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An Assessment of How the Informal Labour Markets Affect the Inflow and Outflow of FDI Across 28 Developed and Developing Countries

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Abstract: ***This project tries to analyze the effects of the informal labor markets on the FDI inflows and outflows from the economy. There are other factors too that are affecting the Foreign Direct Investment (FDI) such as labor cost, corruption, GDP etc which need to be controlled. This study doesn't control such variables but only take into account the informal labor force. The study is done across 28 developed and developing countries and a time period of 26 years. Data are collected from United Nations Conference on Trade and Development (UNCTAD) and World Bank. Focus of the analysis is to test the unit specific fixed effect that is affecting the dependent variable over and above the explanatory variables. The study is also extended to Arellano Bond Estimation.***

Keywords: developing countries, Fixed effects model, wages

JEL: O100, C230, J30

1. Introduction

The project looks at the independent variable i. e. informal labor markets on the FDI inflows and outflows. FDI inflows and outflows of an economy has some positive as well as immediate effects. Positive effects are however are investment in infrastructure, employment opportunities and better pay. It should also be noted that different authors have also shown possible negative effects of FDI, such as an increase in wage inequality (Hanousek, Kocenda & Maurel, 2011). However the whole thing boils down to the institutions of an economy. The 28 countries that are taken in this project are Australia, Argentina, Austria, Belgium, Brazil, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Poland, Portugal, Singapore, Spain, Sweden, Switzerland and United Kingdom. A time from 1991 to 2016 has been taken into consideration. The indicator for the FDI inflows and outflows have been taken as percentage of GDP and the indicator for informal labor is vulnerable employment total (% of total employment). FDI inflows outflows data are taken from UNCTAD and vulnerable employment total (% of total employment) data are taken from WORLD BANK DEVELOPMENT INDICATORS. The regression equation is set up using FDI flows as dependent variable and informal employment as independent variable. STATA is used for the entire analysis.

Model and Methodology

Name of Variable	Description
CC	Country Code
T	Year
INFL	Informal Labour
FDI	FDI Inflows and Outflows

2. Theoretical Framework

Panel data also known as longitudinal or cross sectional time series helps in looking at the different variables. It can be states, countries, individuals etc and observed across time. The usefulness of panel data is that it controls the unobservable and which cannot be measured such as cultural differences, geography etc.

Dynamic panel data describe the case where a lag of the dependent variable is used as regressor. The fixed effect models estimators rely on the fact that there is strict exogeneity between the individual specific ui and the explanatory variables. When there is a lagged dependent this fails and we need to estimate it through certain instrumental variables. Arellano Bond Estimation is used to serve the purpose.

Fixed Effect Model

The fixed effect (FE) is put into use whenever we are interested in looking at the impact of the variable over time. There are other individual specific variables which are specific to an entity and remain fixed such as a person can be male and female and being a male/ female might have diverse opinions and which are generally in most cases are fixed. Fixed effects try to control such effects and try to see only the predictor variable effect on the independent variable. The time invariant characteristics of the individual should not be correlated with the characteristics of other individuals. If they are correlated then the whole purpose of fixed effects boils to nothing. If the error terms are correlated, then FE is not suitable since inferences may not be correct and we need to model that relationship probably using random-effects.

The equation for the fixed effects model becomes:

$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it}$

Where

– α_i (i=1…. n) is the unknown intercept for each entity (n entity-specific intercepts).

– Y_{it} is the dependent variable where i = entity and t = time.
– X_{it} represents one independent variable
– β_1 is the coefficient for the independent variable
– u_{it} is the error term

Random Effects

Random effect assessment however can be analyzed when the variation that arise among the variables are not correlated either with the explanatory variables or the error terms. The random effects model is an appropriate specification if we are drawing *N* individuals randomly from a large population.

Hausman Test

Hausman test tries to simplify our task of whether to use fixed effect model or random effect model. Fixed effect model give more consistent estimators and the random model gives more efficient results. The Hausman test chooses between a more efficient model and a consistent model. The Hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator.

