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Ronald B. Davies
Department of Economics, University of Oregon

Annie Voy
Department of Economics, University of Oregon

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Ronald B. Davies* **and Annie Voy****

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Abstract: This paper examines the extent to which foreign direct investment (FDI) affects child labor. Using 1995 data for 145 countries, we find that, contrary to common fears, FDI is negatively correlated with child labor. This effect, however, disappears when controlling for per capita income. After doing so, we find no robust effect of either FDI or international trade on child labor. This result is robust to corrections for the endogeneity of FDI, trade, and income. Furthermore, this result is confirmed when using data from earlier years and when using fixed effects. This suggests that the impact of FDI and trade on child labor, if any, is the increases in income they generate.

JEL Classification: F14, F16, F23

Key Words: Child Labor, Foreign Direct Investment, International Trade

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* Department of Economics, 435 PLC Building, 1285 University of Oregon, Eugene, OR 97405. Phone: (541) 346-4671. Fax: (541) 346-1243. Email: rdavies@uoregon.edu. We thank Eric Edmonds and Nina Pavcnik for helpful comments and for graciously sharing some of their data with us. All remaining errors are entirely our own.
** Department of Economics, 418 PLC Building, 1285 University of Oregon, Eugene, OR 97405. Phone: (541) 346-4675. Fax: (541) 346-1243. Email: avoy@uoregon.edu

1. Introduction

The effect of trade liberalization and foreign direct investment (FDI) on child labor is a central issue in the globalization debate (Edmonds, forthcoming, provides an overview of this debate). Proponents of globalization argue that free trade increases income and therefore decreases the incidence of child labor. If households send their children to work not out of greed but rather subsistence, then increases in income may push the household above its subsistence threshold, allowing it to reduce or eliminate reliance on income generated through child labor. On the other hand, opponents of globalization argue that globalization increases the demand for cheap, unskilled labor leading to higher incidences of child labor. The net effect of trade on child labor depends on the respective magnitudes of these effects.

This paper analyzes the relationship between openness to international trade and child labor with particular attention paid to the role of foreign direct investment. While the economic literature overwhelmingly fails to find a positive correlation between trade openness and child labor, these studies focus on imports and exports (as a percent of GDP).[1] FDI may therefore have a different effect on child labor than other measures of trade openness. Additionally, with the exception of Edmonds and Pavcnik (2006), previous research ignores the fact that measures of globalization are endogenous to child labor. This paper addresses this issue by using an expanded data set that includes more countries and additional years.

Our results indicate that there exists a negative relationship between FDI and child labor which is strengthened after controlling for endogeneity. This effect, however, appears to mainly be channeled through an income effect. As a result, when per capita income is added to the model, the significance of the relationship between FDI and child labor vanishes. We show that

[1] Neumayer and DeSoysa (2005) are a notable exception. However, as discussed below, by not dealing with the likely endogeneity of FDI and openness, their results are likely biased.

this general result is not driven by omitted variables which drive the relationship between child labor and income by including a set of country specific control variables which are mostly insignificant. A key implication of these results is that in a time when many developing nations are using tax breaks to attract FDI, if doing so forces them to compensate by raising taxes on households, this may actually increase child income by limiting the income effect.

In addition to FDI alone, we are interested in the simultaneous but independent effects of FDI and trade openness on child labor. To test this, trade openness (exports plus imports as a percent of GDP) is added to the FDI equation. As in other studies, we do in fact find negative and significant coefficients on both our FDI and trade coefficients suggesting FDI and trade affect child labor independently. In particular, we find that of the two FDI may well have a more significant role in reducing child labor as only the effect from FDI remains after controlling for the endogeneity of each using instrumental variables. Nevertheless, after the inclusion of per capita income in our model, the significance of both evaporates, suggesting that these effects are largely driven by the impact of globalization on income. This result is robust to the use of additional time series data.

The paper proceeds as follows. Section 2 reviews the existing literature on globalization and child labor. Section 3 highlights the avenues by which FDI might affect child labor apart from its effects on trade. Section 4 describes our empirical methodology and our data. Section 5 reports our results and Section 6 concludes.

2. Literature Review

The empirical research literature, by and large, is unable to find any evidence that trade liberalization raises the incidence of child labor. In fact, it is often found that greater

international trade is associated with lower levels of child labor. The bulk of the literature uses measures of trade openness (export and import shares of GDP or an openness dummy variable) to analyze the relationship. By way of contrast, with the exception of Neumayer and DeSoysa (2005), the effect of FDI on child labor has not been studied by economists.

In their 2005 study, Neumayer and DeSoysa use both FDI and trade openness to explain child labor. They find that countries with higher levels of trade and FDI have lower levels of child labor. The effect, however, though significant at the 1% level is very small in magnitude: for every 1 percentage point increase in their FDI indicator (FDI stock as a percentage of GDP) the incidence of child labor decreases by only 0.03 percentage points. FDI as a percentage of GDP would have to increase by 33 percentage points in order to see a 1 percentage point decline in child labor. In addition to FDI, the authors include a trade variable which is calculated as the sum of exports and imports as a percent of GDP. Neumayer and DeSoysa also find a significantly negative relationship between trade and child labor, however again, the magnitude of the correlation is quite small: a 1 percentage point increase in trade corresponds to a 0.06 percentage point decrease in child labor.

The obvious concern with respect to Neumayer and DeSoysa's model is the endogeneity of FDI. Although the authors discuss the potential for endogeneity to bias their results, they choose not to address it econometrically. In particular, there is the likelihood that FDI is attracted to countries with higher skill levels, a result found in several empirical FDI studies (e.g. Davies (forthcoming); Blonigen, et. al (forthcoming); Markusen and Maskus (2002)). Since skill level/educational attainment is negatively correlated with child labor, parameter estimates of the effect of FDI on child labor would therefore be biased. This potential result is quite relevant in the context of Neumayer and DeSoysa (2005) who find the relationship between FDI and child

labor to be statistically significantly negative, but very small in magnitude. After dealing with the endogeneity of FDI, we find a far greater negative impact of FDI indicating the existence of such a bias.

Cigno, Rosati and Guarcello (2002) also look at the relationship between trade openness and child labor, only without FDI. As measures of trade openness, the authors use exports and imports as a percent of GDP and the Sachs-Warner Index (1995), essentially a dummy variable equal to one if the country is free from a number of barriers to trade. In addition to the labor force participation rate of children age 10-14, the authors use primary school nonattendance rates as a measure of child labor incidence. They argue that, since the child labor force participation rate only measures the involvement of children over the age of 10, this variable improperly measures the effects of trade on child labor. In line with the findings of others, the authors find no evidence that openness to international trade increases the incidence of child labor. To the contrary, they find that trade openness, as measured by the Sachs-Warner index, is negatively correlated with child labor even after controlling for GDP, public health expenditure, and skill levels of the adult labor force.

