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THE NEXUS BETWEEN ECONOMIC GROWTH, NATURAL RESOURCE DEPLETION AND FOREIGN DIRECT INVESTMENT[1]

Abstract. The overall economic performance is summarised in the economic growth. It occurs when resources are combined technically in an effective way. While advanced countries have no reliance on natural resources, they experience steady growth compared to natural resource-abundant countries. The Caspian Sea basin countries (Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan) and Central Asia states (Kyrgyz Republic, Tajikistan, and Uzbekistan) own considerable mineral and ecological resources. This paper aims to examine the relationship between economic growth and natural resource depletion in the region during 1997–2019. Due to abundance of natural resources, this region trades fossil fuels and minerals with other economic blocs. Hence, foreign direct investment is added into the regression model in order to account for economic openness. In addition, the share of industry value added in gross domestic product is included to embody the industrialisation impact on economic growth. Finally, the tertiary enrolment is entered into the regression to measure the effect of human capital on economic growth. After specifying the econometric model, variables under study were tested for unit root. Due to difference in order of integration among variables, panel fully modified least squares method was used to estimate the model. The estimation results indicate the significant and positive effects of natural resource depletion, foreign direct investment, the share of industry value added and tertiary enrolment on economic growth. These findings imply that natural resource depletion contributes to economic growth much greater than foreign direct investment and tertiary enrolment. Thus, the resource curse is not confirmed across the examined countries.

Keywords: economic growth, FDI, natural resources, depletion, enrolment ratio, GDP, Caspian Sea basin, panel-FMOLS

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ИССЛЕДОВАТЕЛЬСКАЯ СТАТЬЯ

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Взаимосвязь между экономическим ростом, истощением природных ресурсов и прямыми иностранными инвестициями

Аннотация. Общие экономические показатели отражают экономический рост, на который влияет эффективное использование имеющихся ресурсов. Несмотря на то, что наиболее развитые страны не зависят от природных ресурсов, они демонстрируют более устойчивый рост, чем государства, богатые природными ресурсами. Страны бассейна Каспийского моря (Азербайджан, Иран, Казахстан, Россия, Туркменистан) и государства Центральной Азии (Кыргызская Республика, Таджикистан и Узбекистан) обладают значительными природными и экологическими ресурсами. Цель статьи — изучить взаимосвязь между экономическим ростом и истощением природных ресурсов в данном регионе в период с 1997 г. по 2019 г. Регион активно сотрудничает с другими экономическими блоками, благодаря обилию природных ресурсов идет торговля топливом и полезными ископаемыми. В связи с этим для учета степени открытости экономики в регрессионную модель включен показатель прямых иностранных инвестиций. Доля добавленной стоимости промышленности в валовом внутреннем продукте отражает влияние индустриализации на экономический рост. Наконец, количество зачислений в высшие учебные заведения используется для измерения влияния человеческого капитала на экономический рост. После уточнения эконометрической модели исследуемые переменные были протестированы на единичный корень. Из-за различий в порядке интегрирования для оценки панельных данных был использован полностью модифицированный метод наименьших квадратов. Согласно результатам анализа, истощение природных ресурсов, прямые иностранные инвестиции, доля добавленной стоимости промышленности и количество зачислений в вузы положительно влияют на экономический рост. Полученные выводы демонстрируют, что истощение природных ресурсов способствует экономическому росту в гораздо большей степени, чем прямые иностранные инвестиции и количество зачислений в вузы.

Ключевые слова: экономический рост, ПИИ, природные ресурсы, истощение, доля учащихся, ВВП, бассейн Каспийского моря, полностью модифицированный метод наименьших квадратов

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1. Introduction

Economic growth is the main goal of every economy, which is defined as an increase in gross domestic product (GDP), or per capita GDP, in constant prices over time. It encompasses all economic activities in agriculture, industry and service sectors in a given period. Not only levels of economic growth are important for comparing performance of different economic systems, but also the persistency of economic growth is more relevant, especially for developing countries.

Economic growth is a measure of the economic performance at the local or national level. An increase in this index indicates economic boom and its decrease and negativity indicate a recession. The changes in employment and investment, technological progress, the composition of economic sectors, political developments, and research and development affect economic growth (Freimane & Bāliņa, 2016; Frey, 2017; Leblang, 2018; Baneliene & Melnikas, 2020). In addition, macroeconomic shocks such as natural and climate events, and energy price shocks influence economic growth (Becker, 2017; Bohi, 2017).