3. Empirical Results

Fixed effect approach

Fixed-effects (within) regression Number of obs = 728
Group variable: countrycode Number of groups = 28

corr(u_i, Xb) = -0.4751 F(1,699) = 45.72
Prob > F = 0.0000

fdistocks	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
informality	-2.615747	.3868646	-6.76	0.000	-3.375303	-1.856191
_cons	82.18678	6.466423	12.71	0.000	69.49084	94.88272
sigma_u	42.133638					
sigma_e	26.809076					
rho	.71181427	(fraction of variance due to u_i)				

F test that all u_i=0: F(27, 699) = 49.73 Prob > F = 0.0000

Interpretation

Prob>F=0.000 i. e. it means that the model is significant. The null hypothesis ui are zeroes are rejected. From the table we can see that the independent variable informality (informal labors) is significant and its coefficient is negative. The coefficient suggest that an one percent increase in the informality of the workers will decrease the FDI outflows and inflows by 2.16 percent.

Random Effect Approach

Random-effects GLS regression Number of obs = 728
Group variable: countrycode Number of groups = 28
corr(u_i, X) = 0 (assumed) Wald chi2(1) = 41.76
Prob > chi2 = 0.0000

fdistocks	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
informality	-2.119294	.3279719	-6.46	0.000	-2.762107	-1.476481
_cons	73.98713	8.940064	8.28	0.000	56.46493	91.50933
sigma_u	37.140526					
sigma_e	26.809076					
rho	.6574467	(fraction of variance due to u_i)				

Interpretation

Prob>chi (2) =0.0000. This suggests that the model is significant. The independent variable is significant and negative. The result suggests that a one percent increase in informality leads to decrease in FDI inflows and outflows by 2.11 percent.

Bruesch-Pagan Lagrangian Multiplier Test for Random Effects

The LM test helps us to decide between a random effect regression or OLS regression. The null hypothesis is that variance across entities are zero i. e. no panel effect.

Estimated results:

	Var	sd = sqrt(Var)
fdistocks	2148.804	46.3552
e	718.7266	26.80908
u	1379.419	37.14053

Test: Var(u) = 0
chibar2(01) = 3664.81
Prob > chibar2 = 0.0000

Interpreting the above table we can see that prob>chi=0.000. Therefore we reject the null hypothesis i. e. variance across null hypothesis is not equal to zero. There is panel effect

Hausman Specification Test

The above mention test helps us to decide between the fixed effect model and the random effect model. The null hypothesis is random effect and the alternative hypothesis is fixed effect model.

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
informality	-2.615747	-2.119294	-.4964536	.2051796

Prob>chi2 = 0.0155

Interpretation

Prob>chi (2) =0.0155. The P-value equals 0.0377 which is less than 0.05. We reject our null hypothesis. This means our model is a fixed effect model.

Arellano Bond Estimation

We might sometime want to model the dependent variable with their lags. For instance we might use to check the FDI stocks with its lag. Here ui is correlated with the independent variable there is endogeneity problem. In such cases we go for ARELLANO BOND ESTIMATION.

Arellano-Bond dynamic panel-data estimation Number of obs = 672
Group variable: countrycode Number of groups = 28
Time variable: year
Number of instruments = 302 Wald chi2(2) = 3383.24
Prob > chi2 = 0.0000

One-step results

fdistocks	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fdistocks L1.	.983198	.0175586	56.00	0.000	.9487838	1.017612
informality	.189391	.2651995	0.71	0.475	-.3303904	.7091724
_cons	-.5212736	4.599885	-0.11	0.910	-9.536883	8.494336

Instruments for differenced equation
GMM-type: L(2/.).fdistocks
Standard: D.informality
Instruments for level equation
Standard: _cons

Interpretation

The Arellano Bond estimation shows that the model is significant and its lag dependent variable is significant but the explanatory variables are not significant. Since the informality is not significant in this model we will stick to our fixed effects model and interpret the results. The insignificance of the independent variable is a further research topic since it might be the case that the lagged value of independent variable might be insignificant.

4. Conclusion

The analysis comprises of dataset containing 28 countries across 26 years. We form a regression where FDI flows are the dependent variable and the informal labor is an independent variable. We examine them with both random and fixed effect. In both the tests we found out the independent variable is significant. In order to decide between the two model we run the Hausman Specification test. The test showed that we reject the null hypothesis and come to the conclusion that our model is fixed effect model. The dynamic panel doesn't give results as required since it is showing the independent variable insignificant.

References

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