In a break from cross country analyses, Edmonds and Pavcnik (2005) use household level data from Vietnam to compare the effects of increasing relative prices of exported staple goods to child labor. Their innovative approach looks at relative rice prices after a period of trade liberalization. Between 1993 and 1998 the Vietnamese government lifted export quotas to the point that they were no longer binding, which led to a substantial increase in the relative price of rice. Additionally the country lifted internal trade barriers making trade between Vietnamese communities easier. The relative price of rice increased by 30% between 1993 and 1998. Rice in Vietnam is widely produced at the household level and a newly exported commodity for the

Vietnamese economy. For this reason, the authors find it to be an appropriate proxy for the degree of trade openness. Overall they find a 9 percentage point decline in child labor associated with the 30% price increase. Households that are net producers of rice decreased their reliance on child labor during the period, while net consumers of rice—those that purchase in the market some or all of their rice consumption—in some instances increased their levels of child labor, an income effect caused by the higher relative price of rice. Overall, they find the rising relative price for rice, a result of trade liberalization policy by the Vietnamese government, accounted for 47% of the decrease in child labor between 1993 and 1998.

For the most part, endogeneity issues have been ignored by the current literature, however a recent publication by Edmonds and Pavcnik (2006) addresses this. As with their 2005 paper, Edmonds and Pavcnik study the relationship between openness to trade and child labor, however they account for the endogeneity of both trade policy and income in a cross-country framework. They find a significant negative relationship between trade openness as measured by exports and imports as a percent of GDP and child labor, even after controlling for the endogeneity of trade. The significance of the relationship, however, goes away when income is integrated into the model. Even after instrumenting for income to address the endogeneity problem, they have a highly significant correlation between income and child labor, but no significant relationship between trade openness and child labor. This implies that any effect of trade on child labor is likely channeled through an income effect. Increased trade is associated with higher levels of national income which itself is correlated with lower incidences of child labor. The results are robust to several model adaptations including narrowing the sample to non-OECD countries and using export levels of unskilled labor intensive products as the openness measure.

The approach laid out by Edmonds and Pavcnik (2006) can be applied to FDI in a similar fashion. By creating an instrumental variable that is correlated with FDI but not skill nor educational attainment, the problem of endogeneity bias can be circumvented. Thus, the goal of this paper is to do so both for data comparable to that of Edmonds and Pavcnik (2006) as well as heretofore unutilized time series data on child labor.

3. Theoretical Framework

The anticipated effect of FDI on child labor hinges on two factors: the impact of FDI on the relative wages of unskilled labor and the impact of FDI on family income.

Opponents of globalization argue that when FDI enters a country it increases the demand for low wage, unskilled labor (of the type that children provide). As a result, increased FDI raises the relative wage of unskilled workers including children. This increases the opportunity cost of non-work alternatives for children, namely leisure and school. As a result, households respond to higher child labor demands (and subsequent higher wages) by substituting away from leisure and school consumption and the incidence of child labor increases. This is often referred to as the substitution effect. Proponents of globalization, on the other hand, argue the opposite. First, they argue that multinational corporations often seek out relatively skilled workers, not unskilled ones. Evidence of this if provided by Graham (2000) who shows that multinationals pay higher than average wages in both high- and low-income countries. Furthermore, this wage premium grows as the average income of the country falls. This indicates that multinationals in less developed countries are hiring their most skilled workers. If this is the case, then increased FDI would lower the relative wage of unskilled workers, increasing the gain for children who forsake work for continued schooling.

In addition, free trade advocates cite that trade almost unequivocally increases national income which can have a negative effect on child labor. This "income effect" of child labor suggests that a household with higher earnings will increase its consumption of child labor substitutes (e.g., schooling and leisure), and child labor will decline. This effect is especially pertinent if one subscribes to the belief that a household which sends its children to work may be doing so out of necessity. If the adult income for the household fails to provide adequate support for the family, it may be essential to supplement adult income with child labor wage-earnings. Thus, parents would be sending their children to work, not out of greed but rather subsistence. Along these lines, Basu and Van (1998) argue that child labor is considered a economic "bad" in consumer theory. Households only consume child labor if their income is below some subsistence threshold; if household income rises above this income level, they will no longer consume child labor. As such, if increased FDI increases income (as found in OECD (1995) and Feenstra and Hanson (1997)), then FDI may have an indirect effect on child labor.

The overall, net effect of FDI on child labor depends on the respective magnitudes of the substitution and income effects as well as the skill level of the labor that multinationals hire. Theoretically, the results are ambiguous; this paper empirically tests these effects.

4. Methodology

We estimate three central equations to test the effect of FDI on child labor. Each equation is estimated multiple times, with and without instrumental variables developed to control for endogeneity of FDI and income. We present these results in section 5.1. In section 5.2 we adapt our three equations to include trade openness to observe the independent effects of FDI and trade

on child labor. Again, we estimate each equation with and without instrumental variables for FDI, trade openness and per capita income.

Our central equation models the relationship between child labor and the log of the level FDI.[2] The log of real GDP is also included to control for country size.[3]

$$child\ labor_i = \beta_0 + \beta_1 \ln\left(FDI_i\right) + \beta_2 \ln\left(GDP_i\right) + \varepsilon_i \qquad (1)$$

The problem however is that as discussed above, FDI is endogenous to child labor. This would cause our coefficient estimates to be biased. For example, by not controlling for the endogeneity of FDI, the model developed by Neumayer and DeSoysa (2005) assumes causality flows from FDI to child labor. In reality causality probably goes both ways. In addition to FDI having a negative effect on child labor, it may be the case that child labor affects FDI as well. For example, countries with high levels of child labor are also typically low-skilled. Typically studies find that FDI avoids such low-skilled countries despite the inexpensive labor. This relationship would cause the coefficient of FDI in equation 1, β_1, to be biased. We address the endogeneity of FDI by creating an instrumental variable for FDI based on geographical determinants. This instrument circumvents the problem of endogeneity as, ideally, it will be highly correlated with FDI, but not necessarily with skill. The derivation of the instrument is described in detail in section 4.2.

