INTERNATIONAL TRADE AND CHILD LABOR: AN ECONOMETRIC ANALYSIS

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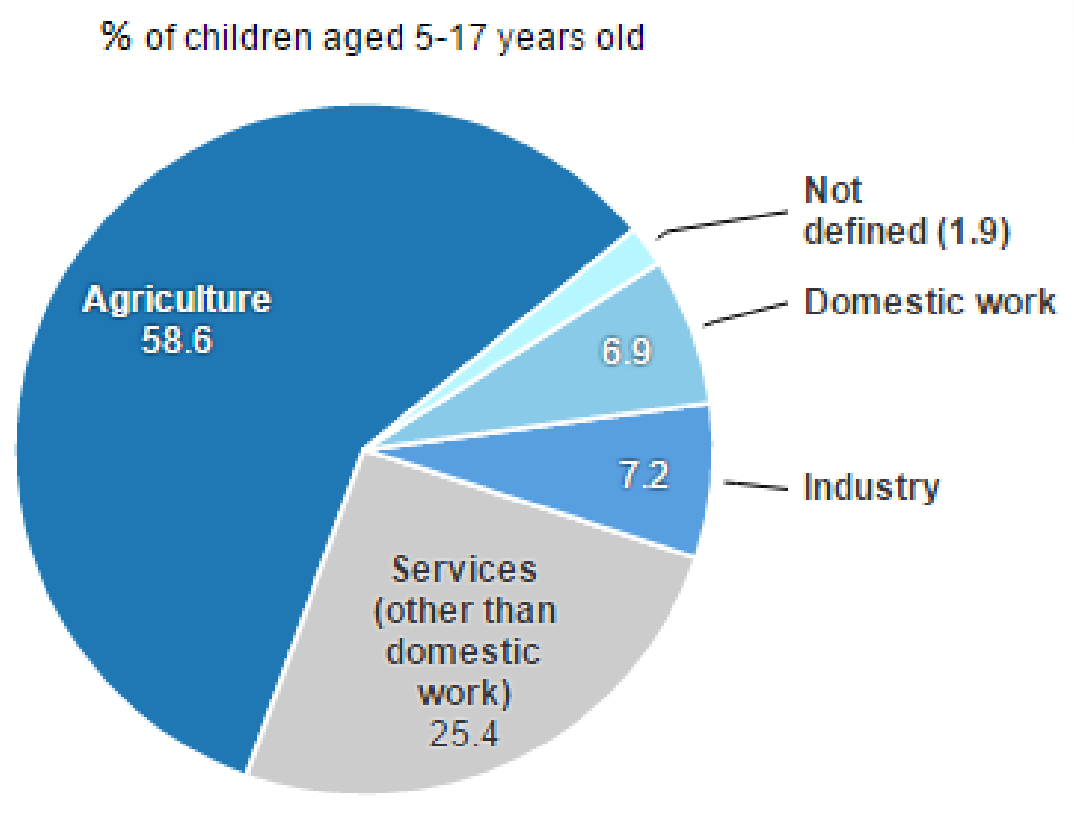
WHAT IS CHILD LABOR?

- According to ILO, work that deprives children of their:
  - Dignity
  - Physical and mental development
  - Childhood
  - Potential and schooling

- Status of child labor(5-17):
  - 168 million worldwide
  - 85 million = hazardous work

CHILD LABOR SCENARIO



Child labour distribution by level of national income, 5-17 years age group, 2012			
National income category	Total children ('000)	Child labour ('000)	Child labour (%)
Low income	330,257	74,394	22.5
Lower middle income	902,174	81,306	9.0
Upper middle income	197,977	12,256	6.2

AIM OF STUDY

DOES TRADE AFFECT THE LIVES OF CHILD LABOURERS?

