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Impact of illicit financial flows on infant vaccination coverage in developing countries

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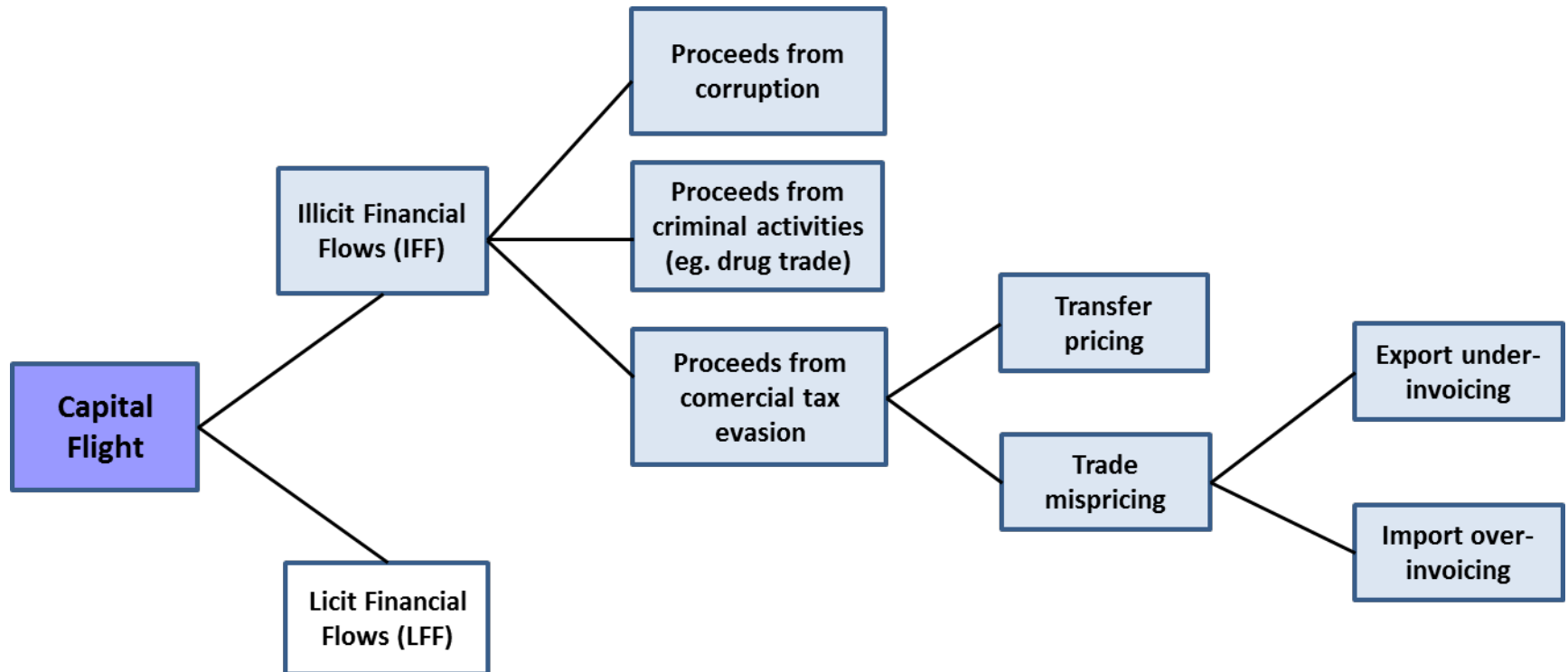
OBJECTIVE

To analyse the impact of **illicit financial flows** (*IFFs*) on the **infant immunisation coverage rate** (*Cov*) as a first step in analysing the **social costs of this kind of capital flight** in low- and middle-income countries.

With this aim, the main **hypothesis** to be tested is:

H1: there is a **negative** impact of the **relative level of IFF** on the combined **coverage rate achieved in infant immunisation** against measles, polio, and DPT in low- and middle-income countries.

WHAT ARE IFFs?

