

FDI and Income Inequality: Evidence from Latin American Economies

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What I'd like to present

- 1 Motivation
- 2 Theoretical background
- 3 Previous findings
- 4 Model & data
- 5 Results
- 6 Conclusion

1. Motivation

Motivation

We analyze whether FDI has contributed to the typically wide income gaps in five Latin American host countries.

- Latin America stands out as "the most economically unequal region in the world."¹
- UNCTAD data reveal: Latin America reported a strong increase in FDI, stronger than Asia since the 1990s
- In relative terms (FDI stocks to the GDP of the region): Latin America outperforms Asia

¹<http://justf.org/blog/2010/06/08/income-inequality-latin-america-today> (accessed: August 2012). See also World Bank (2004).

Motivation

Attracting FDI: Latin America versus Asia

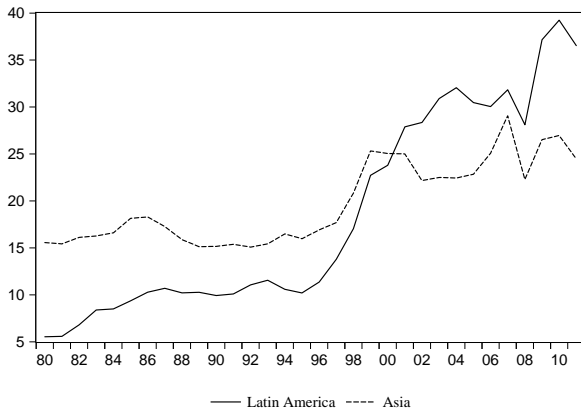


Figure: FDI to GDP-ratios

Motivation

- Higher inequality is widely believed to retard growth (see e.g. Barro 2000)
- FDI is considered to foster economic growth (e.g. OECD 2002)

The relation between both variables is however theoretically ambiguous.

2. Theoretical background

Theory of the multinational enterprise (1)

The theoretical literature departs from the observation that the multinational enterprise (MNE) possesses some sort of firm specific asset (productivity advantage).

- Ownership advantages are required to overcome the "liability of foreignness" (Helpman et al. 2004)
- This goes along with the observation of foreign firms paying higher wages (Aitken et al. 1996; Lipsey 2002)

Theory of the multinational enterprise (2)

The impact of FDI on inequality becomes less clear to predict when we sort the MNE activities by skill intensities (Markusen and Venables 1997).

- MNE headquarter activities require highly skilled labor
- Domestic firms producing for local markets rank at the bottom concerning the involvement of skilled labor.

In a Heckscher-Ohlin framework FDI can be seen as sort of trade liberalization → **The relatively abundant factor of production would benefit**

North-South models

FDI relations among similarly advanced source and host countries are predominantly of the horizontal type (Markusen 1995). However, FDI to Latin America are more of the North-South type.

- **Advanced source countries undertake vertical FDI by offshoring** (unskilled) labor intensive parts of their production process.
- Intuitively, **we would assume inequality to decrease** in the South, since new production facilities would drive the demand for labor.

Feenstra and Hanson (1997)

⇒ FDI adversely affected inequality, since the offshoring activities are relatively skill-intense from a Southern perspective.

Non-linearities

Learning and skill upgrading might induce the 'transition to a new technological paradigm' (see Aghion & Howitt 1998). Inequality in such a theoretical framework would follow an inverted-U.

- Domestic firms would benefit from spillovers
- Inequality would be increased in the short run, since learning efforts result in high demand for skills
- Subsequently, wage inequality would decline to the extent that the supply of required skills improves

Arellano 2002, Puryear & Goodspeed 2008

Human capital formation in Latin America economies lag behind countries with similar per-capita incomes. \implies **Inequality** might **not** be **transitory** then!

3. Previous findings

Previous findings

Gopinath and Chen 2003, Figini and Görg 2011

It seems that the effect of FDI on inequality differs according to the stage of development of the FDI-recipient.

Yet, the cross-country evidence for developing countries is inconclusive.