EFFECT OF CHANGES IN RELATIVE RETURN TO CHILD LABOR

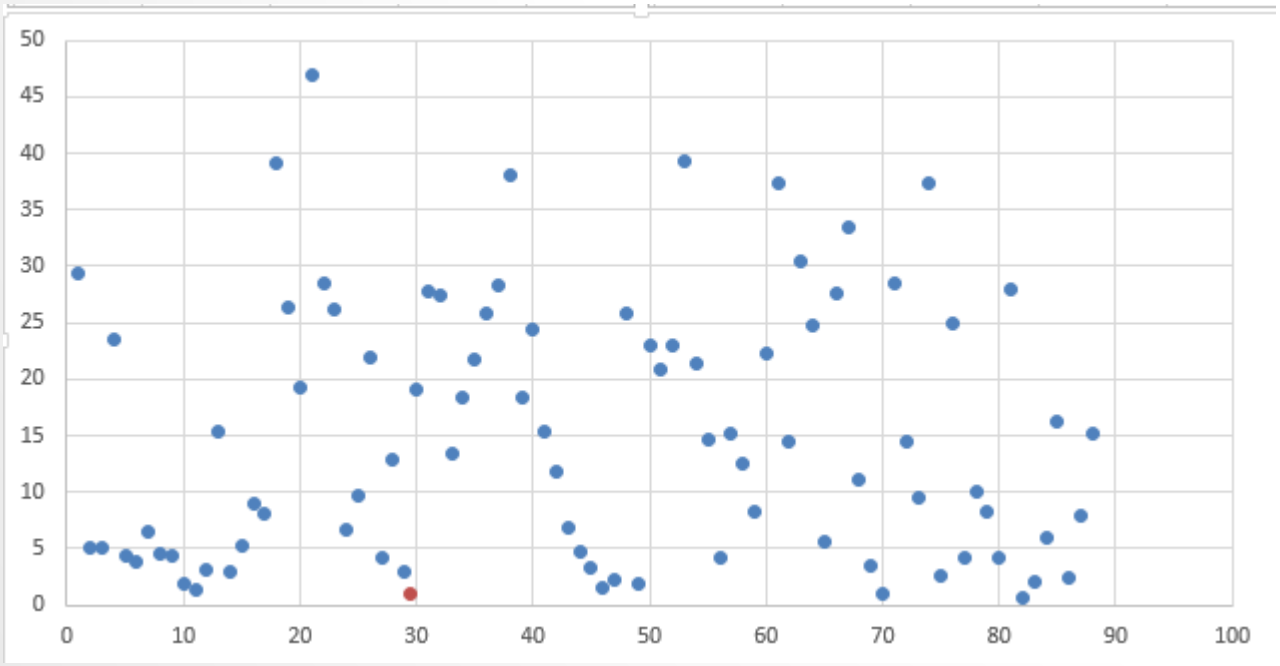
- Assumption(Ranjan 2001):
  - Unskilled labor abundant country
  - Child Labor is imperfect substitute of Adult labor
  - Present discounted return to education>return to child labor
  - Child going to school is parents decision
- Conclusions:
  - Trade Liberalization
    - → Wage of skilled ↓ & unskilled ↑ → Child Labor ↑
    - → Unskilled worker = less credit constrained → Child Labor ↓

METHODOLOGY

- Data from World Bank for 88 countries from 2012
- Child labor = 10-14 age; Economically active
- Openness = (Exports + Imports)/GDP

OPENNESS VS CHILD LABOR

Significant variation in both openness and child labor



MODEL GENERATION

$$cl_i = \beta_0 + \beta_1 \text{openness}_i + \varepsilon_i \qquad (1)$$

Cl_i = for country i, % of 10-14 population that is economically active

β_1 = Average change in Cl_i with an increase in openness

CROSS COUNTRY TRADE AND CHILD LABOR

H_o

- Pro-Liberalization: ($\beta_1 < 0$)
  - International trade ⬆ ⟶ Income ⬆ ⟶ Child Labor ⬇

H_1

- Activists: ($\beta_1 > 0$)
  - International trade ⬆ ⟶ Exports ⬆ ⟶ Demand ⬆ ⟶ Child Labor ⬆

