The European Journal of Comparative Economics
Vol. 21, no. 1, pp. 35-63
ISSN 1824-2979

The dark side of landlockedness: Examining the determinants of foreign direct investment flows in transition economies

Ikboljon Kasimov[*], Hayot Berk Saydaliev[**], Lu Wencong[***]

Abstract

This study investigates the determinants of FDI to 12 transition economies in the Commonwealth of Independent States (CIS) by incorporating the market, institutional, and geographic factors, using panel data from 2002 to 2020. We analyze whether and how these factors differ across regions based on country-specific geographic location characteristics. The results of the Prais-Winsten regression with panel-corrected standard errors (PCSEs) show that market size, trade openness, natural resources, institutional quality, and *sea access* are positively associated with FDI. On the contrary, external debt and *landlockedness* deter FDI, but the adverse effect of *landlockedness* may be neutralized by *sea access*.

JEL classification: F15, F21, O53

Keywords: Foreign direct investment, Economic freedom, Landlocked, Sea-access, Transition economies

1. Introduction

Falling international trade and investment barriers and investment-friendly economic policies and reforms have accelerated foreign direct investment (Chan et al., 2014), increasing global FDI flows from about $240 billion in 1990 to $2.2 trillion in 2021 (World Bank, 2022). Likewise, FDI to economies in transition have increased from $5.5 billion in 2000 to about $23 billion in 2020 (World Bank, 2021). However, in contrast to Central European and Baltics (CEB) transition economies, despite the investment enticing characteristics, such as stable economic growth, large market size, natural resource abundance, and low-cost human capital, foreign direct investment flows to CIS economies have been substantially low (Okafor & Webster, 2015). For

[*] School of Management, Zhejiang University, Hangzhou, 310058, China; Email: 11720063@zju.edu.cn; jonkasimov@hotmail.com

[**] Mematical Methods in Economics, Tashkent State University of Economics, 100003, Tashkent, Uzbekistan; Email: h.saydaliev@tsue.uz

[***] MathSchool of Public Affairs, Zhejiang University, Hangzhou, 310058, China; Email: lu.wencong@zju.edu.cn

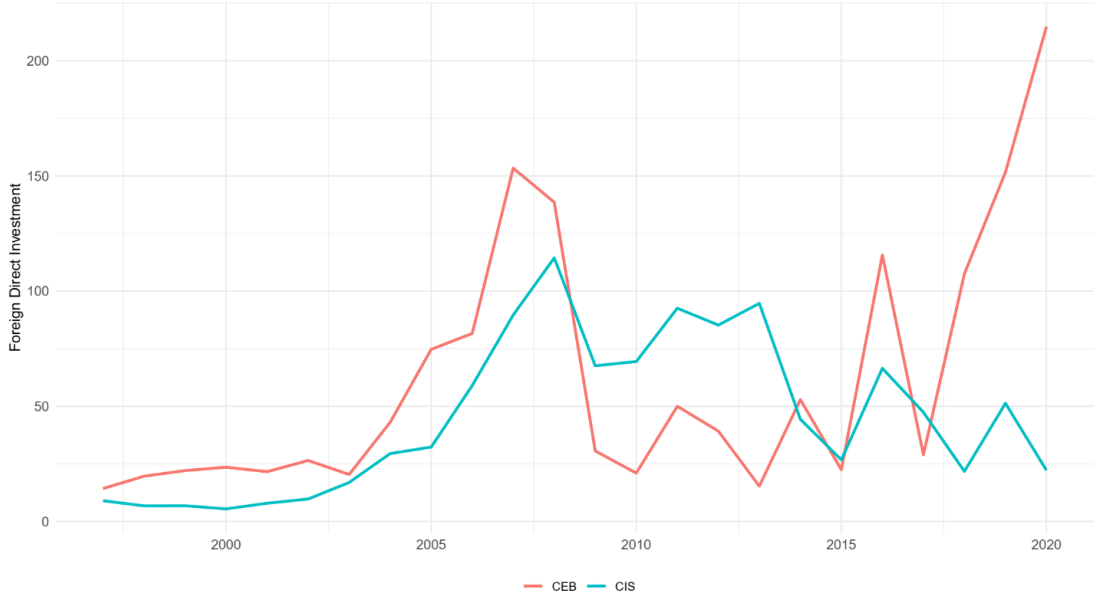
Data availability statement

The data supporting this study's findings are available from the corresponding author upon reasonable request.

http://dx.doi.org/10.25428/1824-2979/027
First published online: 11/04/2024

instance, CEB countries received around $20.4 billion foreign direct investment flows in 2000, which increased to almost $250 billion in 2020. In 2020, Hungary alone hosted around $171.37 billion FDI flows, which compares with the $23 billion of FDI to the entire CIS region (World Bank, 2021). Figure 1 shows the foreign direct investment flows in CEB and CIS countries in current billion US dollars.

Figure 1: Foreign direct investment flows to CIS and CEB in billions of US dollars



Source: World Bank, 2022

Furthermore, despite many similarities in the business climate, the regional distribution of FDI flows has been ominously uneven and mainly dominated by Russia and Kazakhstan. In 2020, these two countries collectively hosted 72.4 percent of the total foreign direct investment inflows to the CIS region. Per capita FDI has also varied significantly across the region, and the maximum variance was observed between Kazakhstan and Uzbekistan with US$1073 and US$26 per capita FDI in 2008 (World Bank, 2021). Noticeably, notwithstanding a great deal of evidence that FDI could promote economic growth, employment, managerial skills, technological know-how, and access to advanced technologies (Apergis et al., 2008; Mehic et al., 2013; Neuhaus, 2006), efforts of CIS countries to attract FDI have been relatively futile. Therefore, given the importance of FDI to transitioning economies, especially with their significant investment needs and limited domestic savings (Dubrovskiy & Ustenko, 2009; Shiells,

2003), the inability of CIS economies to attract FDI is undoubtedly alarming. Given that many CIS countries, such as Russia, Kazakhstan, Azerbaijan, Uzbekistan, and Georgia have continuously introduced institutional reforms and policies to promote FDI as an avenue for technology transfer and skill development in sectors such as resource extraction, manufacturing, services, and technology, where the infusion of foreign capital and expertise can be beneficial for local industries.

A large body of empirical literature has been developed around the determinants of FDI to economies in transition and developing countries. However, the CIS region received limited attention despite its investment appeal. Hence, econometric studies focusing on this region are scarce and remain insufficiently researched. Besides, even the existing literature has been mainly conducted either at a national level or several top FDI destination CIS countries (see, among others, Kuzmina et al. (2014); Ledyaeva (2009)). Moreover, most of these studies have mostly emphasized market determinants of FDI, such as market size, market potential, exchange rates, taxes, and inflation (Iwasaki & Tokunaga, 2014; Lee, 2015), whereas, despite their importance, institutional factors have been mostly neglected in the majority of existing empirical studies. From the institutional perspective, regulatory environment and political stability are vital in shaping FDI decisions as they reflect the legal and political landscape in the country. Given that, favorable institutional climate can be conducive for higher FDI, providing a secure and stable business environment. Equally, geographic location factors, such as being landlocked or having access to the sea, have also been overlooked, regardless of the extensive empirical evidence (Chanegriha et al., 2017; Ly et al., 2018; Redding & Venables, 2004).