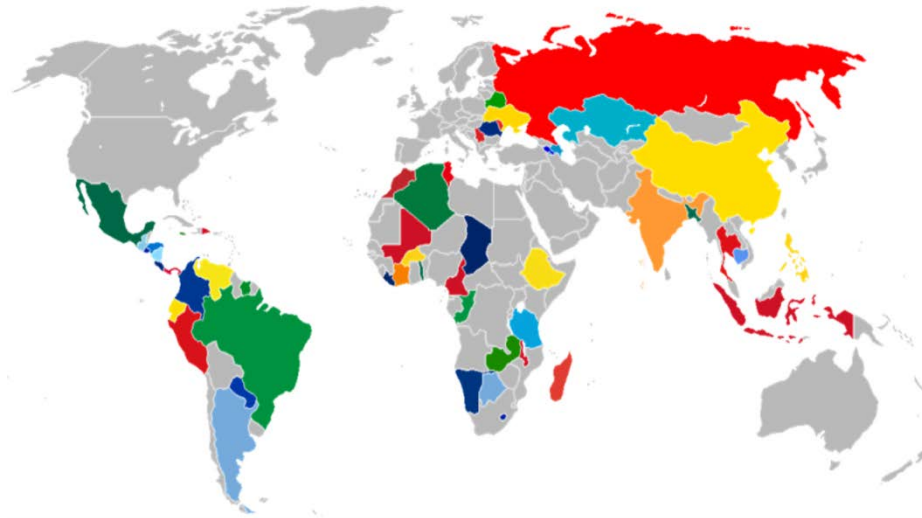


Illicit money is money that is illegally earned, transferred, or utilized. If it breaks laws in its origin, movement, or use it merits the label.

KEY VARIABLES

1. The **infant immunisation coverage rate**, calculated as a composite metric comprising the percentage of **children less than 1 year** who received **measles, polio, and DPT** immunisations in a given year.
2. The **ratio of the IFFs to total trade**, given that the amount of IFFs in a country is closely related to the amount of capital flight originating from trade (close to **80%** of the total estimated annual outflows are moved offshore using **trade misinvoicing**).