We also permit the possibility that a negative relationship between FDI and child labor is driven, in full or in part, by household income. If FDI contributes to higher income per capita, and the Basu and Van (1998) subsistence income theory holds, then child labor should decline in

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[2] As discussed by Blonigen and Davies (2004), FDI data are highly skewed towards the wealthy countries. As such, using logged FDI helps to avoid spurious correlation in many circumstances.

[3] An alternative would be to use the ratio of FDI to GDP, thereby restricting the coefficients on these to be equal but opposite (something the data clearly rejects). Our primary reason for not doing so, however, was to draw from the literature estimating the *level* of FDI when constructing our instrument.

response to increases in FDI. That is some of the relationship between FDI and child labor may actually be due to the indirect effect that FDI has on child labor by means of higher household income; FDI increase income, income decreases child labor. We model this by adding logged per capita income to our first equation[4]:

$$child\ \ labor_i = \beta_0 + \beta_1 \ln\left(FDI_i\right) + \beta_2 \ln\left(GDP_i\right) + \beta_3 \ln\left(income_i\right) + \varepsilon_i \qquad (2)$$

Just as we were concerned about the endogeneity of FDI, per capita income is also potentially endogenous to child labor. As a check for robustness, we create an instrumental variable for per capita income, based on lagged values of income and capital investment. Again, a further description of this instrument is found in section 4.2.

Finally, we control for other geographical, political and social characteristics that might influence child labor by integrating a vector of country attributes into our model:

$$child\ \ labor_i = \beta_0 + \beta_1 \ln\left(FDI_i\right) + \beta_3 \ln\left(GDP_i\right) + \beta_4 \ln\left(income_i\right) + \boldsymbol{\alpha}\mathbf{X}_i + \varepsilon_i \qquad (3)$$

$\mathbf{X}_i$ in the above equation is a vector of country *i*'s attributes and $\boldsymbol{\alpha}$ is a vector of coefficients. Among the variables included, which are described in more detail in section 4.1, is an index of political freedom, a measure of the percent of the population living in rural areas, years of schooling, latitude, regional dummy variables, and a dummy variable indicating whether the country ratified the International Labor Organization's Convention 138 agreeing to set minimum working ages. The inclusion of the control variables is intended to show that our results from estimating equations 1 and 2 are not driven by the omission of country characteristics affecting child labor that are correlated with income and/or FDI.

[4] An alternative would be to also include the square of logged per capita income. We find an overall decline in statistical significance using this specification as discussed in Section 5.3.

In section 5.2, the above three equations are adapted to include trade openness in order to partition the effects of trade and FDI. Our theory is that international trade and FDI may affect child labor distinctly and that these unique effects can be identified independently by including both variables in our model. This is complicated, however because, like FDI, trade openness suffers from endogeneity bias. We recreate an instrument for trade openness used by Frankel and Romer (1999), Frankel and Rose (2002) and Edmonds and Pavcnik (2006) which is discussed in detail in section 4.2.

As in Edmonds and Pavcnik (2006), trade openness is measured as the sum of exports and imports as a percent of GDP. Equation 1 has been modified as follows:

$$child\ \ labor_i = \beta_0 + \beta_1 \ln\left(FDI_i\right) + \beta_2 \ln\left(GDP_i\right) + \beta_3 openness_i + \varepsilon_i \qquad (1')$$

If our estimates of β_1 and β_3 are simultaneously significant (without instruments), then each variable is independently correlated with child labor. If the parameter estimates remain significant after instrumenting for FDI and trade openness to control for endogeneity, then each variable independently affects child labor. Note that as opposed to the FDI variable, following Edmonds and Pavcnik (2006) openness is not logged.

We also are interested in how the coefficient estimates change when income is added to the model. The natural log of per capita income is added to equation 1':

$$child\ \ labor_i = \beta_0 + \beta_1 \ln\left(FDI_i\right) + \beta_2 \ln\left(GDP_i\right) + \beta_3 openness_i + \beta_4 \ln\left(income_i\right) + \varepsilon_i \qquad (2')$$

If, after the inclusion of per capita income, β_1 and β_3 are no longer significant, then it is likely the case that the effect of FDI and trade openness on child labor is channeled through income.

Lastly, we add a series of country specific control variables to the model which are intended to show that our results are not driven by omitted variables that are correlated with child labor and our included independent variables.

$$child\ labor_i = \beta_0 + \beta_1 \ln(FDI_i) + \beta_2 \ln(GDP_i) + \beta_3 openness_i + \beta_4 \ln(income_i) + \boldsymbol{\alpha}\mathbf{X}_i + \varepsilon_i \quad (3')$$

Just as in equation 3, $\mathbf{X_i}$ is a vector of control variables and $\boldsymbol{\alpha}$ a vector of coefficients. The variables included in $\mathbf{X_i}$ are discussed in detail in section 4.1 below.

As a robustness check, section 5.3 re-estimates our results from sections 5.1 and 5.2 using data from 1990 and 1980, the second and third most recent collection years for child labor data, and a pooled dataset with all three years. Although using these older datasets, particularly for 1980, yield significantly smaller sample sizes, our results are largely unchanged. However, when we use the panel data approach to include fixed effects, although we find similar results in the signs of the coefficients, their significance falls greatly. As discussed by Edmonds and Pavcnik (2006) and Edmonds (forthcoming), the child labor data from these earlier years are potentially suspect due to the large amount of imputations done by the ILO. In particular, due to the construction method of the earlier child labor data, most of the variation in child labor is cross-sectional. As Edmonds (forthcoming) details, in several cases only 1995 data are used to construct the child labor measures for earlier years. As a result, when including country-specific fixed effects, it is not surprising that the significance of the other variables falls.

4.1 Data

The data we use are for 145 countries from the year 1995 which is the most recent year for which adequate data can be obtained.[5] Accurate child labor data, due in large part to collection challenges, are scantily available. The International Labor Organization, by means of household surveys, collects a measure of the labor force participation rate of children age 10-14, however the data are problematic for two reasons in particular. First, the measure does not

[5] Note that this is greater than the 113 countries used by Edmonds and Pavcnik (2006) as we use the more recent 6.2 version of the Penn World Tables.

include labor force participation rates for children less than 10 years of age, an age group which in many countries unfortunately is not excluded from economic activities. If a country exhibits a high level of child labor for children under the age of ten, it is likely it will also exhibit high labor force participation rates of 10-14 year olds, therefore the ILO measure, though not ideal, is sufficient in this regard. A second concern of the ILO data pertains to its frequency of collection; the ILO only compiles its household data roughly once ever 10 years, most recently in 1995. Although the ILO has begun the long process of collecting more extensive, even industry, age and gender specific data, they do not (as yet) contain sufficient country level data. In general, child labor force participation rates are not volatile, so restricting our sample to a single year's observations should not pose a problem. Still, as a check for robustness, we re-estimate our results with data from 1990 and 1980, the second and third most recent collection points, and a panel of all three periods. Our main findings are unchanged.