In its neoclassical form, economic growth largely originates from labour, capital and technology. However, endogenous economic growth stems from various factors such as research and development, health, natural resources, governance and so forth (Romer, 2018). Labour is one of the key determinants of economic growth. Economic growth is impossible without labour, since even complex industrial and non-industrial processes and equipment cannot be handled without human intervention. Labour, in the simplest form, is denoted by L and leads to production in the neoclassical production function $q = f(L, K)$ along with the capital factor. The generalised form of labour is called human capital, which is a combination of labour, health, literacy and experience. Human capital affects economic growth positively (Khan & Chaudhry, 2019). For measuring human capital, various indicators may be used. In this paper, the enrolment in tertiary education is applied

to indicate human capital. The students in this level are literate and potent to perform specialised tasks, and specialisation results in economic growth.

Investment, either domestic of foreign, is a key component of aggregate demand. Domestic investment is called gross fixed capital formation, while foreign investment takes different types such as direct and indirect investment. Foreign direct investment (FDI) helps countries to upgrade their infrastructures, attract knowledge, acquire new technologies, and develop local economies.

Besides labour and capital, natural resources can contribute to economic growth (Havranek et al., 2016). Economic exploitation of natural resources differs between resource-rich countries. The share of natural resources in exports and resource earnings in government budget may be substantial. Natural resources are divided into renewable and exhaustible. Most natural resources, for example coal, natural gas and crude oil, are used as energy or fuel, however the other natural forms are inverted into final goods, such as wood, which are used in different economic sectors.

The role of FDI and contribution of natural resources to economic growth have been examined separately in dozens of papers. This article aims to consider the role of foreign direct investment and natural resource depletion in economic growth. The sample of study contains the Caspian Sea basin countries and Central Asia states.

After introduction, the rest of paper is organised in 5 sections. Section 2 is devoted to theory and literature. Section 3 refers to data and methods, and section 4 describes results. Section 5 presents the discussion and implications.

2. Theory

One of the most important methods of financing in developing countries is foreign investment, which complements the domestic sources of capital in these countries. The choice of this method is justified due to the creation of positive effects on technology transfer, opening of economies and increasing effective presence in the field of international trade (Alfaro, 2017; Bakari & Sofien, 2019).

Historically, the global expansion of foreign direct investment has recorded unprecedented acceleration since the 1980s, so that FDI growth has been greater than that of other global economic indicators such as exports, trade, and gross domestic product. Global foreign direct investment has increased from USD 12.36 billion in 1970 to USD 1.49 trillion in 2019, with annual growth rate of 10.27 %, while global exports have increased from 382.56 billion in 1970 to 22.44 trillion in 2020, with annual growth rate of 8.48 %[1].

Foreign direct investment is not balanced in terms of global distribution, so that US has realised most foreign investment in Latin America. Meanwhile, Japan has invested heavily in Southeast Asia. Out of USD 998 billion in 2020, developed countries were hosts for USD 312 billion inflows of FDI. Developing countries attracted USD 663 billion FDI[2].

In accordance with national interest and the rights of guest and host countries, foreign direct investment can bring various benefits such as transfer of technology and production techniques, job creation, strengthening and expansion of financial and international resources, and access to global markets (Iwasaki & Tokunaga, 2016; Makiela & Ouattara, 2018).

In contrast, due to the monopoly control on the technology of production and its transfer by multinational corporations, this type of investment may create the dependence of developing countries on multinational corporations, use of capital-intensive production techniques and gain significant political and economic concessions, such as tax exemptions, in host governments (Ojewumi & Akinlo, 2017). In addition, promotion of inappropriate consumption patterns through advertising and monopoly power in the market are other disadvantages of this type of investment (Wright & Zhu, 2018).

Extraction from mines and fossil resources and cutting down forest trees for economic exploitation means natural resource depletion. By depleting natural resources and turning them into other goods, economic growth is achieved (Nawaz et al., 2019). Although extraction from exhaustible resources is irreversible, by converting them into other goods and providing fuel, the wheels of industries and factories spin, households reach prosperity with access to fuel, and services' sector continues to operate. The agricultural sector also benefits from fossil fuels in running farm machinery.

Natural resource depletion is a critical component in the calculation of adjusted net national income. Adjusted net national income is calculated by subtracting from gross national income (GNI) a charge for the consumption of fixed capital and for the depletion of natural resources. The deduction for the depletion of natural resources, which covers net forest depletion, energy depletion, and

[1] World Bank. Retrieved from: https://data.worldbank.org/

[2] UNCTAD, FDI/MNE database. Retrieved from: www.unctad.org/fdistatistics

mineral depletion, reflects the decline in asset values associated with the extraction and harvest of natural resources. This is similar to depreciation of fixed assets (World Bank, 2020).