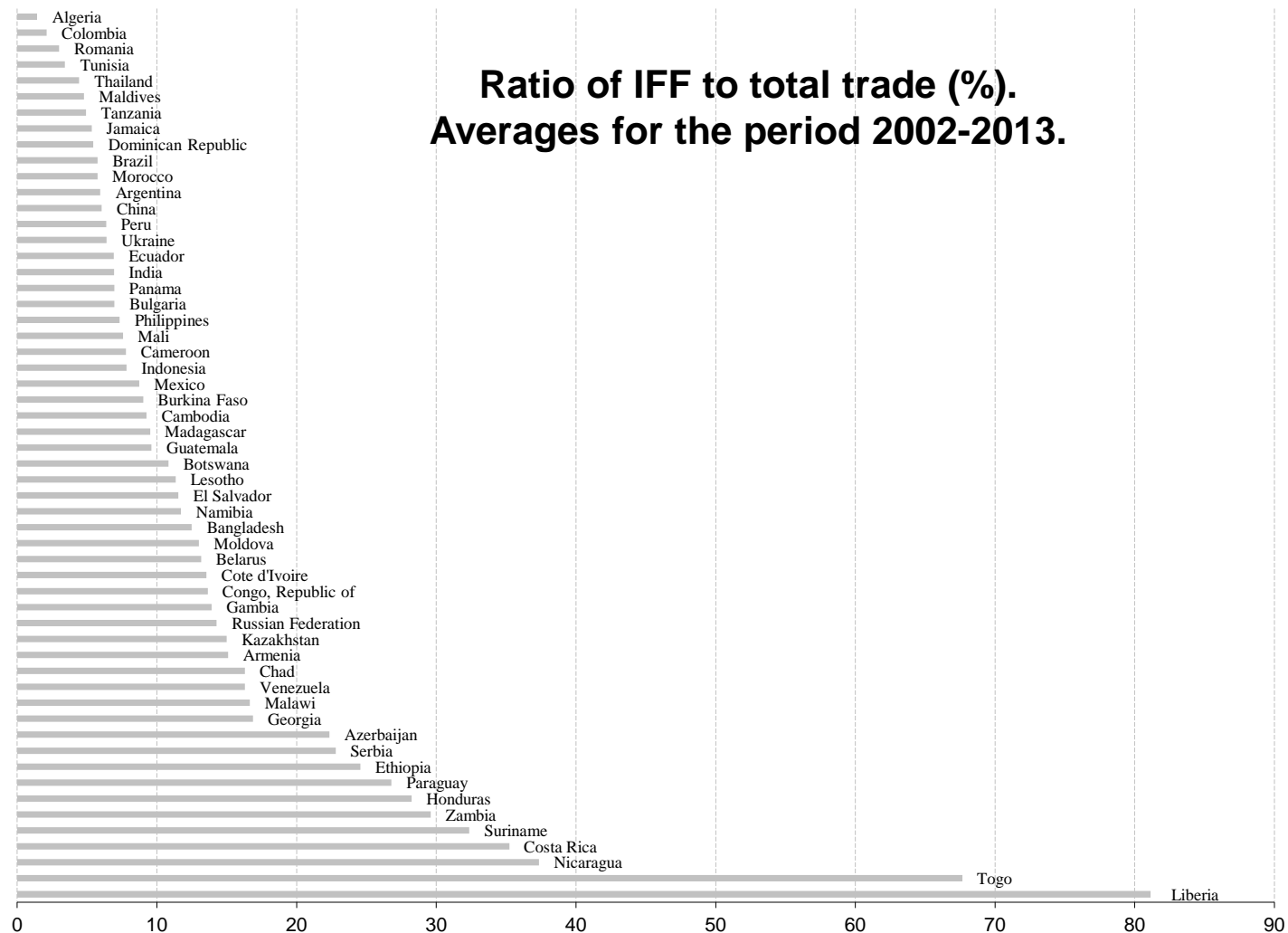
DATABASE



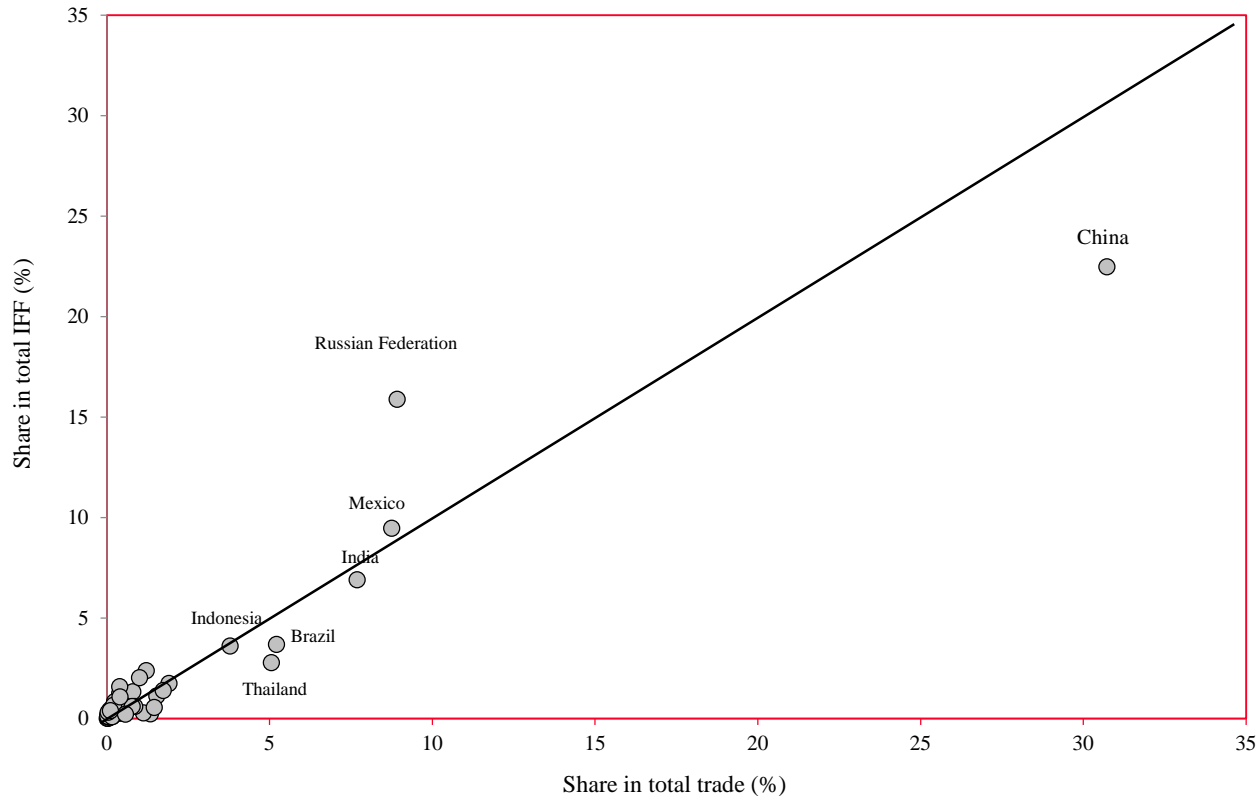
Latin America and Caribbean (17)		Sub-Saharan Africa (17)		MENA (3)	East Asia and Pacific (5)	Europe and Central Asia (11)
Argentina	Nicaragua	Botswana	Malawi	Algeria	Cambodia	Armenia
Brazil	Panama	Burkina Faso	Mali	Morocco	China	Azerbaijan
Colombia	Paraguay	Cameroon	Namibia	Tunisia	Indonesia	Belarus
Costa Rica	Peru	Chad	Tanzania	South Asia (3)	Philippines	Bulgaria
Dominican, Rep.	Suriname	Congo, Rep.	Togo	Bangladesh	Thailand	Georgia
Ecuador	Venezuela	Cote d'Ivoire	Zambia	India		Kazakhstan
El Salvador		Ethiopia		Maldives		Moldova
Guatemala		Gambia				Romania
Honduras		Lesotho				Russian F.
Jamaica		Liberia				Serbia
Mexico		Madagascar				Ukraine

