



PARTIAL ADOPTIONS OF INTERNATIONAL ACCOUNTING STANDARDS AND FOREIGN DIRECT INVESTMENT

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Abstract: This paper investigates the impact of the International Financial Reporting Standard (IFRS) adoption on Foreign Direct Investment (FDI) inflows. An annual panel dataset of 135 countries from 2005 to 2016 are used. Instead of binary dummies of “yes” or “no” used by other authors we use orderly data of partial adoptions. Based on several preliminary tests, we perform fixed effect instrumental variable estimations on the dataset. We find that IFRS adoption has positive effect on FDI inflows, both directly and indirectly through interaction with regulatory quality.

Keywords: IFRS, FDI, governance, corruption

JEL Classification: F21, F36

1. Introduction

While existing literature has examined the impact of the International Financial Reporting Standard (IFRS) adoption on Foreign Direct Investment (FDI) inflows, the papers only binary dummies of adopting (yes) or not adopting (no). In this paper, we use orderly data of partial adoptions. Based on several preliminary tests, we perform fixed effect instrumental variable estimations on the dataset. We find that IFRS adoption has positive effect on FDI inflows, both directly and indirectly through interaction with regulatory quality.

Section 2 reviews empirical literature on the determinants of FDI inflows. Section 3 presents our econometric models and the data. Section 4 discusses the methodology and the results. Section 5 concludes.

2. Existing Literature

A large number of papers on the determinants of FDI inflows are focusing on OECD data of out-bound FDI flows. A survey of this literature and the micro-empirical literature on FDI is provided in Blonigen (2005). Another group examines the

impacts of capital account policies on other variables such as the volume and price of investment in the receiving country. This group includes Henry (2003), Edwards and Rigobon (2005) on the Chilean case, Carvalho and Garcia (2006) on the Brazilian case, and a recent survey by Forbes (2006).

Most papers that have examined the governance - FDI relation center on the effects of capital account policy on FDI inflow. Desai et al. (2004), using firm level data from the U.S., find that American multinationals manage to circumvent capital controls by adjusting their reported intra-firm trade, affiliate profits and dividend repatriations. Alfaro et al. (2005), and Aizenman and Noy (2003), find that capital controls have no impact on aggregate capital flow volumes. Aizenman and Noy (2006), find that while capital controls have no impact on FDI gross flows, controls on the current account do have an indirect impact on FDI inflows through their impact on goods trade.

Asiedu and Lien (2004) use a cross-country macro panel of net FDI flows to examine the impact of external policies (controls on the capital account, exchange rate regime and a surrender of



export proceeds requirement) on net FDI flows. They present mixed findings with some evidence that FDI flows are impacted by capital account policies but only in specific geographical regions. In light of these puzzling and often conflicting results and the prominence of policy debates on these issues, it is clear that more research into the capital flows / capital account policies nexus is desirable.

Noy and Vu (2007) use a different measure of capital controls that was developed in Chinn and Ito (2006) rather than the dichotomous measure used in almost all of the previous literature. Their paper also examines the impact of institutional factors – corruption and political stability - on the degree of association between capital controls and the flows of FDI.

Martinez (2010) investigates the cost of borrowing in relations to institutional quality and capital openness. He finds that the effect of institutional quality on borrowing costs depends on whether the country has an improving financial institutions, which is measured as its openness to capital flows. Concerning the control of corruption, Dutt and Traça (2010) analyze the relationship between corruption and bilateral trade, using a gravity model, with corruption-added. They find that the effect of corruption is ambiguous: corruption can have negative effect on exports if it favors foreign companies, but they can increase exports if the corruption activities are against the foreign companies. Hence, will be interesting to find out the effect of corruption control on FDI as well.

Lee and Farger (2010) examine the impact of IFRS adoption on portfolio investment. They show that IFRS adoption does increase the level of foreign equity investment held by Australian investors. Their results imply that investors are benefitting from a fall in the asymmetry of information through an improvement of transparency and accountability via IFRS adoption. This leaves the question of what is the effect of IFRS adoption on FDI unresolved.

