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“After the Discussion, I am Even More Confident in My Point of View”: An Overview of Studies of Group Polarization

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Abstract

The polarization of the population in Russia is reflected in the psychological state of society. The article deals with the phenomenon of “group polarization”. First, we define the phenomenon formulated in the framework of social psychology. Next, we presented the main theories that explain the mechanism of action of this phenomenon. Further, we considered in more detail psychological experiments aimed to study group polarization empirically. Separately, we considered studies that also established the features of group polarization, but were carried out in related social sciences. The examples of recent events that took place in Russia illustrate the process of group polarization in modern society in the period from 2014 to 2020. Based on the described studies, we formulated the need for a more detailed empirical analysis of this phenomenon in the current conditions of society in Russia. Finally, we outlined the main ways related to the study of the connection between group polarization and the psychological state of society and people’s behaviour.

Keywords: group polarization, psychological state of society, social and political events.

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Introduction

The polarization of the population in Russia is reflected in the psychological state of society (Levedev, Gordyakova, 2019). In the process of society’s development, various issues arise that require discussion and subsequent decisions. Discussions take place at different levels — they can be held within the same family, or these issues can be raised among colleagues. Finally, quite often, sensitive issues are also brought up for discussion in the sphere of mass communications. Although mass communications are rather a broad name for a large variety of sources of information, most of our country’s residents still prefer television. Among television programs,

various so-called “Political talk shows” are presented. Studies that have been associated with this genre of programs have shown that in the course of such talk shows, as a rule, the presenter seeks to develop a common point of view with the guests and “feel-good” generic style is usually taking place (Lauerbach, 2007). However, this is not always the case. Sometimes people who discuss some problems do not come to a common point of view, but, on the contrary, become even more confident in the correctness of their position. Why is this happening? The answer to this question was investigated by social psychologists, who suggested using the term “group polarization” to explain this phenomenon.

Group Polarization as an Object for Research in Social Psychology

Group polarization is defined as "the tendency for members of a group discussing an issue to move toward a more extreme version of the positions they held before the discussion began. As a result, the group as a whole tends to respond in more extreme ways than one would expect given the sentiments of the individual members prior to deliberation". (APA Dictionary of Psychology).

The first comparison of a person's opinion alone and a person's opinion in the process of group discussion, date back to the 60s of the XX century. So, in J. Stoner's studies, it was noted that people who make decisions in a group usually do it riskier than when they make decisions on their own (without discussing them in groups). (Stoner, 1961). Subsequently, research continued by J. Stoner demonstrated that people who tend to make less risky decisions in the course of group discussion, on the contrary, become riskier (Stoner, 1968).

Later, it was found that subjects who had formed their own point of view in the process of group discussion only strengthened it (Moscovici, & Zavalloni, 1969). This phenomenon has been named "group polarization".

In the meta-analysis, which was devoted to the study of the process of group socialization, D. Isenberg considers two main theories that are associated with this phenomenon: *social comparison* and *informational influence* (Isenberg, 1986).

Social Comparison Theory and Group Polarization

Social comparison theory was first proposed by G. Sanders, R. Baron and suggested that person who is in a group is more motivated to have high and more positive ratings from other group members (Sanders, Baron, 1977). To do this, at the beginning of communication in a group, the person monitors which ideas are more popular with group members, and which, on the contrary, are less popular. After that, the person begins to adhere to the point of view that is characteristic for the members of his group. However, people in the group often take not just a position of

the group members, but its extreme form. It is so that the rest of the group members pay their attention to the person. So, in empirical studies, this theory received its confirmation. For example, a study of J. Sieber and R. Ziegler (2019) demonstrated that if people knew how other participants in the experiment felt about the problem under discussion, they were more likely to be group polarized. Besides, if elements of persuasive argumentation were used in the discussion process, then the research participants paid more attention to them if they demonstrated a high level of motivation.

Information Influence and Group Polarization

This approach was based on the fact that in the process of discussion, people pay attention to the arguments that are "presented" to them during the discussion of the problem. If in the group, at the beginning of the discussion, there is a point of view that the majority of people adhere to, then the arguments that will be expressed during the discussion will be related to this position. If a person supports an unpopular point of view, then in the process of group discussion he will pay attention to the arguments "against", otherwise if he supports the point of view of the majority, then he pays attention to the arguments "for". That is, as a result of such a discussion, people who took the position of a minority under the influence of arguments can change their position towards the position of the majority. Empirical studies that were devoted to testing this theory also confirmed it. Referent informational influence theory explains group polarization as conformity, through self-categorization, to a local in-group norm which is polarized as a result of the in-group being located towards an extreme of the salient comparative context or social frame of reference. (Turner et al., 1989).

Contemporary Studies of Group Polarization

Group polarization often becomes an object of study in the study of rather controversial issues. For example, 129 students took part in one of the studies, who were divided into

43 groups. All participants read the text, which described the need to decriminalize smoking marijuana. After that, the study participants were asked to note how much they know something about the topic of the article on the Likert scale (1 — I don't know, 9 — I know well). Also, participants were asked what they personally think about decriminalizing marijuana on the same scale (1 — definitely against, 9 — definitely for).

Initially, the researchers obtained the following results: a minority opposed the idea of decriminalization, a slightly larger fraction expressed a neutral position, the majority supported this idea.

After that, the participants were given materials that contained information on the decriminalization of marijuana. The materials consisted of 16 texts, 8 of which were common to all participants, and the remaining eight materials were different — some contained materials that express a position "for" decriminalization, others, on the contrary, a position "against" decriminalization. The researchers noted that in this way, people who later took part in the study could use the information that was contained in these materials.

After preparing to discuss this issue, the researchers divided the participants into groups (3 people each) and gave instructions that they should discuss within the group the issue of decriminalizing marijuana. It was necessary to discuss this issue until the group came to a consensus. Time for discussion was limited — participants were given no more than 30 minutes. It turned out that the entire discussion took an average of 12 minutes. The results showed no statistically significant difference between people who considered themselves competent in this matter compared to those who were less competent.

Additionally, it was found that members of the discussion group who held more extreme positions contributed more to the discussion than members who did not occupy such positions. In general, groups in which there were people in "extreme" positions were not more polarized than groups in which such people were absent. However, the researchers note that the groups were prone to polarization. This study also noted that the minority could influence

the process of group polarization, but empirical data were not obtained (Lyn, 2009).

In the conditions of modern interaction of people, information and communication means are acquiring an increasing role. Researchers in the field of group polarization are also interested in how the transition from "offline" to "online" communication affects group polarization. One study examined how computer communication (anonymous or not) affects this process. So, the researchers concluded that the *identified* face-to-face computer-mediated communication in certain conditions leads to *weaker group polarization*. In contrast, *anonymous* face-to-face computer-mediated communication increases the level of group polarization (Sia et al., 2002).

Besides, researchers are interested in issues related to the political preferences of people. Thus, in another study, it was found that the polarization of Americans associated with their adherence to the party increases over time and affects not only political views but also their daily life. Adherents of one political party expose adherents of another political party even more than, for example, members of another race (Iyengar & Westwood, 2015).

Research of Polarization Processes in Russia

Today, there are various areas of research into group polarization associated with the study of this phenomenon in the inhabitants of Russia. One of these areas is the study of the question of the influence of Russian residents on the process of elections in the United States. For this, the records of 1239 Twitter users of various political orientations were studied. The study included records from the end of 2017. Researchers found that interaction significantly changed various indicators of attitudes towards politics and people's behaviour (for example, their self-esteem on the scale "liberal" — "democrat"). However, in general, the researchers note that most often they interacted with residents of Russia with strong ideological homophily within their Twitter network, high interest in politics, and high frequency of Twitter usage. In addition, the methods used made it possible to reveal that interaction with "trolls" (people

who disseminate information containing insults, remarks, or one that causes strong disagreement in society) in the Twitter space may not have so much impact on the respondents, since they communicated, mostly with already very polarized voters (Bail et al., 2020).

Besides, studies of polarization in various historical periods are also widespread. So, in one study, it was found that before the First World War, the views within one political movement were different: for example, some believed that war was one of the ways to revive the country, while the other part believed that it was just one of the ways to abolish democratic institutions. The views within the movement and the ways of interacting with people were different: if the moderate right believed that dialogue could be used for interaction, then the extreme right believed that tight control was needed to help achieve their goals. This polarization led to the development of conflicts within this movement and the collapse before the 1917 revolution (Loukianov, 2016).

Studies of polarization were also related to the political sphere. Thus, in one of the studies, using the extended polarization index of Aleskerov-Golubenko (demonstrates a desire to vote for one or another party), it was established that polarization in the State Duma of the Russian Federation was associated "with tension in relations with the executive branch. The more pronounced the tension, the more polarized the State Duma was. The less the tension was expressed, the less the State Duma was polarized" (Aleskerov, Oleynik, 2016, p. 2).

The Current State of the Problem

of Polarization of Russian Society

Researchers in related disciplines (for example, in sociology) also study the degree of polarization of society in a particular country. In Russia, several sociological agencies conduct polls, the results of which demonstrate a fairly large degree of polarization of society. In particular, the Levada Center regularly asks respondents the question "Are things in the country going in the general right direction today, or is the country moving down the wrong path?" The answers also reveal interesting trends in the polarization of people's opinions. For the pe-

riod from 2014 to 2020, it can be admitted that the number of respondents who hold the position "Difficult to answer" does not exceed 20 per cent of the total number of respondents (Assessment of the current situation in the country, 2020).

According to the data published by the analytical centre (<https://www.levada.ru>), one can draw attention to the fact that since March 2014, the polarization of opinions of Russian residents about how things are in Russia differ significantly. It is probably due to an important event for Russia – the annexation of Crimea to Russia. This issue, starting from the very first options for its discussion and up to the present day, causes a large number of discussions in society. The expediency, necessity, legality of this connection are discussed.

But it was this topic that demonstrated how different and polar the opinions of people on issues related to the life of their country could be. In 2016, the gap between judgments about the direction of the country became smaller (probably, it is due to the proceedings on the possible use of doping by athletes from Russia). In June 2018, again, the number of people who agree and disagree with the statement about the path of development of Russia becomes approximately the same – an important political event related to the Russian Federation is taking place – Russia heads the U.N. Security Council (<https://www.levada.ru>).

One of the latest events that indicates the connection between the level of polarization of society and the attitude to the processes that take place in it is the arrest of S. I. Furgal. Then people who disagreed with this decision began to take part in various collective protests. According to sociological data, which were published, 47% of the total "Rather positively" refer to people who take part in the protests. Also, the respondents almost equally (a difference of 2 per cent) agree with two opposing statements related to the explanation of this event. According to the first point of view, the arrest of S. I. Furgal is a way to "remove" a politician who enjoys the authority and respect of people. The second point of view is formulated that this person really violated the law, and there are no political reasons for this arrest (Protests in Bashkiria, 2020).

Conclusions

The listed events demonstrate to researchers a rather interesting tendency — polarization becomes especially noticeable when important events take place within the country and abroad. In periods when there is a high level of polarization in society, the level of people's trust in the authorities (the president, the State Duma, etc.) can also change.

In general, polarization is associated with the reaction of people to certain events and can be a predictor of the psychological state of society. In this case, it becomes possible to develop a system of indicators, which will be based on average estimates of representatives of polarized

groups. Moreover, then the higher the level of polarization, the more accurate the assessment of the psychological state of society can be.

The level of polarization can be associated with the desire (or lack of desire) to participate in various types of collective activities, as shown by previous events. Therefore, in future studies, it is necessary to investigate in more detail the connection between the reactions of people who share different (polar) points of view and their individual psychological and socio-psychological characteristics and readiness to act. The results of such research can serve as the basis for the development of models of behavior of people who hold opposite points of view.

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«После обсуждения я еще больше уверен в своей точке зрения»:
обзор исследований групповой поляризации

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Аннотация. Поляризация населения находит свое отражение в психологическом состоянии российского общества. В статье рассмотрен феномен «групповой поляризации». Дано определение, сформулированное в рамках социальной психологии. Приводятся основные теории, которые объясняют механизм действия данного феномена. Более подробно рассмотрены эксперименты, проведенные в психологии, цель которых заключалась в эмпирическом исследовании групповой поляризации. Отдельно рассматриваются исследования, которые также устанавливают особенности групповой поляризации, но были проведены в смежных социальных науках. На примерах недавних событий, которые происходили в России, проиллюстрирован процесс групповой поляризации в современном обществе в 2014–2020 гг. Сформулирована необходимость более подробного эмпирического изучения данного феномена в России. Обозначены основные векторы исследования взаимовлияния групповой поляризации, психологического состояния общества и поведения людей.

Ключевые слова: групповая поляризация; психологическое состояние общества; общественно-политические события

The Efforts of the International Financial Institutions in Fighting the COVID-19

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Abstract

The article analyses the periods of socio-economic and socio-cultural cycles. It reveals the factors of interrelating conditions of an economy and a nation's health. It reconsiders the issues of organising international assistance programs in various countries. It introduces proposals as to the directions of international aid programs in poor countries of Africa, Asia and Latin America. A major deliverable of the article is the significance of the necessity to break away from the isolation in international relations and deeper cooperation between the nation-states based on the international financial and economic organisations such as the IMF and the World Bank.

Keywords: international financial and economic organisations; world financial crisis; coronavirus (COVID-19), international aid, the programs to develop a human being and society, green investments, socially important infrastructure

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The Disease Impact Through Centuries

What makes the COVID-19 so special compared to earlier plagues? The quick answer is very short — nothing. In the past, the cause of the disease was believed to have a religious image. People were encouraged to show devotion to the Virgin Mary, the Queen of Heaven who would intercede and offer protection against divine judgement. Intercession was desperately needed by people who believed that God punished them with death. One example is when death arrived at Weymouth in June 1348, and it was Black Death. In less than a year, England was stricken. No one could have understood what was happening. Once a person was infected, large foul smelling swellings developed in the groin, neck and armpit. Death followed within two or three days. The disease killed more than a third of the population. By 1350 the population of England was half that of 1315 (Gourinchas & Obstfeld, 2012).

It may come as a surprise, but the leaders of the past did with pests no different like today's policymakers. For example, in the above case, in

the midst of the dying, the theatre of Royalty grew grander. King Edward created the *Order of the Gutter* where two tournament teams played out in a Florian drama based on Saint George's *Chapel in Windsor*. The castle was rebuilt for the show. With the nobility bound to him by chivalric dreams and the shires and towns granting funds for the war in Parliament, the French war could still go on. These examples clearly resemble what recently Jair Bolsonaro in Brazil or Donald Trump did in the US.

Diseases were very important in deciding human fate. They determined the lives of kings and queens. They directly affected the life of the general public. For example, in the summer of 1453, King of England Henry VI went mad. He had probably inherited the strain of madness in his mother's family, the illness that had wrecked Charles VI. The true legacy of the King was a recurring disease that would afflict members of the English Royal family for centuries. He lost his memory. He lost control of his body. He lost the ability to speak coherently or understand what was said to him. His wife gave birth to their only

son, but he knew nothing about it. With King incapacitated, the government needed to be handed to a regent. The man with the backing in the South to take over the reins was Richard Duke of York. The inevitable and disastrous outcome was civil war: Lancaster against York.

The most dangerous thing for the spread of the disease through the centuries was civil wars. The example is the civil war in England under King Charles I. It is now reckoned that possibly a quarter of a million people died in battle, of starvation, of disease as a result of the fighting out of a population of about five million. That is a far higher death rate than in the first world war. This civil war had later brought another disease. It was connected with King Charles II. In a way, the sense of a new beginning was strengthened by the destruction of London by plague and fire. The plague was a swift and grotesque disease which had frequently erupted before, but in 1665 it took a firm grip and killed about 20 per cent of the city's population. London was primarily turned into a ghost city as the survivors fled. The King, who had moved to Hampton court, gave a thousand pounds a week to London charity. And then London began to burn. The King returned to the city with his brother James the Duke of York to take personal charge of firefighting in the streets. Everyone knew that the Mayor had been too timid to pull down houses that might have created firebreaks until he was directly ordered to do so by Charles. It certainly helped the Royal image, though it did not help London much. The old rotting disease structure was purified by an inferno that simply burned the place away as thoroughly as if it had been blasted by a nuclear weapon and a lot more cleanly.