Industrialisation plays a meaningful role in economic growth. Over time, the share of industry in different economies has been increased, and share of agriculture has been decreased. This is an expected transformation of economic structure. Industrialisation leads to mass production, diversification of outputs, industrial goods, and division of labour and diversity of exports. As industry value-added share in GDP increases, economic growth rises. The level of economic development can be defined by industrialisation. The advanced countries have more industrialised economies.

There are numerous works on economic growth determinants. In the following, some studies are reviewed by focusing on foreign direct investment, natural resource depletion, industrialisation and education.

The experiences indicate the positive and crucial impact of FDI on boosting economic growth in host economies (Alvarado et al., 2017; Iamsiraroj, 2016; Hlavacek & Bal-Domańska, 2016). Sunde (2017) investigated economic growth as a function of FDI and exports in South Africa. Using the autoregressive distributed lag model (ARDL), he found co-integration relationship between economic growth, foreign direct investment and exports. He concluded that both foreign direct investment and exports spur economic growth.

Seyed Noorani (1995) believes that FDI in host countries has gradually shifted from the extractive industries (mines, oil and gas) to the communication industries (communications, transportation and banking). Ayanwale (2007) concludes that FDI in Nigeria contributes positively to economic growth.

For a panel of 28 Asian countries in the period 1998–2007, inflow of foreign direct investment was a significant factor negatively affecting economic growth (Tiwari, 2011).

By focusing on 124 countries over the period 1971–2010, Iamsiraroj (2016) found that overall effects of FDI are positively associated with economic growth.

Azman-Saini et al. (2010) investigated the systemic link between economic freedom, foreign direct investment (FDI) and economic growth in a panel of 85 countries. The empirical results revealed that FDI by itself has no direct (positive) effect on output growth. Instead, the effect of FDI is contingent on the level of economic freedom in the host countries.

Acquah and Ibrahim (2020) examined the relationships among foreign direct investment (FDI), economic growth and financial sector development relying on annual panel data spanning 1980–2016 from 45 African countries. Results revealed an ambiguous effect of FDI on economic growth although, for the most part, higher FDI is associated with higher growth.

Regarding the link between natural resource depletion and economic growth, Nawaz et al. (2019) investigated the natural resources depletion in ten South East Asian Nations (ASEAN) over 25 years and found that natural resource depletion and mineral depletion have been major causes of the destruction of economic growth.

Industrialisation can contribute to economic growth. Opoku & Yan (2019) examined the impact of industrialisation on economic growth in Africa. They employed data for the period 1980–2014 from 37 African countries and the generalised method of moments, and found that industrialisation is an important booster of economic growth.

Industrial development has had an important role in the economic growth of countries like China, the Republic of Korea (Korea), Taiwan Province of China (Taiwan), and Indonesia (Kniivilä, 2007). Ndiaya and Lv (2018) examined the impact of industrialisation on economic growth by analysing the Senegalese manufacturing firms during 1960–2017. The econometric analysis has shown that the increase of industrial output will increase economic growth in Senegal. Zhang (2002) attempted to formulate an analytical framework under which China's post-reform growth can be accounted for by its industrialisation process. He found that Chinese economic growth may be better explained by its lasting industrialisation programmes initiated on the outset of reform, which has led to a rising of capital-output ratio.

Ossadzifo (2018) analysed the impact of the manufacturing sector on economic growth through the role of human capital in sub-Saharan African (SSA) countries from 1990 to 2015. He showed that the manufacturing sector through its value added has a positive impact on economic growth in SSA countries.

On the relationship between education indicators and economic growth, Bloom et al. (2014) challenge beliefs that tertiary education has little role in promoting economic growth and alleviating poverty. They find evidence that tertiary education improves technological catch-up and may help to maximise Africa's potential to achieve more rapid economic growth given current constraints.

Hanif and Arshed (2016) used three proxies for the human capital for the case of SAARC (The South Asian Association for Regional Cooperation) countries to see whether higher proxy has better marginal impact on the growth of the selected countries. The results for dynamic panel data models reveal that tertiary education enrolment has highest impact on growth as compared to primary and secondary education enrolment.

Chatterji (1998) investigated the potential importance of tertiary education in the growth process using the standard data in the field. The results suggest that tertiary education may play an important role in the growth process.

