ** and *** indicate statistical significance with 10%, 5% and 1% respectively.
[a] Variable is included as log(1+variable).

One possible explanation for the results can be found in national policymaking. Policymakers generally face a budget constraint that allows them to make certain spending choices. One could argue that expenditures on attracting FDI may thus result in lower expenditures on health and education, which could imply a negative relationship between attracting FDI and lower levels of HDI. However, it should be acknowledged that this is a tenuous relationship (described in H4 in section III) and to show this is the driving force behind the results found in this subsection, further research would be required.

## 4. Differences across countries

One of the ways through which one could imagine the results to differ is through country types. For that reason, in this subsection, we look at some specific country types. Using the World Development Indicators, we consider the percentages of exports as a percentage of merchandise exports. For the starting year of each five-year period, we see which one of three merchandise export types is the largest: manufacturing, natural resources and agriculture. Of the observations for which we have other data available, manufacturing is most important in some 43% of country-year observations, agriculture in 32% of countries and natural resources in 20% of countries. This leads to a problem for natural resources, since it results in the fact that countries for which natural

resources are the most important are too limited to warrantee the small-T, large-N assumption necessary for using the GMM estimator. We thus look only at country-years that are either manufacturing or agricultural exporters.

In table 7, columns 1a-2b replicate the results from table 5 (columns 7a-b) while differentiating between a manufacturing-only sample (1a-b) and an agriculture-only sample (2a-b). We can observe that the patterns found above are more subdued here. This is primarily the result of the significantly smaller sample size. Clearly, not even the Fixed Effects estimations are able to identify any impact of FDI on GDP growth. At the same time, we see that certain effects are more pronounced in this particular case. Having said that, the results should be taken as indicative only; even with the manufacturing-only selection, the low number of groups is taking its toll on the GMM estimator.

**TABLE 7**
**REGRESSION RESULTS WITH GDP GROWTH (1A-2B) AND THE ABSOLUTE GINI COEFFICIENT (3A-4B) AS DEPENDENT VARIABLE**

| | 1a | 1b | 2a | 2b | 3a | 3b | 4a | 4b |
|---|---|---|---|---|---|---|---|---|
| | | | | GDP | | | | Gini Coefficient |
| | Manufacturing | | | Agriculture | Manufacturing | | | Agriculture |
| | FE | GMM | FE | GMM | FE | GMM | FE | GMM |
| Lagged Gini | | | | | -0.206** | 0.352** | -0.039 | 0.433*** |
| | | | | | (0.100) | (0.157) | (0.093) | (0.147) |
| ΔGDP[a] | | | | | 0.899** | -0.053 | -0.333 | -0.003 |
| | | | | | (0.415) | (0.159) | (0.370) | (0.271) |
| Ln(gdpcap) | -0.088*** | -0.005*** | -0.047*** | -0.001 | 0.133* | -0.015** | -0.175** | -0.013 |
| | (0.018) | (0.002) | (0.009) | (0.003) | (0.077) | (0.006) | (0.086) | (0.011) |
| Education[a] | 0.073** | 0.023** | 0.036 | 0.064** | -0.076 | 0.014 | 0.489** | -0.027 |
| | (0.033) | (0.010) | (0.045) | (0.027) | (0.084) | (0.072) | (0.228) | (0.096) |
| Δpopulat.[a] | 0.322 | 0.666*** | 0.805*** | 1.133*** | -0.915 | -1.724** | -3.470*** | 0.292 |
| | (0.400) | (0.259) | (0.271) | (0.284) | (1.077) | (0.792) | (1.191) | (1.089) |
| GFCF[a] | 0.255*** | 0.148** | 0.094* | 0.144*** | 0.105 | 0.271* | 0.908** | 0.142 |
| | (0.093) | (0.062) | (0.051) | (0.046) | (0.322) | (0.157) | (0.347) | (0.212) |
| FDI[a] | -0.018 | -0.013 | -0.051 | -0.053 | 0.230 | 0.513** | -0.665 | -0.244 |
| | (0.049) | (0.037) | (0.093) | (0.098) | (0.139) | (0.212) | (0.616) | (0.664) |
| Inflation[a] | -0.384** | -0.002 | -0.212* | -0.210** | -0.089 | 0.206 | -0.069 | 0.252 |
| | (0.170) | (0.110) | (0.114) | (0.100) | (0.128) | (0.150) | (0.228) | (0.340) |
| Government expenditures[a] | -0.122 | -0.028 | -0.103 | -0.123** | -0.339* | -0.055 | 0.139 | -0.190 |
| | (0.101) | (0.041) | (0.069) | (0.052) | (0.177) | (0.127) | (0.135) | (0.283) |
| Trade[a] | 0.025 | 0.007 | 0.075** | 0.031** | -0.058 | -0.081** | 0.123 | 0.000 |
| | (0.030) | (0.008) | (0.305) | (0.012) | (0.062) | (0.040) | (0.106) | (0.051) |
| Credit[a] | -0.046*** | -0.005 | -0.040* | -0.051** | 0.030 | -0.014* | 0.139 | 0.070 |
| | (0.016) | (0.003) | (0.022) | (0.021) | (0.030) | (0.008) | (0.135) | (0.066) |
| Obs | 337 | 305 | 231 | 215 | 169 | 169 | 77 | 77 |
| Instruments | | 61 | | 61 | | 81 | | 43 |
| Within $R^2$ | 0.584 | | 0.407 | | 0.304 | | 0.658 | |
| Serial correlation test | | 0.914 | | 0.404 | | 0.378 | | 0.576 |
| Hansen test | | 0.312 | | 0.543 | | 0.944 | | 0.915 |