In the early 19th century, the disease partly helped Russia win the war against Napoleon. Fearing the approach of winter but reluctant to abandon his conquest, Napoleon wrote the Czar proposing negotiations. The Czar responded with icy silence. After five weeks of waiting, Napoleon bitterly ordered his soldiers home. On October 19th 1812 he led his men laden with spoils out of Moscow. It was a warm fall day. Three weeks later it began to snow. The Russian winter had arrived early. Temperatures fell. Napoleon's soldiers froze in the open countryside. Food ran out. Horses died by the thousands. Hungry soldiers quarrelled over the horseflesh. They were fighting starvation, cold,

fatigue, disease, and the Cossacks. The Cossacks hurried Napoleon's flanks tearing off his army as if it were a wounded enemy. The French army no longer existed as a fighting force. Napoleon watched as his army die. Fearing capture he carried in a little black leather bag tied around his neck a vial of poison. Six months before he had crossed into Russia with more than half a million soldiers, confident of victory. Now, on December 5th rumours of the coup in Paris forced him to abandon his troops and head back to the French capital. He lost half a million men, a staggering sum. Out of the 600,000 men who went with him, 93,000 came back.

More recently, the disease became also part of economic problems. The economic shocks of the early 1990s in Russia brought related socio-economic problems. For example, crime nearly doubled in the early 1990s from about 1991 up until 1995; then it roughly doubled again by the early 2000s. This affected families, as well. From 1991 to 1993, right at the beginning of the transition, the Russian marriage rate fell by 20 per cent, and the birth rate fell by 12 per cent. Life expectancy for Russian men has plummeted. It went from 64 years of life expectancy in 1989 to 57 years of life expectancy in 1994, with coronary disease, suicide, alcoholism, and murder, all playing a large role. In five years, life expectancy for men went down by seven years. It was just an extraordinary change. When you put all these together, you got shocking estimates of future population decline. The US Census Bureau estimates for countries around the world of population. They said back then that the Russian Federation had 147 million people in the year 2000, by 2010 about it was going to be 140 million people. By 2050, the US Census Bureau forecast was 109 million people in Russia, i.e. the population was going to drop by something like one quarter over the forty years. It was just an extraordinary demographic event. Other than times of plague or massive warfare, you just do not see declines in population like these throughout human history. It was an enormous change. Fortunately, such a disastrous scenario did not realise. However, it is true that in the late 1990s and early 2000s, Russia declined even sharper than the declines when you hear about Japan or some other countries. In those countries, population declines are just based on lower birth rates. They are not based on higher death rates. Lots

of different population factors happened across what used to be the old Soviet Union was driving down the population, and some of the new countries formed out of the old Soviet Union do have higher birth rates, but for that group as a whole what used to be the Soviet Union, the population is still probably going to be lower in 2050 than it is now. Social scientists sometimes like to say demography is destiny. Economic problems like Russia's bring much more deaths with them than even the COVID-19 (Johnson, 2013).

There are, of course, pure economic diseases. For example, there is an IMF study of the Middle East region over the thirty years from 1970 up to 2000. They looked at oil-producing countries and their per capita income over that time. They found that oil-producing countries saw per capita income fall by about 1.3 per cent per year from 1970 to 2000. The non-oil-economies, meanwhile, rose 2 per cent a year over that time (Boddin, 2018).

Later two economists named Jeffrey Sachs and Andrew Warner published papers over the last decade or two systematically looking at economic growth and oil sales and then trying to adjust for other factors like did the economy start out low-income or middle-income or high-income? Was the government inefficient or corrupt? Did the economy have a lot of inequality? Was it open to trade or not? So, they adjusted for all the factors they could think of. And what they found systematically was that higher oil exports across all of the countries of the world were linked to systematically slower economic growth. Another economist Michael Ross looked at oil dependence versus factors like life expectancy, malnutrition, etc. And in one study what he found was each rise of five-percentage-points in oil exports as a share of GDP led to one-third of the year less in life expectancy. It also led to a one per cent rise in malnutrition of children under age five. In another study, Ross looked at oil and democracy. What he tended to find was that more oil leads to less democracy, not just in the Middle East, but also in African countries like Nigeria. There even seems to be some connection between petroleum and civil war in places like Sudan and Angola. You have probably heard about conflict diamonds where arms are financed by selling diamonds. But there is conflict in oil too. The Middle East region is essentially anti-democratic. And it is, of course, riven with conflicts and other abrupt changes of

government. A few years ago, in a little country of South Tome, there were some seismic readings that were announced that said maybe there was oil under the country. They did not actually find any oil, but they had an armed coup a week later, so just in case there was oil to find (Cohen, 2012).

So, the key here is the economics of the Dutch disease. Dutch disease refers back to the situation when Holland discovered offshore natural gas in the 1950s and the 1960s. It discovered this natural gas, and its economy experienced a dramatic slow-down. Similarly, when Norway discovered North Sea oil in the 1960s and the 1970s, its economy experienced rapid inflation, contraction in manufacturing and slow growth. An oil discovery leads to the following sequence of events: it leads to a boom of buying power in the economy, which can easily lead to inflation. Because you have just found oil, it makes focusing on oil look highly profitable, and everything else in the economy looks unprofitable. So, investment capital in education, transportation, communications — everything gets aimed at the oil resources, and the rest of the economy suffers as a result.

Another issue is that the exchange rate appreciates after you have found oil. When you have found lots of oil, you start selling lots of oil to other places. And those high exports mean your country has a big trade surplus. You are earning a lot of foreign currency, say, Saudi Arabia is earning a lot of US dollars. They need to convert that foreign currency back to the home currency of the oil-exporting country. When this happens, it tends to drive up demand for that nation's currency and leads to a strong exchange rate. A strong exchange rate, of course, means that all the other export-based industries of that country will suffer. And imports become expensive, which also feeds inflation. Politically, a government that has oil resources can rely on oil money and oil taxes. So, what exactly is the need for, say, democracy or accountability or a sensible system of broad-based taxes across the economy? Indeed, a government with a lot of oil would discover it is really easy to borrow. Banks are happy to lend you money, based on the future revenues from the oil reserves. And the huge amount of money sloshing around can easily lead to inequality and corruption. It explains many of the patterns noted above. It explains why these countries rein up big budget deficits because people wanted to lend to them.

It explains how there was not very much foreign trade unrelated to oil. It explains why there has not been very much development unrelated to oil. It is all Dutch disease, and now in times of world oil prices' plummeting, it is going to have devastating effects for the economies of many oil-exporting countries (Beetsma, Giuliadori, De Jong, Widijanto, 2016).

Another difficulty is climate and its effect on human health and the economy. A tropical climate tends to have certain economic consequences. Poverty is in general, pretty close to the equator. Wealthier nations tend to be further away from the equator with, of course, a few exceptions. Even within Africa, the high-income countries are the southern ones like South Africa. In South America, the high-income countries Argentina and Chile are far to the South. Because there are high temperatures at the equator in Africa, people tend to live away from the coast where would be hot and up in the mountains and highlands, which, of course, made transformation costs for products even tougher. In an equatorial zone there tends to be less food production.

A temperate climate with winter has various advantages over a tropical climate. Winter kills bugs and pests. It breaks up the soil. It helps to fertilise the soil. A cycle of freeze and melt and water flow makes the soil much more fertile. Plants tend to grow better when it is warm in the day and cool at night. Areas that are right in the equator tend to have lower overall rainfall, especially in coastal areas and greater heat. The summer in temperate areas has longer days. The days get longer and shorter. In the winter, the days are shorter. But around the equator, all the days are roughly the same length. And that does not help growth very much. Around the equator there tend to be seasons of very heavy rains and very dry weather which tends to bleach out the soil. So, there are a lot of reasons why crops do not grow as well around the equator as they would in more temperate areas (Rousseau & Wachtel, 2011).

Right around the equator, there also tends to be more disease. Malaria, for example, probably causes something like a million deaths every year, and tens of millions of cases where some people get it over and over. The social and economic costs are extraordinarily high. It, of course, discourages outsiders from visiting or investing. It is very difficult to think about how you deal

with malaria, because mosquitoes evolve very quickly, and they keep developing more virulent strains of the disease. HIV/AIDS is bad in itself, but it also brings other opportunistic infections like tuberculosis and yellow fever and hock vermin and river blindness, and all those things in tropical climates are much worse than they are in temperate zones. Also, there is less spill-over of technological progress into equatorial regions. Technology that works well in temperate zones often does not transfer well to tropical areas. The green revolution, for example, did gold and rice. It was really good for Asia. But there have not been similar improvements in things like cassava and taro and grounds and things like that, other crops that are really well-suited to Africa. We do not have the same research on malaria and other diseases that affect Africa so much, compared to what we would do in those affected high-income countries. In fact, if you just do a map of the world, and you know each of the countries' latitude, you can actually predict its GDP surprisingly well (Vayanos & Woolley, 2013).

International Aid Programs

One part of the United Nations is that each year it puts out Human Development Report, and it ranks countries according to a mixture of different factors including income measured by per-capita GDP, life expectancy for the country and education levels for the country. They also produce other versions of this measure that might add in factors like the level of inequality between men and women or the level of poverty inside a country. They all do a provocative reading. In the HDR rankings, for example, the United States ranked 12th in the world, according to the human development report. It was just behind Finland and just ahead of Spain. And in these rankings, the US advantage in per capita GDP was to some extent offset by a worse performance on life expectancy and educational performance compared to some other countries. Or compare — Russia and Chile — they were similar in measures of per capita GDP. Chile ranked 55th in the world among all countries in per capita GDP, Russia ranked 58th. Both had pretty high levels of school enrolment, although Russia is a little bit better. Among countries of the world, Russia ranks 37th in school enrolments, and Chile ranks 48th. But Chile is much better

on life expectancy. Chile is 28th in the world in life expectancy, Russia is 119th in the world in life expectancy, with that big decline in life expectancy that followed the economic transition in the 1990s, leading to those big declines in life expectancy for Russia. And as a result in overall human development rankings, Chile ranks well ahead of Russia. In these rankings Chile ended up 40th overall, Russia ended up 67th overall (Lane & Milesi-Ferretti, 2011).

The UN General Assembly adopted a resolution about what it calls the Millennium Development Goals. These, in particular, were eight goals for what countries and development agencies would try to accomplish overtime: to eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability; develop a global partnership for development. What is important about the Millennium Development Goals is that many of these goals have a concrete numerical target behind them. For example, eradicating extreme poverty says the goal is to reduce the percentage of people in the world who are living on less than a dollar a day by half from the 1990 level up to 2020. What is not clear in thinking about this is why they are eight goals, and whether all eight of them make equal sense. For example, three of the goals are related to health: child mortality, maternal health, and other diseases. They are all worthwhile, but maybe health should be one goal rather than three goals. And there is the eighth goal — the global partnership for development which is just empty bureaucrat speak. It is all about a process. It is not about the outcomes you are hoping to get out of the process (Milesi-Ferretti, 2011).

If you think about the period from 1950 up to 2000, world population over that time went from 2.5 billion up to 6 billion. Average incomes rose all around the world. The demand for farm output in that time tripled (Patil & Kulkarni, 2011).

Over the next fifty years, the world population is slated to go from 6 billion in 2000 up to 9 billion by 2050. Average incomes keep rising, and it seems plausible the demand for farm output may double again. Here we rely heavily on an economist Vernon Ruttan. He looked at the possibilities all around the world for using more land, more

irrigation, more fertiliser, and better seeds and better crop cultivation methods. His study back in the 1950s, looking fifty years ahead suggested supply could definitely keep up with the expansion of demand over that time. Later Vernon set down again around the year 2000 to apply the same kind of thinking he had earlier used and to ask whether in the next fifty years or so supply could keep up with demand, and this time he felt a lot shakier about his conclusions. For example, although Vernon argues that soil degradation and erosion is a big problem in some areas, he does not expect it to hold back agricultural growth in the next fifty years in any real substantial way. He also believes that although water supply will be an issue in certain countries and certain places, there are a lot of improvements possible in the use of water that could make water supplies not a big constraint on agricultural output from a worldwide perspective. But he emphasises two big problems: the control of disease and pests is going to be a real and difficult limit on increasing food supply overtime. Lots of pests and diseases have built up in unity to our ways of controlling them. International trade spreads pests around the world more than ever, which encourages them to evolve faster into more difficult strains, and whatever more aware of the environmental and safety costs of just dumping huge amounts of chemical pesticides on them. But Vernon's biggest worry is that it may be difficult to make continued technological progress in crop output because of various physical limits that come up (De Haas & Horen, 2011).

In fact, you need to expect spending more and more on research and development just to keep current output at high levels, given the evolution of pests and diseases that affect plants. One hope is that the new genetic technology might offer fundamental ways to improve output. And certainly, there have been gains in these areas. Still, the question is not whether these technologies can be helpful, but whether they can accelerate and sustain technological gains relative to all the past gains from standard cross-breeding methods. There are surely some successes in those products, but overall the jury is still very much out. There is also strong political opposition in some places to genetically modified crops. For example, Europe has been strongly opposed. And because Europe is strongly opposed, many countries of Africa do not

use genetically modified crops, because they fear they will not be able to sell in Europe as a result. Looking around the world as a whole we really need some substantial increases in agricultural research and development, and we are going to have any confidence that food supplies will grow in the kinds of ways that seem likely to be needed (Kasekende, Brixova, Ndikumana, 2010).

This kind of long-term research work can take ten to fifteen years or more to pay off. You also need to have an ongoing investment in this area. You need to be steadily investing now, so ten to fifteen years from now you will have gains, so the gains will keep continuing on and on into the future. The pests and diseases that affect plants evolve. The seeds need to evolve, too. It does seem plausible in certain poorest parts of the world like large chunks of Sub-Saharan Africa or the poorest areas of Latin America or the poorest parts of Asia, farmers in those areas could do a lot of things differently, for they are already well-known (Ostry, 2012).

Urbanisation as a Curse and a Blessing for Human Society

It is hard to give general advice on what countries should do since across the world places are very different. One big challenge for cities is they need investment in infrastructure: roads, houses, sewers, electricity and more. About a billion people already live in urban slums in low-income countries. When we talk about these slums, what do we really mean in practical terms? We are talking about people living in shacks. They are often so close together that they might not even have streets between them, just walkways. Sometimes they might be built up several storeys. People might be living four, six, eight people in a room. There is mud, dirt, garbage, sewage, smell, noise. There are enormous air pollution problems. Big cities like New Delhi or Jakarta or Beijing have terrible difficulties with the respiratory disease caused by air pollution. In Dacca, in Bangladesh, cars still use leaded gasoline up in the 21st century. So, there are lots and lots of lead in the air. In fact, the lead in the air is something like ten times the government safety limit. One study in Dacca found that 90% of children in the city have enough lead in their blood to impair their learning process. In Mumbai, in India, one study found that air qual-

ity is equivalent to smoking twenty cigarettes a day. People visiting China describe the air in Beijing and Shanghai as chewy, which is maybe good for a bubble gum but not for air. Some of the air pollutions are the local industry. Some of it is electricity. Some of it is people who do not have enough electricity. As a result, they are burning polluting little diesel generators for electricity. They are burning anything they can find for cooking and heat. Some of the pollutions are poor transportation and its gridlock of cars just sitting there pumping out emissions (Kadayan, 2014).

Many cities have enormous water and sewage problems. In Jakarta, the drinking water system is ineffective, so most of the population uses wells and groundwater, which is slowly being depleted. As the groundwater is depleted, then the land begins to settle. It becomes more vulnerable to flooding, and also seawater begins to leak into freshwater aquifer. Mexico City has similar water issues. So does Bangkok. In Mumbai half of the population lacks running water. In Shanghai maybe half the population lives in buildings without any access to sewage. In many of these large megacities in low-income countries, indiscriminate dumping of sewage and industrial supplies happens all the time. It goes into rivers and ends up in the water supply.