Chen et al (2014) use bilateral FDI data from 30 OECD countries for the period from 2000 to 2005 to investigate the relation between International Financial Reporting Standards (IFRS) and FDI. They find that when a country adopts the IFRS, the inflow of FDI goes up because the merging of the domestic and the IFRS reduces information processing costs for foreign investors. We also discover that the effect of reduced information costs is stronger for partner countries whose

accounting systems showed greater pre-convergence differences because they magnify the facilitating role of accounting standard convergence for FDI.

Cory (2015) examines nearly 130 nations around the world that require or permit the use of IFRS in relation to inflows of foreign direct investment (FDI). The study also examines different effects of IFRS on FDI inflows to developed versus developing countries that have adopted IFRS. Performing ordinary least squares (OLS) regressions, the author finds that IFRS adoption appears to be positively associated with FDI inflows for the whole sample of all countries and the subsample of developing countries. However, the author does not find evidence that IFRS adoption is positively associated with FDI inflows for the subsample of developed countries.

3. Model and Data

We develop econometric models for the determinants of FDI. The first is to investigate the direct effect of IFRS on FDI:

$$FDI_{it} = \beta_1 + \beta_2 IFRS_{it} + \sum_{j=1}^n \beta_j G_{jt} + \sum_{k=1}^m \beta_k C_{jt} + u_i + w_t + \varepsilon_{it}$$

where FDI is the net inflows of FDI, $IFRS$ is whether or not a country adopts the standard, C is a vector of governance-indicator variables such as the regulatory quality ($QUAL$), control of corruption ($CCOR$), rule of law ($RULE$), etc. C is a vector of control variables such as GDP growth, infrastructure, etc., u_i indicates the country effect, w_t the time effect, and ε_{it} is the composite disturbance.

The second model is to examine the indirect effect of IFRS through its interaction with each of the good governance variables:

$$FDI_{it} = \beta_1 + \sum_{j=1}^n \beta_j IFRS * G_{jt} + \sum_{k=1}^m \beta_k C_{jt} + u_i + w_t + \varepsilon_{it}$$

where $IFRS * G$ is interactions of $IFRS$ with each of the governance-indicator variables. The control variables are the same as in Equation (1).

We collected annual panel data on World Governance Indicators (WGI) for 213 countries during 2005-2016 from the World Bank Database. Each index of governance is ranked from lowest (-2.5) to highest (2.5), with the highest as the best



governance. To obtain data on dates and countries of the IFRS adoptions, we use a combination of three sources: the Deloitte Website, the AdoptIFRS.org operated by Simon Fraser University in Canada, and the Ministry of Finance of Ukraine website. We use the sales from 0 to 3 to account for partial adoption. $IFRS = 1$ for IFRS lowest level of adoption, $IFRS = 2$ for IFRS intermediate level of adoption, $IFRS = 3$ for IFRS highest level of adoption, and $IFRS = 0$ for not adopted countries. Several countries do not report the date of adoption, resulting in 135 adopted countries with full information. Data for net inflow of FDI are from 2002 to 2013. Net inflow of FDI is defined as total inward FDI minus repatriation and is measured in constant US million dollars with 2010 as the base year. Among the 135 countries adopted IFRS during 2002-2013, only 133 countries reported FDI inflows, so this is our sample size. Table 1 shows the descriptive statistics for the bench mark variables, including IFRS, FDI, QUAL, CCOR, and RULE. It reveals that IFRS adoptions were slow in 2002-2007 and speeded up in 2008-2013. In contrast, net inflow of FDI peaked in 2005-2007 and tapered off in 2008-2013. Data for the other control variables are from the World Bank's World Development Indicators (WDI), such as GDP growth, exports, per capita income, infrastructure, etc.

Methodology and Results

We follow a downward piecewise algorithm in pairing down our specification in order to avoid omitted variables. We gradually eliminate variables with high multi-collinearity, using the Variance Inflation Factors test (VIF). The test uses the diagonal elements of the covariance matrix in a regression and is given by: $VIF_i = (1 - R_{ik}^2)^{-1}$, where R_{ik}^2 is the R^2 from regressing the X_i on k other variables. When there is perfect multi-collinearity, R_{ik}^2 equals one, and the VIF approaches infinity.