3. Data and Methods

In this paper, a descriptive-analytic method is used. Charts and tables are utilised to describe economic growth, FDI, and natural resource depletion.

3.1. Data

As mentioned in the introduction, this paper examines the links among economic growth, natural resource depletion and FDI. Prior to specifying econometric model, these variables were examined graphically. Figure 1 depicts economic growth rate at the starting and end points of the period under study. Most sample countries have experienced considerable economic growth, however Turkmenistan and Iran have recorded negative growth rates in 1997 and 2019, respectively. Tajikistan experienced the highest economic growth in 2019.

Natural resource depletion is the sum of net forest depletion, energy depletion, and mineral depletion. Net forest depletion is unit resource rents times the excess of roundwood harvest over natural growth. Energy depletion is the ratio of the value of the stock of energy resources to the remaining reserve lifetime (capped at 25 years). It covers coal, crude oil, and natural gas. Mineral depletion is the ratio of the value of the stock of mineral resources to the remaining reserve lifetime (capped at 25 years). It covers tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate (World Bank, 2020).

In 1997, the highest and lowest depletion rates were observed to Iran and Tajikistan, respectively. However, in 2019, the highest depletion has occurred in Azerbaijan and the lowest depletion was recorded in the Kyrgyz Republic.

Figure 3 depicts FDI net inflows as percentage of GDP. In 1997, except for Azerbaijan, the share of FDI inflows in GDP was moderate. Azerbaijan has recorded the highest share of FDI in GDP in 1997. Turkmenistan and Uzbekistan have attracted high FDI flows in 2019. Also, the share of FDI inflows to sample countries has been less than 5 %. The lowest share of FDI has been reported in Iran. This may be due to Iranian economic and political system, and sanctions.

Tertiary education enrolment is an indicator of a potential for skilled labour force. The educated labour force is a main determinant in regional competitiveness in the knowledge-based economy. Universities are essential assets in improving an innovation system (OECD, 2009).

Gross enrolment ratio is the ratio of total enrolment to the population of the age group that corresponds to the level of education. Tertiary education normally requires the successful completion of education at the secondary level (World Bank, 2020).

Figure 4 shows the student enrolment in tertiary education. In 1997, the lowest and highest enrolment ratios were recorded to Turkmenistan and Russian Federation, respectively. However, in 2019, the lowest ratio is observed to Uzbekistan, while Russian Federation has the highest enrolment ratio.

