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Financial Internet Quarterly 2023, vol. 19 / no. 2, p. 1-17

10.2478/fiqf-2023-0008

Financial Internet Quarterly

THE IMPACT OF IFRS ADOPTION ON ECONOMIC GROWTH IN TRANSITION COUNTRIES: EVIDENCE FROM CIS

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Abstract

International financial reporting standards (IFRS) have become a worldwide common accounting language which most countries have adopted. However, there are no studies obtained based on transition economies in a particular geographic zone. Thus, this study is carried out to observe the influence of IFRS adoptation on the economic growth of 11 CIS countries from 2005 to 2018. To examine the actual effect of the variables, the regression model was divided into two sub-models based on the category of variables. There is a difference between the economic growth in adopted and non-adopted states. The adoption of IFRS showed negative and insignificant relation to GDP per capita. The number of observations after fully adopting IFRS was low, the data on IFRS adoption was challenging, and an advanced econometric model should be selected. The study compared CIS results with Eastern European countries to see a clear pattern and generate an efficient suggestion for policy implementation. The policy implementations related to Uzbekistan were also provided.

JEL classification: M41, M48, F15, F36

Keywords: economic growth, IFRS, adoption, CISs, transition economy

Received: 02.02.2023 Accepted: 30.03.2023

Cite this:

Mokhirakhon et al. (2023) The impact of IFRS adoption on economic growth in transition countries: evidence from CIS. Financial Internet Quarterly 19 (2), pp. 1-17.

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Introduction

Background to the study

In 1991, fifteen newly independent states appeared on the world's political map. They were located in Central Asia, between Asia and Europe. After becoming independent, most of these states moved from a planned to a market economy. The market economy allowed the states to increase efficiency, productivity, and competition, to begin trading with the entire world and integrating into globalization. Before obtaining independence, most former USSR republics mainly specialized in producing commodities. In contrast, after independence, they started producing and exporting ready products and services or importing from other countries. However, trading was not easy since they had different accounting standards from other countries, which had already integrated into globalization. Consequently, most of them decided to adopt IFRS to have a common reporting system with most developed and developing countries and simplify trading processes.

IFRS are the selection of rules that guarantee financial statements to be consistent, transparent, and comparable worldwide. IFRS are delivered by the International Accounting Standards Board (IASB). IFRS were established to have identical accounting languages and consistency among companies and countries. According to the official IFRS web page (ifrs.com, 2021), around 120 countries required IFRS for domestic companies, and approximately 90 countries fully adopted them.

Theoretically, moving from a planned economy to a market economy is considered a transitional period. There are two paths for transition economies - evolutionary and revolutionary. The difference between evolutionary and revolutionary growth paths is that the former implements changes step by step and requires a long period. The latter implements changes suddenly, completely and radically. Most CIS countries chose the evolutionary way of economic growth and adopted IFRS gradually. There were three stages of IFRS adoption:

I. IFRS Standards were required for domestic public companies;
II. IFRS Standards were required or permitted for listening by foreign companies;
III. The IFRS for SMEs were required or permitted.

According to official government reports of each CIS country, on average, it takes around 5-7 years to fully adopt IFRS. The majority of CIS countries are currently considered in the adoption process of IFRS. For example, except for Azerbaijan, from 2005 to 2007, all other CIS members were regarded as non-adoptees of IFRS, while from 2008, Armenia and Kazakhstan also started implementing IFRS like Azerbaijan. During 2009-2014 Moldova, Georgia, the Russian Federation and Ukraine also started implementing IFRS rules into their reporting systems. Specifically, most of them required domestic public companies to prepare reports based on IFRS. From 2015, Uzbekistan also joined IFRS and required certain selected public companies and banks to follow the standards, while Georgia became a fully IFRS adopted country. The second country that required a relatively short adoption process became Moldova because full adoption of IFRS took only seven years. The first IFRS fully adopted countries in 2017 were Armenia, Kazakhstan and Ukraine, and it took 10, 11 and 8 years respectively for each country. Also, as of the 2018 situation, half of CIS countries: Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova, and Ukraine fully adopted IFRS. While Belarus, the Russian Federation, and Uzbekistan are adopting IFRS, Kyrgyzstan, Tajikistan and Turkmenistan have not adopted those standards yet. Specifically, Uzbekistan actively started adaptation in 2015 and required selected entities and banks to report on these standards. Moreover, the government encourages other firms to use IFRS year by year. In addition, from the end of 2021, joint-stock companies, commercial banks, insurance companies and entities which pay high taxes are required to generate financial reports based only on IFRS rules.

CIS transition economies have not been explored before and compared to other Eastern European transition economies, they chose the evolutionary way of developing rather than the revolutionary. The relevance of this research is that CIS country development would be compared with Eastern European countries and examined by their GDP per capita in the period from 2005-2018. The paper is structured in the following ways. The next section describes the problem statement, then we explain the objectives of the study. Literature review and methodology of the study are described in the following sections. Then the paper describes the empirical results, policy recommendations and conclusion of the study.

Problem statement

The impact of IFRS adoption on an economy has been explored by several researchers around the world and their findings support the hypothesis that IFRS helps to enhance economic development and attract FDI. For instance, Özcan (2016) based on his findings suggests to adopt IFRS to enhance economic growth, Akisik and Mangmaliso (2019) provide evidence from African countries that IFRS adoption helps to attract FDI which leads to economic growth. However, there is a little evidence from the CIS countries perspectives that adoption of IFRS could have any direct impact on

their economic growth whereas the CIS countries are eager to fully adopt the IFRS, willing to integrate with global accounting standards and the economies are also emerging. The study aims to fill this research lacuna and raised the following research question: What is the impact of IFRS adoption on the economic growth of CIS countries?

We have developed a number of hypotheses and adopted the Difference in Difference (DD) method to explore the research question which is described in the later part of this paper.