For our FDI variable, we use net investment inflow in millions of current US dollars from the United Nations Conference on Trade and Development. All of our GDP, investment and trade openness data come from the Penn World Table 6.2.[6] Real GDP is used to control for country size, however we use real *per capita* GDP for our income measure, both measured in US dollars. The income variable is in purchasing power parity terms, deflated with the chain index. Trade openness is the sum of exports and imports as a percentage of real GDP. PWT 6.2 uses base year 2000 for all variables.

The country attribute variables come from a variety of sources, all for the year 1995 (except in section 5.3, where we also use the corresponding data for 1980 and 1990). *Schooling* is the average years of school completed for men and women over the age of 25 and comes from

[6] See Summers and Heston (1991) for a description of these data. These can be found at http://pwt.econ.upenn.edu/.

Barro and Lee (2000). *Rural* measures the percentage of the population living in rural areas and is collected from the World Development Indicators (World Bank, 2004). The political *freedom index* comes from the Freedom House (2006) Political Rights Index. We include regional dummy variables for South Asia, East Asia, Latin America/Caribbean, sub-Saharan Africa, and North Africa/Middle East from the CIA World Factbook (2006). Finally, we use a dummy variable, *ratify* equal to 1 if, as of 1995 (or 1990/80 for the robustness checks in section 5.3), a country had signed the ILO Convention 138 establishing minimum working ages. This information was collected from the ILO website.[7] Descriptive statistics are presented in Table 1.

4.2 Description of Instruments

In order to control for the endogeneity of FDI, we create an instrumental variable for it using a variety of geographical indicators. The idea of this is similar to that of Frankel and Romer (1999), Frankel and Rose (2002) and Edmonds and Pavcnik (2006) who instrument for trade openness using geographical determinants. The key to their instrument is that geographical trade data is correlated with trade but not necessarily with national income, therefore any relationship found to exist between the trade instrument and child labor will represent a causal relationship, the effect of trade openness on child labor, and not the reverse.

Before describing the FDI instrument, we first review this approach to constructing the openness instrument both to frame our FDI approach and since we implement this instrument in section 5.2 to address the endogeneity of openness. We recreate the openness instrument from Frankel and Romer (1999) which is estimated from bilateral trade data and a series of other country specific variables. The estimated first-stage equation for the trade openness instrument is as follows:

[7] Dates of ratification of the ILO Convention 138 can be found at http://www.ilo.org/ilolex/cgi-lex/ratifce.pl?C138.

$$\ln\left(\frac{trade_{ij}}{GDP_i}\right) = \underset{(0.36)}{-1.76} \underset{(0.04)}{-1.02}\ln\left(distance_{ij}\right) + \underset{(0.02)}{0.94}\ln\left(pop_j\right) + \underset{(0.10)}{0.72}\, commlang_{ij}$$

$$+ \underset{(0.20)}{0.67}\, border_{ij} - \underset{(0.01)}{0.28}\ln\left(area_i * area_j\right) - \underset{(0.07)}{0.77}\, landlocked_{ij}$$

The dependent variable is calculated as the natural log of the sum of trade flows between countries *i* and *j* divided by country *i*'s GDP. The explanatory variables include the log of the distance between countries *i* and *j*, country *j*'s population, and the product of the area of country *i* and country *j* in square kilometers. Additionally dummy variables are included equal to 1 if the countries share a common language and border. *Landlocked* measures the number of landlocked countries (0, 1 or 2). The bilateral trade data and geographical characteristics are from Rose (2004). The openness instrument is computed by exponentiating the predicted value of the dependent variable.

For comparability, we would ideally also use bilateral data to construct the FDI instrument used in section 5.1. However, bilateral FDI data for low income countries is incomplete and inadequately collected. Instead we are forced to use FDI net inflows, as data are more widely and accurately available. To generate the instrument we utilize a modified gravity model specification, regressing the log of FDI on a set of geographic and demographic determinants of FDI: country *i's* latitude, log of population, percent of population living in rural areas, and the log of total area in square kilometers.[8] We also include three additional variables. The first is the Freedom House's (2006) political *freedom* index. In addition, we utilize two variables that measure a country's geographical attractiveness to foreign direct investment. The

[8] This specification is the most commonly used FDI specification in the literature. See Blonigen (2005) for a review of the various papers it has been used in. Note that it is common to use GDP as a measure of market size in these regressions. As we use GDP as another explanatory variable in our child labor regressions, we instead use population to reduce multicollinearity.

first of these, *market proximity*, is the sum of real GDP (in millions) for all countries $j \neq i$ weighted by the distance in kilometers between countries j and i. This variable was found to be a significant predictor of FDI by Blonigen, et. al (forthcoming). *Colonial link* is the unweighted sum of the log of real GDP for all countries with which country j has at any point had a colonial tie. The distances used to calculate *market proximity* are calculated using the great circle formula and measure the distance in kilometers between the most important cities (in terms of population) of each country. Colonial information, distance, area and latitude figures come from the CEPII website.[9] The instrument equation is:

$$\ln\left(FDI_i\right) = \underset{(1.82)}{-3.84} - \underset{(0.01)}{0.02}\, latitude_i + \underset{(0.17)}{0.63}\ln(pop_i) - \underset{(0.01)}{0.04}\, rural_i + \underset{(0.00005)}{0.0001}\sum_{j\neq i}\left(\frac{GDP_j}{distance_{ij}}\right)$$

$$+ \underset{(0.14)}{0.08}\ln(area_i) - \underset{(0.09)}{0.20}\, freedom_i + \underset{(0.001)}{0.001}\sum_{j\neq i}\ln\left(colony_{ij} * GDP_j\right)$$

After estimating the equation, we predict the value of the regressand which becomes our instrument for FDI.

We also instrument for per capita income to control for income endogeneity. Our instrument is similar to that of Edmonds and Pavcnik (2006). We use per capita income and capital investment share of GDP from 1980 to estimate our income instrument. The idea is that income and investment lagged 15 years will be correlated with income from 1995, but not necessarily with child labor during that period as the figures come from before even the oldest children in the dataset were born. Therefore any correlation between our income instrument and child labor should represent the effect of per capita income on child labor, and not vice versa. We estimate the instrument equation and then predict the dependant variable for our instrument.