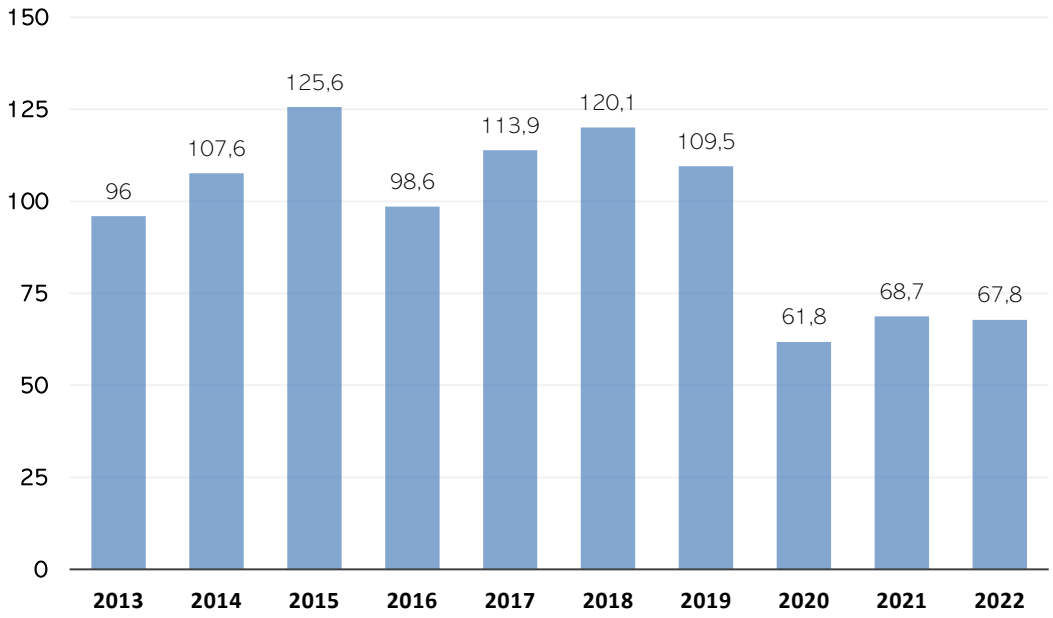
Foreign direct investment in CIS countries is predominantly driven by the rich endowment of natural resources, such as oil, gas, minerals, and metals (Shepotylo, 2012). This resource abundance has made the extraction and processing industries attractive to foreign investors, with substantial capital flowing into ventures related to resource exploration and production. This is due to, unlike other regions, the services sector, including financial services, in many CIS countries is relatively small and underdeveloped. Challenges in the institutional and regulatory frameworks, coupled with deficiencies in infrastructure, contribute to the limited growth of the services sector, redirecting FDI towards resource-driven industries (EABR, 2022). While the

global demand for natural resources remains high, the lack of development of the services sector and the economic reliance on resource-intensive activities have resulted in a pronounced trend of resource-driven FDI in the CIS region. Therefore, given the prevalence of natural resource reserves, a geographic location perspective is crucial for FDI. This is because disadvantageous geographic location tends to increase the cost of transportation, hindering the export activities of foreign investors. Advantageous geographic characteristics of countries, such as having access to the open seas, can make countries more enticing to FDI as it enhances the efficiency of export activities.

The Belt and Road initiative (BRI) launched by China in 2013 accentuated the importance of geographic location and market access and prioritized infrastructure development for promoting connectivity and cooperation through trade and investment across the member-states. Since 2013, the cumulative two-way investment between China and partner countries have reached $380 billion by 2022, where $240 billion worth investments were made by China (SRCIC, 2023). *Figure 2* illustrates the annual Chinese investment inflows in countries of the BRI from 2013 to 2022. Infrastructure development projects within the Belt and Road framework include building roads, railroads, ports, and energy projects. As a result, BRI countries have seen substantial increase in FDI inflows from China, especially in infrastructure related sectors. This is particularly true for the former Soviet transition economies, as these countries are strategically located along the BRI routes and serve to be important transit hubs between Europe and Asia. Nevertheless, given that most of these countries are landlocked, a significant proportion of investments were directed to improving connectivity and infrastructure in these countries. For instance, a recent railway project from China to Uzbekistan through Kyrgyzstan (CKU) is one of the significant transportation corridors with an estimated value of $4.5 billion that can potentially connect Asia to Europe through the railway networks of Turkmenistan, Iran, and Turkey (Genevieve, 2023). Besides, Kazakhstan also seen a significant investment in infrastructure including the $6.6 billion East Europe and East China highway BRI project which thought to contribute to regional trade and development (Vakulchuk et al., 2019). Likewise, other transition countries have also been able to attract substantial FDI inflows to the transportation and logistics sectors within the BRI framework. However, despite the importance of the geographic location factors, econometric

studies accounting for the physical geographic characteristics of CIS countries virtually do not exist. Furthermore, irrespective of the underlying hypothesis, the results of existing econometric studies are somewhat mixed, both in terms of statistical significance and the casualty relationship direction; hence, the determinants of FDI are still equivocal (Iwasaki & Tokunaga, 2014; Keeley & Ikeda, 2017).

Figure 2: Chinese Investment flows in BRI countries from 2013-2022
(in billions of US dollars)



Source: GFDC (2023)

The significance for this research arises from the unique combination of socio-economic characteristics and resource endowments prevalent in these countries. Hence, given the research gap in existing literature, it is critical to explore the determinants of FDI from market, institutional, and geographic perspectives to gain a comprehensive understanding of the factors influencing FDI inflows to the CIS region. Thus, this study aims to explore the determinants of FDI to transition economies, analyze whether these determinants vary based on country-specific geographical location factors, and examine how and to what extent the variance in FDI distribution patterns can be explained. In this context, the contributions of the study refer to the lack of studies focusing on transition economies in the CIS region, where existing literature neither considered an integrated analysis of the market, institutional, and geographic factors nor accounted for

geographic distinctions across countries when analyzing the determinants of FDI. Besides, this research also provides answers to the following questions: (i) whether or not landlockedness and sea-access affect a country's ability to attract foreign investment, (ii) to what extent do these geographic factors affect FDI inflows to transition economies in CIS, (iii) how does the transition towards a market-based economy influence FDI inflows, (iv) what is the relationship between natural resources, external debt, and FDI, and (v) how does geographic location influence these relationships? Furthermore, in contrast to the previous studies, this study provides a clear comparison between 12 member-states, considering the distinctive market, institutional, and geographic characteristics.

Considering the scarcity of existing empirical studies in CIS, the contributions of this paper to the existing literature on FDI determinants are fourfold. Firstly, we contribute to relatively scarce empirical research on FDI in the CIS region. Secondly, building on the prior econometric studies and using a large panel dataset for 12 countries from 2002 to 2020, this study integrates the role of the market (*market size*, *trade openness*, *natural resources*, and *external debt*), institutional (*economic freedom*, the *rule of law*, *control of corruption*, and *political stability*), and geographic factors (*sea-access* and *landlockedness*). Therefore, it allows us to evaluate the impact of market characteristics, institutional quality, and geographic location factors on FDI flows to CIS and understand the factors behind uneven distribution patterns of FDI across the region. Thirdly, we conduct robustness checks to address concerns over the robustness of the results to changes in the underlying empirical model and overcome potential endogeneity problems. Last but not least, we develop policy experiments and estimate the relative impact of selected variables on FDI in contrast to market size.

The remainder of the paper proceeds as follows. Section 2 briefly reviews the existing empirical research on FDI determinants in CIS. Section 3 describes the data, variables, and estimation model applied in this study, and Section 4 provides the results and discusses policy experiments. Then, Section 5 concludes the study with policy implications.

2. Empirical evidence on the determinants of FDI in CIS

This study is empirical; therefore, a thorough summary of the FDI theory is beyond its scope. Nevertheless, it is essential to mention that, over the years, many studies have been carried out, and different paradigms and theories have been developed to explain the determinants of FDI. Though the theoretical literature on FDI has increased in quantity and quality over the years, empirical studies focusing on CIS economies are surprisingly scarce.

In earlier studies, Garibaldi et al. (2001) implemented a general-to-specific model selection approach using the OLS model to explore the determining factors of FDI flows to transition countries from 1990 to 1999. Their results indicated that economic growth, trade liberalization, natural resource abundance, exchange rate, and privatization determined FDI flows to transition economies. Likewise, using GMM and Fixed Effects models with a range of explanatory variables during 1990-1998, the results of Kinoshita and Campos (2004) substantiated the outcomes of Garibaldi et al. (2001). Moreover, they found low-cost labor, quality of institutions, and (surprisingly) lower levels of human capital to be significant, explaining the FDI location decisions in transition economies.