Data from 56 countries for the period 2002-2013 (672 observations)

IFFs: DESCRIPTIVE ANALYSIS

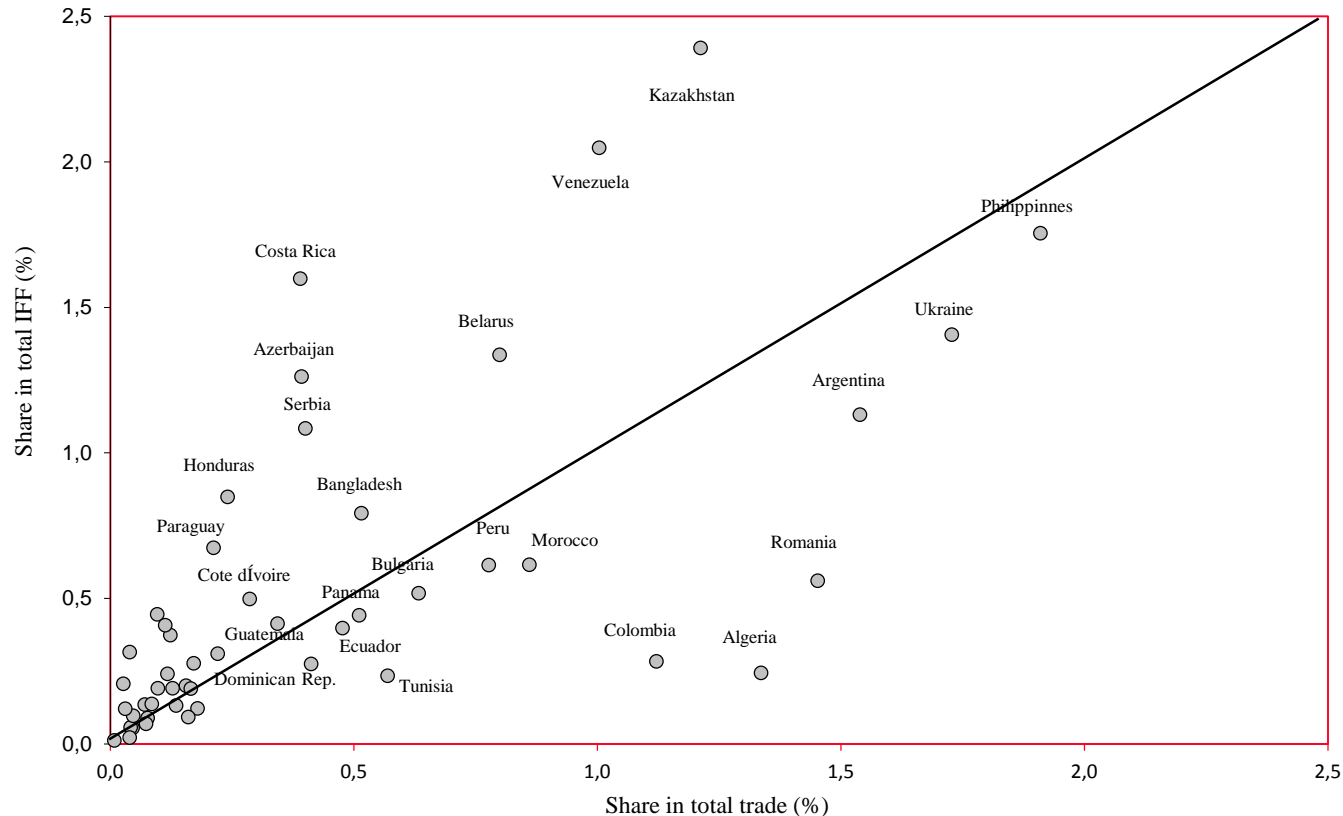


IFFs: DESCRIPTIVE ANALYSIS



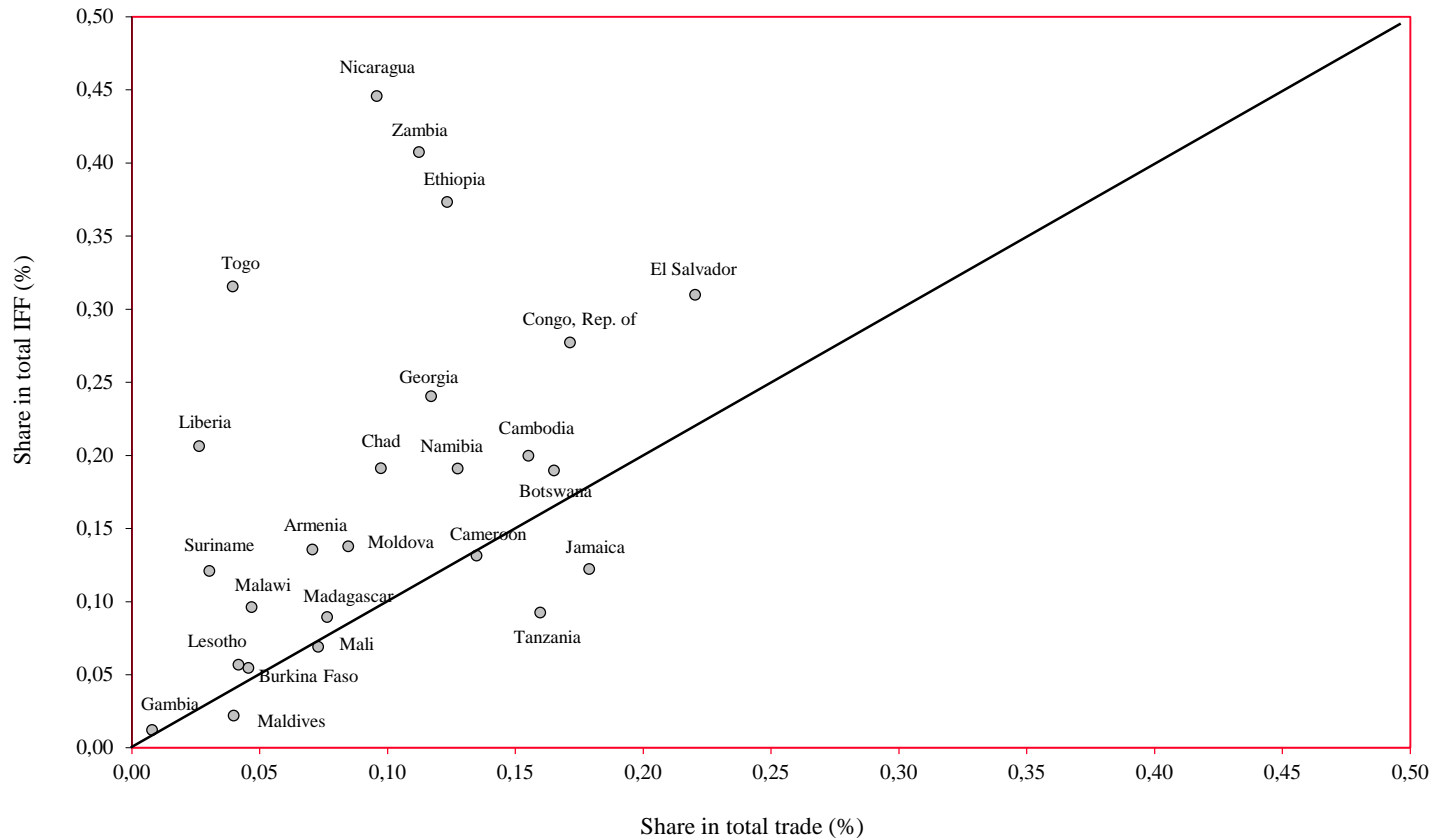
**Relationship between the share to total trade and the share to total IFFs.
All countries in the sample. Averages for the period 2002-2013.**