[9] As of the time of this paper, this was http://www.cepii.fr/anglaisgraph/news/accueilengl.htm.

$$\ln(income_i) = \underset{(0.27)}{0.33} + \underset{(0.04)}{0.93}\ln(income1980_i) + \underset{(0.004)}{0.02}\ln(capinvest1980_i)$$

The use of an instrumental variable for income is largely used as a robustness check and, as we discuss below, doing so does not significantly change our results.

5. Empirical results

5.1 FDI

Table 2 presents the results from estimating equations 1 through 3 with and without the described instrumental variables. When we regress child labor on only FDI and our GDP control variable (without controlling for endogeneity), we find there is a negative and highly significant coefficient on FDI (column (1)). The magnitude however, is relatively small; a 10% increase in FDI corresponds to a 0.24 percentage point decrease in child labor. We suspect, however that the endogeneity of FDI might bias our coefficient. If FDI is correlated with a country's skill level, than our coefficient quantifying the effect of FDI on child labor will be incorrectly estimated. Looking to the results presented in column (2) this appears to indeed be the case. After controlling for the endogeneity FDI using our instrumental variable the magnitude of the coefficient on FDI more than triples and remains highly significant at the 1% level.

When we add per capita income to our equation in column (3) we find a similar pattern to that found by Edmonds and Pavcnik (2006) in their trade model. Although income is negative and significant as expected, FDI is no longer significant. This implies that the effect of FDI on child labor is principally channeled through income, i.e. the effect of FDI on child labor may actually be a result of the combined indirect effects on FDI on income (positive) and the direct effect of income on child labor (negative). As a result, the FDI coefficient is no longer significant when this indirect effect is picked up directly by per capita income.

In column (4) we add additional control variables that might potentially be driving the child labor and FDI/income relationship. Even when these variables are included, income remains significant. The purpose of including these control variables is to ensure that the relationship between child labor and income is not driven by a relationship between income and other geographical, political or social characteristics affecting child labor that have been omitted from the model. Incidentally, none of the control variables except *years of schooling* and the sub-Saharan Africa regional dummy variable, are statistically significant.

Using the income instrument discussed in section 4.2, we control for potential bias caused by the endogeneity of income. These results are presented in columns (5) and (6). The magnitudes of the income coefficients increase marginally, however neither of these changes is significant from a statistical standpoint which suggests income endogeneity is not a large concern in our model. After instrumenting to correct for income endogeneity, none of the control variables are significant even at the 10% level.

The lack of a strong statistically significant relationship between our control variables and child labor provides an additional argument for the appropriateness of the inclusion of *rural*, *ratify*, and *latitude* as explanatory variables in our FDI instrument first stage regression. When developing an instrument, it is best to include variables that are correlated with the variable which is being instrumenting (in this case FDI), but not necessarily with the dependent variable from the original equation (except through which the instrumented variable affects the dependent variable). These control variables are not significant determinants of child labor, but all three are highly significant in our first stage FDI instrumental variable regression.

The fact that we find *years of schooling* to be negatively correlated with child labor and significant should not be surprising. Generally, children who work are often unable to attend

school; many are forced to drop out even before finishing primary school. Thus countries with high incidences of child labor typically have lower average educational attainment. Another likely reason for the strong negative correlation between education and child labor has to do with skill. *Years of schooling* is essentially a proxy for a country's skill level. Countries with lower educational attainment are generally low-skilled; countries with relatively unskilled populations frequently have high levels of child labor. After accounting for the effect of schooling on child labor, the magnitude of the coefficient on income decreases but remains statistically significant. That is, even after controlling for a variety of country characteristics that may influence the level of child labor in a given country, it still appears to be the case that per capita income has a negative impact on child labor.

5.2 FDI and Openness

In this section we add trade openness to our original model. The intent is to test the hypothesis that the negative effect of FDI on child labor is independent of the negative effect of trade openness on child labor. The results are presented in Table 3.

Column (1) presents the estimation results of equation 1', without controlling for endogeneity. Both coefficients are negative and individually significant which suggests that each variable independently affects child labor. Again, we address the endogeneity of FDI and openness using instrumental variables. Recall from section 4.2 the description of the Frankel and Romer (1999) trade openness instrument, which is developed using geographical determinants of bilateral trade. We recreate this instrument for trade openness and use it in addition to our FDI instrument. The results are presented in column (2).

As expected, the magnitude of both coefficients increases when we instrument for FDI and openness, and FDI remains highly statistically significant. Our FDI coefficient, -8.699, is

more than six times greater than the column (1) estimate, and is similar to our estimate of -8.305 from Table 2 (without trade openness). Further, the trade openness coefficient we estimate, -0.077, although no longer statistically significant, is not statistically different from the coefficient obtained by Edmonds and Pavcnik (2006) of -0.12 when they instrument for trade openness.

In column (3) we add income. As was the case in our FDI model, the variable's significance goes away at the inclusion of per capita income. This reinforces our assertion that the effect of FDI (and perhaps trade openness) on child labor is channeled through income. Increases in foreign investment and international trade boost national per capita income which leads to lower levels of child labor. The weakened significance of income may, in part be a result of multicollinearity. Three of our four central variables, *openness*, ln(*GDP*) and ln(*income*), are all functions of a country's gross domestic product. In section 5.3 we find evidence that increasing the sample size improves the significance of our results.

5.3 Robustness Check

To check the robustness of our result, we re-estimate our models using data from 1990 and 1980, the second and third most recent collection points of child labor data, and a pooled dataset of all three years. In order to do so, we create FDI, trade openness and income instruments for 1980 and 1990. Since our income instrument for 1980 is constructed using income and capital investment data from 1965, the sample size becomes relatively small, therefore the results are best used for comparison. Although the results are generally consistent for all model specifications, we only present the results for the instrumented equations as these results are the most pertinent.

Table 4 shows the estimates from our FDI regressions for the years 1980, 1990 and 1995 independently. The results are generally consistent across the years, particularly the coefficient

on FDI in the equations that exclude income. For each sample, the effect shows up negative and highly significant at the 1% level. Further, the magnitude of the effect increases over the three year sample. We also find the same income result in 1980 and 1990 that was observed with our 1995 sample; that is, the addition of per capita income to our model causes FDI to become insignificant, while income is highly significant. This reinforces the theory of an income effect through which FDI affects child labor—FDI increases per capita income, and in turn higher income leads to lower incidences of child labor. The addition of control variables to our 1980 specification, however, appears to be problematic—none of our variables are significant at the 5% level and FDI has an unexpected sign. As suggested previously, this is potentially due to multicollinearity between variables that are functions of GDP. The fact that the significance of income improves for the 1990 and 1995 estimations—which have significantly larger sample sizes—supports this claim.