More recently, Gorbunova et al. (2012) explored the determinants of FDI in former socialist countries employing OLS, 2SLS, and FGLS from 1994 to 2002. Their estimates showed that market variables, such as inflation, exchange rates, and unemployment, are more critical determinants encouraging FDI to transition economies than institutional variables, employment laws, credit recovery, contract negotiation, and duration of new business registration. Concentrating on spatial determinants of FDI during 1993-2007, Shepotylo (2012) applied the 2SLS method with spatial variables and found that market size, governance quality, natural resource abundance, and low wages are critical factors influencing the FDI flows to CIS states. Lu et al. (2020) examined the role of natural resources, economic freedom, and sea-access in attracting foreign direct investment and found that investment location decisions of investors are strongly affected by the geographic contiguity, economic freedom, and access to natural resources in transition economies. The authors have used the Prais-Winsten regression with panel-corrected standard errors (PCSEs) in tandem with the FGLS, RE, and with

Driscoll-Kraay standard errors, and RE with GLS estimation methods from 1998 to 2017.

Empirical research on FDI to transition economies in CIS is relatively scarce, and most studies are rather dated. Besides, they have generally considered traditional variables, with little or no emphasis on institutional and geographic factors. Though prior research provides valuable information on FDI determinants, it only illuminates a part of the picture. Therefore, to better understand the investment climate in CIS, this study incorporates the role of the market, institutional, and geographic factors.

3. Data, variables, and empirical model

3.1. Description of data

Initially, we constructed a panel for 12 CIS countries over the maximum period of 1995 –2020. However, due to a significant amount of missing data, our sample is strongly unbalanced for the earlier years. Therefore, contingent upon data available on all variables and countries included, we consider 2002–2020 as 2002 is the first year to have broader regional coverage. The macroeconomic data were obtained from the World Development Indicators (WDI), and the data for institutional variables came from The World Bank World Governance Indicators (WGI) and the Heritage Foundation. Data on geographic variables were collected from the CEPII's database.

Consistent with the preponderance of literature on FDI determinants (Cleeve et al., 2015; Cuervo-Cazurra, 2008; Dimitrova & Triki, 2018; Helmy, 2013), this study employed the natural logarithm of net FDI inflows in 2015 constant US dollars as a dependent variable.

Market variables: market size (GDP in 2015 constant US dollars), trade openness (trade/GDP), natural resources (total natural resource rents/total exports), and external debt (total external debt/GDP) are used to proxy for the host country's market size, economic openness to trade, natural resource endowments, and market risk and instability.

Institutional variables: *economic freedom*, the *rule of law, control of corruption, and political stability* are employed to reflect the host country's free-market supportive policies and institutions, strength, fairness of the legal system, control of corruption among public

and private officials, and political instability to show how stability or instability influences investment decisions.

Geographic variables: *landlockedness* and *sea access* are two dummy variables constructed to indicate distinctive geographic location characteristics of CIS countries. This is because the geographic location of transition countries in CIS is rather complicated. A few member-states have access to international open waters, and some share territorial coastlines along the Black Sea and the Caspian Sea, despite being landlocked, while others are entirely landlocked. Therefore, *landlockedness* comprises two groups of countries, coastal and landlocked, equal to 1 if a country is landlocked and 0 if otherwise. Equally, *sea access* categorizes the countries into countries with and without territorial access to the sea, equal to 1 if a country has sea access and 0 if otherwise. Table 1 provides a comprehensive overview of the geographic location of transition economies.

This study uses market attractiveness (GDP growth rate) and unemployment (total unemployment rate) as control variables to establish consistency with the literature. Many empirical studies have demonstrated strong correlations between GDP growth, unemployment, and FDI flows. A rapidly growing economy offers relatively better opportunities for profit than slowly growing or stagnant economies. Besides, countries with higher levels of unemployment possess two principal advantages for investment: plenty of available workers and better prospects of finding an available workforce at lower wages. Hence, these determinants are perceived to affect FDI flows positively. The complete list of variables, scales of measurement, and expected effect are reported in Appendix A.

Table 1: Geographic Location Overview of Transition Economies in CIS

Countries	Coastal	Landlocked	Sea-Access	No Sea-Access
Armenia		+		+
Azerbaijan		+	+	
Belarus		+		+
Georgia	+		+	
Kazakhstan		+	+	
Kyrgyzstan		+		+
Moldova		+		+
Russia	+		+	
Tajikistan		+		+

Turkmenistan		+	+	
Ukraine	+		+	
Uzbekistan		+		+

Source: Authors' construct based on CEPII database; The shores of the Caspian Sea bound Kazakhstan, Azerbaijan, and Turkmenistan with Iran and Russia; Georgia, Russia, and Ukraine share the coastlines of the Black Sea with Bulgaria, Moldova, Romania, and Turkey.

3.2. Summary statistics and mean differences

The summary statistics on the dependent, explanatory, and control variables reported in Table 2 provide details about the number of observations, means, and standard deviations, along with the minimum and maximum value ranges. Table 3 presents the mean differences between coastal and landlocked countries in the market, institutional, and geographic factors. The correlation matrix and the mean differences for countries with and without sea access are provided in Appendix B and C.

Table 2: Summary Statistics

Variables	N	Mean	Std. Deviation	Min	Max
FDI inflows (Log)	228	20.805	1.799	15.355	25.037
Market Size (Log)	228	23.932	1.723	20.923	28.462
Trade Openness	228	92.137	28.601	35.179	157.974
Natural Resources	228	1.623	1.605	-1.783	4.154
External Debt	228	-0.900	0.972	-4.662	0.287
Economic Freedom	228	54.8	8.388	38.3	73
Rule of Law	228	23.163	14.356	1.913	64.903
Political Stability	228	32.550	16.088	3.883	72.511
Control of Corruption	228	20.153	15.314	1.421	76.442
Market Attractiveness	228	5.983	5.691	-14.8	34.5
Unemployment	228	8.078	4.314	0.488	19.01
Sea-Access (Dummy)	228	0.5	0.501	0	1
Landlocked (Dummy)	228	0.75	0.434	0	1

Table 3 highlights the presence of substantial differences in the means of selected variables, except for natural resources. The mean variance in FDI inflows is -1.874, indicating that landlocked economies receive, on average, lower FDI inflows than coastal counterparts. Equally, compared to landlocked countries (23.4), market size

tends to be larger in coastal states (25.4). However, trade openness is considerable in landlocked countries, where imports and exports constitute over 95% of the total GDP. This value for the coastal states is about 81%. Though the mean values on natural resources for these two groups of countries appear different, the variance is not statistically significant. In terms of institutional quality, landlocked states seem to have higher economic freedom and political stability but are disposed to weaker rules of law and higher rates of corruption.