ANOVA TABLE FOR (1)

Stata takes null hypothesis that sample parameter is **zero** & we **reject** that!

```
reg child openess
```

Source	SS	df	MS
Model	696.483823	1	696.483823
Residual	10755.1412	86	125.059781
Total	11451.625	87	131.627874

Number of obs	=	88				
F(1, 86)	=	5.57				
Prob > F	=	0.0205				
R-squared	=	0.0608				
Adj R-squared	=	0.0499				
Root MSE	=	11.183				

child	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
openess	-.0851516	.0360825	-2.36	0.021	-.1568812	-.013422
_cons	22.23158	3.238746	6.86	0.000	15.79317	28.66999

Trade ⟷ Income (Frankel & Romer -1999)

```
. correlate openess gdppc
(obs=88)

             |  openess    gdppc
-------------+------------------
    openess  |   1.0000
      gdppc  |   0.1638   1.0000
```

Child Labor ⟷ Income (Edmonds & Pavcnik 2006)

↓

Trade ⟷ Child Labor **??**

$$cl_i = \beta_0 + \beta_1 openness_i + \varepsilon_i$$

$$cl_i = \beta_0 + \beta_1 openness_i + \gamma_1 \ln(income_i) + \varepsilon_i.$$

$\beta_1(2)$= Average change in Cl_i with an increase in openness after **controlling for** any effects of income on trade

$\beta_1(2)$-$\beta_1(1)$ ⟹ Trade↔ Child Labor due to Trade ↔Income

Later

$$cl_i = \beta_0 + \beta_1 openness_i + \gamma_1 \ln(income_i) + \gamma_2 (\ln(income_i))^2 + \varepsilon_i.$$

MODEL WITHOUT LOG

```
. reg child openess gdppc

      Source |       SS       df       MS              Number of obs =      88
-------------+------------------------------           F(  2,    85) =   15.54
       Model |  3065.56124     2  1532.78062            Prob > F      =  0.0000
    Residual |  8386.06376    85  98.6595737            R-squared     =  0.2677
-------------+------------------------------           Adj R-squared =  0.2505
       Total |  11451.625     87  131.627874            Root MSE      =  9.9328

------------------------------------------------------------------------------
       child |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     openess |  -.0590733   .0324873    -1.82   0.073    -.1236667    .0055202
       gdppc |  -.0009972   .0002035    -4.90   0.000    -.0014018   -.0005926
       _cons |   25.04652   2.93345     8.54   0.000     19.21403     30.879
------------------------------------------------------------------------------
```

R-squared is lower than the next model

ANOVA OF MODEL 2

```
. reg child openess login

      Source |       SS       df       MS              Number of obs =      88
-------------+------------------------------           F(  2,    85) =   35.86
       Model |  5240.64656     2  2620.32328            Prob > F      =  0.0000
    Residual |  6210.97844    85  73.0703346            R-squared     =  0.4576
-------------+------------------------------           Adj R-squared =  0.4449
       Total |  11451.625     87  131.627874            Root MSE      =  8.5481

------------------------------------------------------------------------------
       child |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     openess |  -.0405358   .0281552    -1.44   0.154    -.0965158    .0154441
       login |   -6.21072   .7875635    -7.89   0.000    -7.776607   -4.644833
       _cons |   67.67555    6.27189    10.79   0.000     55.20535    80.14575
------------------------------------------------------------------------------
```

R-Squared is higher than previous models (But not more than the final model)