Source: Author's own calculations.
Note: Year dummies and GMM lags of the dependent variable not shown. *, ** and *** indicate statistical significance with 10%, 5% and 1% respectively.
[a] Variable is included as log(1+variable).

While it is possible to replicate all of the results previously obtained, for brevity's sake, we focus on only a few of them. We thus skip the estimations on household consumption, as well as HDI, and

focus on the Gini coefficient. The Gini coefficient suffers from an exacerbated version of the challenges encountered in the GDP analysis. Since the number of observations is smaller in general, the small-T, large-N assumption is even more difficult to uphold. Even the FE estimations (particularly with respect to agriculture) suffer from a lack of observations.

Having said that, columns 3a-4b in table 7 replicate the results from table 5's 1a-b. We see that many factors are deemed insignificant, as a result of the lack of observations. We do find though that, for the manufacturing sample, the inequality-enhancing effect of FDI is retained for the GMM estimation. In the agriculture sample, this effect is reversed, but highly insignificant.

Overall, the results from this subsection are not conclusive, but they do provide some support that the effects we identify may be specific to certain types of economies. However, for conclusive evidence, further research shall be required.

# VI. Conclusions

In this paper, we look at the relationship between FDI and welfare in a general sense. We do so by using more advanced econometric methodology to test whether there is a significant effect of FDI on different measures of welfare. Most importantly, we confirm the results that have previously been found that the flow of FDI has no discernable impact on the rate of economic growth. In addition to that, FDI neither affects the growth of household consumption, which is correlated with GDP growth in any case.

More interestingly, the conclusion that FDI increases inequality (by measure of the Gini index) is also very important. This supports evidence from the existing research that any existing benefits from FDI are reaped by the wealthy rather than the poor. In fact, since the poor are particularly affected by changes in the level of HDI, it may even be possible to conclude that FDI makes poor people worse off, while the relatively wealthy benefit. Similarly, we find that FDI has a negative impact on measures of Human Development, in particular the Human Development Index.

We theorize that the channel for this effect can be found in the fact that government spending excessively on the attraction of FDI may be lacking the capacity to invest in things that are important to Human Development (in particular, health and education).

The conclusions that can be drawn from these results are manifold. First, FDI is not the magic bullet that policymakers sometimes expect it to be. While there are many specific instances increases in FDI were associated with economic improvements, this should not be considered a fixed rule. Rather, if a government is serious about attracting FDI, our results call for very careful consideration and targeted FDI strategies. That is, FDI promotion policies should only be considered after very careful cost-benefit analysis. Second, it is important for governments to take a broader view of the economy. Rather than focusing on the attraction of FDI as a goal itself, it should focus on improving the investment climate and improving economic circumstances. If such changes lead to an increase in FDI, that is okay, but the attraction of FDI should not be the primary policy focus. Third, it appears that the benefits of FDI in a country are not equally distributed. If this finding can be corroborated with micro-level data, it may be worthwhile to alleviate the negative impacts of FDI while continuing to enjoy the positive ones. This could, for example, be done by improving the access to education and the access to domestic credit.

# Bibliography

Agénor, Pierre-Richard. 2004. "Does Globalization Hurt the Poor?" *International Economics and Economic Policy* 1 (1): 21–51.

Aitken, Brian J., and Ann E. Harrison. 1999. "Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela." *American Economic Review*: 605–618.