We follow Kennedy (2003) and eliminate any variable with VIF equals to or greater than ten. The VIF tests reveal that most of the governance variables are highly correlated to each other, so only three variables are left for estimations: QUAL, CCOR, and RULE, among which CCOR and RULE have to be estimated in two separated models because they are also highly correlated to each other. After several rounds of VIF tests and

eliminating variables with p-values > 0.80 , we have two more alternative models, making a total of four alternative models, two for the direct effects based on Equation (1) and two for the indirect effects based on Equation (2).

$$FDI_{it} = \beta_1 + \beta_2 IFRS_{it} + \beta_3 QUAL_{it} + \beta_4 CCOR_{it} + \beta_5 PCY_{it} + \beta_6 EXP_{it} + \beta_7 GDPG_{it} + \beta_8 INFRA_{it} + \beta_9 LABOR_{it} + u_i + w_t + \varepsilon_{it} \quad (3)$$

$$FDI_{it} = \beta_1 + \beta_2 IQUAL_{it} + \beta_3 ICOR_{it} + \beta_4 PCY_{it} + \beta_5 EXP_{it} + \beta_6 GDPG_{it} + \beta_7 INFRA_{it} + \beta_8 LABOR_{it} + u_i + w_t + \varepsilon_{it} \quad (4)$$

$$FDI_{it} = \beta_1 + \beta_2 IFRS_{it} + \beta_3 QUAL_{it} + \beta_4 RULE_{it} + \beta_5 PCY_{it} + \beta_6 EXP_{it} + \beta_7 GDPG_{it} + \beta_8 INFRA_{it} + \beta_9 LABOR_{it} + u_i + w_t + \varepsilon_{it} \quad (5)$$

$$FDI_{it} = \beta_1 + \beta_2 IQUAL_{it} + \beta_3 IRULE_{it} + \beta_4 PCY_{it} + \beta_5 EXP_{it} + \beta_6 GDPG_{it} + \beta_7 INFRA_{it} + \beta_8 LABOR_{it} + u_i + w_t + \varepsilon_{it} \quad (6)$$

where PCY is per capita income, $GDPG$ is GDP growth, EXP exports, $INFRA$ infrastructure, and $LABOR$ the labor force. $ICOR$ denotes the interaction of $IFRS$ with $CCOR$, $IQUAL$ of $IFRS$ with $QUAL$, and $IRULE$ of $IFRS$ with $RULE$. Table 1 reports the results of the VIF tests for the models.

White tests performed on Model (1) and (2) show that they have heteroscedasticity problems, so the subsequent regressions are performed with "Robust" command added to control for this problem.

We also carry out a Granger-causality test. A probit estimation with IFRS as dependent variables is performed against two lagged values of FDI and its own two lags. The interaction of IFRS and each of the above variables is then regressed against two lagged values of FDI and its own two lags. All estimations are carried out with the other control variables. The p-value of the F test for joint significance of the two FDI lags is greater than 0.30 in each case. We thus fail to reject the null hypothesis that the coefficients of these lags are not significantly different from zero. We conclude that FDI does not appear to Granger-cause IFRS, and single equation estimations are appropriate.



Table 1. Results for VIF Tests

Dependent Variable: Net FDI Inflows

Variable	Model (3)	Model (4)	Model (5)	Model (6)
CORR	4.91	-	-	-
RULE	-	6.93	-	-
QUAL	4.45	6.38	-	-
ICOR	-	-	4.60	-
IRULE	-	-	-	7.19
IQUAL	-	4.13	-	6.50
INFRA	1.54	1.48	1.49	1.46
PCY	1.38	1.40	1.41	1.42
EXP	1.18	1.18	1.12	1.12
IFRS	1.12	1.13	-	-
GDPG	1.07	1.07	1.06	1.07
LABOR	1.06	1.06	1.05	1.06
Mean VIF	1.09	2.58	2.13	2.83