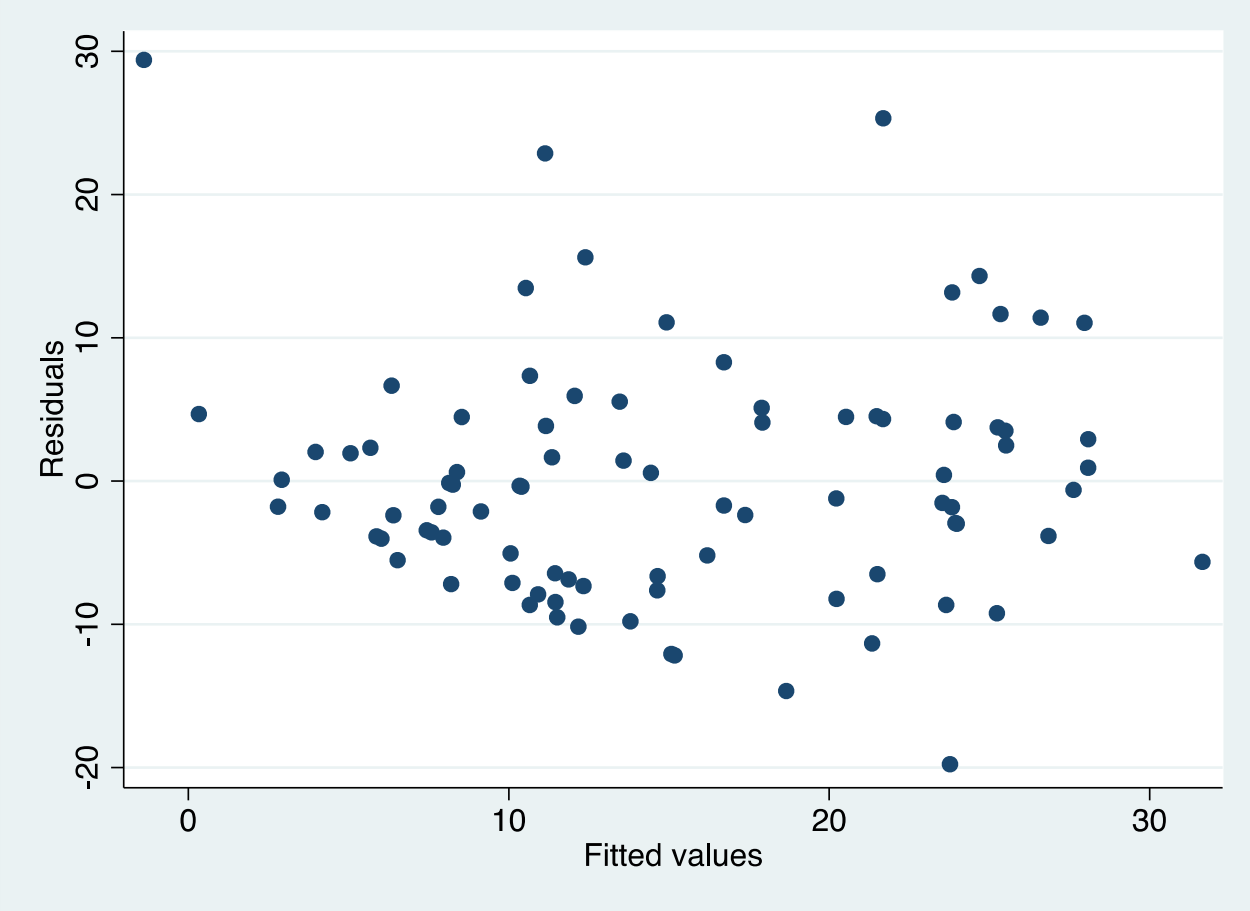
VIF – TEST FOR MULTICOLLINEARITY

```
. vif
```

Variable	VIF	1/VIF
login	1.04	0.959622
openess	1.04	0.959622
Mean VIF	1.04	

VIF is within limits (<10)
Hence sample doesn't suffer from Multicollinearity

RVF PLOT



TEST FOR HETEROSKEDASTICITY

```
. imtest, white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(5)      =     12.46
         Prob > chi2  =    0.0291

Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	12.46	5	0.0291
Skewness	7.90	2	0.0192
Kurtosis	2.46	1	0.1169
Total	22.82	8	0.0036

Since calculated chi2> tabulated chi2, we reject the null hypothesis, and thus the model suffers from heteroscedasticity at 1% significance

ESTIMATION WITH ROBUST STANDARD ERRORS