Table 3: Mean Differences between Coastal and Landlocked countries

Variables	Coastal	Landlocked	Mean Difference
FDI inflows (Log)	22.212	20.337	-1.874***
Market Size (Log)	25.396	23.444	-1.952***
Trade Openness	81.162	95.796	14.633***
External Debt	-0.647	-0.984	-0.337**
Natural Resources	2.966	2.779	-0.187
Economic Freedom	50.293	56.302	6.008***
Rule of Law	31.074	20.526	-10.548***
Political Stability	24.242	35.320	11.078***
Control of Corruption	29.974	16.880	-13.094***

*Note: Coastal denotes three coastal countries, and Landlocked stands for nine landlocked countries. Mean differences for selected variables between coastal and landlocked countries were estimated using independent samples T-test. ***, **, and * denote significance at 0.01, 0.05, and 0.10 levels, respectively.*

3.3. Empirical estimation and model

This study uses linear regression with panel-corrected standard errors (PCSEs) developed by Beck and Katz (1995) for all estimations. Empirically, PCSE denotes heteroskedasticity models and contemporaneously correlated across panels with or without serial correlation. It is best suited to small panels and accounts for finite sample bias while producing panel-corrected standard errors that allow heteroskedasticity and correlation over panels (Beck & Katz, 1996; Cameron & Trivedi, 2009). Though Parks (1967) feasible generalized least squares (FGLS) model is often used in a similar context, Beck and Katz (1995) demonstrated that the variance-covariance estimates of FGLS are generally far too optimistic. Standard errors of the coefficients are underestimated between 50% and 300%, mainly when applied to data with 10–20 panels and 10–40

periods per panel. Empirical studies, such as Haftel (2010); Hecock and Jepsen (2013), and Herrerias et al. (2013) have employed the PCSEs method as an alternative model to FGLS and confirmed that for datasets with characteristics as in this study, PCSEs provides a better fit and more robust estimates. This study does not consider using the fixed-effects model (FE) as it does not allow for estimations of time-invariant variables, sea access and landlockedness. Instead, we augment PCSE estimates with Parks (1967) Feasible Generalized Least Squares (FGLS) and Baltagi and Wu (1999) GLS estimator of the Random Effects (RE) method to address possible methodological concerns and test the sensitivity of the results to changes in the underlying econometric model.

The following equation is estimated using Beck and Katz (1995) PCSE estimation method:

$$y_{it} = x_{it}\beta + u_{it}$$

For $i = 1,\ldots, N$ is the number of panels; $t = 1,\ldots, T_i$; T_i is the number of periods in panel i, y_{it} is the log of net FDI inflows to country i in period t; x_{it} includes an intercept and a set of market, institutional, geographic, and control variables that vary over t and i, and u_{it} is an idiosyncratic error term. Ideally, T is relatively larger than N in long panels; hence, u_{it} may be serially correlated along t or contemporaneously correlated across i. However, in practice, T is not much larger than N, which may create finite-sample bias in the estimators and standard errors. Hence, we specify more restrictive first-order autocorrelation AR(1) with a common coefficient of AR(1) in all panels (Cameron & Trivedi, 2009). When a common coefficient of correlation is specified, PCSEs produce Prais–Winsten parameter estimates and ϱ_i=ϱ is obtained. Hence,

$$u_{it} = \rho u_{i,t-1} + \varepsilon_{it}$$

Where the common correlation coefficient is calculated as follows:

$$\rho = \frac{\rho_1 + \rho_2 + \cdots + \rho_N}{N}$$

where, ρ_i is the autocorrelation coefficient estimate for panel i and N is the number of panels. The covariance of the Prais-Winsten coefficient is estimated as follows:

$$Var(\beta) = (X'X)^{-1}X'\Omega X(X'X)^{-1},$$

where Ω is the full covariance matrix of disturbances and is calculated as:

$$\mathbf{\Omega} = \sum_{N \text{ x } N} \otimes \mathbf{I}_{T_i \text{ x } T_i}$$

where $\sum$ is the N by N panel-by-panel covariance matrix of the disturbances. Given this estimation method we develop the following models to test the impact of sea access and landlockedness on foreign direct investment inflows to transition economies:

$$\begin{aligned} LnFDI_{it} = \beta_0 &+ \beta_1 LnMSize_{i,t} + \beta_2 LnDebt_{i,t} + \beta_3 TOpen_{i,t} + \beta_4 LnNRes_{i,t} \\ &+ \beta_5 EFree_{i,t} + \beta_6 RLaw_{i,t} + \beta_7 Corr_{i,t} + \beta_8 PStab_{i,t} + \beta_9 Land_{i,t} \\ &+ \beta_{10} DLand_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Equation (1)

$$\begin{aligned} LnFDI_{it} = \beta_0 &+ \beta_1 LnMSize_{i,t} + \beta_2 LnDebt_{i,t} + \beta_3 TOpen_{i,t} + \beta_4 LnNRes_{i,t} \\ &+ \beta_5 EFree_{i,t} + \beta_6 RLaw_{i,t} + \beta_7 Corr_{i,t} + \beta_8 PStab_{i,t} \\ &+ \beta_9 Sea\_Access_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Equation (2)

4. Empirical Results

Table 4 presents Prais–Winsten estimates for the total sample with panels corrected standard errors robust to cross-sectional dependence, heteroskedasticity, and autocorrelation. The estimates reported in Table 4 show that our benchmark

specifications in Models 6-8 lead to similar conclusions consistent with the existing literature.

Models 1-2 show regression results for market and institutional determinants of FDI inflows. The estimates indicate that market size, trade openness, natural resources, and economic freedom have a statistically significant positive effect on FDI flows to CIS economies. External debt and the rule of law become statistically significant in Model 3 when the market and institutional variables are incorporated. The coefficient of external debt is negative, while the rule of law is positive. Evidently, larger debt burdens present higher country risks and, thus, are less attractive to foreign investors. Besides, foreign debt is considered an alternative source of investment financing, and increased external debt may deter FDI flows due to the substitution effect. On the other hand, the positive coefficient of the rule of law suggests that ensuring reliable legal systems, protecting foreign investors, and allowing fair market competition encourages FDI.

In Model 4, we include *landlockedness* to test whether the physical geographic location disadvantage constrains FDI flows to landlocked member-states. The results imply that landlockedness negatively affects FDI flows to CIS. The negative and statistically significant coefficient of *landlockedness* shows that FDI flows to landlocked countries are 56.8% below comparable FDI flows to coastal nations.[1] This outcome elucidates that FDI flows to landlocked economies are ultimately deterred by the tyranny of geographic location. Despite the inclusion of *landlockedness*, market and institutional variables preserve their respective effects and significance levels. Equally, in Model 5, we account for sea access to test whether territorial coastlines provide geographic location advantage conducive to FDI. The coefficient of sea access is statistically significant and positive, implying that member-states with territorial coastlines receive, on average, 177.8% more FDI flows than countries without, holding other factors fixed. Furthermore, the coefficient of natural resources becomes statistically insignificant, suggesting that foreign investors are not necessarily discouraged by the lack of natural resources in countries with sea access.

[1] Wooldridge, J. M. (2016). *Introductory Econometrics : A Modern Approach* (6th ed.). Mason, Ohio : South-Western Cengage Learning. explains that when $\widehat{\beta_1}$ is a coefficient of a dummy variable and $\log(y)$ is the dependent variable, the exact percentage difference in the predicted y for x_1=1 versus when x_1=0 can be calculated using $100 * [\exp(\widehat{\beta_1}) - 1]$. Hence, 100*[exp (-0.840)-1] =100*(-0.568289) ≈ -56.8%.