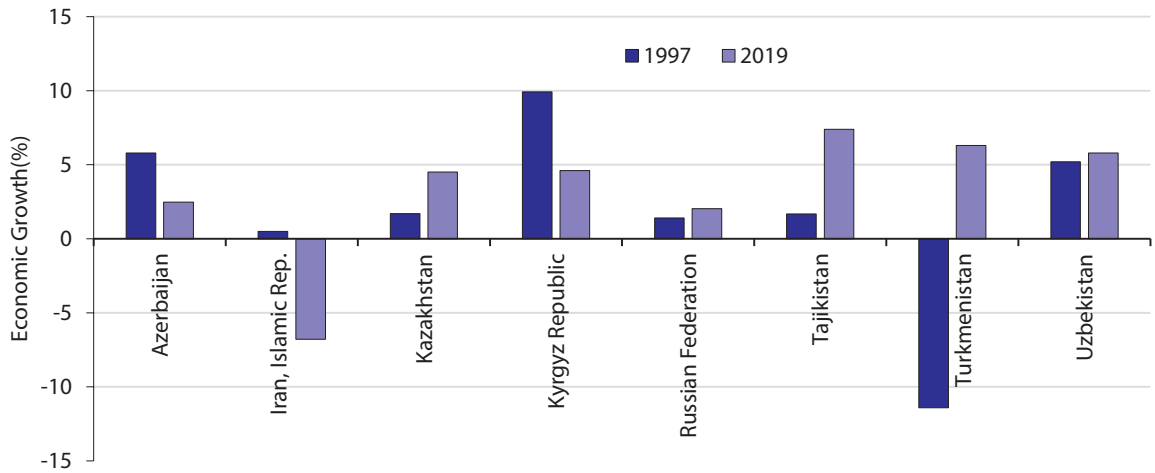


Fig. 1. *Economic growth rate in 1997 & 2019 (source: World Bank, 2020)*

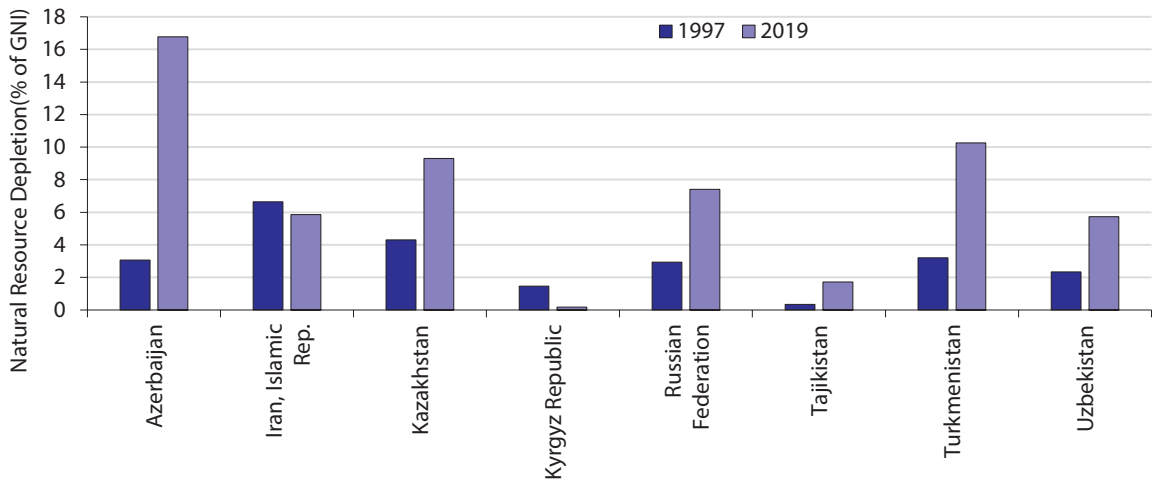
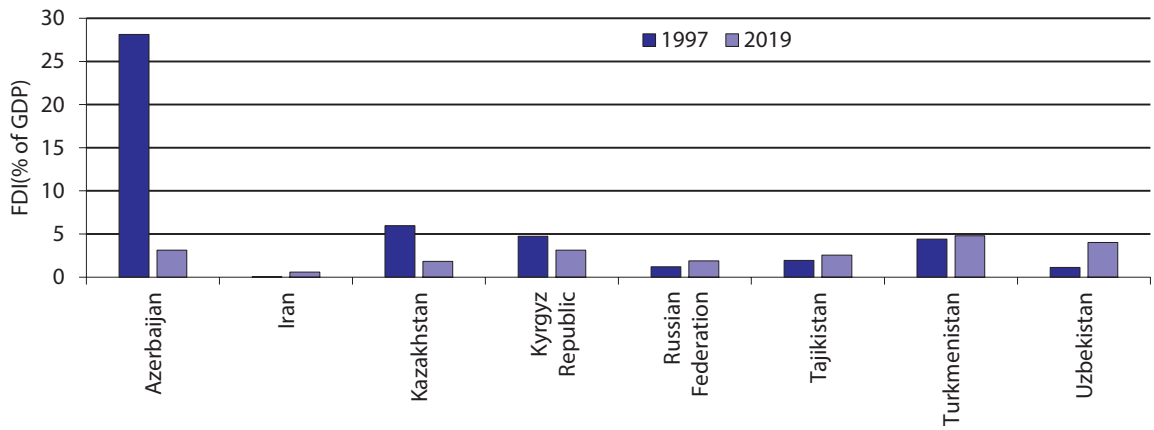


Fig. 2. *Total natural resource depletion (% of GNI) (source: World Bank, 2020)*



Fig, 3. *Net inflows of foreign direct investment (% of GDP) (source: World Bank, 2020)*