As a result, you get outbreaks of disease. Lima, Peru, had the outbreak of cholera in the late 1990s because of a lack of sanitation and sewage being dumped into rivers. Lagos, Nigeria, had cholera outbreaks too. Fifteen of the top twenty megacities are on or near a coast. Poor people often live in the low-line areas of cities. So, as the water table falls and cities sink, they are particularly susceptible to flooding problems. It is common in these cities to have half or fewer of the people with electricity, to have enormous problems with roads and congestion. At one step, what seems possible to do is just getting kids into school. It is not just education, which of course is valuable, but getting kids into school reduces crime and general disorder. It creates a group of parents who monitor the schools and care about them. It creates a group of teachers who argue for higher pay and creates a sort of ties across the community. For example, schools can be a social mechanism for delivering some meals to low-income kids (Obstfeld, 2011).

Foreign aid in the mid-2000s was a little over 100 billion dollars per year. It goes up in a given year if there is a large humanitarian disaster like a tsunami of December 2004 that hit the Indian Ocean off the coast of Indonesia. Of course, it also affected Sri Lanka, Thailand, India and other countries as well. This 100 billion dollar includes what basically is called official development assistance, which is a pretty good measure of foreign aid. The biggest donors in terms of absolute dollars are the big high-income economies of the world. The United States gave 23.5 billion, while the United Kingdom, Japan, France and Germany — all gave in the range of 10 to 12 billion. Of course, these official donations do not cover all forms of assistance (Reinhart & Rogoff, 2011).

Many kinds of foreign aid really are about an immediate need. But there is also foreign aid in the category of building human resources and physical resources for the future. We are talking about better nutrition, better health, better education, clean water, applicable technologies. These sorts of aid are really the primary focus of the discussion here because there are a lot of cases where receiving foreign aid does not seem to have done much to build the long-term future of economies (Yu, 2014).

Foreign aid does have some remarkable accomplishments to its credit. For example, there are health breakthroughs like vaccinations. The World Health Organisation is pretty much rid the world of smallpox, a remarkable accomplishment. The Pan-American Health Organisation pretty much rid the Western Hemisphere at least of polio. After thirty years of aid work in West Africa, they greatly diminished, almost eliminated river blindness, a parasitic worm that causes people to go blind. There is a current effort to fight malaria, free mass distribution of bed nets that have been dipped in the insecticide to chase off the mosquitoes that spread malaria, and also spreading more effective anti-malaria medicines. There are a lot of programmes for clean water and sewage treatment. These have a public health component as well. There is the green revolution, that effort to improve crops all around the world which was largely funded with aid money.

To be clear, the green revolution was a large coordinated research effort to breed better and better plants. They tried lots and lots of different plant combinations. They tried them in different

conditions of soil conditions and dryness and pests and all the rest. Over time they gradually developed some far superior crops, higher yields, more drought resistance, extra nutrients in the crops as well. One difficulty is that while the green revolution research programme was supposed to be carried out worldwide, it was actually carried through much more effectively in South-East Asia than it was across Africa. There are really good yields, for example, of more nutritious rice, which is great for India, Thailand and Malaysia, but it is hard to do a rice pad in a lot of sub-Saharan Africa. So, one frontier for foreign aid would be to spread the green revolution to Africa. There have also been successes in infrastructure or education. More recently, foreign aid programmes started with experiments on what is sometimes called conditional cash transfers, i.e. you give families money if kids attend a school or if they go to doctors' appointments and get vaccinated. The success of these aid programmes than actually led to government programmes in a lot of countries of these conditional cash transfers, but the aid programmes led the way in showing that something was ineffective to proceed. Other small-scale aid projects have had the potential to become large-scale programmes as well. For example, one big problem in many low-income countries is that you have a lot of school buildings, and you have a lot of health care buildings, but especially in rural areas a lot of the time the teachers and the health care workers may not show up for their jobs.

In some cases, those workers may even have other jobs. They just draw a government paycheck. It is not clear how you check this regularly (Dorrucci & McKay, 2011).

Of course, aid has thousands of small-scale successes to its credit, roads that got paved, villages with clean water, schools that got built or, say, small micro-loans that got made to local entrepreneurs. Yet another issue is that health gains from aid may not show up very well as economic gains. Programmes that provide vaccinations or improve infant mortality may increase social statistics like infant mortality or life expectancy, but these may show up not directly as economic gains. In talking about Africa's economy, we spoke about how Africa increases in health and increases in economic statistics were not always aligning. There had been health gains across much of sub-Saharan Africa from the 1970s up to early 2000s,

but really not much in the way of economic gains over that time, or to put it more accurately, it may be the economic benefits or a healthier society in terms of people who develop their full physical capabilities may take several decades to emerge.

A final issue is that aid may, in some ways diminish the power of self-governance. After all, aid agencies have money. That can give them disproportionate power in low-income countries. Just listen to government officials in low-income countries sometimes, talk about their experiences with the International Monetary Fund or the World Bank. Of course, they will admit these agencies had done some good. There is also a lot of prickliness and how they felt pushed around when things go well and even angry when they felt like things were going badly. The force of government and citizen groups sometimes can be just how to get more aid projects, how to comply with aid requirements, how to talk the language of the aid people, how to go to the conferences the aid people hold. In a way, aid can make citizens and governments feel less in charge of their destiny, and instead, they focus on outside forces where they really have limited or no control. Countries, especially low-income countries, may have a limited number of skilled and public-spirited civil servants and administrators. Do those people end up running schools and the transportation and the hospitals and spreading technology to farmers and industry? Or do they end up filling out forms to get more aid money from the World Bank or the IMF and filling up the follow-up paperwork? Reasonable as aid can sound in theory, it can get involved with policies that offer a high level of interference in markets. There can be a process of aid being funnelled to non-democratic leaders that end up being used for their own political survival.

Recommendations to Fight the Disease

Maybe you deal with sewage first with the latrine system, then with the trench system and later on with the pipe system. Maybe you deal with water problems first by selling containers of water from a central source and then letting people distribute those containers around the city rather than with pipes. Maybe you need to encourage privately run firms that provide bathrooms and latrines at some cost. Maybe you need real estate developers coming to slums,

tear down the existing building and build up a new one. However, the builder has to guarantee people currently in that place will have a place to live in the new building, and the builder could then rent or sell extra space for businesses or homes. You might need to deliver electricity with a mixture of large generating plants and smaller devices, maybe solar-powered devices. When you are thinking about water pipes or electrical wires, you need to think about how you are going to limit leakage, i.e. water or electricity being drained out of the system by poor people. You just cannot provide unlimited free stuff to hundreds of thousands of people and try to lower the costs on the rest of the population. Some of the financings here could come from central governments, some from local governments, some from fees and charges, some from foreign aid, some from investment by private-sector firms hoping to make a profit.

For example, in Sao Paulo, Brazil, one of the fastest-growing cities in the world over the last few decades, infant mortality was 51 per 1,000 live births in 1980, now, about thirty years later, it is down from 51 to 12 deaths for every 1,000 live births. In the late 1970s, piped water reached about 50 per cent of the population of Sao Paulo. Now piped water reaches 99 per cent of the population. In the late 1970s, sewage treatment covered 38 per cent of the population, and thirty years later, it reaches 88 per cent of the population. These are all city-projects to extend that infrastructure. Another, a limited but success story is Bangkok's efforts in reducing air pollution. It is something that the city really did, not the national government. The city of Bangkok put pollution control on cars. It set high taxes on motor scooters which run pretty dirty, and it made taxis run on natural gas. Those changes make a big difference.

Here are some of the especially juicy targets for foreign aid. One would be nutrition supplements. There are tens of millions of children, maybe hundreds of millions of children around the world who lack essential vitamins and nutrients in their diets like zinc and iron. There are things you could do like providing vitamin capsules for orphans who are aged under two or zinc supplements, particularly for infants aged under two as well. There are things you can do to make sure salt is iodised, which is an enormous gain to people's diet. There are also ways to fortify other essential foods like

bread with iron. You can figure out, maybe using genetic engineering if necessary, how to grow biofortified crops, which just means that the crop itself has iron or vitamin or other nutrients in it. It can often be highly effective to do de-worming programmes. If someone gets infested in the worm, it ruins their nutrition, it stunts their growth, and it can stunt their intellectual development. One way to provide those de-worming programmes is to connect them with school-age children and thus do it through the school system.

Another area where aid can be very effective is broadly in concerns with water and sewage. In poor rural areas across the world, you can get clean water if you can dig it deep, borehole down the water, and then use a hand pump to help get the water up. There are also probably a few places in Africa where large dams should be considered. Large dams have a bad reputation these days and often deservedly so. Dams can be total white elephant projects with huge, huge cost overruns. It can also lead to massive displacement of people who are living near the river, which is in the area that is going to be flooded. But on the other side of it, Africa really badly needs electricity, and it has hydro-electric power available if some dams were built. Africa also really needs to manage its water supply for irrigation purposes and also to reduce the chance of floods in many areas. So, there may well be areas in Africa, in specific locations where the costs of dams are less than the benefits you can receive. In any event, ruling out dams altogether is a pretty large step in terms of the possible benefits you might be giving up. Africa has not been dammed extensively in the past. And so at a minimum, aid can think about where some sides are plausible or sensible.

There are more places where aid could help. How about bio-sand filters for dealing with sewage and wastewater? A bio-sand filter basically involves packing sand and gravel into a concrete or plastic chamber, and then you run your sewage or your wastewater through that filter. You do need to clean out the filters from time to time, but in general, this can be a quite efficient and low-cost way of dealing with sewage and getting cleaner water instead. There are also a lot of possible health gains still possible for routine care. There are a lot of places where children do not get the immunisation they should get, for example, against tuberculosis.

We mentioned earlier the efforts against malaria, more bed nets dipped and insecticide to fight mosquitos that spread malaria, making new treatments available for malaria to develop as mosquitos and the disease develop resistance to earlier treatments. Other people would add up programmes, say, to make microloans available to people in low-income countries for starting businesses.

A big part of fighting disease is clearly a diet, especially diets for mothers and new-borns. As you get higher incomes, diets are a lot better. In general better diet makes you more resilient against all kinds of other health problems. There are better health habits like personal cleanliness. There is public health, like public sanitation and vaccination programmes. There is also the treatment of some common conditions like diarrhoea and dehydration that used to cause a lot of people to die very young. Now, probably different factors are important at different times over the last couple of centuries. But my point here is that when life expectancies are rising sharply, and birth rates are staying much the same, the population is going to increase really sharply. Though we are emphasising a global view here, in reality, this happened in one region of the world at a time. We saw these higher life expectancies in population growth first take off in the United States and Western Europe in the 19th century, and that process took decades to happen.

Conclusion

In the globalised economy of the future, the main economic powers will probably continue to be nation-states — the United States, China, India, the European Union combination, Germany, the United Kingdom, Brazil, many others. Nation-states will follow the policies they want to follow. They want to pass the laws they want to pass. But as they become more interconnected, international agencies and agreements may play an important role as well. Agreeing on ground rules and certain kinds of coordination becomes more important in a world of globalisation, and international agencies are the places where these kinds of ground rules get hammered out. Many of these international agencies have already been mentioned.

The World Bank has long seen its key role as providing loans to countries that might not oth-

erwise have access to financial capital. Perhaps the best answer for foreign aid is for foreign aid to focus on specific projects like vaccination or clean water or anti-malaria efforts, ways to solar energy or electrical technology, reward schemes for education.

The IMF has traditionally been an international agency that steps in when there is an international financial crisis. But it is not clear that that role works as well now as it did a few decades ago either. The IMF is the one agency in the world that has the power to lend tens of billions of dollars on relatively short notice to address this kind of immediate financial crisis. Roughly speaking, you can think of the IMF as macroeconomics, i.e. it works on money and exchange rates and overall growth, and you can think of the World Bank as microeconomics on particular aid projects, although the division in practice is not quite that simple.

The fundamental problem, though, of solving poverty and this is something so obvious, but it makes sense, is hooking up unskilled workers to consistent local paychecks. When you focus on the poor, their immediate needs are so great, it is easy for the discussion to focus on food and clean water and health care and education, all the things they need and these are all worthwhile endeavours, but even if you provide food and clothing and vaccinations and anti-malarial nets dipped in second side and classrooms for the kids, you still have not solved the problem of earning income.

Of course, in low-income countries, there is not like a food stamp programme or something like that. They might not even have a very good list of who actually lives in certain rural areas. You cannot just hand out money. But what you can do is undertake a different kind of programme.

A programme called conditional cash transfer is a payment where they send the money to those who send their children to school. That targets families with kids, and it encourages education. Or you could give food assistance to moms who shore up for pre-natal health appointments, or who bring their kids to get vaccinated. Another approach is the government creating work projects, maybe working on infrastructures like roads or irrigation. Anyone who shows up and works gets paid. Maybe they get paid in terms of food or maybe in cash. Only those who do not really have good options are going to show up. And you do not have to work extremely hard. It just provides a way of selecting out poor people and getting them money and getting them food, so people can get the food they need, rather than trying to hold the price at an artificially low level.

The pull is that development of manufacturing and services needs workers, and it needs them in somewhat more centralised locations. That pattern is held true in the US over the last few centuries. It is held true in Europe, and it is occurring now in low-income countries all around the world. This shift is sometimes presented as a shift from the beautiful, bucolic and environmentally friendly countryside to the exploitation of sweatshop manufacturing and urban slums. Like any economic transition, you can turn it into a morality play if you want to. Certainly, some individuals have lived out that morality play. But it is worth remembering that even though work and living conditions have been pretty bad for recent immigrants to cities. In low-income countries, it can be pretty down and lousy out on the farm too. Being poor, a rural low-income country typically means not much food, dirty water, illness, not much health care or education.

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Деятельность международных финансовых институтов в борьбе с коронавирусом

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Аннотация. Проанализированы этапы развития социально-экономических и социокультурных циклов. Выявлены факторы взаимовлияния состояния экономики и здоровья нации. По-новому рассматриваются вопросы организации международной помощи в различных странах. Вносятся предложения о направлениях международной помощи в бедных странах Африки, Азии и Латинской Америки. Сделан вывод о значимости преодоления изоляции в международных отношениях и необходимости более тесного сотрудничества стран мира на базе международных финансово-экономических организаций.

Ключевые слова: международные финансово-экономические организации; мировой финансовый кризис; коронавирус; международная помощь; программы развития человека и общества; инвестиции в зеленую экономику; общественно необходимая инфраструктура

Assesment of the Ability of Elective Choice System

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Abstract

I am studying in the greenfield liberal arts school, meaning there are a lot of experiments and hot patching that happens during the studying process. While some things change, one thing got through three years of school existence almost unchanged – the elective choice system. And now, when this system is finally questioned as to the one that can allow students' self-interest to lead to a constructive and just distribution to electives, I want to assess the ability of current elective choice system – the semester-rating based one, with the seven-median grading – to distribute students satisfiable in a different modelled situation and to find out if this system is that stable in critical conditions. What I suppose is that this system will be stable enough in a short-term perspective, but will need to be changed after some time.

Keywords: game theory-based models; agent based models; elective choice system

JEL Classification: I29, Z13

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I'll use two models – the Game Theory-based one and agent-based, to look into how the elective course choice is made and where this process may destabilize. Because both of these ways can have their insights and shortcoming, they will complement each other and can lead to a reasonable model of the elective choice process.

Game-theoretic Model

To simplify the problem, let's imagine the elective course choice as the 2x2 game: two student-players are interested in having comfortable learning process that is as close to their interests as possible; there are also two elective courses that students can choose, but if both students choose one elective, it will become overcrowded, and both of students will be unable to learn. That's the most simple coordination problem that we can see – there's not enough place for everyone on every course. Such a problem-game can be expressed as a table, similar for both students:

	Course 1	Course 2
Course 1	0	1
Course 2	1	0

Choice-function

In the most primitive form, the motivation of the student k to go to the elective course ϵ_i can be expressed as:

$$\mu_{ki} = \beta - (\pi_k - \epsilon_i)^2,$$

where μ_i is the motivation to go to the elective ϵ_i ($\mu_i \in [\beta - 1, \beta]$), ϵ_i is the numeric equivalent of the main feature of the elective – its field of study (it is normalized to 1, so $\epsilon_i \in [0, 1]$). There is always some basic motivation β of a student to go to any course, although it is not that big for the electives that the student denies going to. I'm implying here that the further student is from the elective course in the sense of numeric difference of their study preferences π_k (the scale is the same as the one of elective's field of study, $\pi \in [0, 1]$) with ϵ_i , the less probable it is for this student to choose the course.