In Table 5 we present the results of our pooled regressions of our FDI model. We ran each equation with and without country fixed effects. In general, the country fixed effects lead to insignificant coefficients. This could be because, as suggested by Edmonds and Pavcnik (2006) and Edmonds (forthcoming), the fixed effects pick up the ILO imputations rather than actual variations in child labor. The robustness of our results can be verified, however, by observing the results without fixed effects. The coefficient on FDI in column (1) is not statistically different from our estimate obtain using only 1995 data. The income coefficient estimates for the panel estimates are also statistically similar to their 1995 counterparts. As expected, increasing the sample size does in fact improve the significance of our model; the income coefficient is negative and highly significant even after introducing country attributes control variables. In addition, when excluding fixed effects and the additional controls, FDI retains a significantly

negative coefficient even when including income. In all, re-estimating our model using the panel data strongly reinforces our results presented in Table 2. It should be noted that in column (6) of Table 5 we do find a positive effect for income, the one significant exception to our overall result of a negative (or at least zero) effect. As we show momentarily, however, this anomalous result disappears with the inclusion of openness and/or higher orders of income.

Again, using data from 1980 and 1990, we repeat this test for robustness for our trade model. Table 6 presents the results from each year independently while Table 7 presents the panel output. In general, the coefficients of interest are qualitatively similar to our estimates in Table 3, and as expected, the significance of income improves substantially after broadening the sample size to include 1990 and 1980. In particular, as in Table 5, when we add income to the baseline specification in column (3) we still find a significantly negative effect from FDI. Also similar to Table 5, the inclusion of country fixed effects eliminates the significance of the other control variables, indicating that the variation in child labor is primarily cross-sectional.

Finally, in Table 8, we show that our results are not significantly changed by adding the square of logged income to our models. The results of our FDI model are presented in columns (1) through (4). Without including country attributes, FDI, income, and income squared are significant. After including these control variables, however, none of our variables are significant. Again, we attribute this in part to multicollinearity. When our data are pooled in column (3), the significance of our income variables (along with *rural* and *years of school*) returns, thus the adverse consequences of multicollinearity are overcome by increasing the sample size. We document a similar pattern in our trade models presented in columns (5) through (8). In both our FDI and trade models, however, the inclusion of country fixed effects, columns

(4) and (8), yields insignificant results. We again, attribute this to the ILO imputation of child labor.

6. Conclusion

In this paper, we have sought to determine whether FDI has an effect on child labor. Similar to Neumayer and DeSoysa (2005), we find a negative effect of FDI on child labor. Unlike that paper, however, we demonstrate that this estimate is biased by the endogeneity of FDI. When an instrument is development based on geographical determinants of FDI and used in its place, the magnitude of the effect of FDI on child labor increases significantly. Neveretheless, we find that any significant effect of FDI is channeled through its impact on per capita income. This indicates that the relationship between FDI and child labor is comparable to that found by Edmonds and Pavcnik (2006) between trade and child labor. In addition, we find that our result is robust to the inclusion of trade and across time.

A key implication of this finding is that if governments wish to reduce child labor FDI can play a role but primarily insofar as it affects income. This suggests that policies that increase the income effects of FDI may be especially useful in combating child labor. Such policies include payroll tax reductions that encourage multinationals to hire more workers and pay higher wages, providing concessions to firms that engage in worker training, and the like. Thus, rather than interpreting these findings as an indication that FDI has no effect on child labor, we believe that our results point towards the need for nuanced policy that exploits these indirect effects.

Table 1: Descriptive statistics (1995)

Variable	Obs	Mean	Std. Dev.	Min	Max
Child labor	145	11.24	14.69	0	54.55
ln(FDI)	145	5.15	2.53	0	10.98
ln(GDP)	145	24.26	1.96	19.56	29.62
ln(Income)	145	8.40	1.15	5.14	10.33
Trade openness	145	79.89	49.31	2.03	355.49
Freedom index	145	3.61	2.16	1	7
Rural	145	47.78	23.34	0	92.70
Ratify (ILO Convention 138)	145	0.27	0.44	0	1
Average years of schooling	101	6.00	2.90	1	12
Latitude	145	18.72	25.50	44.28	60.13
South Asia	145	0.05	0.22	0	1
East Asia	145	0.10	0.30	0	1
Latin America/Caribbean	145	0.17	0.37	0	1
Sub-Saharan Africa	145	0.26	0.44	0	1
North Africa/Middle East	145	0.10	0.31	0	1
ln(Population)	145	15.94	1.65	12.29	20.91
Market proximity	145	8,340	4,562	3,081	29,360
ln(Area)	145	11.98	2.08	5.70	16.65
Colonial link	145	56.38	142.59	0	1,452
ln(Income), 1980	122	8.31	1.15	6.13	10.86
Capital investment, 1980	122	18.46	9.97	1.32	58.94

Table 2: Child labor and FDI (1995)

	(1)	(2)	(3)	(4)	(5)	(6)
ln(FDI)	-2.436	-8.305	-3.714	1.244	-4.162	-4.269
	(0.673)***	(2.640)***	(3.008)	(3.206)	(2.585)	(11.385)
ln(GDP)	-0.716	4.956	2.828	-0.108	3.124	3.830
	(0.828)	(2.750)*	(2.421)	(2.522)	(2.155)	(8.285)
ln(Income)			-7.403	-3.494	-7.713	-5.942
			(2.122)***	(1.693)**	(1.873)***	(3.460)*
Freedom index				-0.551		-1.197
				(0.668)		(1.453)
Rural				0.103		0.010
				(0.071)		(0.173)
Ratify (ILO Convention 138)				-0.706		-2.002
				(1.975)		(3.240)
Years of schooling				-2.188		-1.284
				(0.560)***		(1.887)
Latitude				0.019		-0.014
				(0.040)		(0.074)
Regional dummy variables	No	No	No	Yes	No	Yes
IV for FDI	No	Yes	Yes	Yes	Yes	Yes
IV for income			No	No	Yes	Yes
R-squared	0.25	0.17	0.49	0.77	0.57	0.65
IV R-squared (FDI)		0.55	0.55	0.58	0.59	0.58
IV R-squared (income)					0.90	0.89
Observations	145	145	145	101	122	95