Objective of study

The study's main objective is to study the effect of IFRS adoption on economic growth in transition countries, especially CIS countries. Also, the following objectives will be considered:

1) to identify other factors that influence economic growth in CIS countries,
2) to measure the relationship between IFRS adoption and economic development,
3) to provide policy recommendations based on findings.

In fact, the study of the impact of IFRS on economic growth in CIS countries is yet unexplored. Hence, the main goal of this research is to examine the relationship between economic growth and IFRS adoption in the sample of 11 CIS countries from 2005 to 2018. To explore the research objectives and to investigate the relationship among variables, two models, namely an economic model and financial model have been developed in this study.

Literature review

Most of the scientists and economic researchers agreed on the positive influence of IFRS adoption on the economy of the country (Lima et al., 2010; Alexander & Ghedrovici, 2013; Akisik, 2014; Efobi, 2015; Ebaid, 2016; Mhedhbi & Zeghal, 2016; Boolaky et al., 2018; Hao et al., 2019; Riahi & Khoufi, 2019; Amidu & Haruna, 2019; Ayadi & Sassi, 2020; Tawiah & Boolaky, 2020; Khan et al., 2020). The main reason is that the single accounting language for different countries increases foreign investment, economic growth and reduces poverty (World Bank, 2017).

The study conducted by Liu et al., (2011), based on Chinese firms that already have used IFRS-convergence accounting standards to measure earnings management and value relevance of accounting since 2007, showed that the earnings reporting improved by adopting standards similar to IFRS in China. Empirical analysis indicated that adoption increased value relevance and significantly dropped earnings smoothing — also, Liu et al., (2011) obtain an outcome that shows insignificant changes in B-share firms compared to A-share firms. As possible solutions to this problem, they indicate an increasing period. Overall, the adoption of IFRS presented a high positive impact on China's accounting system, growth, market efficiency and negative relation on the cost of capital.

In addition, the study by Shima and Yang (2012) shows that the Choi and Meek (CM) model provides efficient results where all eight factors were significant and have a strong influence on adopting IFRS. This work analyzes the factors that affect the adoption of IFRS in 73 countries. As a dependent variable, adopting IFRS, they used a categorical approach and levelized it from 0 to 2. The regression results showed a positive and significant relation between IFRS adoption and economic growth rate, political and social ties, literacy, legal system and uncertainty avoidance. In contrast, sources of finance, inflation and taxation surprisingly showed negative influence on the dependent variable. The researchers explained these unexpected negative relations as countries with smaller capital markets and environmental dimensions. Also, they concluded with the limitation of using only the CM model, which was solved by another researcher – Zehri and Chouaibi (2013). They conducted almost the same work as Shima and Yang (2012). However, they used the logit model to estimate the relationship between IFRS adoption and other factors. To measure adoption of IFRS, Zehri and Chouaibi (2013) applied dummy variables where 0 indicated non-adopted and 1, which shows that countries have adopted IFRS. Moreover, they compared the average indicators of adopted and non-adopted developing countries' control variables, the same as previous research, except for the absence of taxation and inflation rates. They estimated that all parameters besides the political system coefficient had a more significant influence in adopted IFRS developing countries. The estimated results were also similar to the previous study done by Shima and Yang (2012), the relationship between FDI or source of finance was negative, which rejected the hypothesis that developing countries with open economies may adopt IFRS. Furthermore, empirical results have proven that countries are most favourable to adopting IFRS when they have high economic growth, literacy rate and legal law system, while the remaining variables of the model, such as the political system, culture, internationality and existence of the capital market, were statistically insignificant and did not influence the decision of adoption. Simultaneously, the authors indicated a limitation of their research, stating that the estimated results can apply only to developing countries. There might be omitted variables that could be resolved in new studies.

In globalization, most countries started to trade with each other, developed their economies, and

adopted IFRS to make the trade process easier. The economists began to ask whether adoption and using IFRS might be the prerequisite of economic growth.

The research undertaken by Zaidi (2014) also examines the relationship between economic growth and IFRS adoption. As we observed in the previous two studies, these two variables had a positive and significant correlation where the dependent variable was the adoption of IFRS. However, evaluated findings by using OLS indicated the negative and insignificant relationship between GDP per capita and IFRS. Zaidi (2014) used a matched pair strategy similar to the model of Zehri and Chouaibi (2013), where he equally divided countries into adoptees and non-adoptees. To cover the limitations of previous research, the sample included countries from different geographical regions and development statuses, which allowed more comprehensive results. As new variables, the researcher added corruption level and dummy variable European union, which shows 0 for non-member, 1-member of the union. As mentioned above, the empirical results under the OLS model showed an unexpected negative relationship between GDP and IFRS adoption. As a result, Zaidi (2014) modified the model by creating consistency variables from independent variables such as level of enforcement and using 2SLS which overall had a positive influence on the adoption of IFRS. Still, the level of education variable becomes negative and significant. The high multicollinearity problem was the cause of such variation on variables, so Zaidi (2014) added a new variable that indicates the number of years since the adoption of IFRS and empirical outcomes normalized by getting closer to previously conducted research results.

To determine the effects of IFRS adoptation strategies and theories on emerging stock markets, Othman and Kossentini (2015) conducted a study. Based on analysis obtained using panel data for 50 emerging economies from 2001 to 2007, full IFRS adoption is highly correlated with stock market development (SMD). The researchers used SMD as a dependent variable. In contrast, control variables used the rule of law, corruption level, financial market liquidity, GDP growth, inflation rate, investment level, intermediary financial development, and level of IFRS adaptation, which are similar to previous research work. The authors suggested enhancing financial information quality through complete IFRS adoptation as policy implementation. Othman and Kossentini (2015) indicated data selection problems, a small number of control variables and measurement of certain variables as limitations of the research.