Table 4: Prais-Winsten Estimations (for the full sample)

	Dependent Variable: FDI inflows							
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Constant	-3.616*	4.845***	-4.763***	-2.120	-1.760	-1.282	-3.021	-4.160*
	(1.985)	(1.189)	(1.783)	(1.748)	(1.736)	(2.673)	(2.144)	(2.518)
Market Size	0.923***		0.870***	0.741***	0.746***	0.716***	0.790***	0.839***
	(0.074)		(0.066)	(0.073)	(0.066)	(0.102)	(0.077)	(0.095)
Trade Openness	0.016***		0.018***	0.017***	0.013***	0.016***	0.014***	0.014***
	(0.003)		(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Natural Resources	0.270***		0.278***	0.210**	0.056	0.216**	0.010	0.000
	(0.078)		(0.082)	(0.086)	(0.102)	(0.089)	(0.107)	(0.111)
External Debt	-0.044		-0.235**	-0.294***	-0.178**	-0.248**	-0.173**	-0.175**
	(0.099)		(0.098)	(0.093)	(0.088)	(0.098)	(0.087)	(0.088)
Economic Freedom		0.096***	0.025**	0.048***	0.039***	0.048***	0.041***	0.034***
		(0.017)	(0.010)	(0.015)	(0.010)	(0.014)	(0.010)	(0.013)
Rule of Law		0.006	0.030***	0.025***	0.016**	0.027***	0.013	0.012
		(0.012)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Control of Corruption		0.007	-0.002	-0.004	0.002	-0.004	0.001	0.003
		(0.011)	(0.007)	(0.007)	(0.005)	(0.006)	(0.005)	(0.005)
Political Stability		0.006	-0.001	0.003	-0.001	0.003	-0.000	-0.002
		(0.007)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)
Landlockedness				-0.840***		-0.902***		0.326
				(0.365)		(0.381)		(0.457)
Sea-Access					1.022***		1.038***	1.174***
					(0.261)		(0.245)	(0.338)
Market Attractiveness						0.012	0.012	0.012
						(0.009)	(0.009)	(0.009)
Unemployment						-0.016	0.026	0.036
						(0.032)	(0.026)	(0.032)
Observations	228	228	228	228	228	228	228	228
R^2	0.896	0.848	0.901	0.902	0.896	0.900	0.888	0.887
Wald Chi^2	175.07	29.62	249.35	269.04	414.30	298.00	545.49	574.92
Rho	0.6273	0.7626	0.5925	0.5707	0.4915	0.5544	0.4384	0.4352

*Note: Prais-Winsten regression with PCSEs was used for all estimations. Panels corrected standard errors are in parentheses, and ***, **, and * denote significance at 0.01, 0.05, and 0.10.*

Models 6-8 are the benchmark estimations, where we control the regression estimates in previous models for market attractiveness and unemployment. The results show that both control variables are statistically not significant, and our models remain unaffected, except for the rule of law in Models 7 and 8. In Model 8, we test whether *sea access* can mitigate the adverse effect of *landlockedness* on FDI and include both geographic variables in one regression. The coefficient for *sea access* is significant and positive, indicating that territorial sea access encourages FDI, whereas *landlockedness* is

statistically insignificant. This result suggests that *sea access* may have a moderating effect that can neutralize the negative impact of *landlockedness* on FDI flows to landlocked CIS economies. These results were consistent even after introducing the time fixed effects (see Appendix D).

Table 5 reports regression results on disaggregated data for landlocked and sea-access countries. We examine if the results change when the sub-samples of landlocked countries and countries with sea access are explicitly considered. As is shown in Table 5, the estimates across Models 1-4 lead to practically similar results reported in Table 4 (Models 4-7). For instance, the coefficient of *sea access* is significant and positive, accounting for a substantial share of FDI flows to landlocked countries with territorial coastlines. *Landlockedness* is negative but statistically is not significant. This result highlights the importance of territorial sea access for landlocked countries. It denotes that FDI flows to landlocked countries with sea access may not necessarily differ from coastal transition economies. Though most coefficients are similar across Models 1- 4, natural resources and external debt vary across the two groups of countries. The coefficient of natural resources is significant when accounted for *sea access*, whereas external debt is statistically significant when controlled for *landlockedness*. Furthermore, Model 3 shows that the unemployment coefficient is positive and statistically significant for landlocked economies, implying that higher unemployment encourages FDI in landlocked countries. Perhaps, a possible explanation is that due to the lack of other employment opportunities, people in landlocked countries place a higher value on their current job and are more committed and willing to work for lower wages.

Table 5: Prais-Winsten Estimations (sub-samples of landlocked and sea-access countries)

	Dependent Variable: FDI inflows			
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Landlocked	**Sea-Access**	**Landlocked**	**Sea-Access**
Constant	-1.700 (2.412)	0.610 (1.851)	-5.047 (3.110)	-1.529 (2.269)
Market Size	0.721*** (0.104)	0.676*** (0.090)	0.865*** (0.136)	0.741*** (0.096)
Trade Openness	0.014*** (0.004)	0.007** (0.003)	0.016*** (0.004)	0.008** (0.003)
Natural Resources	-0.038 (0.129)	0.378*** (0.179)	-0.114 (0.139)	0.381*** (0.172)
External Debt	-0.191** (0.095)	-0.121 (0.079)	-0.195** (0.087)	-0.157* (0.081)
Economic Freedom	0.055** (0.019)	0.035*** (0.015)	0.047** (0.019)	0.033*** (0.014)
Rule of Law	0.015 (0.010)	0.008 (0.014)	0.007 (0.010)	0.011 (0.014)
Control of Corruption	-0.005 (0.012)	0.013 (0.010)	-0.002 (0.011)	0.007 (0.010)
Political Stability	-0.002 (0.005)	0.008 (0.004)	-0.004 (0.006)	0.006 (0.005)
Landlockedness		-0.335 (0.454)		-0.197 (0.462)
Sea-Access	1.056*** (0.365)		1.284*** (0.367)	
Market Attractiveness			0.005 (0.010)	0.008 (0.011)
Unemployment			0.063** (0.027)	0.059 (0.045)
Observations	171	114	171	114
R^2	0.895	0.923	0.873	0.900
Wald Chi^2	302.63	332.55	375.47	410.50
Rho	0.5060	0.4129	0.4403	0.3226

*Note: Prais-Winsten regression with PCSEs was used for all estimations. "All" represents the full sample of 12 transition economies in the CIS region. "Landlocked" represents nine landlocked countries, and the "Sea-Access" stands for six countries with territorial access to the sea. Panels corrected standard errors are in parentheses, and ***, **, and * denote significance at 0.01, 0.05, and 0.10.*

4.2. Robustness checks

To test the robustness of the benchmark estimations reported in Table 4 (Models 6-8) to changes in the underlying empirical model, we re-estimate the PCSEs regressions

using FGLS and RE estimators in Table 6. The results in Table 6 show that both FGLS and RE methods produce comparable estimates to the regressions reported in Table 4 (Models 6-8), except for external debt in Model 2. The coefficient of external debt is negative but not significant in Model 2, whereas it is significant at the 5% level in Table 4 (Model 7).

Table 6: Robustness check: FGLS and RE Estimations

	Dependent Variable: FDI inflows					
	Model 1		**Model 2**		**Model 3**	
	FGLS	**RE**	**FGLS**	**RE**	**FGLS**	**RE**
Constant	-1.282 (2.834)	-1.726 (3.009)	-3.021 (1.988)	-2.888 (2.155)	-4.160* (2.520)	-3.834 (2.738)
Market Size	0.716*** (0.110)	0.739*** (0.118)	0.790*** (0.070)	0.784*** (0.076)	0.839*** (0.097)	0.825*** (0.106)
Trade Openness	0.016*** (0.004)	0.016*** (0.004)	0.014*** (0.003)	0.014*** (0.003)	0.014*** (0.003)	0.014*** (0.003)
Natural Resources	0.216** (0.103)	0.216*** (0.109)	0.010 (0.097)	0.030 (0.106)	0.000 (0.098)	0.022 (0.107)
External Debt	-0.248** (0.121)	-0.258*** (0.128)	-0.173* (0.103)	-0.162 (0.112)	-0.183** (0.096)	-0.166** (0.107)
Economic Freedom	0.048*** (0.017)	0.046** (0.018)	0.041*** (0.012)	0.040*** (0.013)	0.034*** (0.012)	0.035** (0.016)
Rule of Law	0.027*** (0.010)	0.023** (0.011)	0.013 (0.009)	0.014 (0.010)	0.012 (0.009)	0.013 (0.010)
Control of Corruption	-0.004 (0.008)	-0.001 (0.009)	0.001 (0.007)	0.001 (0.007)	0.003 (0.007)	0.003 (0.008)
Political Stability	0.003 (0.005)	0.001 (0.006)	-0.000 (0.004)	-0.000 (0.005)	-0.002 (0.005)	-0.002 (0.005)
Landlockedness	-0.902*** (0.384)	-0.843** (0.393)			0.326 (0.450)	0.277 (0.494)
Sea-Access			1.038*** (0.218)	1.029*** (0.240)	1.174*** (0.287)	1.146*** (0.318)
Market Attractiveness	0.012 (0.010)	0.011 (0.010)	0.012 (0.009)	0.012 (0.010)	0.012 (0.009)	0.012 (0.010)
Unemployment	-0.016 (0.034)	-0.013 (0.037)	0.026 (0.028)	0.020 (0.030)	0.036 (0.031)	0.029 (0.034)
Observations	228	228	228	228	228	228
R2		0.832		0.863		0.864
Wald Chi2	350.84	261.93	541.27	441.51	547.96	440.03
Rho	0.5545	0.4861	0.4384	.4861	0.4353	0.4861