Alfaro, Laura, Areendam Chanda, Sebnem Kalemli-Ozcan, and Selin Sayek. 2004. "FDI and Economic Growth: The Role of Local Financial Markets." *Journal of International Economics* 64 (1): 89–112.

Arellano, Manuel, and Stephen Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *The Review of Economic Studies* 58 (2): 277–297.

Arellano, Manuel, and Olympia Bover. 1995. "Another Look at the Instrumental Variable Estimation of Error-Components Models." *Journal of Econometrics* 68 (1): 29–51.

Basu, Parantap, Chandana Chakraborty, and Derrick Reagle. 2003. "Liberalization, FDI, and Growth in Developing Countries: A Panel Cointegration Approach." *Economic Inquiry* 41 (3): 510–516.

Becker, Gary S. 1988. "Family Economics and Macro Behaviorl." *The American Economic Review* 78 (1): 1–13.

Bircan, Cagatay, Tilman Brück, and Marc Vothknecht. 2010. *Violent Conflict and Inequality*. Forschungsinstitut zur Zukunft der Arbeit GmbH. http://papers.ssrn.com/sol3/papers.cfm?abstract_id= 1631125.

Blomström, Magnus, and Ari Kokko. 2003. "The Economics of Foreign Direct Investment Incentives". National Bureau of Economic Research. http://www.nber.org/papers/w9489.

Bond, Stephen Roy, Anke Hoeffler, and Jonathan Temple. 2001. "GMM Estimation of Empirical Growth Models". Economics Group, Nuffield College, University of Oxford. http://econpapers.repec.org/paper/nufeconwp/0121.htm.

Borensztein, Eduardo, Jose De Gregorio, and Jong-Wha Lee. 1998. "How Does Foreign Direct Investment Affect Economic Growth?" *Journal of International Economics* 45 (1): 115–135.

Carkovic, Maria, and Ross Levine. 2002. "Does Foreign Direct Investment Accelerate Economic Growth?" *U of Minnesota Department of Finance Working Paper*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=314924.

Chandra, Vandana, and Shashi Kolavalli. 2006. "Technology, Adaptation, and Exports: How Some Countries Got It Right." In *Technology, Adaptation, and Exports: How Some Developing Countries Got It Right*, by Vandana Chandra, 252:1–49. World Bank Publications.

Chowdhury, Abdur, and George Mavrotas. 2006. "FDI and Growth: What Causes What?" *The World Economy* 29 (1): 9–19.

Dries, Liesbeth, and Johan FM Swinnen. 2004. "Foreign Direct Investment, Vertical Integration, and Local Suppliers: Evidence from the Polish Dairy Sector." *World Development* 32 (9): 1525–1544.

Goyal, Rishi, and Jingqing Chai. 2008. Tax Concessions and Foreign Direct Investment in the Eastern Caribbean Currency Union. International Monetary Fund.

Hansen, Henrik, and John Rand. 2006. "On the Causal Links between FDI and Growth in Developing Countries." The World Economy 29 (1): 21–41.

Harrison, Ann, and Andrés Rodríguez-Clare. 2009. "Trade, Foreign Investment, and Industrial Policy for Developing Countries". National Bureau of Economic Research. http://www.nber.org/papers/w15261.

Havranek, Tomas, and Zuzana Irsova. 2011. "Estimating Vertical Spillovers from FDI: Why Results Vary and What the True Effect Is." Journal of International Economics 85 (2): 234–244.

Herzer, Dierk, Stephan Klasen, and Felicitas Nowak-Lehmann. 2008. "In Search of FDI-Led Growth in Developing Countries: The Way Forward." Economic Modelling 25 (5): 793–810.

Ito, Takatoshi, and Anne O. Krueger. 2000. "Introduction to' Role of Foreign Direct Investment in East Asian Economic Development, The (NBER-EASE Volume 9).'" In The Role of Foreign Direct Investment in East Asian Economic Development, 9:1–8. NBER-EASE. University of Chicago Press. http://www.nber.org/chapters/c8493.pdf.

Kosack, Stephen, and Jennifer Tobin. 2006. "Funding Self-Sustaining Development: The Role of Aid, FDI and Government in Economic Success." International Organization 60 (1): 205.

Mankiw, N. Gregory, David Romer, and David N. Weil. 1992. "A Contribution to the Empirics of Economic Growth." The Quarterly Journal of Economics 107 (2): 407–437.

Nourzad, Farrokh. 2008. "Openness and the Efficiency of FDI: A Panel Stochastic Production Frontier Study." *International Advances in Economic Research* 14 (1): 25–35.

Nunnenkamp, Peter. 2004. "To What Extent Can Foreign Direct Investment Help Achieve International Development Goals?" *The World Economy* 27 (5): 657–677.