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Child labor with FDI and trade (1995)

	(1)	(2)	(3)	(4)	(5)	(6)
ln(FDI)	-1.441	-8.699	-5.418	4.971	-4.562	-6.517
	(0.678)**	(3.001)***	(3.361)	(4.973)	(2.822)	(18.612)
Openness	-0.085	-0.077	0.006	-0.061	0.008	0.051
	(0.024)***	(0.099)	(0.057)	(0.065)	(0.050)	(0.172)
ln(GDP)	-2.301	4.627	4.193	-4.193	3.671	6.443
	(0.909)**	(3.597)	(2.815)	(4.808)	(2.456)	(16.603)
ln(income)			-6.606	-0.394	-7.717	-8.375
			(2.733)**	(3.678)	(2.249)***	(11.672)
Freedom index				0.146		-1.619
				(1.068)		(2.818)
Rural				0.159		-0.007
				(0.114)		(0.269)
Ratify (ILO Convention 138)				-0.018		-2.151
				(2.640)		(3.768)
Average years of schooling				-2.616		-0.943
				(0.912)***		(2.985)
Latitude				0.046		-0.041
				(0.058)		(0.140)
Regional dummy variables	No	No	No	Yes	No	Yes
IV for FDI and openness	No	Yes	Yes	Yes	Yes	Yes
IV for income			No	No	Yes	Yes
R-squared	0.32	0.25	0.49	0.61	0.56	0.54
IV R-squared (FDI)		0.57	0.58	0.57	0.59	0.58
IV R-Squared (openness)		0.34	0.34	0.34	0.34	0.34
IV R-squared (income)					0.90	0.89
Observations	147	123	122	94	117	92

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Child Labor and FDI 1980, 1990 & 1995

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		1980			1990			1995	
ln(FDI)	-4.912	-0.799	-0.107	-5.071	0.202	0.179	-8.305	-4.162	-4.269
	(1.548)***	(1.598)	(1.297)	(1.786)***	(1.124)	(1.573)	(2.640)***	(2.585)	(11.385)
ln(GDP)	-0.186	-0.621	1.311	0.972	-0.568	0.511	4.956	3.124	3.830
	(1.473)	(1.245)	(1.097)	(1.789)	(1.034)	(1.471)	(2.750)*	(2.155)	(8.285)
ln(income)		-11.327	-4.479		-11.381	-6.176		-7.713	-5.942
		(1.751)***	(4.382)		(1.069)***	(2.192)***		(1.873)***	(3.460)*
Freedom index			1.216			-0.505			-1.197
			(0.801)			(0.846)			(1.453)
Rural			0.116			0.070			0.010
			(0.097)			(0.046)			(0.173)
Ratify (ILO Convention 138)			-0.090			-0.687			-2.002
			(2.392)			(1.873)			(3.240)
Average years of schooling			-1.134			-1.613			-1.284
			(0.541)**			(0.560)***			(1.887)
Latitude			0.021			0.011			-0.014
			(0.047)			(0.037)			(0.074)
Regional dummy variables	No	No	Yes	No	No	Yes	No	No	Yes
R-squared	0.21	0.72	0.84	0.30	0.70	0.79	0.17	0.57	0.65
IV R-squared (FDI)	0.53	0.61	0.61	0.66	0.66	0.62	0.55	0.59	0.58
IV R-squared (income)		0.95	0.94		0.91	0.91		0.90	0.89
Observations	105	80	73	114	113	91	145	122	95

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Child Labor and FDI (1980, 1990 & 1995 Panel)

	(1)	(2)	(3)	(4)	(5)	(6)
ln(FDI)	-6.228	3.193	-2.277	4.263	1.363	1.663
	(1.157)***	(2.115)	(1.246)*	(7.173)	(1.323)	(1.665)
ln(GDP)	2.081	-5.502	1.324	-33.601	-0.139	-17.309
	(1.147)*	(2.951)*	(1.036)	(46.273)	(1.156)	(8.158)**
ln(income)			-9.686	26.458	-5.427	14.018
			(0.920)***	(37.264)	(1.375)***	(6.372)**
Freedom index					-0.006	-0.197
					(0.400)	(0.196)
Rural					0.104	0.091
					(0.034)***	(0.112)
Ratify (ILO Convention 138)					-0.459	1.383
					(1.091)	(1.282)
Years of schooling					-1.664	0.422
					(0.318)***	(0.521)
Latitude					0.015	
					(0.025)	
1980	-1.454	4.089	1.319	-16.487	1.903	-7.074
	(2.084)	(1.536)***	(1.453)	(26.189)	(1.463)	(4.051)*
1990	0.848	2.105	0.415	-2.779	0.935	-0.933
	(1.790)	(0.933)**	(1.200)	(5.099)	(1.138)	(0.901)
Regional dummy variables	No	No	No	No	Yes	No
Country fixed effects	No	Yes	No	Yes	No	Yes
R-Squared	0.22	0.02	0.67	0.0002	0.76	0.001
IV R-squared (FDI)	0.59	0.59	0.62	0.62	0.60	0.60
IV R-squared (income)			0.90	0.90	0.90	0.90
Observations	364	364	315	315	259	259
Number of countries	155	155	130	130	101	101

Robust standard errors in parentheses. Latitude and regional dummy variables are omitted from country fixed effect models as there is no variation between countries. We report the overall R-squared for the fixed effect specifications.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Child labor with FDI & trade 1980, 1990 & 1995