In contrast to other studies mentioned above, the research conducted by Aghimien (2016) compared Middle Eastern accounting standard development to the United States of America. The author analyzed 5 Middle East countries such as Cyprus, UAE, Iran, Saudi Arabia and Turkey and compared them with the USA in the following categories: population, religion, culture, law system, taxation, needs and pressures. Comparison analysis showed that the USA and Middle East accounting standards are wildly divergent and similar at the same time. Aghimien (2016) noticed that despite cultural, legal and political barriers, the accounting standards of the Middle East would develop while cultural influence, taxation, economic growth, and source of finance will impact the development of accounting standards in the Middle East and the USA.

Correspondingly to the work of Liu et al., (2011), Nurunnabi (2017) analyzed the auditor's perception of the implementation of IFRS in Bangladesh based on the interviews collected from 75 interviewers. The significant impacts of slowing IFRS implementation were the low cost of auditor fees and lack of qualified accountants. Also, interviewers indicated that most firms violate transparency rules (hide accurate information) and copy reporting styles from other firms. According to the above results, corruption and IFRS adoptation have negative relations. Also, the government does not protect Chartered accountant (CA) firms. As a result, investors do not trust their annual accounting reports due to the low quality of reporting.

Similarly, Özcan (2016) assessed the effect of IFRS adoption on economic growth using cross country data. Özcan (2016) and Zaidi (2014) constructed a similar model, but Özcan (2016) got extraordinary outcomes. In contrast to Zaidi (2014) and Zehri and Chouaibi (2013), where samples are equally consisting of 51 and 32 adoptee and non-adoptee countries respectively, Özcan's (2016) sample includes 41 adoptee and 29 not adopted countries. As independent variables, he presented an adaptation of IFRS, FDI, education level, political stability, financial development, and level of enforcement as Zaidi (2014) and added one new trade openness variable. Empirical estimates show a positive impact of all variables on the country's economic growth in 5% and 1% levels of significance. Özcan (2016) indicates that the leading international organizations such as the World Bank, IMF, EU and OECD should stimulate countries to adopt an international financial reporting system to increase their wealth. Although adoption of IFRS has a robust positive effect on economic growth, the research showed that it is not statistically significant in any level of significance like FDI, political stability and financial development. However, the other variables such as trade openness, level of education and level of enforcement gave conventional results.

Most of the studies mentioned above used cross-country data without specification of a geographic area, which made some regression coefficients.

Procházka (2017) chose central and eastern European countries to avoid this issue. The paper reviews the literature and investigates the specifics of the adoption process in the CEE region's countries that joined the EU from 2004. The author demonstrated that the capital market has a relatively minor influence on raising funds for financing business activities compared to FDI, which became the most significant source of money inflow. Also, the past communistic history of the CEE region influences its institution, so it concluded that the adoption of IFRS will lead to uncertainty and unfavourable outcomes.

By analyzing the outcomes of previous research, Akisik and Mangmaliso (2019) demonstrated that they specified geographical regions, took African countries, involved more explanatory variables, and increased time constraints. The researchers selected the economic growth of 49 African countries during 2003-2017. Most African countries are considered developing and have low inward investment rates while they cannot invest in their economy by their savings. Consequently, they decided to implement IFRS to attract FDI and protect the growth. Similar to previous studies, the authors selected IFRS adoption as independent variables: the dummy variable, political stability, the rule of law, interest rate, annual growth rate, inflation rate, total population, the openness of the country, greenfield investment, and human capital. The new variable - total population, was added as it was recommended by Zaidi (2014). The authors ran the lag model with fixed country and time effects to estimate parameters. Estimated results showed the insignificant influence of IFRS and irrelevant signs of coefficients that differed from other works. To protect estimation from endogeneity, the author used the GMM model. It gave results where IFRS, FDI, total population and annual growth rate negatively influenced real GDP per capita. However, the consistency variable created by multiplying IFRS to FDI showed a positive impact on the dependent variable. Also, Akisik and Mangmaliso (2019) mentioned that economic growth depends on the capital market, but they cannot show it since all four regression models estimated insignificant coefficients.

The financial side effect of IFRS adoption showed some determinants' negative impact, such as cost of equity. According to findings Habib et al., (2019), mandatory adoption of IFRS will decrease the cost of equity, reduce information asymmetry, and enhance comparability. The research estimated Australian firms based on determinants such as total accruals, total assets, return on assets, sales, account receivable, bankruptcy risk, the firm's riskiness, earnings stream, audit committee independence, absolute discretionary accruals, etc. to find an influence on the cost of equity. Estimation results showed the inverse relationship between the cost of equity and reporting quality through mediating channels and proved that deterioration in financial reporting quality after IFRS increased the cost of capital. The overall finding suggests that IFRS implementation became more beneficial for mature firms.

What is more, Akisik et al., (2020) modified the previous research conducted on African countries in 2019 mentioned above. The authors divided countries by Anglophone and Francophone countries and used a similar regression model with similar independent variables. One of the main changes was increasing the time limit from 1997-2017 and running separate regression for each type of country group. Empirical estimations show the critical role of FDI in economic growth, and one of the factors which attract it is IFRS adoption. However, there are some differences between Anglophone and Francophone country groups. For example, openness for foreign trade has a significant effect on Francophones but not for Anglophone. Moreover, there are differences in economic growth and its explanatory variables; corruption and IFRS are negatively related for Francophone countries and vice versa with Anglophone countries, meaning that low corruption control will increase the likelihood of adopting IFRS in Francophone countries. Consequently, substantial corruption control in Anglophone countries leads to an increased probability of adoption of IFRS. The researchers suggested a policy for African countries, in particular, to invest in human development, reduce corruption, protect the rule of law and increase transparency by applying strict governance and reporting standards.