```
. reg child openess login, robust

Linear regression                               Number of obs =      88
                                                F(  2,    85) =   40.03
                                                Prob > F      =  0.0000
                                                R-squared     =  0.4576
                                                Root MSE      =  8.5481
```

child	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
openess	-.0405358	.0323148	-1.25	0.213	-.1047863	.0237146
login	-6.21072	.7095668	-8.75	0.000	-7.621529	-4.799911
_cons	67.67555	7.041235	9.61	0.000	53.67569	81.67541

- Pro-Liberalization: ($\beta_1 < 0$)
  - International trade ⬆ ⟶ Income ⬆ ⟶ Child Labor ⬇ **Do Not Reject**

- Activists: ($\beta_1 > 0$)
  - International trade ⬆ ⟶ Exports ⬆ ⟶ Demand ⬆ ⟶ Child Labor ⬆ **Reject**

ANOVA TABLE FOR (3)

```
. gen login = ln(gdppc)

. gen squarelogin = login*login

. reg child openess login squarelogin
```

Source	SS	df	MS
Model	5457.10338	3	1819.03446
Residual	5994.52162	84	71.3633526
Total	11451.625	87	131.627874

Number of obs	= 88
F(3, 84)	= 25.49
Prob > F	= 0.0000
R-squared	= 0.4765
Adj R-squared	= 0.4578
Root MSE	= 8.4477

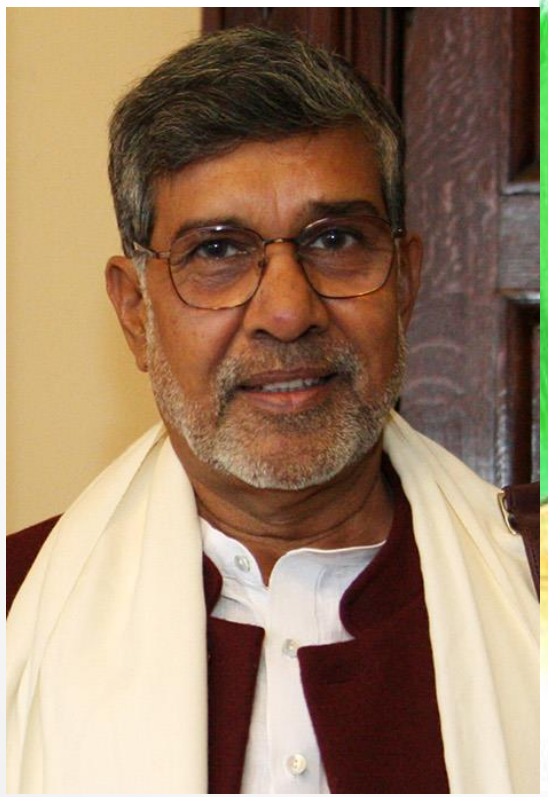
child	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
openess	-.0369884	.0278988	-1.33	0.188	-.0924682	.0184915
login	-25.47201	11.0869	-2.30	0.024	-47.51953	-3.424493
squarelogin	1.226543	.7042627	1.74	0.085	-.1739608	2.627047
_cons	141.2818	42.71569	3.31	0.001	56.33695	226.2266

CONCLUSIONS

- Negative association between child labor and openness
- Trade 10% ⬆ ⟶ Child Labor **0.4%** ⬇
- After controlling for income difference across countries, **no evidence for significant association** between openness to trade and child labor.
- Income turned out to be a significant determinant of child labour rate!

HOW DO WE TACKLE CHILD LABOR?

- Corporate Social Responsibility
- Social dialogue
- Education
- Time bound programmes
- Government Policies



https://critperspective.wordpress.com/2011/05/27/realizing-corporate-social-responsibility-and-ending-child-labor/

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