Differentiation proves this choice heuristic:

$$\frac{d\mu_i}{d\pi} = \pi - \epsilon_i - \text{if the preferences of a student are the}$$

same as the study field of the elective course, then it will be the best choice for this particular student.

How is the Game Going?

General function, showing the overall state of the game, can be denoted this way:

$$\sigma = \left(\frac{(\mu_{11} - \mu_{12}) - (\mu_{21} - \mu_{22})}{\beta} \right)^2, \sigma \in [0, 1].$$

Where the value zero of σ means that both students are on the same elective course (meaning it is “overcrowded” and it is impossible to learn) or the preferences of the students are not satisfied (one of the possible causes for such a situation may be that the pool of electives is centred on the discipline students don’t necessarily feel interested in). Value one, on the contrary, means that students are on their own elective courses and their preferences are too different ever to choose the same elective course.

However, if the preferences of the students are similar enough or the elective pool is not diverse (i.e. both courses are almost the same), the choice of both students will be the same with a high probability (the game function proves that — it gives zero for the case with $\epsilon_1 = 1, \epsilon_2 = 1, \pi_1 = 0, \pi_2 = 0, \beta = 2$ and is close to zero in some less extreme cases). Therefore, having preferences of the students and study fields of the electives as the only criteria for choice is not enough to resolve this coordination problem.

The Controlling Measures

Here three Bowles-inspired (Bowles, 2006) ways emerge: to control the choice with some external authority, deciding who’ll be advantaged in the choice (the “state” solution); to have some agreement to emerge between the students on how they will choose their electives based on the choice of others (the “community” way); to introduce some kind of property rights to elective courses for some students to regulate the choice of others (the “market” way).

Most universities implement the “state” way. Some authority prioritizes some students over the others in their elective course choice and controls the number of students on the electives. However, such systems are not isolated, and students can communicate with each other and have agreements and plans on who’ll go where thus the “community” way is partially present in the current elective choice system too.

The “State” Way

“State” way in the elective course choice system usually involves prioritization of students by

measurable criteria — grades (Grade Point Average (GPE) or the grades for a previous semester), year of study, speed of choice. This prioritization is not obviously connected with the study preferences of the students, so it may help to resolve situations when students pick the same elective, or the electives are almost the same. Still, it leaves some students on the courses they don’t necessarily like as a tradeoff. Thus, the choice of the elective course in the situation of the “state”-like regulation is governed by this kind of choice function:

$$\mu_{ki} = \frac{\beta}{\rho_k} - (\pi_k - \epsilon_i)^2.$$

Where ρ_k is the rating position of the student s_k . $\rho_k \in [1, n], S = \{s_1, \dots, s_n\}$ and the higher the rating position of the student is (and the lower the numeric value of ρ_k is), the more possibility there is for the student to be on the elective they want to be on. For our 2x2 game, the value of β / ρ_k will be β for one of the students and 0.5β for the other. Then, the outcome of the game will shift towards the student with the higher grades (if it’s the grades that students are ranged by), because they will have a higher motivation¹ to choose their preferred electives.

The derivative of this choice-function looks

like this $\frac{d\mu_{ki}}{d\rho_k} = -\frac{\beta}{\rho_k^2} - 2(\pi_k - \epsilon_i)$, and, in the ex-

tremum point, $\beta / \rho_k^2 = -2(\pi_k - \epsilon_i)$, which means that the lower the student is in the rating, the more carefully they need to choose their elective because of their inability to get the course they want will scale exponentially. Although this may seem like nonsense, it makes sense in this model, initially built on the idea of the preferences of the students. And, quite realistically, if there is the same pool of electives, the game turns to a probabilistic one — not knowing what the student on the first rating position will pick, the second student will almost flip the coin and hope not to be moved to the elective they didn’t like (either all of them or none of them).

This enhancement solves the problem of the overcrowding, given that the students’ interests

¹ After the introduction of the external control, calling the choice of an elective course made by a student a “motivation” loses a part of its meaning, but it’s not that harmful, so let it be there.

are diverse, and so are the course's topics, diversifying it even more. Of course, additional criteria can always be introduced, but, so far, this is already a satisfactory model of the elective choice system. However, the inability to cope with the probabilistic choice in case of similar (or normally-distributed) courses and students' interests is one of the coordination problems that emerge both in the game described above and in the practice of the universities and that, it seems, cannot be easily solved without the control over the elective capacity.

The "Community" Way

In the real world, a part of this non-disparity problem gets regulated by the interactions and shared experiences of the students that either help the choice system to distribute students justly, or tear it to pieces as a result of (dis)organized effort. Ignoring such phenomena would be harmful. However, the tools of simple game theory fall short of ways to work with such a group-oriented idea as a rumour, especially in the case of an overly simplified 2×2 game. I will only show one possible choice-function that takes the opinion of the others into account:

$$\mu_{ki} = \frac{\beta}{\rho_k} \left[\frac{\pi_k - \epsilon_i + \left(\sum_{n=1}^m \pi_n - \epsilon_i \right)}{m} \right]^2,$$

where $m =$ a number of friends that k has.

With such a model, the person that relies too much on their friends (or just has too much of them) will have no hints on which course to choose if these friends have no information about the courses in question or are too different in their relation to the course. This reliance on someone else's opinion can also be used as an explanation of the interest-based groups' occurrence, but that goes much beyond both this paper and the decribed 2×2 game.

Agent-based Model

Based on the ideas of the game-theoretic model from before, an agent-based model was built with the tools provided by the NetLogo agent-based modelling environment. Due to this environment being modelling-ready, a lot more concepts found their way into this model, including *happiness, grading system, students' rating, choice,*

and elective popularity. This list mirrors the one, based on the Artino & Stephens 2007 study and Sabot & Wakermann-Linn 1991 paper, proposed before: "motivation, elective difficulty, [and] major preference" (Bologov, 2020, p. 5) of a student are expressed through the happiness and choice, while the "grade history and the opinion of peers" (Bologov, 2020, p. 5) are collaterally used in the "state"-regulatory grading, rating, and elective selection system.

Happiness

The main new concept that was not present in the game-theoretic model is *happiness*. Although happiness is quite a vague term, it is general enough to represent the psychological well-being, risk, and confidence of a person. Using this meaning of happiness, we can make it responsible for the confidence, risky behaviour and the motivation of a student to study.

As an example, here's the new choice-function that is now much more dependent on the happiness of students:

$$\mu_{ki} = (\pi_k - \epsilon_i)^2 + (\text{random}(\chi_{max} - \chi_k)),$$

where χ is student's happiness level. It accords with the Prospect Theory idea of different behaviours while in losing state and while in winning state — while losing, a person risks more and tries to win in any way possible. In contrast, the winning person tries to preserve the prize. This risky oscillating change of mood governs how student studies, chooses elective courses and will the student stay in the institution or leave it because of exhaustion.

Elective Change

The idea that electives need to change and do actually change was foreign to the game-theoretic model due to its limitations. Still, the agent-oriented model allows for the choice between different models of how electives change. There are two models for elective selection: based on student's interest and, consequently, the number of students on elective, and the random selection.

When there's the selection based on the elective popularity, only the electives with the maximum number of students remain. It might have lead to the stagnation and some stable equilibrium

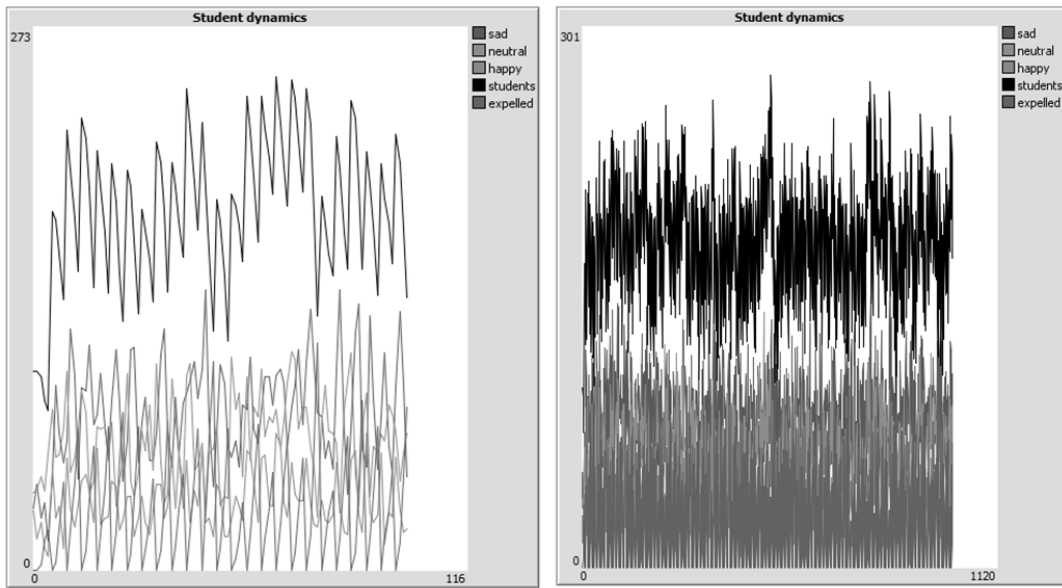


Fig. 1. Seven-median system mid-term & long term oscillations

Source: The author.

if the interests of the students were not uniformly distributed. But in the situation of uniform students' interest distribution and the competition for interests, there's no stable equilibrium both due to the students' chaotic behaviour and electives' complementarity.

The random elective selection changes several random electives with others. While this may seem as the chaos-provoking selection, it appears to provoke as much or even less chaos than the students' number-based selection, probably because the student-maximum course selection reinforces the anomalies of the distribution that centre around some particular elective and stay there.

Student Elective Choice Privileges

Because the "state" way of regulating elective selection usually uses some criteria to compare students by, there is an inevitable rating system that emerges out of it. Several systems are modelled: the GPA rating, the module-based rating, and a random rating.

The GPA-based rating is looking at all the grades the person had during their study time and compared the average grade with others to make a rating of students. Because the GPA of one grade equals to this grade, and the more there are grades, the closer they are to the normal distribution. The freshmen that come every year in this system will have both advantage and disadvantage — if they are lucky, they can

easily get above the second-, third-, or fourth-year students. Still, if they are unlucky, they will be at the bottom of the rating and their GPA will consequently get lower which can then reinforce the divergence because of the inability to choose the elective that is close to preferences of the one.

The module-based rating does the same as GPA-based one, but takes a smaller period, thus shrinking the differences between the students of different years and making them relatively equal. No wonder that so many institutions use the module-based rating systems — they are both more comfortable to use and are relatively just to the students.

The random system is, then, going even closer to equality of the students, because it puts students in the rating in the random order every time. However, this system is the most unjust of students. It causes the biggest oscillations in the number of students over time because of unpredictable expulsions happening because of the... randomness of the distribution.

The Grading Systems

There are a lot of grading systems, but I think that having four of them is a good survey of the main ideas in grading. These four systems are uniform grading, seven-median grading rule, effort-based grading, and random grading.

The seven-median system is the one that my school uses, and one of the goals of this paper

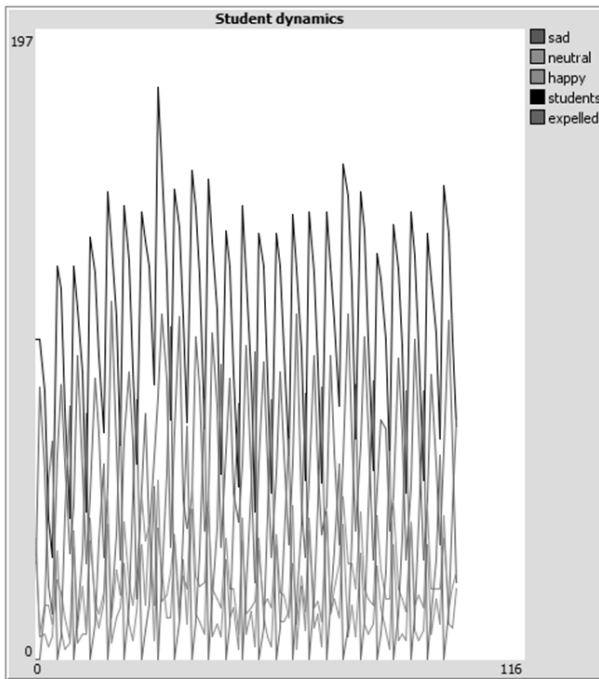


Fig. 2. Uniform grading system mid-term behaviour

Source: The author.

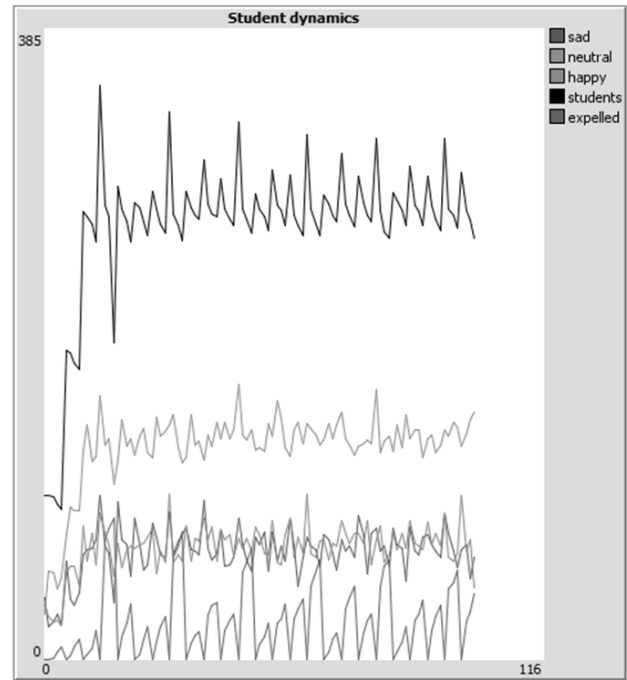


Fig. 3. Effort-based grading system mid-term behaviour

Source: The author.

was to look at how well this system can make students' choice of electives satisfied and if this system is the optimal one in terms of "state"-like control of elective choice. The essence of the seven-median is the idea that among the grades for any course, there should be the same number of grades below seven as above seven. This system sounds like the one that is controlling both students and instructors from the possible chaos. I can say it does, because, after some initial risky oscillations, it becomes stable enough for quite a long time. Although after 800 modules (200 years) it started to show some unpredictable peaks and widen the amplitude of oscillation, it seems stable enough.

Uniform system (i.e. the one where all the students, sorted in the order of their efforts, are given the grades from 0 to 10) was constantly underestimating the efforts of students. It caused all the students to leave the school out of exhaustion eventually. However, the reason for that was that the average effort of students, set by myself, that students have put to work was higher than the average grade (seven versus five). After setting the average effort to five, the uniform distribution has worked even more stable as seven-median, because it turned into an approximate five-median. However, then, uniform distribution needs to be changed into a non-uniform one to suit some real situations

and to be stable enough, which is too much of a sacrifice.

Effort-based system (i.e. the one that was just measuring the efforts of students with some constant error) has been satisfying most students' need for the acknowledgement of their efforts but made them get stuck on the neutral mood, therefore making up for less motivation and the essential chaos that can generate new useful events. But even a little of chaos in the evaluation of efforts were causing unexpectedly strong oscillations. However, this system was the most stable out of all the grading systems in the long term, given the stable effort and a small grading error.

The random grading system was making the same mistake of students' efforts underestimation as a uniform grading system with high efforts. Yet, it was more stable because of randomness — some students randomly graded highly, were satisfied by the grades and stayed in the school. However, this system, especially together with other random systems, was creating the strongest oscillation that this model was able to create — up to almost all the students leaving the school and then regaining the numbers to nearly twice the initial state.