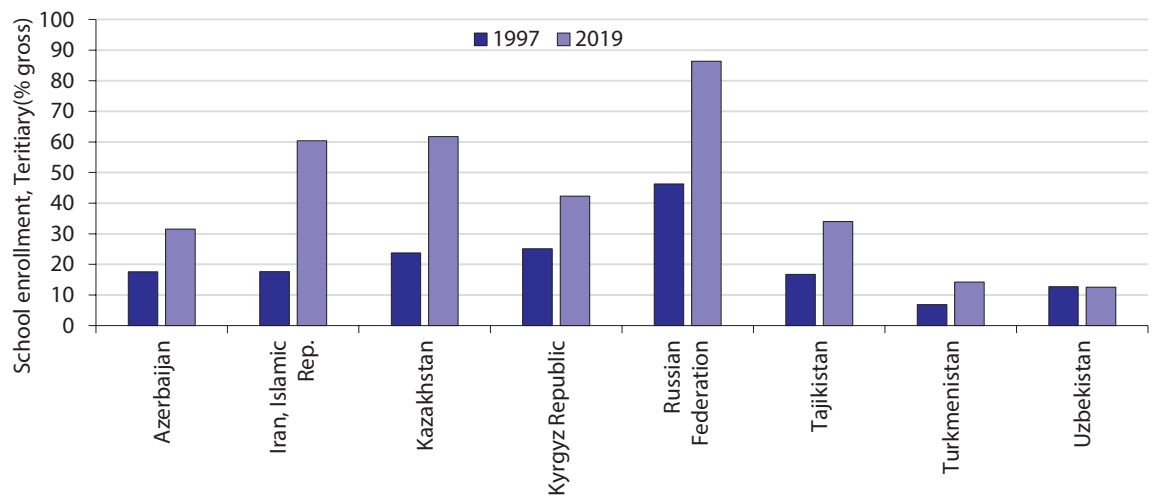


Fig. 4. *School enrolment, Tertiary (% gross) (source: World Bank, 2020)*

3.2. Model

To explain economic growth, a simple neoclassical production function is applied. It is assumed that production (Y) is a function of human capital (HC), physical capital (PC) and natural capital (NC) as follows:

$$Y = A(HC)^{\alpha}(PC)^{\beta}(NC)^{\gamma}, \quad (1)$$

where A denotes technology level, and α, β and γ are elasticities of production with respect to human capital, physical capital and natural capital, respectively.

Taking natural logarithm from both sides of equation 1 leads to the following relation:

$$\ln(Y) = \ln A + \alpha \ln(HC) + \beta \ln(PC) + \gamma \ln(NC). \quad (2)$$

By differentiating both sides of equation 2, and by defining $d\ln(X) = \dot{X}$, equation 3 is obtained.

$$\dot{Y} = \dot{A} + \alpha \dot{HC} + \beta \dot{PC} + \gamma \dot{NC}. \quad (3)$$

In which $\dot{Y}$ is economic growth, $\dot{A}$ is technological progress. $\dot{HC}$ denotes change in human capital, $\dot{PC}$ represents change in physical capital and $\dot{NC}$ indicates change in natural capital.

Human capital is an essential factor influencing economic growth. It can be regarded as a combination of labour and education. Education attainment is generally quantified by enrolment ratios. There may be various variables indicating human capital, however change in human capital is routinely measured by population growth rate, enrolment in schools or literacy rate.

Change in physical capital is called investment, which is composed of both domestic and foreign investment. In exact words, investment is defined as follows:

$$I = \Delta K_t = I_n + \delta K_t, \quad (4)$$

where I and I_n denote total investment and net investment, δ is depreciation rate, and K is capital stock. By definition, domestic investment and FDI are applied as proxies for change in physical capital ($\dot{PC}$).

Natural capital is the stock of natural resources, where men do not play any role in its creation, but this kind of capital can be depreciated or depleted due to exploitation by man. Hence, the change in natural capital is proxied by natural resources depletion. By these proxies, equation 3 is rewritten in an econometric specification as follows:

$$\dot{Y}_t = \dot{A}_t + \beta_1 ENROL_t + \beta_2 INV_t + \\ + \beta_3 FDI_t + \beta_4 DEPLET_t + \beta_5 X_t + \varepsilon_t, \quad (5)$$

where *ENROL*, *INV* and *DEPLET* denote enrolment ratio, domestic investment and natural resource depletion, X shows other control variables such as industrialisation (*IND*), population growth (*PG*) and trade (*OPEN*).

4. Results

The statistical sample covers the Caspian Sea basin countries and Central Asia countries, total 8 countries. Period of study is from 1997 to 2019.

The first step in estimating model is to assure stationary of variables. Since if variables have unit roots, the interpretation of *t*-statistic and *F*-statistic will be misleading, and whole regression will be spurious.

In this paper, Levin-Lin-Chu (2002) test and Im, Pesaran and Shin (2003) test are used for testing panel unit root. The results of panel unit root test are reported in Table 1, which indicates that economic growth (*EG*) and Natural resource depletion (*DEPLET*) are *I*(0), but *FDI*, *INV*, *ENROL* and *IND* are *I*(1). Due to different integration degrees, the econometric strategy is Panel Fully Modified Least Squares (*FMOLS*). This method is based on two assumptions. First, the dependent and explanatory variables are *I*(0) or *I*(1). Second, there is no co-integrating relationship between independent variables (Pedroni, 2001). These assumptions are valid in this paper.

