Coordination and Assessment of the Significance of Factors Influencing the Investment Environment

Petrosyan Georg S.
Russian-Armenian (Slavonic) University,
Postgraduate student of the Department of Economics and Management of the national economy
(by industries and areas of activity) (Macroeconomics) (Yerevan, RA)
ORCID iD: 0009-0001-5561-761X
gevorg.petrosyan307@gmail.com

Ներդրումային միջավայրի վրա ազդող գործոնների համակարգում և կարևորության գնահատում

Պետրոսյան Գևորգ Ս.
Հայ- Ռուսական (սլավոնական) համալսարան,
Տնտեսագիտություն և ազգային տնտեսության կառավարում (իր ճյուղերով)
Մակրոտնտեսագիտություն ամբիոնի ասպիրանտ (Երևան, ՀՀ)

Ամփոփագիր. Տնտեսական գրականության մեջ առկա են բազմաթիվ աշխատություններ, որոնք ուղղված են ներդրումային վարքագծի ուսումնասիրմանը: Բազմաթիվ տնտեսագետներ ժամանակի ընթացքում փորձել են առանձնացնել գլխավոր գործոնները, որոնք կարող են բնութագրել ներդրումների էությունը և դրանց միջոցով տալ տնտեսամաթեմատիկական գնահատական:

Ներդրողների համար շատ կարևոր են այն ոլորտները, որտեղ նրանք ցանկանում են ներդրումներ կատարել, ինչպես նաև երկրները բնութագրող ցուցանիշները: 2020 թվականի սկզբից իրենց ֆոնդերի դիվերսիֆիկացիան շատ կարևոր է ներդրողների համար: Կորոնավիրուսի համաճարակը ցույց է տվել, որ ներդրողները հակված են ներդրումներ կատարել ավելի կայուն երկրներում: Երկիրը գրավիչ է դառնում, երբ ունի կայուն արտաքին և ներքին քաղաքականություն:

Աշխատանքի նպատակն է ներդրումների վրա ազդող գործոնների որոնումը, համակարգումը և գնահատումը: Տրվել է ավելի քան 10 գործոն և յուրաքանչյուրը գնահատվել ըստ կարևորության:

Հանգուցաբառեր` ներդրումներ, ներդրումային միջավայր, մակրոտնտեսագիտություն, գործոնների գնահատում, բաց տնտեսություն

Координация и оценка значимости факторов, влияющих на инвестиционную среду

Петросян Георг С.
Российско-Армянский (Славянский) университет,
аспирант кафедры Экономика и управление народный хозяйством (по отраслям и сферам
деятельности) (Макроэкономика) (Ереван, РА)

Аннотация. В экономической литературе имеется немало работ, направленных на изучение инвестиционного поведения. С течением времени многие экономисты пытались выявить основные факторы, которые могут охарактеризовать природу инвестиций, и использовать их для того чтобы дать эконометрическую оценку. Для инвесторов очень важны индексы, которые характеризуют те сферы в которых они хотят сделать инвестиции, а также страны. С начала 2020-го года для инвесторов очень важна диферсификация своих средств. Пандемия коронавируса показала, что инвесторы склонны инвестировать в более стабильные страны. Страна становится привлекательной когда у нее стабильная внешняя и внутренняя политика. Цель работы искать, координировать и оценить факторы которые влияют на инвестиции. Были приведены более 10-и факторов и каждый из них был оценен по шкале важности.

Ключевые слова: инвестиции, инвестиционная среда, макроэкономика, оценка факторов, открытая экономика

Literature Review

There are many works in economic literature that are aimed at the study of investment behavior. Over time, many economists have tried to identify the main factors that can characterize the nature of investments and use them to give an economic-mathematical assessment.

There are many economic factors that influence investment decisions. In 2004, the World Bank created the Investment Climate Team, whose purpose is to study the factors affecting the investment climate, help countries create a favorable investment business environment, maximize returns

from private investment, and ensure the security of the global investment chain **[1]**.

Every year, the World Bank conducts global, regional, and national level analyses, trying to highlight the reasons that can lead to a decline in the investment level and provide ways to eliminate them.

In 2020, because of the coronavirus, there were large fluctuations in the global investment environment, which led to a drop of about 40% in the volume of global investments.