To summarize, all studies showed similar results, and as a key limitation of the research, they indicated an econometric model, sample size, geographical location and range of explanatory variables. However, none of them compared their findings with other countries' results and this research would cover this gap. In harmony with the described literature, the following hypotheses were developed:

H_0: All independent variables are significant in predicting economic growth.

H_1: IFRS adoption has a positive and significant relationship with economic growth.

H_2: There is a positive and significant relationship between education rate and economic growth.

H_3: FDI and economic growth have a positive and significant relationship.

H_4: There is a positive and significant relationship between the rule of law and the country's economic growth.

H_5: Voice and accountability and the country's economic growth have a positive and significant relationship.

H_6: There is a negative relationship between foreign debt and the country's economic growth in the long run.

H_7: Corruption and economic growth have a negative and significant relationship.
H_8: There is a positive and significant relationship between political stability and the country's economic growth.
H_9: The bank cost to income ratio negatively influences the country's economic growth.
H_{10}: Bank ROA has a positive influence on economic growth.

Table 1: Expected signs for independent variables

Independent Variables	Expected Influence on Economic Growth
IFRS adoption	+ / positive
Education rate	+ / positive
Voice and accountability	+ / positive
Rule of law	+ / positive
Political stability	+ / positive
Control of corruption	- / negative
Foreign debt	- / negative
FDI	+ / positive
CIR	- / negative
ROA	+ / positive

Source: Own elaboration.

Methodology and description of Models

Panel data consist of 14 years from 2005 to 2018 for CIS countries: Armenia, Azerbaijan, Belarus, Kazakhstan, Kirgizstan, Moldova, the Russian Federation, Tajikistan, Ukraine, and Uzbekistan.

Except for IFRS adoption, all data were collected from the World Bank database. The IFRS adoption data were collected manually by comparing each country's official governmental reports and rules with the ifrs.org web page. All variables were selected based on previous studies' estimations. The following dependent, control and independent determinants were developed to estimate the impact on each other:

Dependent variable

GDP per capita (PPP based) is gross domestic product transformed to international dollars using purchasing power parity rates per 1 person (citizen of the country).

Independent variable

IFRS adoption - 1 - not adopted, 2 - partially adopted, 3 - fully adopted.

Control variables

1. Voice and accountability - measures extend citizens' participation in a government election, independent media, freedom of expression ($-2.5 \leq x \leq 2.5$).
2. The rule of law - represents the degree to which representatives have confidence in and abide by the rules of society, excellence of contract enforcement, citizens' rights, the police and the courts, and the possibility of crime and violence.
3. Political stability - given in percentage, and it shows the probability that the government will be overthrown or destabilized by unauthorized means.
4. Corruption - the percentage of public power is exercised for private gain. The high value indicates a high level of corruption.
5. FDI - Investment received from foreign countries in US dollars.
6. Foreign debt - all debt taken from foreign sources, measured by per cent of GNI.
7. Bank cost to income ratio - used in measuring banks' profitability.
8. Bank return on assets after tax is a financial ratio used to measure after - tax income earned by a bank from its assets.
9. Education rate - gross enrolment rate to primary school.

$$\frac{\textit{Total number of enrollment to primary school regardless of age}}{\textit{Total number of population with age corresponding to the level of education}} \quad (1)$$

Table 2: Descriptive statistics

Variables	Mean	Standard Deviation	Minimum	Maximum	Count
GDP per capita	10,905.78	6,740.70	1,704.54	28,763.52	154
IFRS adaptation	1.60	0.65	1.00	3.00	154
Education rate (Edu)	100.37	4.99	90.96	114.52	154
Voice and accountability (Voice)	-0.91	0.66	-2.12	0.34	154
Rule of law (Law)	-0.76	0.40	-1.46	0.48	154
Political stability (PS)	-0.51	0.56	-2.02	0.78	154
Control of corruption (Corruption)	-0.82	0.45	-1.37	0.89	154
Foreign debt (Dept)	59.43	31.96	10.30	132.03	154
FDI	5.93E+09	1.27E+10	-3.7E+08	7.48E+10	154
Bank cost to income ratio (CIR)	57.40	12.74	27.33	103.79	154
Bank return on assets after tax (ROA)	0.87	3.83	-24.18	15.06	154

Source: Own elaboration.

By reviewing the correlation matrix (see: Appendix 1), we can observe no strong correlation among control variables despite the high correlation between Corruption and Law variables, the medium correlation between IFRS-Law, Voice-Law, Corruption- Voice and Debt-Voice variables. At the same time, the correlation between other independent variables does not exceed 0.4.

Model description

The balanced panel data consists of 11 transitional economies data for 14 years from 2005 to 2018. The reason for choosing longitudinal data is to observe the annual change in variables of CIS countries. The motive for selecting CIS countries was the suggestion of Procházka (2017) about geographic area specification. To measure the difference between periods of IFRS adaptation, the Difference in Difference (DD) model was used. DD is the best technique to see the changes after policy implementation. In the example of the present study, where the adoption of IFRS is divided into three stages. The first treatment group, which is the control group, is represented as 1 - not adopted and 0 - in the process of adoption and fully adopted, the second treatment group shows as 1 - in the process of adoption while 0 - no adoption and fully adopted, in addition, the third treatment group shows as 1 - fully adopted and as 0 - no adoption or in the process of adoption. We can estimate the effect of partial and full implementation of IFRS through this treatment group's coefficients.

The assumptions of the DD model are the same as the OLS model's assumptions; however, the DD model involves parallel trends assumptions where the differences between consecutive time trends are equal between each other:

$$\overline{Y_{st}} : Y_2 - Y_1 = Y_n - Y_{n-1} \quad (2)$$

The DD fixed-effect model was exploited to control the mean differences across countries in any observable or unobservable estimators and avoid omitted variables bias.

The regression model has been divided into economic and financial models to see the more precise effect of each group variable.