Roodman, David. 2008. "Through the Looking Glass, and What Ols Found There: On Growth, Foreign Aid, and Reverse Causality." *Center for Global Development Working Paper* (137). http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1100142.

——— 2009. "A Note on the Theme of Too Many Instruments*." *Oxford Bulletin of Economics and Statistics* 71 (1): 135–158.

UNCTAD. 2013. "Foreign Direct Investment (FDI)." *UNCTAD*. Accessed January 10. http://unctad.org/en/Pages/DIAE/Foreign-Direct-Investment-(FDI).aspx.

UNU-Wider. 2008. "UNU-WIDER World Income Inequality Database, Version 2.0c, May 2008". UNU Wider.

Windmeijer, Frank. 2005. "A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators." *Journal of Econometrics* 126 (1): 25–51.

World Bank. 2013. "World Development Indicators 2013". World bank. http://data.worldbank.org/data-catalog/world-development-indicators.

Zhang, Kevin Honglin. 2001. "Does Foreign Direct Investment Promote Economic Growth? Evidence from East Asia and Latin America." *Contemporary Economic Policy* 19 (2): 175–185.

UNITED NATIONS

# Series:

ECLAC **Production Development**

## Issues published

**A complete list as well as pdf files are available at**

**www.eclac.org/publicaciones**

196. Foreign direct investment and welfare, Olaf J. de Groot (LC/L.3800), 2014.
195. Chinese foreign direct investment in Latin America and the Caribbean, Taotao Chen and Miguel Pérez Ludeña (LC/L.3785), 2014.
194. Tecnología, heterogeneidad y crecimiento: una caja de herramientas estructuralistas, Mario Cimoli, Gabriel Porcile (LC/L.3736), 2013.
193. The public debate about agrobiotechnology in Latin American countries: A comparative study of Argentina, Brazil and Mexico. Renata Campos Motta (LC/L.3591), 2013.
192. The top 20 multinationals in Chile in 2010: retail, forestry and transport lead the international expansion. Miguel Pérez Ludeña (LC/L.3399), 2011.
191. Crecimiento en base a los recursos naturales. Tragedia de los comunes y el futuro de la industria salmonera chilena. Jorge Katz, Mishiko Lizuka y Samuel Muñoz (LC/L.3307-P), No de venta S.11.II.G.28, (US$10.00), 2011.
190. Transmisión de precios en los mercados del maíz y arroz en América Latina, Laure Dutoit, Karla Hernández y Cristóbal Urrutia (LC/L.3271-P ), Nº venta S.10.II.G.77 (US$10.00), 2010.
189. Evolución en las estrategias de expansión internacional del sector turísticos vacacional: el papel de las empresas españolas en Latinoamérica, Ana Ramón (LC/L.3134.P), Nº venta S.09.II.G.109 (US$10.00), 2010.
188. Arbitraje internacional basado en cláusulas de solución de controversias entre los inversionistas y el estado en acuerdos internacionales de inversión: desafíos para América Latina y el Caribe, Michael Mortimore (LC/L.3049-P) Nº de venta S.09. II. G.51 (US$10.00), 2009.
187. Theory and Practice of Industrial Policy. Evidence from the Latin American Experience, Wilson Peres, Annalisa Primi (LC/L.3013-P) Nº de venta E.09.II.G.34 (US$10.00), 2009.
186. Aglomeraciones productivas locales en Brasil, formación de recursos humanos y resultados de la experiencia CEPAL/SEBRAE, Francisco Teixeira, Carlo Ferraro (LC/L.3005-P) Nº de venta S.09.II.G.13 (US$10.00), 2009.
185. Del monopolio de Estado a la convergencia tecnológica: evolución y retos de la regulación de telecomunicaciones en América Latina, Carlos Razo, Fernando Rojas (LC/L.2849-P) Nº de venta S.07.II.G.172 (US$10.00), 2007
184. Evaluación de un programa de innovación y sistemas de producción en América Latina: estudio sobre la dinámica de redes, Mario Cimoli (LC/L.2842-P) Nº de venta S.07.II.G.165 (US$10.00), 2007.
183. Pobreza rural y políticas de desarrollo: avances hacia los Objetivos de Desarrollo del Milenio y retrocesos de la agricultura de pequeña escala, Martine Dirven (LC/L.2841-P) Nº de venta S.07.II.G.164 (US$10.00), 2007.

196

# PRODUCTION DEVELOPMENT

ECLAC Series

ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN
COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE
www.eclac.org