The Hausman tests for the model selection show that the fixed effect models are more appropriate than random effect models. All p-value are greater than 0.10, indicating that the null hypotheses favoring the random effect models are not rejected. The random effects and fixed effects are defined as in Greene (2008). The Arellano-Bond (1991) tests for the panel data show that the models do not have autocorrelation problems: all p-values are greater than 0.10 for the AR(1) and AR(2) processes. We then perform the modified Hausman tests, called the second variant of the Hausman tests in Kennedy (2003), to pinpoint the endogenous variables. The theoretical foundation of the test is simple: when variable X_i is regressed on a vector of all exogenous variables X_j , $X_j = [x_1, x_2, \dots, x_{i-1}, x_{i+1}, \dots, x_j]$, the part of X_i explained by these variables would be factored out. The rest of X_i is explained by the residual from the estimation, V_i .

This V_i is then added to the regression of the structural equation. If the t statistics for the estimated coefficient of V_i is significant, then V_i is correlated with the dependent variable, so V_i and X_i are correlated with the error term of the structural equation and so X_i is an endogenous variable. We discover that CCOR and QUAL are endogenous in equation (3), RULE and QUAL are endogenous in equation (4), ICOR and IQUAL are endogenous

in equation (5), while IRULE and IQUAL are endogenous in equation (6). Hence, random effect instrumental variable (REIV) estimations are needed.

Since RULE and CCOR are discovered to be highly correlated with each other in the aforementioned VIF tests and so have to be excluded in alternative models, they can be instrumental variables (IVs) for each other, providing that they are not correlated to the error terms of the structural equations. Whether they can be IVs for QUAL (or IQUAL) have to be tested empirically. We use RULE and first lagged of RULE (RULE1) as IVs for QUAL (or IQUAL) and CCOR (or ICOR), respectively. Performing separate regressions of the structural equation in Models (3) and (4) with RULE and RULE1 added, we find that estimated coefficients of RULE and RULE1 are not statistically significant (with p-values are ranging from 1.79 to 0.638), implying that they are not correlated to FDI. Hence, the potential IVs are not correlated to the error terms in Models (3) and (4). We then carry out regressions of QUAL (or IQUAL) on RULE and CCOR (or ICOR) on RULE1 with all other exogenous variables in tow and find that estimated coefficient of RULE and RULE1 are highly significant (all p-values are less than 0.01), implying that RULE is highly correlated to QUAL (or IQUAL) and RULE1 is highly correlated to CCOR (or



ICOR). As a result, RULE and RULE1 are satisfactory IVs for Models (3) and (4).

In Table 2, we report the estimated results for Models (3) and (4). The direct effect of IFRS is positive and statistically

Table 2. Estimation Results for Models (3) and (4)

Dependent Variable: Net FDI Inflows

Variable	Model (3)		Model (4)	
	Coefficient	p-value	Coefficient	p-value
IFRS	3.842***	0.006	-	-
QUAL	5.108**	0.032	-	-
CCOR	2.548*	0.078	-	-
IQUAL	-	-	7.124***	0.003
ICOR	-	-	0.176	0.287
PCY	0.109*	0.087	0.176**	0.025
GDPG	0.284**	0.023	0.331***	0.007
EXP	0.039	0.314	0.037	0.334
INFRA	0.018	0.308	0.029	0.436
LABOR	0.023***	0.001	0.021***	0.004
INTERCEPT	-3.146	0.226	-1.978	0.482
Number of observations:	1442		1442	
Number of group:	133		133	
Wald chi2 (8):	81.74		82.04	
Prob > chi2:	0.000		0.000	
Rho (fraction of variance due to u _i):	0.598		0.575	

Note: The *, **, and *** indicate 10%, 5%, and 1% statistically significant, respectively.