*Note: FGLS and RE regressions were used for all estimations. Models 1-3 report FGLS and RE estimates comparable to Models 6-8 in Table 5. Robust standard errors are in parentheses, and ***, **, and * denote significance at 0.01, 0.05, and 0.10.*

4.2. Policy experiments

Herein we analyze the relative impact of the market size in contrast to trade openness, economic freedom, the rule of law, and sea access on FDI, using two landlocked countries, Azerbaijan and Uzbekistan, with and without territorial access to the sea. These two countries are selected as benchmarks for two reasons: (1) relative proximity in market size and (2) significant difference in FDI flows. Columns 1 and 2 in Table 7 report the average values of selected variables for the two countries from 2002 to 2020. Column 3 presents the estimated coefficients, and Column 4 indicates the equivalent effect of a change in the selected variables for market size.

The experiments in Table 7 are based on parameter estimates reported in Models 6 and 7 of Table 4, assuming α=0.05 significance level. The table shows that an increase in trade openness from the group of Uzbekistan to that of Azerbaijan produces the same positive effect on FDI as increasing the market size by 61.55 percent.[2] Likewise, improving the level of economic freedom in Uzbekistan to that level of Azerbaijan results in a similar positive effect as increasing the market size by 81.15 percent. Further, enhancing the current state of the legal system in Uzbekistan to that of Azerbaijan has the same positive impact as increasing the market size by 60.16 percent, while hypothetical territorial sea access has a similar positive effect as increasing the market size by about 145 percent.

[2] The equivalent effect of a change in trade openness is calculated as follows: 100*(89.632-62.088) *0.016/0.716, where 0.016 and 0.716 are the estimated coefficients of trade openness and market size (Model 6 in Table 5). In prior studies, Asiedu, E. (2006). Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Instability. The World Economy, 29(1), 63-77. https://doi.org/10.1111/j.1467-9701.2006.00758.x has conducted similar experiments. See Appendix E for detailed explanation of coefficient calculations for policy experiments.

Table 7: Policy Experiments

Policy Measures	Uzbekistan	Azerbaijan	Estimated Coefficient [a]	Equivalent Effect on Market Size (%) [b]
Trade Openness	62.08	89.632	0.016	61.55
Economic Freedom	56.86	68.966	0.048	81.15
Rule of Law	7.983	23.937	0.027	60.16
Sea-Access	0	1	1.038	145

Notes:

[a] *These are the estimated coefficients from Models 6 and 7 reported in Table 4.*

[b] *The equivalent effect of a change in trade openness from the level of Uzbekistan to that of Azerbaijan is estimated by 100*(89.632-62.088) *0.016/0.716, where 0.716 is the coefficient of the market size (Model 6 in Table 4).*

These estimates accentuate the importance of international trade, economic freedom, the rule of law, and the economic advantages conveyed on countries with territorial coastlines. Hence, as opposed to increasing the market size, accruing international trade, creating open, fair, and competitive markets, ensuring property rights protection and contract enforcement, or establishing active trade routes may have, on average, a more significant impact on FDI flows to Uzbekistan, holding other factors fixed.

5. Conclusion and policy implications

This study sought to estimate the impact of market, institutional, and geographical variables on FDI flows to the CIS region using a panel of 12 countries from 2002 to 2020. Our estimates indicate that market size, trade openness, natural resources, economic freedom, the rule of law, and sea-access are significant factors encouraging FDI flows to transition economies in CIS. In contrast, external debt and landlockedness are found to be deterrents to FDI, whereas no statistically significant dependence of the means of control of corruption and political stability on FDI flows was detected. The coefficients of landlockedness and sea-access demonstrate the advantages of countries with coasts over landlocked countries, given that transportation costs are higher and access to broader markets is limited for countries without sea access. Nevertheless, we also find that the adverse effect of *landlockedness* may be moderated by *sea-access*, indicating that FDI flows to coastal countries and landlocked countries with coastlines

are not significantly different in the CIS region. These indicators remain statistically significant despite the inclusion of control variables, changes in the empirical model applied, and consideration of endogeneity problem, confirming that physical geographical location is indeed an essential factor, encouraging or discouraging FDI. Hence, our findings have significant policy implications.

First, our estimates suggest that natural resource endowments do not exclusively drive FDI to CIS member-states. Countries can attract FDI by actively participating in foreign trade and decreasing government restrictions and regulations on the economy. Second, improving the current state of governance institutions can also play an essential role in attracting FDI flows. From this perspective, developing a more favorable investment climate characterized by improved property rights protection, effective contract enforcement, dispute resolution, and a lower likelihood of crime and violence can be vital for CIS economies to encourage FDI flows (Asiedu, 2006); Khoury and Peng (2011). Furthermore, the risks and expenses associated with the lack of sea access or being distant from major capital markets should be mitigated by creating efficient transportation infrastructure, seaports. Landlocked countries, such as Armenia, Belarus, Kyrgyzstan, Moldova, Tajikistan, and Uzbekistan, may reduce the negative effect of landlockedness by establishing internal and external transportation infrastructures. Hence, these states should develop regional infrastructure integration strategies and maintain strategic partnerships with neighboring countries to build active trade routes using transit seaports in countries with sea-access (Casal-Campos et al., 2015; Idan & Shaffer, 2011).

We acknowledge that this study is not without limitations. The first limitation arises from the lack of data on bilateral FDI for CIS countries. Though aggregate FDI flows have been extensively used in literature as a valid proxy, future research may consider employing bilateral FDI, distinguishing the types of investment and accounting for the differences between home and host countries in macroeconomic performance, institutional quality, and geographic location. Besides, the insignificant relationship between political stability, control of corruption, and FDI requires further investigation and thus may open a new avenue for further research. Likewise, future research may also incorporate spatial dependence and agglomeration effects on bilateral FDI or examine whether our results hold for FDI flows from other developing countries.

Appendices

Appendix A

Table 8: Description of Variables and Data Sources

Variable	Definition	Measure	Expected Effect
FDI inflows	Annual net FDI inflows (natural log)	in 2015 constant US dollars	
Market Variables			
Market Size	Gross Domestic Product (natural log)	in 2015 constant US dollars	+
Trade Openness	Trade (exports and imports) to GDP ratio	%	+
Natural Resources	Total natural resource rents/total merchandize exports	%	+
External Debt	External debt stocks/GDP	%	-
Institutional Variables			
Economic Freedom	Economic Freedom Index: measures the overall economic freedom in the host country	Scale (0-100)	+
Rule of Law	Rule of Law Index: measures the degree of contract enforcement, property rights, theft, and crime	Scale (0-100)	+
Control of Corruption	Control of Corruption Index: measures the exercise of public power for private gain	Scale (0-100)	+
Political Stability	Political Stability Index: measures the probability of government destabilization	Scale (0-100)	+
Geographic Variables			
Landlockedness	A dummy variable for landlocked countries	0 and 1	-
Sea-Access	A dummy variable for countries with sea access	0 and 1	+
Control Variables			
Market Attractiveness	Annual real GDP growth rate	%	+
Unemployment	Total unemployment (% of the total labor force)	%	+