Equation 4 was estimated by *FMOLS*, and Table 2 reports the regression output. In the first estimation, *INV* was an explanatory variable, but it

Table 1

Panel unit root test: Summary

Variable	Method	Level		First difference		Result
		Statistic	Prob.	Statistic	Prob.	
EG	LLC* *t*-stat	–3.998	0.000	—	—	*I*(0)
	IPS** *W*-stat	–4.3011	0.000	—	—	
FDI	LLC *t*-stat	–2.1127	0.017	–9.5958	0.0000	*I*(1)
	IPS *W*-stat	–1.1176	0.1319	–9.7902	0.0000	
DEPLET	LLC *t*-stst	–4.4333	0.000	—	—	*I*(0)
	IPS *W*-stat	–3.3920	0.0003	—	—	
ENROL	LLC *t*-stat	2.4835	0.9935	–1.583	0.05	*I*(1)
	IPS *W*-stat	2.9693	0.9985	–3.038	0.0012	
INV	LLC *t*-stat	–1.1071	0.1341	–5.8500	0.0000	*I*(1)
	IPS *W*-stat	–1.3927	0.0819	–4.8825	0.0000	
IND	LLC *t*-stat	–0.7216	0.2352	–4.6741	0.0000	*I*(1)
	IPS *W*-stat	0.2424	0.5958	–3.2100	0.0007	

* Levin, Lin & Chu.

** Im, Pesaran and Shin.

Table 2

Model estimation with Panel-FMOLS (Dependent Variable: EG)

Variable	Coefficient	Std. Error	*t*-Statistic	Prob.
FDI	0.206	0.063	3.257	0.001
DEPLET	0.219	0.0615	3.5621	0.001
IND	0.232	0.0647	3.579	0.001
ENROL	0.143	0.088	1.608	0.1098
R-squared = 0.446		Adjusted *R*-squared = 0.378		
S.E. of regression = 4.061		Long-run variance = 16.743		
No. of periods = 23		No. of cross-sections = 8		

was not significant and had wrong sign. Hence, it was excluded from the final regression.

Table 2 indicates the significance of *FDI* in explaining economic growth. If *FDI* increases by 1 %, the economic growth will increase by 0.206 %, other things being equal. The sign of *DEPLET* coefficient is positive; it shows that when natural resource depletion goes up by 1 %, the economic growth will rise by 0.219 %. The coefficient of *IND* is 0.232, i. e., if industry share in GDP increases by 1 %, the economic growth will increase by 0.232 %. The coefficient of *ENROL* is positive but insignificant. Ceteris Paribus, if enrolment ratio increases by 1 %, the economic growth will increase by 0.143 %.

Both *R*-squared and adjusted *R*-squared are small. This is not surprising. When the variables are all in percentage, the *R*-squared get smaller. In this situation, the significance of variables suffices. In fact, about 38 % of changes in economic growth are explained by *FDI*, *DEPLET*, *IND* and *ENROL*.

5. Discussion and Implication

In Table 2, the effect of *FDI* on economic growth is positive. Hence, increasing net *FDI* inflows result in higher economic growth. This finding is compatible with findings of Ayanwale (2007), Iamsiraroj (2016) and Acquah and Ibrahim (2020). However, this finding has no consistency with the results obtained by Nawaz et al. (2019) and Azman-Saini et al. (2010).

FDI can provide capital and technology to host country. As new and advanced technology comes into FDI-receiving country, the production can be achieved in fast rate, and productivity of capital and labour can be increased.

FDI is explained by micro theories based on industrial organisation and macro theories based on the cost of capital. FDI in microeconomics context considers market imperfections, and desire of multi-national corporations to develop and expand their monopoly power. Multi-national corporations due to cost advantages such as economies of scale, multi factory economies, and advanced technology, efficient marketing and distribution methods are of necessary ability to finance investment projects in capital-hosting countries (Caves, 1971).

According to microeconomic view on FDI, multinational corporations find direct development in a foreign country cheaper than domestic trade. Moreover, *FDI* focuses on regulatory limitations including quota and tariffs which provided its expansion dependent on trade liberalisation of host country.

The effect of natural resource depletion on economic growth is also positive. The finding of this paper is contradictory to the study of Nawaz et al. (2019).

Depletion means exploitation of natural resources and their transformation into different goods. Normally, natural resource depletion results in economic growth, however decreases the stock of natural wealth. Mineral and energy depletion cannot be compensated. However, forest depletion can be restored through afforestation.

Natural resource depletion is a change in natural stock by harvesting and exploiting natural resources. Economic growth rates are not same among resource-rich countries. Some experienced high growth rates, and the other reported low growth rates. As a result, intergenerational justice requires optimal exploitation of natural resources by considering intertemporal constraints and initial stock.

Industrialisation affects economic growth positively. This finding is consistent with the results of Opoku & Yan (2019) and Ossadzifo (2018). If the share of industry value added in gross domestic product (GDP) increases, the economic growth will go up. Industry is a main component of economic structure in every country. Industrialisation is accompanied to automate and mechanise processes, transform from agricultural to industrial economy, division of labour, ease of doing works, and increase the number of firms and factories.

Technological progress, a shift from rural workforce to industrial labour, and financial investment in new industrial structure are features of the first Industrial Revolution (Pollard, 1981). The invention of the internal combustion engine, the harnessing of electricity and the construction of canals, railways and electric-power lines, establishing coal mines, steelworks, and textile factories are characteristics of the second Industrial Revolution (Henning, 1995).

The school enrolment in tertiary education influences economic growth in a positive direction,

but the relevant coefficient is not significant at 1 % or 5 %. The positive effect of the tertiary education on economic growth has been confirmed by Bloom et al. (2014), Hanif and Arshed (2016) and Chatterji (1998).

The school enrolment is a proxy for human capital. When human capital is high, the per capita income can be higher. The number of students enrolled in colleges and universities indicates higher level of human capital. Why is this variable insignificant in explaining economic growth? It may be due to the low level of school enrolment in tertiary education in most countries under study.

Economic growth is a macro-level target in all economies. Various factors contribute to economic growth. In the neoclassical tradition, the endowments of capital and labour are main drivers of economic growth, however, endogenous economic growth emphasises multiple factors.

In addition, economic growth rates are high in countries that opened their economies to foreign capital flows and to international migrants. Capital formation is a key driver of economic growth, which is divided into domestic and foreign investment. The experience of advanced and developed countries reveals that foreign direct investment is of good potential in increasing economic growth.

The econometric model estimation confirmed a positive link between *FDI* to economic growth. Therefore, the countries under study should make policies, which accelerate *FDI*. Reduction in tariff and non-tariff barriers, ease to transfer of exchange earning, sound economic and political environment, strengthening of infrastructure, reduction of external debts are some policies to attract *FDI*, and then increase economic growth.

Regarding natural resource depletion, it should be said that harvesting forests, and exploiting energy and mine resources could increase economic growth. In some countries such as Iran, Russian Federation, Azerbaijan and Turkmenistan, foreign exchange earnings fuel economic growth. However, some other countries such as Tajikistan and the Kyrgyz Republic face the shortage of considerable oil and gas resources. In these countries, mineral depletion is more important. For sample countries, it is recommended to convert natural resources into the productive capital that will help to upgrade economic growth. The direct depletion and not converting to other goods and services is crude selling of natural resources. This direct depletion should be stopped in the region.

The analysis indicated a direct link from industrialisation variable to economic growth. The global experience also demonstrates the impact of industry share in GDP on economic growth.

Industrialisation has occurred in different waves, and it has been effective in producing goods and services. The common variable for industrialisation is the share of industry value added in GDP. Industry has the broad definition. It contains mining, manufacturing, construction, electricity, water, and gas. Almost all main industries are in this definition. As a result, all policies and actions, which help to increase the industry value added, play vital role in enhancing economic growth. The countries under consideration can achieve higher economic growth rate through investing in industries especially in labour-intensive ones, because of overcoming unemployment problem. In addition, investing in capital-intensive industries is recommended for the Russian Federation, Iran and Azerbaijan.

In the estimated model, the effect of enrolment on economic growth was positive but insignificant. The tertiary education enrolment is a proxy for human capital. As the students enrol in colleges and universities, they learn advanced sciences, get familiar with the latest technological developments, learn sciences and techniques, communicate with other students in domestic and foreign universities, and get experience to solve problems.

The greater economies in the sample under study, i. e. the Russian Federation, Iran and Kazakhstan, are characterised by higher tertiary education enrolment. The economic growth rate in these countries is also higher in total. The lesson can be learned here is to invest in education of the people by providing academic opportunities to upgrade human capital and to increase economic growth.

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