Lessons to Learn

This study is not nearly a complete one. There are a lot of ways to go: the models can be made

more realistic by adding the professors as a group of agents, by making the supposed difficulty of the course to influence the choice; the perspectives of the Bowles-inspired “community” and “market” solutions are yet to be explored, for example, by bringing the interactions proposed in the game-theoretic part of the paper, into the agent-based model where the interactions will fit better.

The current results are useful already. Although the seven-median module-rating system may seem like an unfavourable choice after the comparison given above, I understand now why the specific kind of seven-median grading was so ubiquitous in my school — the changes in it made the grading shift towards the effort-based one, causing both disperse and stable elective-choice and studying system and giving a solid ground for future courses. Then, the changes that the seven-median module-rating system needs only a minor change in comparison to what I supposed at the beginning of this work.

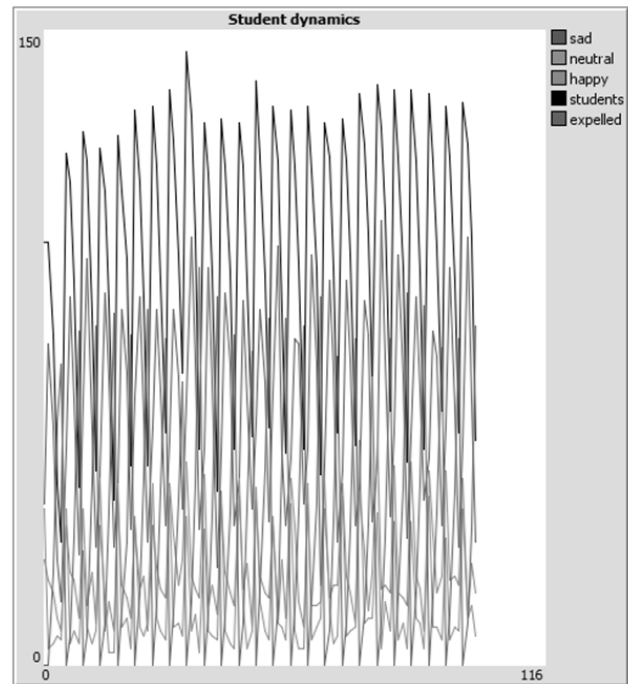


Fig. 4. Random grading system together with the random rating system and random elective selection: mid-term behaviour

Source: The author.

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Оценка возможности системы факультативного выбора

Артем Бологов

Аннотация. Я учусь в гринфилдской школе свободных искусств, а это значит, что в процессе обучения происходит много экспериментов и внезапных исправлений. В то время как некоторые вещи меняются, одна вещь прошла через три года существования школы почти без изменений — система факультативного выбора учебных курсов. И теперь, когда эта система поставлена под сомнение относительно того, способствует ли она развитию личного интереса студентов к конструктивному и обоснованному распределению факультативных занятий, я хочу оценить способность нынешней системы факультативного выбора — семестровой рейтинговой системы с семимедианной оценкой распределения студентов и выяснить, является ли эта система стабильной в критических условиях. Я предполагаю, что эта система будет достаточно стабильной в краткосрочной перспективе, но через некоторое время ее нужно будет изменить.

Ключевые слова: модели; основанные на теории игр; агентные модели; система элективного выбора

Modelling the Disruptive Innovations

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Abstract

Horse carriages, film cameras, and traditional encyclopedia were dethroned by the once bizarre cars, digital cameras, and online resources, respectively. Although such major shifts were happening for at least one hundred years by now, the Theory of Disruptive Innovations was designed only in the late nineties by a prominent academic and business consultant Clayton Christensen. So, the main questions of my paper are how do disruptive innovations proceed and what are the factors causing the disruption? The existing literature provides a substantial critique of Christensen's theory and taken this into account. I propose that the disruptions usually succeed due to the random factors or the ones not directly connected to Disruption Theory and unfold favourably for incumbents irrespectively of their strategical choices.

Keywords: Theory of Disruptive Innovations; disruptive business; disruptive character of innovations

JEL Classification: M31, M13, O32, O33

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Literature Review

The Theory of Disruptive Innovations was designed only in the late nineties by a prominent academic and business consultant Clayton Christensen. Now, this popular management framework is used extensively in various industries both by the executives of small enterprises and multinational corporations. However, “despite the theory's widespread <...> appeal, its essential validity and generalizability have been seldom tested in the academic literature” (King & Baartartogtokh, 2015, p. 78).

The primary source I want to rely on in this paper is research conducted by Clayton Christensen. It has laid a foundation for the disruptive innovation theory, which, in a word, points out that “the technological changes that damage established companies are usually not radically new or [technological] difficult” (Christensen & Bower, 1995). According to Christensen, disruptive innovations (1) initially offer new performance attributes that are not valued by existing customers, (2) start from the low-performance and low-price sectors of the market and attract non-customers, and (3) improve performance attributes valued by existing customers “at such a rapid pace that [they] can later invade established markets” and displace incumbents (Christensen & Bower, 1995). The performance curve of the market is sustained,

and even the disruptors usually do not change it. So, there are low-demand, middle-demand, and high-demand customers, and incumbent companies are better off focusing on the most lucrative clients — high-demand ones. When new disruptive business emerges, incumbents often disregard it being too niche and end up losing the share. The plenty of examples of disruptive businesses, as Christensen writes, can be found in the technological industry and a hard disk sector particularly (Christensen & Bower, 1995). Telephony, online encyclopedia, transistors, and streaming are the disruptors as well — everything in this list has started as an inferior competitor with peculiar features but ended up triumphant; these technologies have already taken over their markets entirely or are in the process of doing so. However, despite the immense both theoretical and practical acceptance of the theory, there are some contesters of it.

In his study, professor of strategy and entrepreneurship in London Business school and one of the famous experts on strategy and innovation Constantinos Markides (2006) insists that although technological, business-model and new-to-the-world product innovations are rendered as one in disruptive innovations theory because of similarities, the distinction should be made since these three types of innovations

“produce different kinds of markets and have different managerial implications” (Markides, 2006, p.19). For example, unlike disruptive technological innovations, business-model ones do not necessarily grow to dominate the market and it is not an oversight of the managers that they do not accept them — they mostly do not make sense for established companies (Markides, 2006, p. 22). For example, “budget, no-frills flying as a way of business has grown phenomenally since 1995 but has captured no more than 20 per cent of the total market [by 2005]” (Markides, 2006, p. 21). Radical product innovations, in turn, are disruptive both for companies and for customers because (1) they “disturb prevailing consumer habits and behaviors in a major way” (Markides, 2006, p. 22), and (2) “the markets they create undermine the competences and complementary assets on which existing competitors have built their success” (Markides, 2006, p. 22). Furthermore, such innovations are not usually driven by demand but rather pushed by “those responsible for developing new technologies” (Markides, 2006, p. 22). Such disruptors, as Markides writes, frequently lose their share excessively developing the performance of a product and hence heightening its price. Thus, only technological enthusiasts and early adopters are pioneers’ clients, while incumbents come to the market later with good-enough and cheap-enough products appealing to the mass market. So, Markides provides insight that disruptive innovations may have similar trajectories but present different outcomes and inherent features.

Proceeding with the critique of Christensen and Raynor’s research, Andrew A. King and Baljir Baatartogtokh write that “the theory is so widely accepted that its predictive power is rarely questioned” (King & Baatartogtokh, 2015, p. 78). Thus, contrary to Christensen, “approximately one-third of incumbents were not displaced by new technology” (King & Baatartogtokh, 2015, p. 81) — “most managers respond effectively to potentially disruptive threats” (King & Baatartogtokh, 2015, p. 78). Furthermore, the incumbents can sometimes fail because of major foresight or other semi-random events, but not their technical inferiority; “A few early sales can initiate a feedback loop of network advantage that tips all customers to one supplier” (King & Baatartogtokh, 2015, p. 85). It was the case with Apple’s MacOS and Microsoft

DOS when the last one acquired IBM’s favour and was thought of as a system that customers would adopt. Also, the researchers describe the “gold rush” that takes place after the creation of new infrastructure and/or change of demographics that is to a certain extent similar to the process of disruptive product innovations that Markides describes. When the change in the market happens, “sometimes incumbents are simply outnumbered by the sheer quantity of new competitors. ... Because of their numbers ... new entrants [are] able to cover more ground in the aggregate. The laws of probability thus said that in most cases, new entrants would stake the best claims and be the biggest winners” (King & Baatartogtokh, 2015, p. 85). But it is not clear whether this conclusion is contradictory to the one of Markides. On the one hand, the outcomes of these two seemingly similar processes are different (victory of newcomers in the last case and incumbents in the former), but on the other, King and Baatartogtokh’s example of “gold rush” is not said to be disruptive for consumers and thus may be another type of innovation. However, the significant implication is present in both sources — the rate of innovations and the number of competitors are at their highest when novelty is introduced.

To sum up, the findings of C. Markides, A. King, and B. Baatartogtokh that complement the basic Theory of Disruptive Innovations and that are crucial for my research are (1) there is some randomness in the final power balance of competitors; (2) about a third of incumbents survive disruptions; (3) rate of innovations and quantity of competitors are at their highest when novelty is introduced.

Research Method

To investigate the plausibility of the disruption processes described in the literature, I decided to create an agent-oriented model in NetLogo 6.1.1. Besides the basic theory of Christensen, my model adopts the concepts of Markides, King and Baatartogtokh; namely, the disruptive character of innovations both for users and producers, and the decreasing rate of innovations after introduction.

To recreate the trajectory of technological development Christensen described in his papers, I’ve designed two breeds of turtles — *users* and *developers*.

The users usually have distributed demands or, in other words, *preferences* which increase by a certain per cent every tick if the market performance is on par with user preferences and decrease if the preferences greatly exceed the performance. The formula of preferences:

$$p_t = p_{t-1} * (a * (1+x) + (1-a)^2 * (1-x)),$$

where:

p_t — preference of user at tick t ;

a — dummy variable that shows whether the performance of the best product is greater than the preferences of the least demanding user

x — the share by which preferences change.

Then, there is a *budget* that is positively correlated with the preferences by 95% initially. To justify such a high correlation, I assume that the budget is mentally accounted for things users value; its computation goes as follows:

$$b_t = b_{t-1} * (1+x),$$

where:

b_t — a budget of the user at tick t ;

x — share by which budget of a user grows per tick

At last, users possess *conservatism* which represents how long they are bound to stay with the product they once chose. The developers, in turn, have one distinct variable — stamina, which is analogous to conservatism. Every user or developer is attached to a *product*.

Products are the patches that users and developers choose. They have cumulative funding — the sum of users' budgets on the patch is added to it every tick, but the salary for the developers is subtracted; if the product is unpopular with users or developers, its funding drops by a certain per cent every tick (this figure is five per cent in my model).

The equation for computation *funding* is:

$$F_t = F_{t-1} - a * \left(n_d * \bar{b} - \sum_{i=0}^{n_u} b_i \right) - (1-a)^2 * F_{t-1} * d,$$

where:

F_t — funding of product at tick t ;

n_d — number of developers on patch;

n_u — number of users on patch;

b — budget of the user;

\bar{b} — mean budget of users;

a — dummy variable that displays whether the product is popular among users and developers;

d — decrease-share of funding per tick.

Then, every product has *productivity* — the rate of developers' contribution towards the enhancement of the product's performance; the more performance exceeds average users' preferences, the smaller the productivity. This concept is retrieved from the observations of C. Markides I mentioned in the Literature Review. Like funding, the performance of a product degrades if the product is unpopular among users and developers. *Performance* equation is below:

$$P_t = P_{t-1} + n_d * e - a * o,$$

where:

P_t — performance of the product at tick t ;

n_d — number of developers on patch;

a — dummy variable that displays whether the product is popular among users and developers;

o — obsolescence rate (constant)

e — productivity rate of the patch.

To choose the product, users and developers calculate the utility functions of patches and pick the one with the highest output. The assumptions that are behind this formula are that (1) the users either benefit from the popularity of a product or value it more if it is popular among people; (2) users appreciate that developers support the product; (3) users do not like the lack or excess of performance.

The utility function of a user for product x :

$$U_x = \frac{P}{b} * (1+k_u) * (1+k_d) - (P-p)^2,$$

where:

U_x — the utility function of product x ;

P — performance of product x ;

b — budget of the user;

k_u — coefficient of product x popularity among users;

k_d — coefficient of product x popularity among developers;

p — preference of the user.

The utility function of a developer for product x :

$$U_x = F * (1+k_u),$$

where:

U_x — utility function of product x ;

F — funding of product x ;

k_u — coefficient of product x popularity among users

To simulate the disruption in my model, I create n developers and m users in an unpopular patch and increase developers' stamina to let them advance the product and not flee. Funding for a disruptor initially equals mean product funding. In ideal circumstances, the performance curve of my disruptors replicates the one described by A. Christensen, and they should eventually "invade established markets"; the productivity coefficients of the early lifecycle let them do it. There is also a feature of manual investment into the disruptor in the model.

Findings

The results of the simulation suggest that the success of disruptions depends greatly on the moment they happen. When the response-curves of users start to go down, the average share of attracted users appears to be greater than in the case of disruptions launched in a steady growth period. Thus, in the latter case, the chance of the product's survival decreases considerably, and even the additional investments or boosted productivity could not help it most of the time I launched the model. Rapid exponential fall of the response rates that happen after the long stagnation is not the best time for disruptions too, since, on such occasion, users usually quit the disrupting product even before the developers. At this stage, it is hard for new competitors to attract big enough funding and thus, new developers and gain performance.

Furthermore, according to my observations, the full-blown disruptions of major incumbents are extremely rare in given circumstances. Indeed, disruptors that were able to stay on the market poach the users of other products. Still, developers usually remain loyal to their patch due to accumulated funding and big userbase and sustain the product performance. The initial increased number of users in disruptor patch do not help attracting users of other demand-levels and developers from different patches as well. In my launches, even multiple disruptors introduced at the same time have not destroyed the incumbents

ever; they have been only making their share of the market smaller.

Another observation is that due to the feedback loops, from run to run predispositions of a market are different; sometimes the response rates are the highest for the most demanding customers, and sometimes middle-range or low-tier users are the most satisfied. Anyhow, in the vast majority of cases, disruptions cannot change the response trends — all indicators recover shortly after the appearance of a new competitor. Moreover, even multiple disruptors introduced at the same time make the response curves less stable, but do not change their trajectory (at least, the effect is not immediate).

Discussion

My findings are more in line with the research of A. King rather than the one of A. Christensen — the disruptions in the model are rare and do not deserve the attention of incumbents most of the time since the strategy has proven to be irrelevant in fighting them. Due to the incumbents' stability, and disruptors' comparatively small starter userbase, its low solvency, a small number of developers, and thus low attractiveness for new users, disruptors mostly either are self-eliminated or end up secondary to incumbents they were supposed to disrupt in my model.

A perceived "disruption" in the real world can happen due to the factors we do not see, and thus inherently conform the mechanisms completely different from the one of Disruptive Innovations Theory. As it is said in the A. King's study, "a majority of the 77 cases [of disruption] were found to include different motivating forces or displayed unpredicted outcomes. Among them were cases involving legacy costs, the effect of numerous competitors, changing economies of scale, and shifting social conditions" (King & Baatartogtokh, 2015, p. 79). This complexity can even be traced in my model, where some of these factors were at play. For example, sometimes the "disruptors" appeared right before the collapse of a popular product and merely inherited its userbase; sometimes a few unsatisfied users started the feedback loop leading to the product's growth, and sometimes a new disruptor indirectly helped the old one to gain userbase merely raising its comparative popularity coefficient.

Conclusions

So, the Theory of Disruptive Innovations may be a guiding light for some entrepreneurs, and the examples that conform to this framework may be found in abundance. Still, we cannot be sure that the survivorship bias is avoided in case studies of such a sort. The Theory of Disruptive Innovations can be regarded as a “good reminder of potential pitfalls <...> but in no way does it predict what most companies will do” (King & Baatartogtokh, 2015, p. 86). My model echoes these warnings and shows that even with all the conditions provided, successful disruptions are rare and happen mostly due to the random factors; even intensive investments or a big initial

userbase can sometimes do no good in such situations.

Future Scope

In future research, I plan to work closely with the concepts C. Markides introduced in his paper. The division of disruptive innovations by their managerial implications and adding a set of strategical responses for incumbents may add another layer of useful complexity to my model and thus can let me be more confident about the plausibility of the results.

Furthermore, in the future, I want to supplement this paper with the statistics on the frequency of disruptions in the model and provide the data on the statistical significance of my conclusions.

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Моделирование разрушительных инноваций

Леонид Харлов

Аннотация. Конные экипажи, кинокамеры и традиционная энциклопедия были свергнуты с «престола» некогда причудливыми автомобилями, цифровыми камерами и интернет-ресурсами. Хотя такие серьезные сдвиги происходят уже по меньшей мере сто лет, теория разрушительных инноваций была разработана только в конце 90-х годов видным ученым и бизнес-консультантом Клейтоном Кристенсеном. В статье представлены результаты поиска ответа на вопрос: как происходят разрушительные инновации и каковы факторы, вызывающие их разрушение? Существующая литература содержит основательную критику теории Кристенсена. Автор предполагает, что деструкция обычно достигает успеха благодаря случайным факторам или тем, которые непосредственно не связаны с теорией деструкции, и разворачиваются благоприятно для действующих лиц независимо от их стратегического выбора.

Ключевые слова: теория деструктивных инноваций; деструктивный бизнес; деструктивный характер инноваций

Analysis of the Influence of TNCs on the Economy of Developing Countries and Countries with Economies in Transition

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Abstract

Formation and expansion of TNCs, particularly in developing countries and countries with economies in transition, is primarily due to a complex network of international production and localisation activities on promising markets at the expense of foreign direct investments (FDI). These processes every year is increasingly becoming one of the key components of the global economy. Tasks of this paper are to describe the nature and content of the concept of “transnational corporation”, to identify critical factors and characteristics of the modern transnational business in developing countries, countries with economies in transition, and to consider the place and role of TNCs in developing countries and countries with economies in transition.

Keywords: TNC; FDI; globalisation; BRICS

JEL Classification: F14, F21, F23

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Introduction

There are many ways for the evaluation of the activities of TNCs — foreign direct investments (FDI), portfolio investment, direct contracts. With their help TNCs form, deepen and expand the system of international production and trade. To assess the extent of the TNCs international integration activities on each of these forms is often quite complicated, especially when it comes to the economy individual countries and sectors.

Currently, the perfect indicator of the TNCs trends development is foreign direct investments (FDI), which serve as the main international exchange of capital instrument. On FDI, there is a good data of systematic statistical material, sufficient to the TNCs participation evaluation in varying countries in international integration and globalisation processes, including their activities in various sectors.

In 2012, the world FDI inflows amounted to \$ 1351 billion, to the 2018 FDI inflows rose to \$1430 billion¹. Stormy TNCs activity in different

spheres of the world economy has meant that to date the TNCs control over 50 per cent of world production and more than 65 per cent of world trade, thereby forming more than 25 per cent of global GDP.

Russia and Brazil, who are members of BRICS, according to the UN methodology, are related to developing countries. Since the beginning of the 21st century, BRICS states reinforce their positions in the world economy. In 2012 these countries accounted for about 27.1 per cent of world GDP, to 2018 this proportion rose to 32.7 per cent².

However, there are several institutional issues which determine recessive TNCs development in Russia and Brazil. Remains far distance of Russian and Brazil TNCs from the world’s largest TNCs, headquartered in developed countries, which resulted in advanced manufacturing technology, financial resources shortage, inefficient management methods, absence of high level international

¹ UNCTAD. World Investment Report 2018. URL: https://unctad.org/en/PublicationsLibrary/wir2018_overview_ru.pdf (accessed: 20.04.2019).

² EconomicData.ru. Statistics: Brazil. URL: https://www.economicdata.ru/country.php?menu=america-country&cu_id=28&cu_ticker=BRA&country_show=economics (accessed: 20.04.2019).

territorial production diversification, high level of corruption and, in general, closed, and low economy transparency.

This raises the deeper analysis need for both the impact of TNCs on the economies of Russia and Brazil and, in turn, influence the economies of Russia and Brazil on the TNCs activities, which results in the relevance of the chosen research topic.

Literature Review

The degree of research topic scientific development: the founder of the international production theory, linkages between TNCs and direct investment is considered S. Hymer. In the following years, various aspects of the TNCs activities in international economic relations have made such economists as P. Buckley, J. Dunning, N. Behrman, R. Vernon, R. Grosse, C. Kindleberger, M. Casson, K. Kojima, S. Lall, J. McManus, T. Ozawa, M. Porter, etc.

The TNCs activities in the context of the overall capital transfers problems were characterised in the works of B. Olin, E. Heckscher, K. Iversen, R. Nurkse and other researchers based on which were prepared more specific publications on the TNCs activities, such researchers like E. Penrose, M. Posner, G. Hufbauer, R. Coase.

Problems of TNCs activities in different world regions and countries are covered in the works of such authors as A. S. Belousov, T. J. Belous, V. A. Vinogradov, N. P. Gusakov, R. I. Zimenkov, A. V. Kuznetsov, A. G. Movsesyan, E. P. Ostrovskaya, E. M. Romanova, G. P. Solus, L. N. Fedyakina, E. S. Hesin, Y. I. Yudanov, J. Humphrey, O. Memedovic, J. Sturgeon, and others.

In domestic literature, the TNCs functioning problems in developing countries and their international exchange of capital participation is reflected in the works of I. O. Abramova, O. T. Bogomolov, N. A. Volgina, S. Y. Glazyev, S. V. Zhukov, A. V. Kuznetsov, A. A. Movsesyan, V. A. Oreshkin, G. E. Roshchin, L. L. Fituni, B. A. Heifetz.

There also are studies conducted at UN, UNCTAD, the International Monetary Fund, the World Bank, the Central Bank of Russia and Brazil, Customs statistics of Russia and Brazil, Federal statistical service of Russia and Brazil, normative-legal acts regulating the TNCs activities in Russia and Brazil, international agencies data, press materials.

TNCs: Concept, Criteria for Attribution, Types

Nowadays, development in the international economy and international trade is increasingly defined by globalisation. Transnational corporations (TNCs) play a significant role in this process. They have several apparent advantages as compared to start-up companies and national enterprises: efficient use of material resources, labour force and timing budget; cost-cutting at the expense of scale economy; technology and capital flow from countries and sectors with higher unit costs to ones with lower unit costs. As a result, more efficient use of available resources and capital assets. According to the Heckscher-Ohlin theory of international trade, countries, and sectors where comparative labour content per unit of output is lower score an advantage [Regional economy, 2017]. Transnational corporations take advantage of the backdrop of the world market due to several reasons³:

The sophistication of market relations — increased competition on the national and international markets; creation of barriers to entry and exit (tariff barriers), increased the homogeneity of market relations; regulatory tightening of corporation' activity and the stakeholders' attention to the results of their activity

Creation and development of global value chains — diffusion of technological innovations, development of crowdfunding, innovative projects outsourcing, high-tech frames

Growth of economic, ecological, and social ties between countries and national economies, hence TNCs become the main trend-watchers of advanced technical, economic, and social projects

Trends in the conglomeration of national enterprises and economies in global value chains. Within this framework, international economic unions assume importance for they aim at liberalising and facilitating entrepreneurship on a cross-border scale. The main organisations are ASEAN, OPEC, SCO, APEC, EU, WTO

Level increase in the TNC's activities in the context of the sustainable development concept — an increase in corporation's transparency, the growth of investments in the 'green business', formalisation

³ Future of working. 7 Advantages and Disadvantages of Multinational Corporations. URL: <https://futureofworking.com/7-advantages-and-disadvantages-of-multinational-corporations/> (accessed: 20.04.2019).

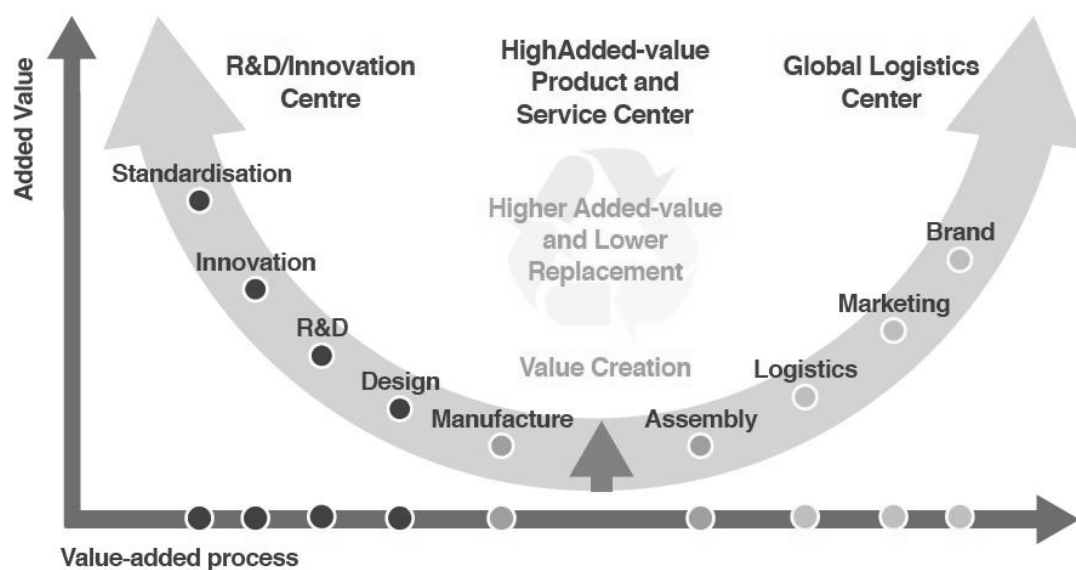


Fig. 1. GVCs circuit – “Smile Face”

Source: URL: <https://aftershock.news/?q=node%2F701564> (accessed: 20.04.2019).

sation of requirements for corporate and social responsibility, ecological consequences, and corporations’ integrated reporting, including these entering international commodity, currency and stock exchanges (NASDAQ, FTSE, LSE⁴).

The major goal of TNCs’ role in the global value chains is the creation of a unified system of the world economy through unifying fragmented enterprises within one general value chain. GVCs as one of the reasons for the business trans-nationalisation will be examined in the next part of the paper from the perspective of value-added groups of companies [Kukushkina, 2016]. Russian and Brazilian markets are attractive to foreign investors. However, internal barriers hamper the creation of the mentioned above chains. Thus, it is relevant to carry out a research on the TNCs on these markets, identify key problems and suggest ways of solution based on perspectives of foreign direct investments and state-private partnership and interaction with small and medium business in these countries [Shimko & Shimko, 2018].

Value added is the difference between the price of the product at different stages of its production. For instance, if taking the chain ‘raw materials–semi-finished goods–end product–goods for resale’, each next step adds a fixed interest to the product value. As a result, the value of a semi-finished good

becomes higher than the value of raw material, the value of an end product is higher than the value of a semi-finished good, and the value of a reprocessed and distributed product is accordingly higher than the value of an end product at the enterprise. It takes place due to labour costs (salaries), fuel and energy costs, general expenses of production, general administrative expenses, business expenses, i.e. key elements of the calculation provisions.

Figure 1 shows both backward and forward linkages. That said, the added value is created in both of them. However, export-oriented countries are more likely to undergo risks of global raw materials price fluctuations and more dependent on the import of technologies. Russia is one of the brightest examples of such countries: the budget is shaped owing to oil incomes, and home industry largely depends on the import of the so-called ‘high chemistry’. The transition from one development paradigm to another is always challenging for both the country and for the TNCs which represent the country on the world market.

This transition is also known under the name of the Dutch disease. In the middle of the 20th century, the Netherlands has discovered a new gas deposit; however, in 1972, the global energy market forced the country’s shift from catching-up development to outstripping development. Consequently, Amsterdam has become one of the cities, leading in the number of start-up companies per capita, i.e. it has shifted from forwarding linkages towards backward linkages [Stragis, 2019].

⁴ Blackwellpublishing. The Multinational Corporation. URL: http://www.blackwellpublishing.com/content/BPL/Images/Content_store/Sample_Chapter/0631233423/Gooderham_001.pdf (accessed: 20.04.2019).

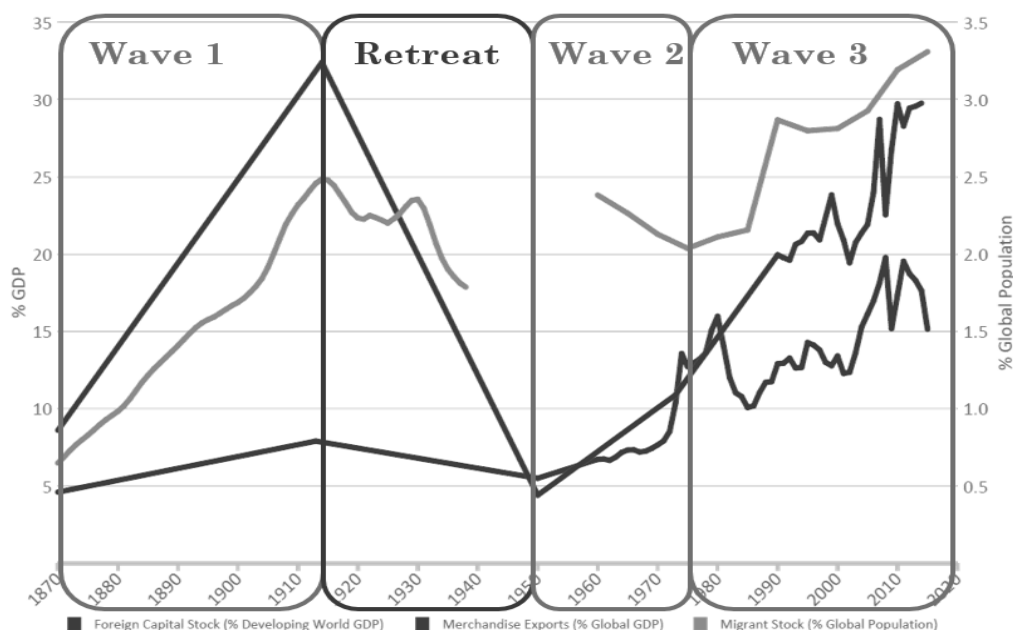


Fig. 2. Three waves of globalisation

Source: AGF Management Limited. Has technology become an enemy of globalisation? URL: <https://www.agf.com/ca/en/insights/market-commentaries/articles/article-has-technology-become-an-enemy-of-globalization.jsp> (accessed: 20.04.2019).

The TNCs' activity within the framework of the GVCs may exist in different forms: diversified business (often producing not interrelated goods, e.g. Virgin Group, BIC), segmented and highly segmented business (orientation towards specific products on a specific market for a limited number of consumers, e.g. BI Consult, Rolls-Royce), different forms of cooperation (sophisticated and expensive projects, including the creation of investment pools and financial-industrial groups, for example, NASA and Roscosmos or Space-X and Rocket and Space Corporation Energia). Diversified holding open joint-stock companies as a form of corporate relations dominate in international trade.

The increasing role of TNCs in the world economy is closely related to globalisation. Its nature is manifested in the confluence of material, intellectual, financial, labour (sometimes legal) streams across state borders and continents⁵. Historically, globalisation has been developing in several key stages.

It appeared as a separate notion for the first time in the 19th century in light of growing colonial trade (in the British Empire, France, German Empire, Spain, Portugal [Grechko, 2019]), thus world investment rates represented in Figure 2 are so high.

One can notice that the level of investments is even higher than the modern figures. It is possible due to the following mathematical paradox: ensuring high investment rates is easier within small figures than in an extensive system. Let us cite an example: doubling the sales growth from 2 mln roubles to 4 mln roubles is easier and faster than doubling it from 4 mln to 8 mln. At the same time, equal two mln sales growth in the shift from 2 to 8 gives a 100 per cent increase, whereas the shift from 100 to 102 gives only a 2 per cent increase, which is 50 times less. Thus, one can see in the figure that the slope of the curve between 1800 and 1860 is significantly greater than the analogous angle between 1960 and 2020, although the analysis period is the same. It will be more noticeable if we are to compose a correlation equation of capital increase at the end of the 19st century. The equation of linear regression shows that the Industrial Revolution, which took place at the end of the 19th century (depending on an industrial sector), greatly encouraged international trade with its peak at the beginning of the World War I⁶.

Starting in 1920 there was a break-neck fall in production which did not reach the pre-war level in many countries by 1939 (the first year of World

⁵ Boston Consulting Group. The power of diversified companies during crises. URL: http://image-src.bcg.com/Images/BCG_The_Power_of_Diversified_Companies_During_Crises_Jan_12_tcm27-106136.pdf (accessed: 20.04.2019).

⁶ LawBook.online. Definition and characteristics of a transnational Corporation. URL: <https://lawbook.online/pravo-torgovli-mejdunarodnoe/ponyatie-priznaki-transnatsionalnoy-15557.html> (accessed: 20.04.2019).

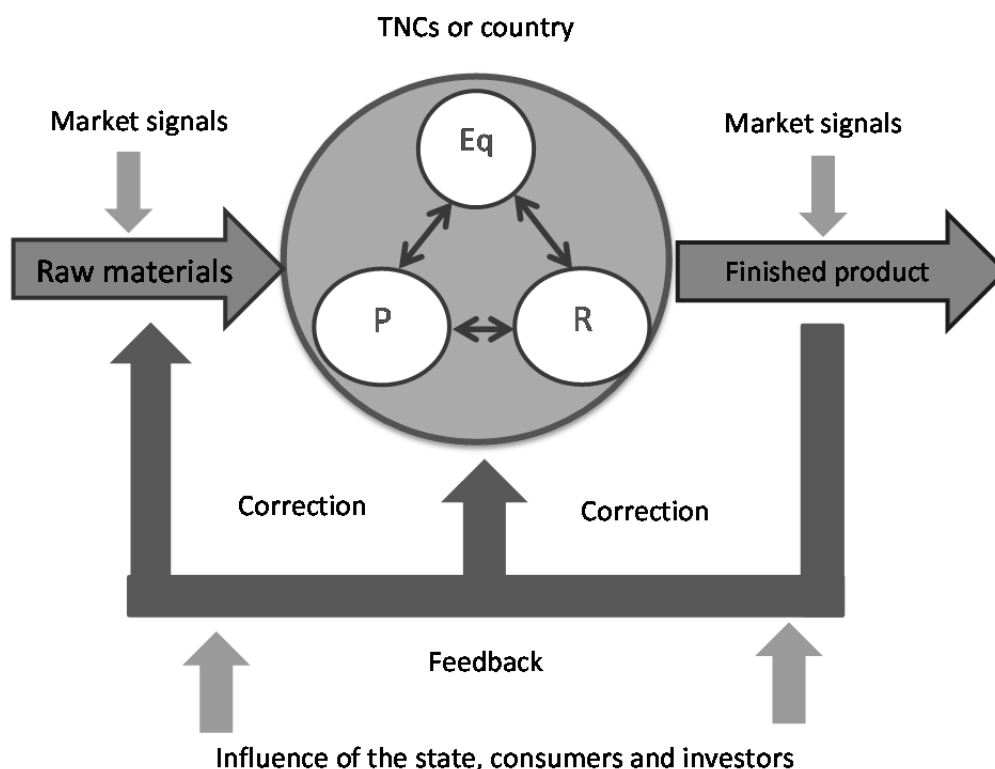


Fig. 3. Country/ TNC development scheme from the system perspective

Source: Compiled by the author.

War II). Further development since 1950 has been showing stable but not booming growth rate worldwide and in the TNCs' sales. It is largely due to the fact that world trade and TNCs as a sample of world trade in miniature are closed systems with communications as a feedback loop. In general terms, it can be developed, as shown in Fig. 3.

This figure allows us to make a statement that there is a direct positive relation between world investments, world GDP and global population. Also, it is natural because it is impossible to ensure investments growth in the context of population decline. It is where the system approach 'Human resources is key' applies, that is population growth increases the number of investors as well as the number of trading operations. Thus, business gains momentum, and so does the world GDP [Kuznetsova & Podbiralá, 2019].

However, this regression model has its limits. Following the UN concept of sustainable development, exponential population growth will constantly reduce the number of available resources per person under set production capacity. Consequently, the technological leap is a must, but it will not happen instantly rather after adequate changes in all the elements of the system (people, capital,

resources) are made. Hence, it is possible to predict that any further delay in the world GDP growth and investments and, vice versa, when the population growth reaches its peak, the technological leap will take place signifying a spiral transition to a new level of development according to Kondratiev long economic cycles [Kuznetsova & Podbiralá, 2019].

It is why it is necessary to develop both TNCs and stakeholders associated with them. It will let them make this 'leap'. A similar leap has been subject to implementation in Russia with the help of the national technological initiative (NTI) carried out the agency of strategic initiatives under the President of the Russian Federation⁷. However, efforts to implement the NTI are likely to be a response to external economic sanctions and attempts to reanimate the Russian industry predominantly based on the Soviet legacy. Thus, the attempts to implement nanotechnologies and modernisation have started in the 19170s in the Soviet Union. When analysing the media space of 2018, popular notions of modernisation and nanotechnologies will be barely present in the periodical press or academic papers

⁷ Agency for strategic initiatives. National technology initiative. URL: <https://asi.ru/nti/> (accessed: 20.04.2019).

in comparison to 2007, even though their implementation was planned for a 10–20-year period.

Nowadays, there is a whole variety of opinions on the notion of the TNC in both national and international literature. For example, E.A. Gryaznov argues that TNCs are an advanced organisation type in a multinational corporation which appears at the moment of critical accumulation of industrial, financial and intellectual assets which subsequently are redistributed among two or more countries [Petrova, 2019]. Let us cite an example, where a company possesses enough industrial assets in a particular country, and further territorial expansion is not economically rational. In this case, a multinational corporation (supposedly employing international staff) redistributes its assets by making investments into the building industry or the industrial production first in neighbouring countries and later in other continents⁸. The localisation of production in the People's Republic of China is able to make any enterprise transnational based on technicalities.

As for the legal approach to TNCs appearing in the works of Schmigof and Rakhman [World economy, 2019], TNCs are social, economic, and legal institutions featuring cross-shareholding within different jurisdictions. In such instance, referring a TNC to a competitive country happens at the place of share issue and registration, whereas local specialised registration companies conduct the process of registration. Holdings are a classic example of such a TNC. They are the most widespread organisational forms for both stock companies (Coca Cola) and family firms (IKEA). There are other examples of corporations of a similar legal type: concerns (Volkswagen, Gazprom), consortiums (General Electric, Siemens, Mitsubishi Electric), syndicates (BBC Radio International, Farmers Group Inc.) and trusts (International Nickel Company of Canada — INCO, Unilever [Shimko, 2019]).

The UN, namely, the UNCTAD, gave the classic definition of TNC (although non-official). According to the definition, TNC features the following:

Includes units in two and more countries irrespective of legal forms and business areas

Functions within the framework of decision-making system, which allows conducting an agreed

policy and carrying out a shared strategy by one directing centre or more

Contains separate units which can have a significant influence on the other's function, in particular, share knowledge, resources, and responsibility with others⁹.

In the 21st century, the UN has corrected the definition by specifying that the minimal 10 per cent threshold for controlling the company's share in the controlled companies' authorised capital. The classic definition of TNC is considered to be relevant for the research and corresponding to the graduation thesis' specificity.

Having analysed Russian and foreign works on international trade and relations between corporate forms of ownership, we can point out several key features in the TNCs' functioning which can be divided into two groups: quantitative and qualitative [Contemporary international, 2019]. Quantitative features can be found and calculated in the corporation's financial, statistical, and administrative reports [Zubenko et al., 2019]. Qualitative features are defined by expert evaluation. The major features characterising the TNCs' activity are provided in Table 1.

According to the Federal Act, there is several criteria which define corporations as TNCs in Russia. Besides, there is a precise definition of a multinational (transnational) corporation. There are special administrative districts, where TNCs' activity is referred to as the place of their localisation (the Isle Russkii, Kaliningrad Oblast). In concordance with the Federal Act 292-FZ as of August 3, 2018, the notion 'personal law of the legal entity' was clarified in paragraph 3 of the article 1202 of the Civil Code of the Russian Federation¹⁰. It was specified that the personal law of the legal entity is the right of a country where the legal entity was established unless contrary to provisions of applicable law and the Federal International Companies Act 290-FZ as of August 3, 2018¹¹.

⁹ UN. Convention agreements. International development strategy for the third United Nations development Decade. URL: https://www.un.org/ru/documents/decl_conv/conventions/dev_strategy_ch3ae.shtml (accessed: 20.04.2019).

¹⁰ The Federal law "On modification of article 1202 of part three of the Civil code of the Russian Federation" of 03.08.2018 No. 292-FZ (last edition). URL: http://www.consultant.ru/document/cons_doc_LAW_304046/ (accessed: 20.04.2019).

¹¹ The Federal law "On international companies" dated 03.08.2018 No. 290-FZ (latest version). URL: http://www.consultant.ru/document/cons_doc_LAW_304052/ (accessed: 20.04.2019).

⁸ Boston Consulting Group. Tomorrow Never Dies: The Art of Staying on Top. URL: <https://www.bcg.com/ru-ru/publications/2015/growth-innovation-tomorrow-never-dies-art-of-staying-on-top.aspx> (accessed: 20.04.2019).

Table 1
Criteria for a company to be qualified as a TNC

Criterion	The value of the criterion
Quantitative features	
Profit margin	More than \$ 1 bln
Revenue	More than \$ 10 bln
Number of employees	10 thousand people
Number of nationalities in the staff	More than 2
The number of countries of localisation	At least 2
Number of subsidiaries, branches, and representative offices with production capacity	At least 3
The share of foreign capital in the turnover of the corporation	Not less than 25 per cent
Share in the authorised capital of subsidiaries and affiliates abroad	Not less than 10 per cent
Information Technology	Not less than 25 per cent
Qualitative features	
Positions in key markets and degree of influence on consumers	Leading
Degree of influence on stakeholders	High
Decision making system	Centralised
Organisational structure of management	Vertically integrated
Level of control of regulatory factors	1. International Business Standards Organization (priority) 2. National business standards
Degree of activity restrictions: by national authorities and international organisations	1. National – depending on the policy of protectionism 2. Supported in the framework of globalisation and GVCs
Level of fame in the media	Frequent mention (news)
Number of subscribers in social networks (Twitter, Instagram, Facebook, etc.)	Not less than 1 mln

Source: Compiled by the author based on [Nikitochkina & Makarova, 2014].

In turn, this law defines the legal status of business companies with the status of an international company registered in the Unified State Register of Legal Entities (USRLE) due to a change in personal law in the procedure for replacing a legal address from one jurisdiction to another while maintaining organisational and legal status and corporate structure (re-domiciliation), the rights and responsibilities of shareholders, the characteristics of their activities, and also in connection with the reorganisation or liquidation¹².

¹² The Federal law “On state registration of legal entities and individual entrepreneurs” of 08.08.2001 No. 129-FZ (latest version). URL: http://www.consultant.ru/document/cons_doc_LAW_32881/ (accessed: 20.04.2019).

Thus, according to the wording of the law, an international company is a foreign legal entity, a commercial, a corporate organisation that has changed its law under the established legislative procedure.

Conditions of obtaining the status of an international company are as follows:

Belonging to a FATF (Financial Action Task Force on Money Laundering) member state or an observer state or a Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism – MONEYVAL member

Conducting business on the territory of several states including Russia

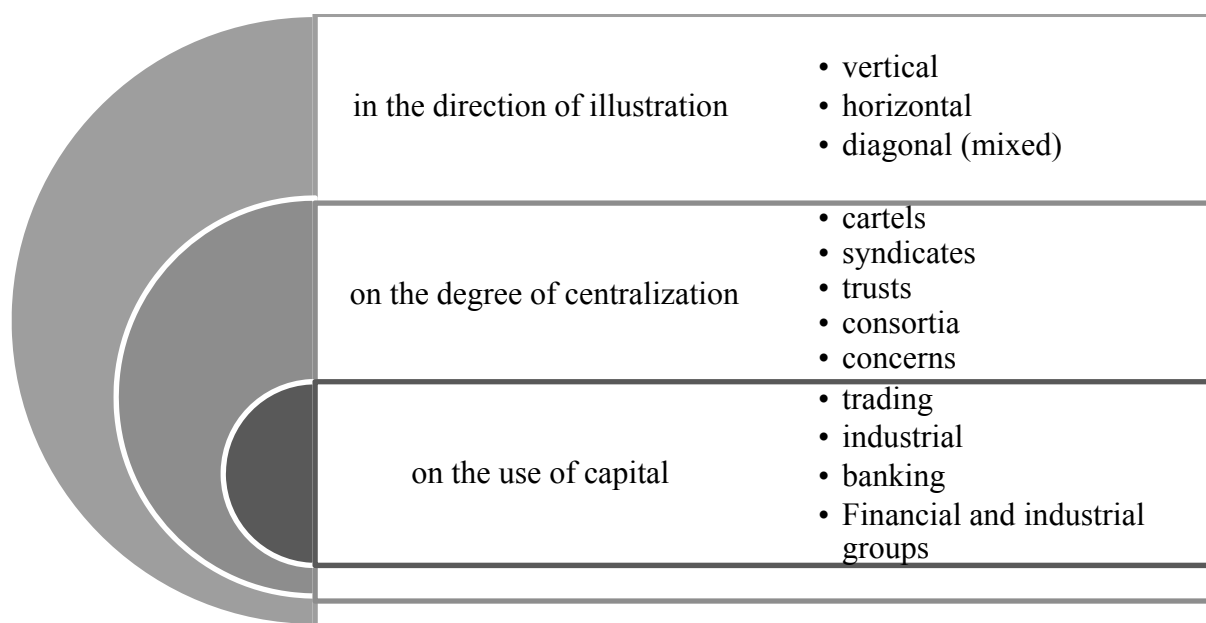


Fig. 4. Types of TNCs (compiled by the author)

Source: Britannica. Multinational corporation. URL: <https://www.britannica.com/topic/multinational-corporation> (accessed: 20.04.2019).

Investment commitments on the territory of the Russian Federation, with a minimum investment of 50 million roubles for a period of at least six months from the date of state registration of the international company

The abbreviated company name of the international company in Russian should contain the full or abbreviated name of the international company and the abbreviation 'MK', and the abbreviation 'MKPAO' for public joint-stock companies.

The new law also regulates: the results of changes in personal law by foreign legal entities; features of state registration in the status of international companies and the acquisition of this public status by joint-stock companies; regulations on securities and other financial instruments; features of the registration of rights to shares; the procedure for termination of status without changing personal law, or changing personal law when changing jurisdiction.

The features considered, of course, are not strictly regulated; as a rule, the classification of a corporation as a TNC is carried out according to compliance with a larger number of features from the above. Most often, a corporation is a transnational corporation, but it does not necessarily strictly comply with all the chosen criteria. The degree of compliance often depends on the organisational and legal form and the segment of activity. That is, it can be said that a TNC is 'more or less' transnational, depending on its type. For a better

understanding of the nature of the types of corporations, let us characterise them in Fig. 4 below.

According to the data from this figure, one can conclude that different types of TNCs react differently to the level of trans-nationalisation and are more oriented towards it [Glosecki, 2017]. For example, vertically integrated corporations are more trans-nationalised than horizontal ones due to the peculiarities of the distribution of raw materials and end products. As for the degree of concentration, for example, trusts are less inclined to form transnational structures, due to the more rigid subordination of corporate units of the controlling company, which may conflict with the need for diversification within the framework of a corporate, divisional structure. In general, TNCs at a high level of their development are inclined to give more freedom to their divisions, while observing a common corporate business policy of development strategy¹³. It is especially evident in new business forms like franchising, outsourcing, outstaffing and the allocation of corporate, investment and venture funds for the implementation of priority and innovative projects. Let us consider the key features of the business trans-nationalisation under current conditions.