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		1980			1990			1995	
ln(FDI)	-4.893	-0.432	0.609	-4.931	-0.017	0.364	-8.699	-4.562	-6.517
	(1.759)***	(1.701)	(2.020)	(1.791)***	(1.152)	(1.782)	(3.001)***	(2.822)	(18.612)
Openness	-0.185	-0.071	-0.064	-0.142	-0.020	-0.028	-0.077	0.008	0.051
	(0.110)*	(0.055)	(0.069)	(0.094)	(0.037)	(0.037)	(0.099)	(0.050)	(0.172)
ln(GDP)	-1.872	-1.993	-0.570	0.033	-0.544	-0.104	4.627	3.671	6.443
	(2.402)	(1.534)	(2.732)	(2.126)	(1.139)	(2.088)	(3.597)	(2.456)	(16.603)
ln(income)		-10.243	-1.738		-11.040	-5.641		-7.717	-8.375
		(2.072)***	(6.873)		(1.518)***	(2.642)**		(2.249)***	(11.672)
Freedom index			1.127			-0.437			-1.619
			(0.853)			(1.040)			(2.818)
Rural			0.093			0.057			-0.007
			(0.093)			(0.056)			(0.269)
Ratify (ILO Convention 138)			-0.398			-0.693			-2.151
			(2.430)			(1.916)			(3.768)
Average years of schooling			-1.419			-1.574			-0.943
			(0.765)*			(0.590)***			(2.985)
Latitude			0.035			0.012			-0.041
			(0.055)			(0.041)			(0.140)
Regional dummy variables	No	No	Yes	No	No	Yes	No	No	Yes
R-squared	0.30	0.72	0.82	0.38	0.72	0.79	0.25	0.56	0.54
IV R-squared (FDI)	0.54	0.61	0.60	0.66	0.66	0.62	0.57	0.59	0.58
IV R-Squared (openness)	0.27	0.27	0.27	0.30	0.30	0.30	0.34	0.34	0.34
IV R-squared (income)		0.95	0.94		0.91	0.91		0.90	0.89
Observations	103	79	72	111	109	88	123	117	92

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: Child Labor with FDI and Trade (1980, 1990 & 1995)

	(1)	(2)	(3)	(4)	(5)	(6)
ln(FDI)	-5.376	2.621	-2.442	3.911	1.555	1.917
	(1.198)***	(2.910)	(1.331)*	(6.847)	(1.493)	(2.992)
Openness	-0.155	-0.125	-0.029	0.105	-0.042	0.037
	(0.062)**	(0.245)	(0.028)	(0.359)	(0.030)	(0.220)
ln(GDP)	0.072	-2.984	1.143	-30.253	-1.092	-18.931
	(1.441)	(8.215)	(1.190)	(41.588)	(1.705)	(15.296)
ln(income)			-9.140	22.977	-3.928	15.105
			(1.097)***	(31.575)	(1.914)**	(10.263)
Freedom index					0.089	-0.183
					(0.452)	(0.228)
Rural					0.091	0.125
					(0.035)**	(0.220)
Ratify (ILO Convention 138)					-0.653	1.445
					(1.070)	(1.649)
Years of schooling					-1.708	0.445
					(0.354)***	(0.747)
Latitude					0.021	
					(0.029)	
1980	-4.284	5.312	1.047	-14.103	1.267	-7.997
	(2.221)*	(3.101)*	(1.573)	(22.186)	(1.451)	(7.229)
1990	-2.217	1.494	0.073	-1.760	0.590	-0.903
	(1.921)	(1.465)	(1.298)	(3.175)	(1.147)	(1.097)
Regional dummy variables	No	No	No	No	Yes	No
Country fixed effects	No	Yes	No	Yes	No	Yes
R-Squared	0.32	0.02	0.66	0.00004	0.76	0.001
IV R-squared (FDI)	0.59	0.59	0.61	0.61	0.60	0.60
IV R-squared (income)			0.91	0.91	0.90	0.90
Observations	334	334	305	305	252	252
Number of countries	132	132	125	125	98	98

Robust standard errors in parentheses. Latitude and regional dummy variables are omitted from country fixed effect models as there is no variation between countries. We report the overall R-squared for the fixed effect specifications.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: Square of Income Robustness Check

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1995		Panel		1995		Panel	
ln(FDI)	-7.514	-20.041	-1.664	-2.090	-8.340	-43.476	-1.637	-3.272
	(4.125)*	(34.515)	(2.262)	(4.203)	(4.747)*	(144.147)	(2.726)	(9.198)
Openness					0.010	0.333	-0.022	0.103
					(0.064)	(1.267)	(0.039)	(0.584)
ln(GDP)	6.072	15.640	2.299	17.303	7.231	39.612	1.888	31.645
	(3.651)*	(24.922)	(2.005)	(31.260)	(4.506)	(129.879)	(3.038)	(96.443)
ln(Income)	-64.272	-61.850	-72.692	-114.551	-72.247	-114.806	-75.490	-184.091
	(19.125)***	(60.494)	(14.752)***	(102.556)	(22.366)***	(260.461)	(19.158)***	(437.802)
$(\ln(\text{Income}))^2$	3.492	3.145	4.043	6.289	3.973	5.153	4.231	9.856
	(1.209)***	(3.530)	(0.848)***	(4.972)	(1.406)***	(10.982)	(1.066)***	(22.278)
Freedom index		-2.657	-0.356	-0.052		-6.604	-0.304	0.044
		(4.046)	(0.501)	(0.317)		(20.331)	(0.591)	(0.725)
Rural		-0.159	0.106	0.241		-0.420	0.094	0.404
		(0.575)	(0.033)***	(0.207)		(1.947)	(0.038)**	(1.007)
Ratify (ILO Convention 138)		-4.844	-0.220	-1.991		-6.643	-0.142	-3.549
		(9.960)	(1.086)	(3.352)		(23.484)	(1.127)	(10.506)
Average years of schooling		0.928	-1.904	-0.818		4.127	-1.925	-1.311
		(5.942)	(0.293)***	(1.307)		(22.355)	(0.337)***	(3.483)
Latitude		-0.143	-0.053			-0.350	-0.047	
		(0.218)	(0.035)			(1.102)	(0.048)	
1980			1.068	13.575			0.960	22.847
			(1.382)	(17.726)			(1.370)	(60.950)
1990			0.562	3.938			0.375	6.906
			(1.039)	(4.056)			(1.095)	(18.411)
Regional dummy variables	No	Yes	Yes	No	No	Yes	Yes	No
Country fixed effects			No	Yes			No	Yes
R-squared	0.44	0.15	0.76	0.01	0.42	0.43	0.75	0.02
IV R-squared (FDI)	0.59	0.58	0.60	0.60	0.59	0.58	0.60	0.60
IV R-Squared (openness)					0.34	0.34	0.34	0.34
IV R-squared (income)	0.90	0.89	0.90	0.90	0.90	0.89	0.90	0.90
Observations	122	95	259	259	122	95	252	252
Number of Countries			101	101			98	98

Robust standard errors in parentheses. Latitude and regional dummy variables are omitted from country fixed effect models as there is no variation between countries. We report the overall R-squared for the fixed effect specifications.

* significant at 10%; ** significant at 5%; *** significant at 1%

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Institute for International Integration Studies
The Sutherland Centre, Trinity College Dublin, Dublin 2, Ireland