To obtain an efficient model and successfully hypothesis test and avoid type I and II errors, we get four types of model: DD random effect, DD robust random effect, DD fixed effect, and DD robust fixed effect. It was decided to run the Hausman test to differentiate between fixed and random effects.

Table 3: Hausman test for the Economic model

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))S.E.
	Fixed effect	Random effect	Difference	
t	0.0585482	-0.0032924	0.0618406	0.0104885
1.dum2	0.0764477	0.3089563	-0.2325086	0.0900809
dum2#c.t1	-0.0124279	0.0324264	-0.0448543	0.0102674
1.dum3	0.5204786	-1.3529950	1.8734740	0.3150104
dum3#c.t 1	-0.0408586	0.1665155	-0.2073741	0.0281651
Edu	-0.0010493	0.0070594	-0.0081087	0.0076967
Voice	0.1008759	-0.1855438	0.2864196	0.2351728

	(b) Fixed effect	(B) Random effect	(b-B) Difference	sqrt(diag(V_b-V_B))S.E.
Law	0.0221310	0.1060153	-0.0838843	0.3449866
PS	0.0545288	0.3376544	-0.2831256	0.0575539
Corruption	-0.0259311	0.3292370	-0.3551681	0.2823574
FDI	3.26E-12	2.70E-11	-2.37E-11	4.93E-12

Source: Own calculations.

H_0: difference in coefficients not systematic.

$$chi2(10) = (b-B)'[(V\_b - V\_B)^{(-1)}](b-B) = 135.54 \quad (3)$$

$$Prob > chi2 = 0.0000 \quad (4)$$

For the economic regression model, the Hausman test shows that we reject the null hypothesis at a 5% confidence level, meaning the fixed effect model is appropriate to estimate the economic model.

Table 4: Hausman test for Financial model

	(b) Fixed effect	(B) Random effect	(b-B) Difference	sqrt(diag(V_b-V_B))S.E.
t	0.067302	0.067099	0.000203	0.000119
1.dum2	0.126037	0.127149	-0.001110	0.001407
dum2#c.t1	-0.018350	-0.018140	-0.000210	0.000124
1.dum3	0.829660	0.826183	0.003477	0.004293
dum3#c.t 1	-0.064620	-0.064060	-0.000560	0.000349
Debt	-0.001960	-0.001970	9.33E-06	4.87E-05
FDI	3.87E-12	4.04E-12	-1.75E-13	9.29E-14
Bank CIR	0.000230	0.000233	-3.03E-06	1.88E-05
Bank ROA	0.000636	0.000653	-1.7E-05	3.55E-05

Source: Own elaboration.

H_0: Difference in coefficients not systematic.

$$chi2(8) = (b-B)'[(V_b - V_B)^{(-1)}](b-B) = 10.22 \quad (5)$$

$$Prob > chi2 = 0.2497 \quad (6)$$

In contrast to the economic model, the Housman test showed that the fixed effect model is not applicable for the financial model. However, we will continue using fixed-effect as a rule of thumb since two models should use the same statistical analysis.

In the overall regression models provided below, both models have IFRS adoption as an independent variable and remain control variables allocated based on their category. The only exemption is FDI. As mentioned in the literature review, most of the researchers used it as an economic and financial variable so both models included it. We took the natural logarithm from economic growth to avoid high fluctuation in the independent variable.

Regression models

Economic model

$$Ln(GDP_{i,t}) = \beta_0 + \beta_1 Time_1 + \beta_2 Treatment_1 + \beta_3 Time_1 * Treatment_1 + \beta_4 Time_2 + \beta_5 Treatment_2 + \beta_6 Time_2 * Treatment_2 + \beta_7 Edu_{i,t} + \beta_8 Voice_{i,t} + \beta_9 Law_{i,t} + \beta_{10} PS_{i,t} + \beta_{11} Corruption_{i,t} + \beta_{12} FDI_{i,t} + u \quad (7)$$

Financial model

$$Ln(GDP_{i,t}) = \beta_0 + \beta_1 Time_1 + \beta_2 Treatment_1 + \beta_3 Time_1 * Treatment_1 + \beta_4 Time_2 + \beta_5 Treatment_2 + \beta_6 Time_2 * Treatment_2 + \beta_7 Debt_{i,t} + \beta_8 Bank\ CI\ Ratio + \beta_9 Bank\ ROA_{i,t} + \beta_{10} FDI_{i,t} + u \quad (8)$$

Table 5: Model coefficients description

Economic model	Financial model
β_0: Intercept	β_0: Intercept
β_1, β_4: Time trend common to control and treatment groups	β_1, β_4: Time trend common to control and treatment groups
β_2, β_5: Treatment group-specific effect	β_2, β_5: Treatment group-specific effect
β_3, β_6: True effect of treatment	β_3, β_6: True effect of treatment
β_7- β_{12}: Slopes of independent variables represents unit change effect on the dependent variable.	β_7- β_{10}: Slopes of independent variables represents unit change effect on the dependent variable.
u: Error term	u: Error term

Source: Own elaboration.

Table 6: Breusch-Pagan LM test

Economic model	Financial model
H_0: no dependence between residuals chi2(55) = 153.314, Pr = 0.0000	H_0: no dependence between residuals chi2(55) = 137.191, Pr = 0.0000

Source: Own elaboration.

According to Breusch-Pagan LM tests, we reject both models' null hypotheses, which means there is dependence between residuals. This issue may cause unexplained broad confidence intervals because the standard errors of the model might be underestimated. We should run our regression with a robustness command to avoid this issue.

Table 7: Modified Wald

Economic model	Financial model
H_0: sigma(i)^2 = sigma^2 for all I chi2 (11) = 210.74 Prob > chi2 = 0.0000	H_0: sigma(i)^2 = sigma^2 for all i chi2 (11) = 587.21 Prob > chi2 = 0.0000

Source: Own calculations.