The rates of recovery in developing countries are lower than in developed countries, which in turn leads to many obstacles in the way of ensuring prosperity in developing countries. In 2022, an international survey was conducted, according to which investors reduced their investments in developing countries by about 30%.

Now the global investment environment is facing another problem. It is explained by global security issues, which can be explained by the Russian-Ukrainian **[2]** and Israeli-Palestinian conflicts. Investors tend to invest in more stable political, socio-economic, and legal countries and regions.

These are the reasons that lead to the complexity of assessing the nature of investments, because many factors that explain the nature of investments are considered subjective and can only be estimated in an approximate way.

Many works on the identification, study and evaluation of the factors affecting investment are published on the example of different national economies. In the following work, an attempt is made to evaluate the effects of several factors on the example of the Republic of Armenia.

As mentioned, there are many factors affecting investment in economic literature. They can be organized into several groups: economic, political, legal, social, market, cultural, etc. **[3,** p.887**]**

It is extremely important to identify the external and internal factors affecting the country's investment environment and give their assessment. It will make it possible to choose the most correct investment policy, predict the expected income in the easiest way and perform risk diversification.

Analysis

In this work, a database was created, in which the data of several factors of the World Bank are available on an annual basis. Data from 1994-2022 is available in the database. **[4]** Some factors had data gaps in some years and to fill this gap, data entry was carried out using linear interpolation and extrapolation methods.

The following factors were chosen to create the database:
• Annual inflation (inf),
• The real interest rate (int_rate),
• Corruption level management (corr_control),
• Density of new businesses per 1000 people (new_business_dens),
• Level of force of law in the country (law_rank),
• Spending on education (% of GDP) (edu_exp),
• Share of labor force with basic education (basic_edu_labor),
• Unemployment rate (unemploym),
• The volume of export of goods and services (in GDP) (export),
• The volume of high-tech exports (in GDP) (hi_tech),
• Taxes from income, profits, and capital gains (in total taxes),
• Gini index (gini)
• Degree of political stability (Pol_stab).

Each of these factors are being used by several international organizations such as World Bank, IMF, Kearney, European Development Bank, Asian Development Bank etc. Some of these factors are being cumulated with other daughter factors such as poverty rate, literacy rate, GDP growth rate, some metrics of ease of business doing index, ecological metrics, development rates of different segments in national economy e.g. agriculture, metallurgy, high-tech technology, services, education, etc.

For different countries the weight of each factor is different. For the last years trend shows that those factors which are directly related to the high-tech industry have higher weight due to low risks of the income loss. Education and financial spheres are becoming more and more popular. On the other hand, the energy sector becomes more volatile, and the risks are rising which causes the downfall of investments.

A linear regression model estimation was carried out with selected factors that estimate the extent of their impact on Foreign Direct Investment (FDI).

The primary view of the estimated model looks like this:

Table 1: *Estimated linear regression model with all the chosen factors.*

OLS Regression Results

Dep. Variable:	fdi	R-squared:	0.747
Model:	OLS	Adj. R-squared:	0.528
Method:	Least Squares	F-statistic:	3.413
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	0.0129
Time:	18:13:22	Log-Likelihood:	-50.635
No. Observations:	29	AIC:	129.3
Df Residuals:	15	BIC:	148.4
Df Model:	13		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	-7.7248	12.987	-0.595	0.561	-35.406	19.956
Pol_stab	-2.1738	1.611	-1.350	0.197	-5.607	1.259
inf	-0.0021	0.001	-1.559	0.140	-0.005	0.001
int_rate	0.0730	0.053	1.366	0.192	-0.041	0.187
corr_control	-5.2632	2.937	-1.792	0.093	-11.523	0.997
new_business_dens	1.7368	1.535	1.131	0.276	-1.536	5.009
law_rank	0.1237	0.155	0.801	0.436	-0.206	0.453
edu_exp	3.8461	2.227	1.727	0.105	-0.901	8.593
basic_edu_labor	-0.0585	0.129	-0.452	0.658	-0.334	0.217
unemploym	-0.2604	0.705	-0.369	0.717	-1.763	1.242
export	0.1478	0.142	1.043	0.313	-0.154	0.450
hi_tech	-0.8272	0.565	-1.463	0.164	-2.032	0.378
taxes	-0.1403	0.130	-1.077	0.299	-0.418	0.137
gini	-0.0792	0.253	-0.313	0.758	-0.618	0.459

Omnibus:	3.813	Durbin-Watson:	1.885
Prob(Omnibus):	0.149	Jarque-Bera (JB):	2.259
Skew:	0.577	Prob(JB):	0.323
Kurtosis:	3.732	Cond. No.	2.30e+04

In the following model, it is necessary to pay attention to the following indicators:

• Adj. R-Squared, which represents the quality of the multivariate estimated model or the explanatory power of the dependent variable (DV) of the selected factors.

• Coef, which represents the numerical expression of each factor that the dependent variable can obtain.

• |P|>t, which indicates the degree of importance of the given factor. If it is greater than 0.05, then we can consider it insignificant.

The quality of the evaluated model is 52.8 percent, which is considered average quality. Since there are many selected factors in the estimated model, it was predictable that many factors would be insignificant.

The most unsignificant factors from this list are Gini index (0.758), Unemployment rate (0.717), Share of labor force with basic education (0.658) and Level of force of law in the country (0.436). This was predictable as these factors had a non-significant amount of data and for several years linear interpolation method was used to fill the gap in the data which caused autocorrelation in these factors.

If we remove some factors that are too insignificant, we have the following picture:

Table 2: *Estimated linear regression model with the remaining factors.*

```
                           OLS Regression Results
==============================================================================
Dep. Variable:                   fdi   R-squared:                       0.726
Model:                           OLS   Adj. R-squared:                  0.597
Method:                Least Squares   F-statistic:                     5.608
Date:               Sun, 10 Dec 2023   Prob (F-statistic):           0.000786
Time:                       18:56:41   Log-Likelihood:                 -51.785
No. Observations:                 29   AIC:                             123.6
Df Residuals:                     19   BIC:                             137.2
Df Model:                          9
Covariance Type:           nonrobust
==============================================================================
                     coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const             -9.1935      8.931     -1.029      0.316     -27.886       9.499
Pol_stab          -2.1471      1.465     -1.465      0.159      -5.214       0.920
inf               -0.0016      0.001     -2.127      0.047      -0.003   -2.55e-05
int_rate           0.0553      0.035      1.596      0.127      -0.017       0.128
corr_control      -3.6968      2.010     -1.839      0.082      -7.904       0.510
new_business_dens  1.6944      1.230      1.378      0.184      -0.880       4.269
edu_exp            4.1163      1.731      2.378      0.028       0.493       7.740
export             0.1076      0.097      1.113      0.279      -0.095       0.310
hi_tech           -0.8403      0.502     -1.675      0.110      -1.891       0.210
taxes             -0.1148      0.104     -1.103      0.284      -0.333       0.103
==============================================================================
Omnibus:                       7.836   Durbin-Watson:                   1.920
Prob(Omnibus):                 0.020   Jarque-Bera (JB):                6.788
Skew:                          0.757   Prob(JB):                       0.0336
Kurtosis:                      4.824   Cond. No.                     1.73e+04
==============================================================================
```

Here we already have 59.7 percent model quality and the degree of importance of the remaining factors has increased. The more we continue with the following action, the more significant the remaining factors will become.

Conclusion

From the results of the model evaluation, we can say that the degree of political stability in the country, the rate of inflation, real interest rates, the degree of anti-corruption management, the degree of density of new businesses, spending on education, the volume of exports of goods, services and high technologies, and taxes are the most significant.

Attention can also be paid to the Durbin-Watson index, which shows the level of autocorrelation in the model or the predictability of data from past years' (lag) indicators. If it is close to 2, then autocorrelation is not present in the model. As we can see the indicator is close to 2 in both models.

This work is a preliminary or skeletal assessment of the factors affecting investments, after which more complex analysis will be possible.

Literature Review

1. **World Bank Investment Climate team,** "A better Investment Climate for Everyone", World Development Report, 2005
2. **Ruta, Michele,** "The impact of the War in Ukraine on Global Trade and Investment", Open Knowledge Repository Beta, Washington, DC. 2022
3. **Anastasiya M. Gladkih,** "Factors Affecting Investment Activity", Conference on Land Economy and Rural Studies Essentials, July 2021
4. World Bank, DataBank, Armenian Data 1994-2022