Appendix B

Table 9: Mean Differences between Countries with and without Sea-Access

Variables	Sea-Access	No Sea-Access	Mean Difference
Dependent Variable: FDI inflows	22.085	19.526	2.559***
Market Size	24.881	22.983	1.898***
Trade Openness	85.469	98.805	-13.336***
Natural Resources	3.580	2.071	1.509***
External Debt	-1.180	-.620	-.560***
Economic Freedom	56.313	53.286	3.026**
Rule of Law	24.608	21.719	2.888*
Control of Corruption	20.417	19.890	.527
Political Stability	33.421	31.680	1.740

*Note: Mean differences for selected variables between countries with and without sea-access were estimated using independent samples T-test. ***, ** and * denote significance at 0.01, 0.05 and 0.10 levels, respectively.*

Appendix C

Table 10: Correlation Matrix

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
FDI flows	1												
Market Size	0.756***	1											
Trade Openness	-0.297***	-0.450***	1										
Natural Resources	0.474***	0.466***	-0.539***	1									
External Debt	-0.246***	-0.203***	0.201***	-0.432***	1								
Economic Freedom	0.406***	0.335***	-0.314***	0.604***	-0.106	1							
Rule of Law	0.068	0.108*	0.179*	-0.384***	0.462***	-0.094	1						
Control of Corruption	0.105	0.050	0.103	-0.419***	0.349***	-0.291***	0.653***	1					
Political Stability	0.131*	0.061	0.247***	-0.088	-0.194***	0.044	0.071	0.112	1				
Landlockedness	-0.452***	-0.492***	0.222***	-0.053	-0.150	0.311***	-0.319***	-0.371***	0.299***	1			
Sea-Access	0.713***	0.552***	-0.233***	0.499***	-0.288***	0.180**	0.100	0.017	0.054	-0.577***	1		
Market Attractiveness	-0.069	-0.202***	0.077	0.095*	-0.354***	0.061	-0.201***	-0.155**	0.064	0.232***	0.012	1	
Unemployment	-0.292***	-0.367***	-0.317***	-0.032	0.360***	-0.104	0.461***	0.310***	-0.309***	-0.195***	-0.119	0.001	1

****, ** and * denote significance at 0.01, 0.05 and 0.10 levels, respectively.*

Appendix D

Table 11: Fixed Effects Regression results

Variables	Time effects			Time and Country effects		
	1	2	3	4	5	6
Constant	-1.341 (1.682)	6.433*** (0.896)	-1.98 (1.448)	8.523 (6.057)	8.108*** (0.818)	5.194 (6.244)
Market Size	0.885*** (0.069)		0.846*** (0.058)	0.638*** (0.278)		0.59** (0.281)
Trade Openness	0.009*** (0.003)		0.009*** (0.003)	0.011*** (0.03)		0.011*** (0.004)
Natural Resources	0.219** (0.076)		0.215** (0.098)	0.203*** (0.068)		0.183** (0.075)
External Debt	-0.073 (0.28)		-0.183** (0.079)	-0.426 (0.277)		-0.347** (0.159)
Economic Freedom		0.058*** (0.018)	0.021** (0.009)		0.046*** (0.014)	0.031*** (0.012)
Rule of Law		0.007 (0.011)	0.033*** (0.008)		0.009 (0.011)	0.037*** (0.012)
Control of Corruption		0.003 (0.01)	-0.01 (0.007)		0.012 (0.009)	0.005 (0.01)
Political Stability		0.005 (0.007)	0.003 (0.005)		0.001 (0.006)	-0.002 (0.006)
R2	0.884	0.939	0.944	0.891	0.932	0.909
Wald Chi2	289.465	351.183	944.192	105.951	296.436	331.508
Observations	228	228	228	228	228	228
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Country effects	No	No	No	Yes	Yes	Yes

*Note: Fixed effects regression was used for all estimations. Robust standard errors are in parentheses, and ***, **, and * denote significance at 0.01, 0.05, and 0.10.*

Appendix E

Consider the following equation in Wooldridge (2016):

$$ln\,(y_i) = \beta_0 + x_{1i}\beta_1 + ln(x_{2i})\,\beta_2 + x_{3i}\beta_3 + \varepsilon_i$$

where $ln\,(y_i)$ is the dependent variable that is the natural log of a continuous variable, x_{1i} is an independent continuous variable, $ln(x_{2i})$ is a natural log of an independent continuous variable, x_{3i} is an independent dummy variable that equals 1 (if yes) and 0 (if no), and ε_i is the error term.

Then, holding other factors fixed, the coefficients of estimates are interpreted as:

$\beta_1 = \partial ln(y_i)/\partial x_{1i}$ – one-unit change in x_1 generates a 100*β_1 percent change in y_i

$\beta_2 = \partial ln(y_i)/\partial ln\,(x_{2i})$ – 100% change in x_2 generates a 100*β_2 percent change in y_i

$\beta_3 =$ the movement of x_{3i} from 0 to 1 generates a 100*β_3 percent change in y_i

Hence,

1. Trade Openness is a continuous variable; hence, 100*(89.632-62.088) *0.016/0.716≈ 61.55%.
2. Economic freedom is a continuous variable; hence, 100*(68.96-56.86) *0.048/0.716≈ 81.15%.
3. Rule of law is a continuous variable; hence, 100*(23.937-7.983) *0.027/0.716≈ 60.16%.
4. Sea-Access is a dummy variable; hence, 100*(1.038/0.716) ≈ 145%.

Asiedu (2006); Bosker and Garretsen (2009); Redding and Venables (2004) has considered similar policy experiments in prior studies.

References

Apergis N., Lyroudi K., Vamvakidis A. (2008), 'The Relationship between Foreign Direct Investment and Economic Growth: Evidence from Transition Countries', *Transition Studies Review*, 15(1), 37-51. https://doi.org/10.1007/s11300-008-0177-0

Asiedu E. (2006), 'Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Instability', *The World Economy*, 29(1), 63-77. https://doi.org/10.1111/j.1467-9701.2006.00758.x

Baltagi B. H., Wu P. X. (1999), 'Unequally Spaced Panel Data Regressions with Ar(1) Disturbances', *Econometric Theory*, 15, 814-823.

Beck N., Katz J. N. (1995), 'What to do (and not to do) with Time-Series Cross-Section Data', *The American Political Science Review*, 89(3), 634-647. https://doi.org/10.2307/2082979

Beck N., Katz J. N. (1996), 'Nuisance vs Substance: Specifying and Estimating Time-Series Cross-Section Data', *Political Analysis*, 6(1), 1-36.

Bosker M., Garretsen H. (2009), 'Economic development and the geography of institutions', *Journal of Economic Geography*, 9(3), 295–328. https://doi.org/10.1093/jeg/lbn047

Cameron A. C., Trivedi P. K. (2009), *Microeconometrics : Methods and Applications*. Cambridge Univ. Press.

Casal-Campos A. *et al.* (2015), 'An integrated environmental assessment of green and gray infrastructure strategies for robust decision making', *Environmental science & technology*, 49(14), 8307-8314.

Chan M. W. L. *et al.* (2014), 'Foreign direct investment and its determinants: A regional panel causality analysis', *The Quarterly Review of Economics and Finance*, 54(4), 579-589. https://doi.org/https://doi.org/10.1016/j.qref.2013.07.004

Chanegriha M., Stewart C., Tsoukis C. (2017), 'Identifying the robust economic, geographical and political determinants of FDI: an Extreme Bounds Analysis', *Empirical Economics*, 52(2), 759-776. https://doi.org/10.1007/s00181-016-1097-1

Cleeve E. A., Debrah Y., Yiheyis Z. (2015), 'Human Capital and FDI Inflow: An Assessment of the African Case', *World Development*, 74, 1-14. https://doi.org/https://doi.org/10.1016/j.worlddev.2015.04.003

Cuervo-Cazurra A. (2008), 'Better the devil you don't know: Types of corruption and FDI in transition economies', *Journal of International Management*, 14(1), 12-27. https://doi.org/https://doi.org/10.1016/j.intman.2007.02.003

Dimitrova A., Triki D. (2018), 'Does state fragility matter for foreign direct investment? Evidence from Southern and Eastern Mediterranean countries', *Management Decision*, *56*(8), 1787-1803. https://doi.org/10.1108/MD-03-2017-0252

Dubrovskiy V., Ustenko O. (2009), *Business Climate in CIS Countries* [Working Paper](307). C. N. S. a. Analyses.