- Tsai (1995)→ Correlations between FDI and income inequality reflect structural differences in inequality between geographical country groups
- Choi (2006)→ More pronounced income inequality where the ratio of FDI stocks to GDP is higher
- Basu and Guariglia (2007)→ Trade-off between FDI-related growth promotion and rising inequality

4. Model & data

The model

We assume that the following bivariate equation is a correct specification of the long-run relationship between FDI and inequality

$$EHII_{it} = a_{1i} + a_2 \left(\frac{FDI}{GDP} \right)_{it} + e_{it}$$

- $EHII_{it}$ stands for estimated household income inequality (Gini-format)
- $\left(\frac{FDI}{GDP} \right)_{it}$ is the inward FDI stock as a percentage of GDP

The data

SUMMARY STATISTICS

Country	Average of $\left(\frac{FDI}{GDP}\right)_t$	Average of $EHII_t$	Average of $GDP_{percapita}$
<i>Bolivia</i>	23.9	47.1	934.3
<i>Chile</i>	48.0	45.7	3363.8
<i>Colombia</i>	7.1	43.1	2293.0
<i>Mexico</i>	8.4	41.3	5067.0
<i>Uruguay</i>	6.4	42.8	5708.1

5. Results

Testing for cointegration

Pedroni (1999, 2004)	
Panel PP t -statistic	-4.87**
Panel ADF t -statistic	-4.87**
Group PP t -statistic	-5.89**
Group ADF t -statistic	-5.13**
Kao (1999)	
DF_{ρ}	-8.15**
DF_t	-5.22**
ADF t -statistic	-3.98**
DF_{ρ}^*	-3.53**
DF_t^*	-3.89**

Notes: **indicate a rejection of the null of no cointegration at the 1% significance level. The number of lags is based on the Schwarz information criterion with a maximum number of four.

Dynamic OLS estimates - Panel (1)

We use Dynamic Ordinary Least Squares (DOLS) to identify the long-run relationship.

$$EHII_{it} = a_{1i} + a_2 \left(\frac{FDI}{GDP} \right)_{it} + \sum_{j=-p}^p \theta_j \Delta \left(\frac{FDI}{GDP} \right)_{it-j} + \epsilon_{it}$$

DOLS-Characteristics

- Less biased than other panel cointegration estimators (Kao & Chiang 2000)
- Φ_j are coefficients of lead and lag differences which account for possible serial correlation and endogeneity of the regressors, thus yielding unbiased estimates.

Dynamic OLS estimates - Panel (2)

Estimates of the long-run effects of FDI on inequality

Within-dimension DOLS Estimator Kao and Chiang (2000)		DOLS mean group estimator Pedroni (2001)	
FE	FE &PE	FE	FE &PE
0.123** (3.83)	0.083* (2.42)	0.055** (7.54)	0.033* (2.63)

*Notes:**(**) indicate a rejection of the null of no cointegration at the 5%(1%) level. *t*-statistics are reported in parentheses.

VECM: Long-run causality test in the panel (1)

We estimate a vector error correction model (VECM) with one lag of the form:

$$\begin{bmatrix} \Delta EHHI_{it} \\ \Delta \left(\frac{FDI}{GDP} \right)_{it} \end{bmatrix} = \begin{bmatrix} c_{1i} \\ c_{2i} \end{bmatrix} + \sum_{j=1}^p \Gamma_j \begin{bmatrix} \Delta EHHI_{it-j} \\ \Delta \left(\frac{FDI}{GDP} \right)_{it-j} \end{bmatrix} + \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} eC_{it-1} + \begin{bmatrix} \epsilon_{1it} \\ \epsilon_{2it} \end{bmatrix}$$

Inverse Causality

When FDI is attracted by wage dispersion in the host economy the causality might also run into the other direction.

VECM: Long-run causality test in the panel (2)

Calculation method of ECT	Dep. Variable ΔEHI_{it}	Dep. Variable $\Delta \left(\frac{FDI}{GDP} \right)_{it}$
Kao & Chiang (2000)		
FE	-3.99**	1.01
two-way FE	-3.89**	1.05
Pedroni (2001)		
FE	-5.05**	-1.13
two-way FE	-6.07**	1.24

Notes: ***(**)** indicate a rejection of the null of no cointegration at the 5%(1%) level.

Dynamic OLS estimates - Country

Country	Coefficient	<i>t</i> -statistic	$\overline{R^2}$
<i>Bolivia</i>	0.394**	3.31	0.87
<i>Chile</i>	0.114**	6.82	0.97
<i>Colombia</i>	0.144**	3.05	0.81
<i>Mexico</i>	0.364**	4.68	0.74
<i>Uruguay</i>	-0.740	-1.01	0.20

Notes: ** indicate a rejection of the null of no cointegration at the 1% level.

6. Conclusion

Conclusion (1)

- Panel cointegration revealed a significant and positive effect of FDI on income inequality
- Our results proved to be robust to the choice of different estimation methods
- No evidence for reverse causality from inequality to FDI
- FDI contributed to widening income gaps in all individual sample countries, except for Uruguay

Conclusion (2)

- Our results fit into the Feenstra & Hanson framework
- There is evidence that the magnitude of foreign investment matters
- Inequality might be less affected when FDI comes from regional sources

Thank you for your kind attention!