Relying on the Modified Wald test estimations, we should reject both models, meaning both of our models have heteroscedasticity problems. As mentioned above, we should run a robust regression model to prevent it. Also, it should be noted that the heteroscedasticity problem may affect the p-values of coefficient, and they might become artificially significant.

Empirical results

Economic model

According to estimated regression results, the 88.5% variations in the endogenous variable are explained by variation in exogenous variables. Moreover, the significance test shows that at a 95% confidence interval, the independent variables are consistent in predicting the dependent variable since the p-value is 0.00 < 0.05.

The constant term of this model is statistically significant at a 1% significance level and differs from zero and represents that on average economic growth in the control group equals to exp (8.859) = $7,037 in time = 1 ceteris paribus. The coefficient (Time) is also significant and differs from zero at 99% confidence interval, and it shows that the economic growth in the control group increased by 5.85% from time = 1 to time = 2. On average, the change in GDP per capita would equal $7,037 + 7,037 x 0.0585 = $7,449, holding other variables constant. The treatment group coefficient tells us that at time = 1 between the first treatment group where the 1 - in process of adopting IFRS and control group there is a difference in economic growth. Specifically, the economic growth in first treatment group countries is higher than the control groups by 7.64% or equal to $7,037 + 7,037 x 0.0764 = $7574.63 in 10%

confidence level holding other variables constant. The coefficient DD coefficient is statistically significant at a 5% significance level. It represents that starting implementation of IFRS will cause a decrease in economic growth by 1.24%, which rejects our hypothesis which states that IFRS adoption has a positive and significant effect on economic growth. However, the works of Özcan (2016), Akisik and Mangmaliso (2019) also showed the same negative results where they explained it as a low number of observations. Considering that the first treatment group represents countries that have not fully adopted IFRS but are in the adoption process, we can conclude that partial adoption might negatively impact overall economic growth. Similarly, β_4 indicates the growth from time = 2 to time = 3; however, this variable is omitted because of the low number of fully adopted countries.

The β_5 is the second treatment coefficient which shows that the growth between countries that fully adopted IFRS and the control group differs by 52%, meaning on average the second treatment group has higher GDP per capita ceteris paribus, while showed the negative and insignificant result, which states that full adoption of IFRS will cause a 4.09% decrease in the country's economic growth. Relying on the data analysis, there were 6 out of 11 CIS countries that adopted IFRS till the year 2018, and it might be a significant impact on the coefficient and rejection of H_1.

The hypotheses H_3, H_5 and H_8 were failed to reject since FDI, Voice, and PS have positive and significant coefficients. For example, every $100,000,000,000 investment from abroad will raise economic growth by 32.6%. At the same time, every point increase in Voice and PS indexes will increase a dependent variable by 10.1% and 5.45%, respectively holding other variables unchanged. The variables Law and Corruption kept expected signs but lost significance, so we should reject H_4 and H_7.

Based on Özcan (2016) research results, the educational variable gave a conventional sign which stays as a positive, as change in educational rate leads to decrease independent variable by 0.105%. As a result, the H_2 hypothesis should be rejected.

Generally, almost all variables got expected coefficients. The difference in the coefficient becomes negative, which can be interpreted as when increasing transparency in the reporting system more organizations could not artificially modify their accounts (Nurunnabi, 2017), and it might influence their profit which becomes smaller than it was. As a result of true values, we can observe a small and insignificant decline in growth.

Table 8: Economic regression model

Economic Model	(1)	(2)
Variables	FE	FE robust
T	0.05850***	0.05850***
	(0.00371)	(0.00450)
1.dum2	0.07640*	0.07640
	(0.04490)	(0.06390)
0b.dum2#co.t	0.00000	0.00000
	(0.00000)	(0.00000)
1.dum2#c.t	-0.01240**	-0.01240
	(0.00516)	(0.00866)
o.t	-	-
1.dum3	0.52000	0.52000
	(0.35300)	(0.32200)
0b.dum3#co.t	0.00000	0.00000
	(0.00000)	(0.00000)
1.dum3#c.t	-0.04090	-0.04090
	(0.02690)	(0.02660)
Edu	-0.00105	-0.00105
	(0.00228)	(0.00341)
Voice	0.10100*	0.10100
	(0.05450)	(0.07820)
Law	0.02210	0.02210
	(0.08910)	(0.09470)
PS	0.05450***	0.05450
	(0.01910)	(0.03140)

Economic Model	(1)	(2)
Variables	FE	FE robust
Corruption	-0.02590	-0.02590
	(0.06900)	(0.11800)
FDI	3.26e-12 ***	3.26e-12 ***
	(0.00000)	(0.00000)
Constant	8.85900***	8.85900***
	(0.23900)	(0.33600)
Observations	154.00000	154.00000
Number of Countries	11.00000	11.00000

Notes: The standard errors of coefficients are shown in parentheses, where *, **, *** Significant at the 10, 5 and 1 per cent level, respectively (two-tailed)

Source: Own elaboration.

Financial model

The empirical estimations on the financial regression model state that this model is statically significant. All independent variables are essential in predicting dependent variables, and 88.3% of the variation of the independent variable can be explained by variation in independent variables.