EABR. (2022), *EDB monitoring: foreign direct investments between CIS countries and China, Iran, Arab states exceed US $75 billion.* European Development Bank. https://eabr.org/en/press/news/edb-monitoring-foreign-direct-investments-between-cis-countries-and-china-iran-arab-states-exceed-us/

Garibaldi P. *et al.* (2001), 'What Moves Capital to Transition Economies?', *IMF Economic Review*, 109-145.

Genevieve D.-M. (2023), 'Full steam ahead for the China-Kyrgyzstan-Uzbekistan railway?', *The Interpreter.* https://www.lowyinstitute.org/the-interpreter/full-steam-ahead-china-kyrgyzstan-uzbekistan-railway

GFDC. (2023), *China Belt and Road Initiative (BRI) Investment Report 2022,* Green Finance & Development Center. https://greenfdc.org/china-belt-and-road-initiative-bri-investment-report-2022/

Gorbunova Y., Infante D., Smirnova J. (2012), 'New Evidence on FDI Determinants: An Appraisal Over the Transition Period', *Prague Economic Papers*, 2012(2), 129-149. https://EconPapers.repec.org/RePEc:prg:jnlpep:v:2012:y:2012:i:2:id:415:p:129-149

Haftel, Y. Z. (2010), 'Ratification counts: US investment treaties and FDI flows into developing countries', *Review of International Political Economy*, 17(2), 348-377. https://doi.org/10.1080/09692290903333103

Hecock R. D., Jepsen E. M. (2013), 'Should Countries Engage in a Race to the Bottom? The Effect of Social Spending on FDI', *World Development*, 44, 156-164. https://doi.org/https://doi.org/10.1016/j.worlddev.2012.10.016

Helmy H. E. (2013), 'The impact of corruption on FDI: is MENA an exception?', *International Review of Applied Economics*, 27(4), 491-514. https://doi.org/10.1080/02692171.2012.752445

Herrerias M. J., Cuadros A., Ort V. (2013), 'Energy intensity and investment ownership across Chinese provinces', *Energy Economics*, 36, 286-298. https://doi.org/https://doi.org/10.1016/j.eneco.2012.08.043

Hoechle D. (2007), 'Robust standard errors for panel regressions with cross-sectional dependence', *Stata Journal*, 7(3), 281-312. https://EconPapers.repec.org/RePEc:tsj:stataj:v:7:y:2007:i:3:p:281-312

Idan A., Shaffer B. (2011), 'The foreign policies of Post-Soviet landlocked states', *Post-Soviet Affairs*, 27(3), 241-268.

Iwasaki I., Tokunaga M. (2014), 'Macroeconomic Impacts of FDI in Transition Economies: A Meta-Analysis', *World Development*, *61*(C), 53-69. https://EconPapers.repec.org/RePEc:eee:wdevel:v:61:y:2014:i:c:p:53-69

Keeley A. R., Ikeda Y. (2017), 'Determinants of foreign direct investment in wind energy in developing countries', *Journal of Cleaner Production*, *161*, 1451-1458. https://doi.org/https://doi.org/10.1016/j.jclepro.2017.05.106

Khoury T. A., Peng M. W. (2011), 'Does institutional reform of intellectual property rights lead to more inbound FDI? Evidence from Latin America and the Caribbean', *Journal of World Business*, 46(3), 337-345.

Kinoshita Y., Campos N. (2004), *Estimating the determinants of foreign direct investment inflows: how important are sampling and omitted variable biases?* https://EconPapers.repec.org/RePEc:bof:bofitp:2004_010

Kuzmina O., Volchkova N., Zueva T. (2014), 'Foreign direct investment and governance quality in Russia', *Journal of Comparative Economics*, 42(4), 874-891. https://doi.org/https://doi.org/10.1016/j.jce.2014.08.001

Ledyaeva S. (2009), 'Spatial Econometric Analysis of Foreign Direct Investment Determinants in Russian Regions', *The World Economy*, *32*(4), 643-666. https://doi.org/http://dx.doi.org/10.1111/j.1467-9701.2008.01145.x

Lee H. (2015), 'Foreign Direct Investment in North Korea and the Effect of Special Economic Zones: Learning from Transition Economies', *Journal of Economic Development*, 40(2), 35-56. https://EconPapers.repec.org/RePEc:jed:journl:v:40:y:2015:i:2:p:35-56

Lu W. *et al.* (2020), 'Foreign Direct Investment, Natural Resources, Economic Freedom, and Sea-Access: Evidence from the Commonwealth of Independent States', *Sustainability*, 12(8), 3135. https://www.mdpi.com/2071-1050/12/8/3135

Ly A., Esperança J., Davcik N. S. (2018), 'What drives foreign direct investment: The role of language, geographical distance, information flows and technological similarity', *Journal of Business Research*, *88*, 111-122. https://doi.org/https://doi.org/10.1016/j.jbusres.2018.03.007

Mehic E., Silajdzic S., Babic V. H. (2013), 'The Impact of FDI on Economic Growth: Some Evidence from Southeast Europe', *Emerging Markets Finance and Trade*, *49*(sup1), 5-20. https://doi.org/10.2753/REE1540-496X4901S101

Neuhaus M. (2006), *The Impact of FDI on Economic Growth: An Analysis for the Transition Countries of Central and Eastern Europe,* Physica-Verlag HD. https://doi.org/https://doi.org/10.1007/3-7908-1735-X

Okafor G., Webster A. (2015), 'Foreign Direct Investment in Transition Economies of Europe and the Former Soviet Union', in H. J. & T. H. (Eds.), *Palgrave Dictionary of Emerging Markets and Transition Economics,* Palgrave Macmillan. https://doi.org/https://doi.org/10.1007/978-1-137-37138-6_22

Parks R. W. (1967), 'Efficient Estimation of a System of Regression Equations When Disturbances Are Both Serially and Contemporaneously Correlated', *Journal of the American Statistical Association*, 62. https://doi.org/10.2307/2283977

Redding S., Venables A. J. (2004), 'Economic geography and international inequality', *Journal of International Economics*, 62(1), 53-82. https://doi.org/https://doi.org/10.1016/j.jinteco.2003.07.001

Reed W. R., Ye H. (2011), 'Which panel data estimator should I use?', *Applied Economics*, 43(8), 985-1000. https://doi.org/10.1080/00036840802600087

Shepotylo O. (2012), 'Spatial Complementarity of FDI: The Example of Transition Countries', *Post-Communist Economies*, 24(3), 327-349. https://doi.org/10.1080/14631377.2012.705468

Shiells C. R. (2003), 'FDI and the Investment Climate in the CIS Countries', *Policy Discussion Paper*, 2003/005, I. M. Fund.

SRCIC (2023), 'Central Asia a model region for Belt and Road success', *Silk Road Chamber of International Commerce*. https://srcic.org/news/central-asia-a-model-region-for-bri-success/

Vakulchuk R., *et al.* (2019), 'BRI in Central Asia: Rail and Road Connectivity Projects', *Central Asia Data-Gathering and Analysis Team (CADGAT)*.

Wooldridge J. M. (2016), *Introductory Econometrics : A Modern Approach* (6th ed.), Mason, Ohio : South-Western Cengage Learning.

World Bank, T. (2021), *World Development Indicators,* Washington, D.C: World Bank.

World Bank, T. (2022). *World Development Indicators*. https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD