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**STUDY OF THE RELATIONSHIP BETWEEN THE ECONOMIC GROWTH,
FOREIGN DIRECT INVESTMENT, THE INTENSITY OF R&D AND
CORRUPTION ON ENVIRONMENTAL POLLUTION.
THE CASE OF KAZAKHSTAN**

Investment is a driver of socio-economic transformation of any countries. FDI in emerging market economy can be mutually beneficial both: for the host country and transnational corporations. In the host country, transnational corporations provides further financial resources through investments and taxes, creates jobs and generates spillovers such as the knowledge sharing, technology, management skills and corporate governance practices. On the other hand, TNCs get access to local market, natural resources related to specific objects, low labor resource costs and take advantage of bilateral and multilateral trade policies.

In this paper, we have made a preliminary analysis on the situation of the relationship between the economic growth and the level of environmental pollutions in Kazakhstan. There is a gap in research about the relationship between these variables in developing countries, especially between the territories of the former Soviet Union. We have also been interested in analyzing whether, the perceived level of corruption and the intensity of research and development activities moderate this relationship, as their study in these economies not carried out. The special interest is to analyze does the investment by transnational corporations in these countries is helping or not to reduce environmental pollutions.

Key words: economic growth, transnational corporations, foreign direct investment, environmental pollution.

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**Экономикалық өсу, тікелей шетел инвестициясы, ғылыми-зерттеу және
тәжірибелік-құрастырымдық жұмыстар мен жемқорлықтың
қоршаған ортаға әсері. Қазақстан жағдайында.**

Инвестициялар кез келген мемлекеттің әлеуметтік-экономикалық трансформациясының басты драйвері болып есептеледі. Дамып келе жатқан нарықтық экономикада тікелей шетел инвестициялары қабылдаушы мемлекет пен трансұлттық корпорациялар үшін өзара тиімді болып табылады. Қабылдаушы елде трансұлттық корпорациялар салықтар негізінде мемлекет қазынасына қосымша қаржы ресурстарын жұмсайды, жаңа жұмыс орындарын ашып, білім алмасу, технология, басқарушылық дағдылар және корпоративтік басқару тәжірибесі тәрізді жақсы ортаны қалыптастырады. Трансұлттық корпорациялар болса, жергілікті нарыққа, белгілі бір нысандарға байланысты табиғи ресурстарға, еңбек ресурстарының төмен шығындарына қол жеткізе алады және екі жақты және көп жақты сауда саясатын жүргізу тиімді блып келеді.

Мақалада экономикалық өсу мен Қазақстанның қоршаған ортаның ластану деңгейі арасындағы байланысқа талдау эмпирикалық талдау жасалынды. Дамушы елдерде, әсіресе, бұрынғы Кеңес Одағының аумақтары арасында осы айнымалылардың өзара байланысы туралы

зерттеулерде айырмашылық бар. Сондай-ақ, осы қатынастарда, сыбайлас жемқорлықтың және ғылыми-зерттеу және тәжірибелік-құрастырымдық жұмыстар белсенділігінің қарқындылығын ескере отырып модель құрастырдық. Трансұлттық корпорациялардың қабылдаушы елдегі инвестициялары қоршаған ортаның ластануын азайтуға немесе оны көбейтуге қандай әсері бар екенін анықтадық.

Түйін сөздер: экономикалық өсу, трансұлттық корпорациялар, тікелей шетелдік инвестициялар, қоршаған ортаны ластау.

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Исследование отношений между экономическим ростом, иностранными прямыми инвестициями, интенсивностью НИОКР и влияние коррупции на окружающую среду. На примере Казахстана

Инвестиции являются движущей силой социально-экономических преобразований любой страны. Прямые иностранные инвестиции в странах с переходной экономикой могут быть взаимовыгодными как для страны пребывания, так и для транснациональной корпорации. В принимающей стране транснациональные корпорации предоставляют дополнительные финансовые ресурсы за счет инвестиций и налогов, создают рабочие места и способствуют вторичным эффектам, как обмен знаниями, технологии, управленческие навыки и практика корпоративного управления. В свою очередь, транснациональные корпорации получают доступ к местному рынку, природным ресурсам, связанным с конкретными объектами, низким затратам на трудовые ресурсы и используют двустороннюю и многостороннюю торговую политику.