The effect of QUAL is also positive and statistically significant. Specifically, adopting IFRS increase FDI inflows by 3.782% and an increase of one standard deviation in regulatory quality index appears to increase FDI inflows by 5.301%. The estimated coefficient of CCOR is only statistically significant at 10% level (its p-value is 0.097). As discussed in Greene (2008), the R-squared values are meaningless in IV regressions, so we report the Wald Chi-squared values and their p-values as measures of fit for the models. As shown in the table, both models have p-values of 0.000, indicating their good explanatory power.

Regarding the indirect effect, the interaction of QUAL and IFRS is also positive and statistically significant. It implies that IFRS adoption also seems to help countries improve quality of governance which increases inward FDI. Specifically, an increase of one standard deviation in IQUAL appears to increase

significant. This implies that IFRS adoption appears to increase inward FDI.

FDI inflows by 7.342% , which is a 2.041% improvement over having high quality of regulation alone (= 7.342% - 5.301%). The interaction of CCOR and IFRS is not statistically different from zero. The results on CCOR and ICOR are in line with the aforementioned literature on corruption and trade where the effects of CCOR are ambiguous.

We then perform the REIV estimations of Models (5) and (6). We use CCOR and first lagged of CCOR (CCOR1) as IVs for QUAL (or IQUAL) and RULE (or IRULE), respectively. Performing several separate regressions, we find that the potential IVs are not correlated to the error terms in Model (5) and (6). The regression results also reveal that CCOR is highly correlated to QUAL (or IQUAL) and CCOR1 is highly correlated to RULE (or IRULE). Hence, CORR and CCOR1 are satisfactory IVs for Models (5) and (6). Table 3 displays the



results and shows that the direct effect of IFRS is again positive and statistically significant. The effect of QUAL is also positive and statistically significant. Specifically, adopting IFRS increase FDI inflows by 3.351% and an increase of one standard

deviation in regulatory quality index appears to increase FDI inflows by 6.372%.

Table 3. Estimation Results for Models (5) and (6)

Dependent Variable: Net FDI Inflows

Variable	Model (5)		Model (6)	
	Coefficient	p-value	Coefficient	p-value
IFRS	3.354**	0.019	-	-
QUAL	5.379***	0.003	-	-
RULE	0.921	0.302	-	-
IQUAL	-	-	8.830**	0.019
ICOR	-	-	2.012	0.336
PCY	0.287**	0.017	0.187*	0.035
GDPG	0.305***	0.008	0.316**	0.029
EXP	0.032	0.388	0.046	0.249
INFRA	0.009	0.274	0.017	0.404
LABOR	0.028***	0.009	0.024***	0.004
INTERCEPT	-3.829	0.219	-2.741	0.167
Number of observations:	1442		1442	
Number of group:	133		133	
Wald chi2 (8):	81.98		76.09	
Prob > chi2:	0.000		0.000	
Rho (fraction of variance due to u _i):	0.572		0.594	

Note: The *, **, and *** indicate 10%, 5%, and 1% statistically significant, respectively.

Concerning the indirect effect, the interaction of QUAL and IFRS is again positive and statistically significant. Specifically, an increase of one standard deviation in IQUAL will increase FDI inflows by 8.873% which is a 2.501% improvement over having high quality of regulation alone (= 8.873% - 6.372%).. The interaction of RULE and IFRS is not statistically different from zero.

5. Conclusion

Our basic findings from Models (3) and (5) are clear and intuitive; the IFRS adoption affects amount of FDI inflows positively. Our results from Models (4) and (6) also imply that countries that have high quality in regulations in addition to IFRS adoptions gain even more from the adoptions. Since it is

easier for the investors to circumvent rule and regulations in corrupt and opaque environments, IFRS adoptions will generate more in FDI inflows in environments with high levels of regulatory quality.

Since this paper uses orderly dummy variables to measure of IFRS adoptions, the results are more precise than using binary dummy variables. However, magnitude of the estimated coefficients might still change if more detailed data become available on the depth of the adoption, for example, for public firms only, for private firm of large operation scales only, or for all firms in the economy. Similar exercises can be performed to see the effects of these various levels of financial deepening when new data become available.



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