IFFs: DESCRIPTIVE ANALYSIS



**Relationship between the share to total trade and the share to total IFFs.
All countries in the sample excluding those indicated before.
Averages for the period 2002-2013.**

IFFs: DESCRIPTIVE ANALYSIS



**Relationship between the share to total trade and the share to total IFFs.
All countries in the sample excluding those indicated before.
Averages for the period 2002-2013.**

EMPIRICAL MODEL

In order to analyse the impact of the relative size of IFFs on infant vaccination coverage, as a baseline specification, we employed the following **dynamic panel data model**:

$$\mathbf{Cov}_{it} = \mu_i + \eta_t + \lambda \mathbf{Cov}_{it-1} + \alpha \mathbf{IFFT}_{it-1} + \beta \mathbf{X}_{it} + \varepsilon_{it} \quad (1)$$

where:

Cov = coverage level (in %) with measles, polio and DPT;

IFFT = IFFs as a % of total trade;

X = control variables;

μ = unobserved country-specific (fixed) effects;

η = time-specific effects.

ESTIMATION STRATEGY

- Firstly, we employed **OLS** to estimate equation (1).
Problem: “dynamic panel bias”.
- Secondly, using the **bias-corrected LSDV estimator** developed by Bruno (2005) in the Stata program xtlsdvc.
Problem: “endogeneity bias”.
- Finally, employing Arellano and Bond **GMM estimator for equation (1) in first differences** (i.e. the “difference-GMM” estimator). In addition to eliminating the non-observed time-invariant effects in the regressions, the estimated parameters are reliable even in the case of omitted variables.

ESTIMATION RESULTS

<i>Independent variables</i>	<i>Coefficient</i>	<i>z-statistic</i>
Cov _{it-1}	0.376	3.45
In GDPpc _{it} (constant US\$)	5.581	2.10
GIR _{it} (Gross intake ratio to first-grade female education, in %)	0.241	2.26
IFFT _{it-1} (%)	-0.069	-2.08
<i>IFFT long-run effect</i>	-0.1 = -0.069 / (1-0.376)	
m ₂	-1.39 (0.164)	
Hansen J test (50 instruments)	47.67 (0.405)	
Two-step first-difference GMM Dependent variable: Cov_{it} = Infant immunisation coverage level (%) (56 countries, 10 years, 560 observations)		

ESTIMATION RESULTS

1. Estimations show that, over this period, *the ratio of IFFs to Trade was negatively associated with vaccination coverage levels in low- and middle-income countries.*
2. As expected, estimations also show that both *higher GIR and GDPpc promote higher infant vaccination coverage levels.*



CONCLUSIONS

1. The total effect of an annual 1 p.p. increase in the ratio of IFFs to total trade is a 0.1 p.p. decrease in the level of vaccination coverage rate over the coming years.
2. Estimations results suggest that, for the countries in the sample as a whole, the reduction of 0.1 p.p. in the level of vaccination coverage rate would mean that, at least, **65,300 children will not receive this basic health care intervention in the future.**

LIMITATIONS

1. Further research is needed to study the effect of IFFs on **additional dimensions** of human development.
2. Moreover, within the health dimension, it is important to study the specific mechanisms how IFFs may damage the provision of **basic health care services** (e.g. reducing the fiscal space for health) and how they reduce other achievements in related **health outcomes**.
3. The **sample of countries** included in the analysis should be widened in order to obtain more general results.

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