В статье проводится предварительный анализ ситуации взаимоотношений между экономическим ростом и уровнем загрязнения окружающей среды в Казахстане. Существует пробел в исследованиях относительно взаимосвязи между этими переменными в развивающихся странах, особенно между территориями бывшего Советского Союза. Мы также были заинтересованы в анализе того, насколько восприимчивый уровень коррупции и интенсивность исследований и разработок смягчают эти отношения. Особый интерес заключается в анализе того, способствуют ли транснациональные корпорации в принимающих странах уменьшению или же увеличению выбросов в окружающую среду.

Ключевые слова: экономический рост, транснациональные корпорации, прямые иностранные инвестиции, загрязнение окружающей среды.

Introduction

Currently, large transnational corporations (TNCs) have a significant role in the global economy that cannot be underestimated. They represent a very powerful mechanism to influence the economy of countries and the world as a whole. In the case of Kazakhstan, the TNCs focus on the primary sector, mainly on the mining and oil sector, these sectors associated with a high negative impact on the environment.

Previous work on the activities of the TNC indicates that they are responsible for environmental pollutions throughout the world (Pao H.T. and Tsai C., 2011). In the case of Kazakhstan, the country's economy is strongly oriented towards the extraction of oil and gas, representing approximately 20% of GDP (World Bank, 2017), assuming, in turn, approximately 60% of the value of exports. In addition, the production of electricity occurs, almost uniquely, in plants that use fossil fuels. Although Kazakhstan

has recognized necessity to move towards a Green Economy and has started to using of renewable energies to take advantage of their great potential. On the other hand, when we talk about sustainable development, we should consider the Brundland report "Our Common Future" defined as "development in which the needs of living people are being met, and the ability to meet their needs for future generation's remains." The principle of this approach to the problem is that the global economy must move towards a sustainable economy, where the responsibility shared by the states, governmental and non-governmental international organizations and the TNC, as main actors. Dean J.M. (1992), Copeland B.R. and Taylor M.S. (1994) and other authors have conducted scientific studies on this subject. They shows number of cases, the growth of welfare is accompanied first by increase and then by reduction of burden on the environment. This phenomenon could described graphically with the shape of an inverted U, and known as the Kuzntes curve. Thus, the term

“ecological Kuznets curve” related to this phenomenon. In any case, the empirical studies on this phenomenon are not easy both from a methodological and conceptual point of view, since it is necessary to define and measure the environmental damage caused. Therefore, some polluting industries cause pollution in the air (e.g., oil, transportation), but others focus on problems in the water (e.g., chemical or paper industry). The list of “environmentally dirty” industries compiled by UNCTAD includes chemical, mining (mining of minerals, including oil, gas, coal and metal ores), pulp and paper, cement, glass and ceramics, as well as metallurgy and metalworking. At the same time, these industries have different effects on the environment.

In this paper, we have made a preliminary analysis on the situation of the relationship between the economic growth and the level of environmental pollutions in Kazakhstan. There is a gap in research about the relationship between these variables in developing countries, especially between the territories of the former Soviet Union. We have also been interested in analyzing whether, the perceived level of corruption and the intensity of research and development activities moderate this relationship, as their study in these economies not carried out. The special interest is to analyze does the investment by TNC in these countries is helping or not to reduce environmental pollutions.

Data and Methodology

This study empirically examine the effects of foreign direct investment inflows and economic growth on environmental pollution in the Republic of Kazakhstan from 1998 to 2016. We include additional variables, such as CO₂ emission, metric tons per capita, \ln GDP, FDI net inflows, gross national income per capita, share of industry in GDP as an indicator of the availability of natural resources, research and development expenditure (R&D, % of GDP), trade openness and Corruption perceptions Index.

Literature review

According to Dean (1992), the growth of income has a long-term effect on the environment, since it is capable of changing demand, making ecologically responsible goods more desirable. This means that, in the production mix, the percentage of intensive products in environmental pollutions tends to decrease, thus reducing emissions. Thus, considering an economy with constant effects of scale and without changes in the type of intensity of emissions by the industry, the total per capita emissions should

decrease in the long term. Despite this, at low levels of income and production, the negative effects of the scale seem more prominent, resulting in higher levels of environmental pollutions as international direct investment (FDI) flows increase.

The TNCs tend to try to avoid the high environmental standards that established in developed countries. For this, most polluting industrial activities transfers to developing countries, where the standards are much lower, thus worsening the environmental conditions of the countries in which they invest (Chichilnisky, 1994, Copeland and Taylor, 1994). Copeland and Taylor (1994) proposed a static North-South model to analyze the relationship between national GDP and environmental and commercial transactions at the international level. In this way, they defined that income gains due to international trade affect pollution in a differentiated manner from improvements in income derived from domestic economic growth. Yanmin Shao (2018), in his part, showed that the IDF has a negative impact on the intensity of coal use in the countries that receive the investments. After considering the other factors, including the percentage of oil, the industrial intensity, the level of urbanization and the international trade opening, the effects of the FDI remained significant.

Other works have focused on the relevance of the TNC in the gas and oil sector in environmental pollutions, finding that finding that the situation depends on the level of maturity of the problem, prevailing the pressures to be environmentally responsible in the long term (David L. Levy and Ans Kolk, 2002). On the other hand, some studies have found that TNCs face, over time, increases in environmental standards in the countries in which they invest (Dean 1992, Zarsky, 1999). In this way, the TNCs that invest in local industries are able to implement new technologies that are not available, so that they can improve environmental conditions in the long term, by having access to cleaner technologies and knowing how to implement them better, thanks to their experience in their countries of origin. In this way, TNC tend to improve the use of resources to solve the environmental pollutions of domestic companies and thus contribute to a general environment improvement through the dissemination of knowledge and technology or transfer of funds, among other ways.

Thus, there is contradictory evidence on the effect of the TNCs on the levels of environmental pollutions of the recipient countries, there being both arguments for and against them as a factor facilitating an environmental improvement. Therefore, in this

work we are interested in analyzing the influence of the same on the case of Kazakhstan.

Birdsall and Wheeler (1993) found that open economies actually encourage industries to be cleaner, eliminated barriers to importing higher environmental standards, while more protected economies tend to favor more polluting industries. Wheeler (2001) used data from three developing countries (China, Brazil and Mexico) with a high level of FDI to study its effect on pollution. In this case, he found that the level of FDI decreased the levels of pollution. For their part, Perkins and Neumayer (2008) verified the relationship between FDI and the efficiency in CO₂ and SO₂ emissions in 114 countries. The results proved that economies that started from a worse environmental situation improve their ecological efficiency faster when they adopted technologies and environmental policies similar to those of countries that started from a better situation, resulting in a convergence over time. Atici (2012) found, on the other hand, that the level of FDI had a negative and significant impact, so that they did not tend to increase pollution levels in the long term.

On the other hand, the intensity of research and development activities has a great relevance on the relationship between the economic level and the level of pollution. On the one hand, there are direct effects of better efficiency on the reduction of pollution levels for a level of income. On the other hand, there is the effect of the greater benefit per unit of production, which decreases the energy intensity needed for production by each economic unit. Therefore, we assume that the greater the intensity of R&D activities, the lower the environmental impact of economic activities.

Results and discussion

To check the relationship between the variables, we focused on the case of Kazakhstan, since its interest on being a developing economy, which comes from a territory that was part of the former Soviet Union and in which, the activities derived from oil and gas have a great economic relevance, being the main source of income for the country. In general, large transnational corporations in the Republic of Kazakhstan represent the raw material sector, which has a very serious negative effect on the environment. The relations between TNCs and market are incompatible with the tasks of nature protection. The world environmental movement, born on the wave of criticism “consumer society”, traditionally designed by large corporations as the main opponent of nature conservation and the culprit for the destruction of the biosphere.

This study empirically examine the effects of foreign direct investment inflows and economic growth on environmental pollution in the Republic of Kazakhstan. We have used data from 1998 to 2016 on the following variables:

- FDI, measured by the investment received during the year from abroad.
- GDP per capita.
- GNI per capita, PPP.
- Share of industry as an indicator of the availability of natural resources (% of GDP).
- Intensity of R&D, measured as the expenses on R&D.
- Trade openness, considering the importance of the sum of exports and imports as a percentage of GDP.
- Emissions of CO₂ per capita, environmental degradation measured as CO₂ emissions.
- Corruption, measured by Corruption Perceptions Index

For the analysis, we use a regression according to following formula:

$$CO_2 \text{ level} = 0 + b$$

Variable	Coefficient
Constant	-15.9633***
FDI	2.33092e-05
GNIpc	000540226***
LogGDPpc	2.56717***
% Industry	0.0482677
R&D	-0.000106056**
TO	0.00677285
Corruption	-0.0116533
R2	0.9857

** p<0,99; *** p>0,999

As a result, the intensity of the R&D activities have a negative and significant effect on the intensity of CO₂ emissions, demonstrating their relevance in the transition towards a Green Economy.

The results with respect to FDI and trade openness are not significant, demonstrating the difficulty of making a clear and direct relationship between the openness of economy, both from the point of imports and exports, and foreign direct investment, in the environmental efficiency of an economy.

Conclusions

This work is a preliminary work framed within a broader project, in which we intend to analyze the relevance of TNC and FDI in the economic growth of the Republic of Kazakhstan. As main findings, we can highlight the inverse relationship between R&D intensity and environmental pollution, measured by CO₂ emissions per capita. This result is relevant, and opens the way to analyze the same relationship in other countries in the area and see if this relationship is typical of this economy, given its high dependence

on the energy sector, mainly oil extraction, or can be generalized to other economies in the area.

On the other hand, the results have not been relevant in relation to the role of the TNC in the emission levels. Therefore, we intend to deepen this relationship, analyzing it in detail to determine what the relationship that occurs in the Republic of Kazakhstan is. We are especially interested in changing our approach to the micro level, in such a way that we can see the relevance of the direct transfer of knowledge from the TNC to local companies.

References

- Atici, C. (2012), "Carbon emissions, trade liberalization, and the japan-ASEAN interaction: a group-wise examination", *Journal of the Japanese and International Economies*, vol. 26 No. 1, pp. 167-178.
- Birdsall, N. and Wheeler, D. (1993), "Trade policy and industrial pollution in Latin America: where are the pollution havens?" *The Journal of Environment & Development*, vol. 2 No. 1, pp. 137-149.
- Chichilnisky, G. (1994), "North-South trade and the global environment", *The American Economic Review*, vol. 84 No. 4, pp. 851-874.
- Copeland, B.R. and Taylor, M.S. (1994), "North-south trade and the environment", *The Quarterly Journal of Economics*, vol. 109 No. 3, pp. 755-787.
- David L. and Ans Kolk (2002) "Strategic Responses to Global Climate Change: Conflicting Pressures on Multinationals in the Oil Industry" *Business and Politics*. vol. 4, No. 3, pp. 275-300.
- Dean, J.M. (1992), "Trade and the environment: a survey of the literature", *Policy Research Working Paper*, vol. 68, pp. 103-116.
- Eskeland, G.S. and Harrison, A.E. (1997), "Moving to greener pastures? Multinationals and the pollution haven hypothesis", *Journal of Development Economics*, vol. 70 No. 1, pp. 1-23.
- Sarsenov, Ilyas; Aldiyarov, Azamat. 2017. Kazakhstan - The economy is rising: it is still all about oil - country economic update (Fall 2017). Kazakhstan economic update. Washington, D.C.: World Bank Group.
- Pao, H.-T. and Tsai, C.-M. (2011), "Multivariate granger causality between CO₂ emissions, energy consumption, FDI (foreign direct investment) and GDP (gross domestic product): evidence from a panel of BRIC (Brazil, Russian federation, India, and China) countries", *Energy*, vol. 36 No. 1, pp. 685-693.
- Perkins, R. and Neumayer, E. (2008), "Fostering environment efficiency through transnational linkages? Trajectories of CO₂ and SO₂, 1980-2000", *Environment and Planning A*, vol. 40 No. 12, pp. 2970-2989.
- Wheeler, D. (2001), "Racing to the bottom? Foreign investment and air pollution in developing countries", *The Journal of Environment & Development: A Review of International Policy*, vol. 10 No. 3, pp. 225-245.
- Yanmin Shao, (2018) "Does FDI affect carbon intensity? New evidence from dynamic panel analysis", *International Journal of Climate Change Strategies and Management*, vol. 10 Issue: 1, pp.27-42,
- Zarsky, L. (1999), "Havens, halos and spaghetti: untangling the evidence about foreign direct investment and the environment", *Foreign direct Investment and the Environment*, vol. 13, pp. 47-74.
- Vukina, T., Beghin, J.C., Solakoglu, E.G., 1999. Transition to markets and the environment: effects of the change in the composition of manufacturing output. *Environ. Dev. Econ.* 4, vol. 16, pp. 582-598.
- Wang, S., Fang, C., Guan, X., Pang, B., Ma, H., 2014. Urbanization, energy consumption, and carbon dioxide emissions in China: a panel data analysis of China's provinces. *Appl. Energy* 13, vol. 11, pp. 738-749.