Compared to the previous model, the average economic growth of the control group of the financial model equals $5,808 per capita at 99% confidence interval ceteris paribus. Also, the dependent variable of the control group increases by 6.60% from time = 1 to time = 2, which becomes $5,808 + $5,808 x 0.066 = $6,191 holding other variables constant. By starting the process of implementing IFRS, the economic growth rises by 12.3%, meaning it will become $6,522 per capita on average, holding other variables unchanged. The DD model coefficient is statistically significant and differs from zero and shows that the countries adopting IFRS will face a small decrease in economic growth equal to 1.75% or $101.64 per capita at a 1% level of significance, holding all other variables constant. As in the economic model, the Time variable coefficient is omitted because of collinearity. At the same time, the second treatment has a positive effect on GDP per capita in 95% confidence interval, and by fully adopting IFRS, its GDP becomes higher than the control group's by $4,774 or it will be equal to $10,582 per capita. However, harms the economic growth of the second treatment group at a 5% level of significance. The coefficient shows that after adopting IFRS, the GDP per per capita might decline by 6.35% than if it wouldn't be adopted. In this model, the H1 hypothesis also becomes rejected since and negatively related to a dependent variable. According to the expectations of Shima and Yang (2012), Debt has a negative effect on economic growth. The failed to be rejected since the coefficient of Debt has a negative and significant impact on the dependent variable, which shows that a 1 % - point increase in Debt will decrease economic growth by 0.18% in 99% level of confidence. Since FDI can be categorized as an economic and financial variable, both models have a control variable. In both models, it is statistically significant and not equal to zero. According to an empirical estimation of a financial model, every $100,000,000,000 increase in FDI raises GDP per capita of the country by 37.5% ceteris paribus. Relying on the relationship between Cost to income ratio and Economic growth should be negative and statistically significant. Nevertheless, this hypothesis should be rejected because it represented the opposite sign and became statistically insignificant as the Education variable in the economic model. The also should be rejected since ROA become statistically insignificant, but it shows a one-point increase in profit generated on bank's assets will positively influence GDP per capita by 0.061%.

Overall, most financial models' coefficients become statistically significant in predicting dependent variables, and differences in adoption of IFRS have the same sign as the economic model's empirical estimations.

Table 9: Financial regression model

FINANCIAL MODEL	(3)	(4)
VARIABLES	FE	FE robust
T	0.066000***	0.066000***
	(0.003550)	(0.004470)
1.dum2	0.123000***	0.123000**
	(0.044000)	(0.054600)
0b.dum2#co.t	0.000000	0.000000

FINANCIAL MODEL	(3)	(4)
VARIABLES	FE	FE robust
1.dum2#c.t	-0.017500***	-0.017500**
	(0.004950)	(0.005740)
1.dum3	0.822000**	0.822000*
	(0.352000)	(0.382000)
0b.dum3#co.t	0.000000	0.000000
	(0.000000)	(0.000000)
1.dum3#c.t	-0.063500**	-0.063500*
	(0.026900)	(0.032700)
Debt	-0.001800***	-0.001800*
	(0.000560)	(0.000894)
FDI	3.75e-12 ***	3.75e-12 ***
	(0.000000)	(0.000000)
CIR	0.000313	0.000313
	(0.000731)	(0.000977)
ROA	0.000611	0.000611
	(0.002060)	(0.001840)
Constant	8.667000***	8.667000***
	(0.055400)	(0.061300)
Observations	154.000000	154.000000

Notes: The standard errors of coefficients are shown in parentheses, where *, **, *** Significant at the 10, 5 and 1 per cent level, respectively (two-tailed)

Source: Own elaboration.

Discussion

The findings of this research clearly showed that CIS countries in the process of implementing IFRS and education level have minor negative effects on the country's economic growth. This contradictory effect of IFRS and educational level were observed by Özcan (2016) where he explained it as an influence of th developing economy and time limit, and Akisik and Mangmaliso (2019) where they interpreted it as a short period effect after the adoption of IFRS, while in the work of Akisik (2020) the previous limitations were avoided. They indicated a negative effect of IFRS and educational rate as a cultural effect.

In addition, global statistics show that all CIS-listed countries are developing, and it might be because of the negative effect of IFRS. Moreover, the negative relation of education level might be because, after the USSR collapse, the quality of education dropped dramatically in most new republics. Nevertheless, IFRS and level of education have no significant effect on economic growth after running a robust regression model (2). In contrast, in the robust financial regression model (4), IFRS adoption still has a negative and significant effect on GDP per capita. As mentioned in the literature, voice and accountability, political stability, and FDI have a positive and significant effect on the economy. While Debt and Corruption are inversely related to growth, as it was found by Nurunnabi (2017), the level of corruption in this research is not important in predicting future growth. Debt also loses its high significance after running a robust regression model (4). The rule of law and ROA positively affect economic growth, but unfortunately, they are insignificant in CIS countries' cases. However, after modifying the regression model, Zaidi (2014) concluded that level of enforcement plays an essential role in the developing economy. A similar modification done by Habib (2019) indicated the significant relationship of ROA on decreasing the cost of equity and increasing the entity's growth. The final determinant is the cost to income ratio, which surprisingly showed a negative connection with economic growth, which might be solved by increasing the quality of banks and increasing the number of observation years. Additionally, the abnormal signs of coefficient and their insignificance could be the impact of the cold war, the global financial crisis from 2007-2009, or conflicts between Russia and western countries.

We can conclude that they have higher economic growth than CIS countries. As proven in research by Zaidi (2014), the IFRS adoption allowed Eastern European countries to grow their economies faster than CIS countries. For example, in 2005, the GDP per capita in Eastern Europe and CIS countries were on average $7,027 and $1,917 accordingly. While in 2017, the difference between Eastern Europe and CIS countries, $12,076 - $4,563 = $7,513 becomes even higher than the year 2005 difference.

Taking it all into account, we can conclude that the revolutionary development and adoption of IFRS, which is compulsory in the EU, increased Eastern Europe's countries' economies significantly. The result of the hypotheses that we developed at the beginning of this research are shown in Tables 9 and 10, which show that out of 11 hypotheses the findings of the research accepted 4 hypotheses in the Economic model and 3 hypotheses in the Financial model.

Table 10: Result of the hypotheses for the economic model

Sl no	Hypothesis	Result
1	H_0: All independent variables are significant in predicting economic growth.	Accept
2	H_1: IFRS adoption has a positive and significant relationship with economic growth.	Reject
3	H_2: There is a positive and significant relationship between education rate and economic growth.	Reject
4	H_3: FDI and economic growth have a positive and significant relationship.	Accept
5	H_4: There is a positive and significant relationship between the rule of law and the country's economic growth.	Reject
6	H_5: Voice and accountability and the country's economic growth have a positive and significant relationship.	Accept
7	H_7: Corruption and economic growth have a negative and significant relationship.	Reject
8	H_8: There is a positive and significant relationship between political stability and the country's economic growth.	Accept

Source: Own elaboration.

Table 11: Result of the hypotheses for the financial model

Sl no	Hypothesis	Result
1	H_0: All independent variables are significant in predicting economic growth.	Accept
2	H_1: IFRS adoption has a positive and significant relationship with economic growth.	Reject
3	H_3: FDI and economic growth have a positive and significant relationship.	Accept
4	H_6: There is a negative relationship between foreign debt and the country's economic growth in the long run.	Accept
5	H_9: The bank cost to income ratio negatively influences the country's economic growth.	Reject
6	H_{10}: Bank ROA has a positive influence on economic growth	Reject

Source: Own elaboration.

This study was limited by several issues such as data collection and its availability, time limit, and econometric model. The collection of data for CIS countries was challenging because most of them are closed economies, and some countries are not fully explored. For example, there were many cases of omission indexes for the particular year or country in the World Bank database. Moreover, collecting data about IFRS adoption was very time-consuming because it was collected manually and divided into periods relying on the legal system's reports about IFRS. In addition, the limited number of control variables also can be indicated as a limitation of this research, and in the future, the range of them should be increased to see a clear pattern. Also, the new econometric DD model, which was used in contrast to GMM and 2SLS, showed unexpected results. Consequently, as a recommendation for future researchers, we can suggest increasing the sample size by finding more information about all selected countries, increasing the number of control variables, and using a more advanced econometric model.

Policy implications for Uzbekistan

The revolutionary growth path showed higher efficiency in rising GDP per capita. Therefore, the first recommendation for Uzbekistan policymakers is to speed up the process of IFRS adoption by encouraging SMEs with tiny 1% - 2% discounts in tax if they prepare reports according to IFRS because statements under IFRS will be understandable and reliable for foreign investors.

The second recommendation for the government of Uzbekistan is to increase the rule of law and independence of the media to guarantee to the entire world the openness and credibility of the economy.

Thirdly, the government should protect its political stability and decrease corruption. To reduce corruption, the government may implement certain strict judgments or increase benefits for those at risk of being corrupted by increasing their salaryies or offering bonuses to discourage them from engaging in corruption.

Fourthly, the Uzbekistan government should care about the quality of education by implementing innovations in the educational system. For example, they may improve the qualification of teachers by implementing new courses or programs where they can exchange their knowledge between each other or with foreign colleagues. Moreover, local universities with finance faculties should have ACCA accelerated modules to increase the number of highly qualified specialists. Additionally, the bank system also needs reforms by increasing its profitability ratios and decreasing its interest rate. Local banks should start integrating online systems to reduce the distance between consumers and avoid bureaucracy. Consequently, if the government implements all the recommendations mentioned above, the process of IFRS adoption will improve along with the increase in international trust for the country; thus, attracting the FDI dramatically, which will increase GDP significantly.

Conclusion

This research examines the influence of IFRS on the economic growth of CIS countries. CIS countries chose the evolutionary way of slowing down their adoption process of IFRS, while Eastern European countries chose the revolutionary way of development. According to empirical analysis, political stability, voice, and accountability show FDI is positive and has a significant impact on the economic growth of CIS countries. The rule of law, the cost to income, and ROA also have a favourable effect on GDP; however, in this research, they lose their significance which might be improved by increasing the time interval of research. The debt from foreign countries is statistically significant and negatively related to growth as expected, while corruption loses its significance. In contrast to expectations and literature, education becomes the factor that decreases economic growth. This negative relationship was explained by the uncertainty and low quality of the education system in CIS countries after gaining independence. The most unexpected results showed the IFRS adoption impact on Economic growth. It became statistically significant in any level of the adoption process and had a small but negative influence of around 4% - 6% on economic growth. As suggested in the literature, the negative effect of IFRS adoption could also be positive. By observing the growth of Eastern European countries, we can see positive and fast growth in GDP. Overall, this research proved the hypothesis that the adoption of IFRS influences economic growth. Consequently, findings obtained by this research may encourage regulators from non-adoptee CIS countries to start adoption. For countries in the process of adoption, such as Uzbekistan, it is recommended to speed up the process by attracting FDI that will enhance the country's economic growth.

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Appendix 1: Correlation Matrix

	Gdp per capita	IFRS adoptation	Education rate	Voice and accountability	Rule of law	Political stability	Control of corruption	Foreign debt	FDI	CIR	ROA
Gdp per capita	1.0000										
IFRS adoptation	0.4771	1.0000									
Education rate	0.2997	0.0365	1.0000								
Voice and accountability	-0.0672	0.2916	-0.0699	1.0000							
Rule of law	0.2936	0.5967	0.1243	0.6899	1.0000						
Political stability	0.2750	0.1282	0.2273	-0.0015	0.2663	1.0000					
Control of corruption	0.1698	0.3032	0.1491	0.5162	0.7854	0.2449	1.0000				
Foreign debt	0.0197	0.2679	0.2667	0.5566	0.3521	0.0361	0.2743	1.0000			
FDI	0.5776	0.0283	0.0414	-0.0242	-0.0235	-0.0771	-0.1354	-0.1936	1.0000		
CIR	0.3135	-0.0288	0.0472	-0.1931	-0.0686	-0.1047	-0.0950	-0.3369	0.4509	1.0000	
ROA	0.0639	-0.0146	0.0665	-0.0295	0.1401	0.2569	0.1463	-0.1600	0.0488	0.0854	1.0000

Source: Own elaboration.