¹³ Boston Consulting Group. Measuring and managing corporate vitality. URL: <https://www.bcg.com/ru-ru/publications/2017/strategy-strategic-planning-measuring-managing-corporate-vitality.aspx> (accessed: 20.04.2019).

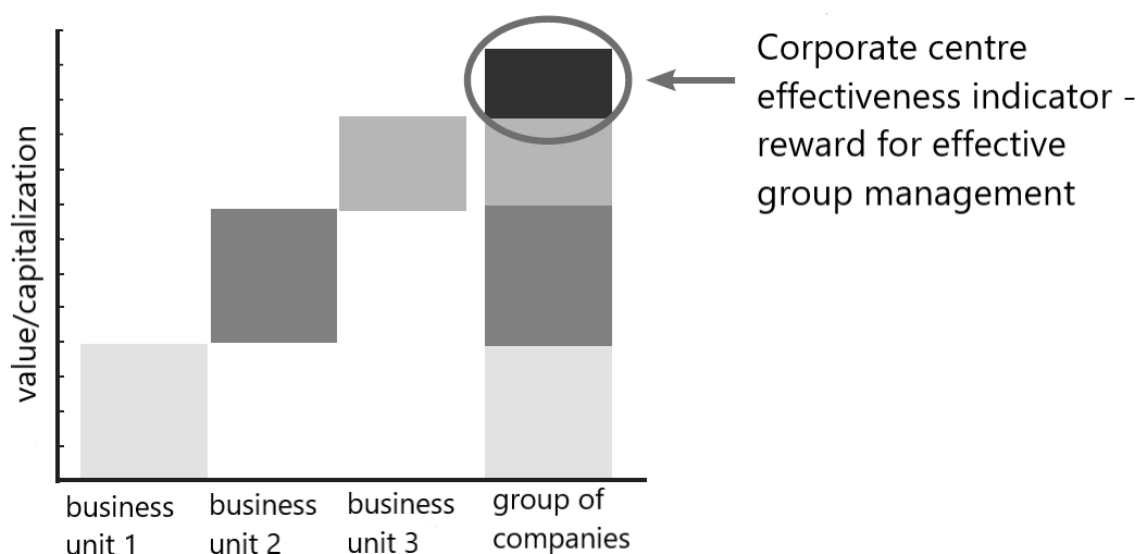


Fig. 5. Synergy effect of the TNC's activity in comparison to other business units' activity

Source: [Leikin, 2017].

Trans-Nationalisation as a New Stage in the Evolution of Emerging Countries

The effect of global value chains lies in the synergy effect due to which the value of a group of companies becomes greater than each of its divisions separately. Similar processes take place when functions are combined but in the opposite direction. In the global value chain, maintenance costs, functions combined into a unified system, on the contrary, decrease (Fig. 5).

It implies an important conclusion: the efficiency of TNCs depends on whether it brings additional income from the joint implementation of business projects or not. Should the answer be negative, the creation of GVCs, and therefore, the creation of TNCs in general, is not rational. In this regard, the efficiency of the corporation can be conditionally evaluated with Formula 1:

$$E = GC - BU, \quad (1)$$

where:

E — stands for the effect of the TNC's activity

GC — means the value of the group of companies

BU — is the total value of the company's business units.

The E value must be above zero, and it defines the criterion of economic efficiency of the TNC's creation and functionality within the GVC¹⁴. Simi-

larly, the profit of TNC's administrative functions performance is calculated; however, in this case, the result must be below zero.

Let us explain it in detail: TNC products go through several stages from creating a business idea to bringing it to world markets. These are research and development, experimental development, testing (especially important for medical treatments that are subject to many stages of clinical research), pilot production, small batch production, large batch production, market seizure and IPO expansion (as the final stage of recognition of the corporation's success on the market). All the above-listed stages require investments that are significant and riskier at the initial stages (venture capital financing) and less risky at the later stages (mezzanine financing [Krasnostanova, 2014]). The main stages of the investment project life cycle, including entering new markets, are presented in Fig. 6.

Figure 6 shows that the largest share of investment comes at an early stage of the project and its payback depends on how quickly we can bring products to new emerging markets [Gorbatkow et al., 2014]. International relations imply the outsourcing of a significant part of the research functions to small and medium-sized innovative companies that are affiliated with the controlling company. In this case, the greatest effect is achieved with the advanced processing of raw materials and resources. It is confirmed by the following factors: the price of chemical synthesis products (PVC, PET) is significantly higher than the price of petroleum

¹⁴ World.Lib. Development and interaction of domestic and international law in the context of globalization. URL: http://world.lib.ru/o/orlowskij_a/tnk.shtml (accessed: 20.04.2019).

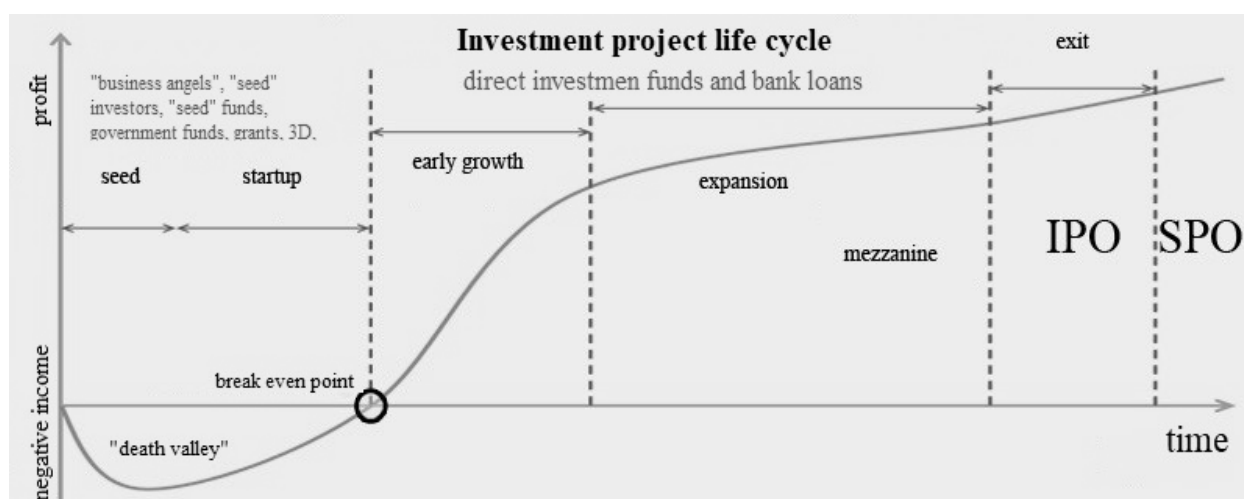


Fig. 6. Investment project life cycle when entering a new market

Source: IT-management, project management, cloud technologies, software development. URL: <https://dteplyakov.blogspot.com/2011/11/it.html> (accessed: 20.04.2019).

products from which they are produced. Hence, the dependence is obvious. The greater the amount of processing, the higher the economic rent (income derived from value-added). The value of this economic rent determines the level of competition on the relevant market and the number of companies on this market. The conclusion is that the economic rent, created in the value chain, under otherwise equal conditions is higher than the mining rent, derived from the simple extraction of resources (Fig. 7).

As can be seen from Fig. 7, when the flows are ascending, the main part of the value-added is formed outside the country. In contrast, when they are descending, most of the value-added, and, consequently, state revenues, is formed within the country, because foreign corporations localise their production in the country with the best investment attractiveness, credit regime, political and administrative conditions, socio-economic climate, which are components of sustainable development. At the same time, not all the industries are in the same conditions, for example, the presence of foreign oil-producing and refining companies in Russia (not considering their beneficiaries) is minimal (for example, foreign companies in the Russian Federation). And in the pharmaceuticals industry, it is the opposite (Teva, Abbott, Sanofi, etc. [Miloslavskaya, 2014]).

As a rule, countries do not use any particular type of international integration for a long time due to changes in the external economic and foreign policy situations. Therefore, there can simultaneously be present foreign TNCs and the support of national producers in the same country (Russia

and Brazil are not an exception [Catmull & Wallace, 2016). A substantial imbalance in one direction or another is fraught with economic problems for the country; however, there are significant differences between these forms, so the governments have to manoeuvre between the interests of national producers and possible tax revenues from the presence of international TNCs in their countries. A classic example of such a bias is offshore zones (the Seychelles, Cyprus, Belize), where full priority is given to foreign TNCs due to a minimum and zero tax liabilities. An example of bias in the opposite direction can be nationalised economies (North Korea), which does not allow foreign corporations to enter their markets. Therefore, it is necessary to clarify the fundamental differences between these two forms of international integration (Table 2).

GVCs are a direct means of globalisation, that is, the active transfer of technologies, human resources, information from one region to another. This process, like the first corporations, began in the era of colonialism — the active invasion of European countries into the territories of South America, Africa, and Asia. One of the first world corporations is the East India Company (Dutch corporation), which specialised in the import of spices from India and neighbouring countries¹⁵. Precisely at that moment, both the corporate form of ownership and shares (the rights for the ownership) appeared. Throughout the years of development, corporations had transformed into transnational during the third wave of

¹⁵ Diletant. Honorable East India Company. URL: <https://diletant.media/articles/36355214/> (accessed: 20.04.2019).

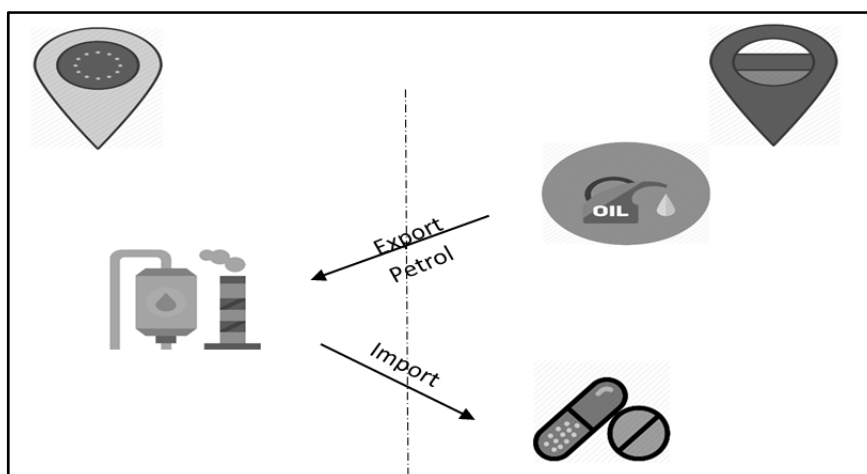


Fig. 7. The process of creating (or forming) value-added in export-import operations

Source: Compiled by the author.

globalisation, when they acquired the main modern features that we know now [Muravyov, 2014].

In general terms, a corporation is a legal entity whose property is distributed among several other legal entities and which manages one or several types of activity¹⁶. Accordingly, we can say that the concept of a corporation is included in the concept of a legal entity. According to the Civil Code of the Russian Federation, Article 48, 'a legal entity is an organisation that has separate property and is liable for its obligations, can acquire and exercise civil rights on its own behalf and bear civil obligations, be a plaintiff and a defendant in court'¹⁷.

However, 'legal entity' is a broader concept than the concept of a corporation. In turn, the notion of the joint-stock company as the main form of the corporation's activities in the world economy is an even narrower concept. Therefore, it is necessary to differentiate between these terms. In the Russian Federation, a corporation is an entity that has some specific characteristics¹⁸:

A legal entity must be registered in the Unified State Register of Legal Entities (Unified State Register) and have TIN, KPP, OGRN codes

'In accordance with the paragraph 1 of the article 65 of the Civil Code of the Russian Federation, corporate legal entities (corporations) are legal entities, where their founders (participants) have the right of participation (membership) in them and form their supreme body. In contrast to corporations, legal entities whose founders do not become their participants and do not acquire membership rights in them are called unitary'

The System of National Accounts 2008 (SNA 2008) provides an extensive definition of a corporation, and the term 'corporation' is used in a wider sense than in a strictly legal¹⁹. These are all units that:

May gain profits or other financial benefits for their owners

Are recognised by law as legal entities separate from their owners who have limited obligations

Are established to participate in market production and are considered in the SNA as corporations, regardless of how they can characterise themselves and call themselves.

If a corporation is localised in one country and carries out its activity in other countries (including branches, representative offices), then the corporation can be classified as international or, in other words, transnational. TNC is a corporation that uses its capital in carrying out its activities on international markets. In this interpretation, the country of localisation and the availability of production space abroad pale into insignificance, whereas both financial and intellectual capitals

¹⁶ The Peoples' Friendship University of Russia. Legal regulation of the status of transnational corporations. URL: http://web-local.rudn.ru/web-local/prep/rj/files.php?f=pf_333e84b2af05ff43d415e840973d2a21 (accessed: 20.04.2019).

¹⁷ "The civil code of the Russian Federation" of 30.11.1994 No. 51-FZ (edition of 03.08.2018) (with changes and additions). URL: http://www.consultant.ru/document/cons_doc_LAW_5142 (accessed: 20.04.2019).

¹⁸ OK 028–2012. All-Russian classifier of organizational and legal forms (app. Order Rosstandart of 16.10.2012 No. 505-St) (issued 24.10.2018) (together with the "Notes to position OKOPF»). URL: http://www.consultant.ru/document/cons_doc_LAW_139192 (accessed: 20.04.2019).

¹⁹ UN. System of national accounts 2008. URL: <https://unstats.un.org/unsd/nationalaccount/docs/SNA2008Russian.pdf> (accessed: 20.04.2019).

Table 2
Comparative characteristics of approaches to the business internationalisation

Characterised position	TNC localisation	Development of national producers
Economic effect	<ul style="list-style-type: none"> – an increase in tax revenues – the transfer of foreign technologies to the country of localisation – training employees in the sphere of advanced technologies 	<ul style="list-style-type: none"> – the creation of a full value-added a chain and, therefore, added income within the country – an increase in competitiveness of national business – development of national technologies and national markets
Hazard rates	<ul style="list-style-type: none"> – access to the socially significant industries (health care, military-industrial system, education) 	<ul style="list-style-type: none"> – excessive protectionism can create a prerequisite for a dishonest competition (competition of weak producers who will not strive for improving their businesses) – Artificial support of non-competitive enterprises only on the basis of their national belonging
Social effect	<ul style="list-style-type: none"> – creation of new jobs, charity initiatives – environmental protection and community support 	<ul style="list-style-type: none"> – maintaining employment in mono cities – creation of the possibility of job retraining in special economic zones
Technological trans	<ul style="list-style-type: none"> Import of specialists and equipment with the subsequent possibility of their employment at a national enterprise 	<ul style="list-style-type: none"> – the accent placed on technologies included ones in the priority list, supported by the government – the possibility of a farsighted and trend-watching in line with global trends (transferring the experience of advanced foreign countries onto the ‘Russian soil’, taking into account its socio-economic peculiarities)
The time is given for the entry	<ul style="list-style-type: none"> Limited by administrative barriers, internal economic sanctions, and customs quotas 	<ul style="list-style-type: none"> Limited by the duration and timing of the implementation of state programs for the development of industries and territories

Source: Compiled by the author based on [Miloslavskaya, 2014].

take the lead in cross-border operations. Stemming from this, in addition to the characteristics that are mandatory for any corporation, some additional features of TNCs can be distinguished [Ponomareva, 2014]:

Involvement of international capital and foreign exchange transactions. That being said, the binding of capital to any state and nationality is not a priority. The priority is only the country of the jurisdiction where active operations involve this capital.

In the era of the development of digital technologies in the economy, and digital marketing in the field of online services, the financial and intellectual nature of business becomes the leader as concerns profits. Therefore, we can see the trend of the gradual transformation of a classic industrial corporation with factories

around the world into a virtual corporation. The core of the business is online business operations. To a certain extent, this complicates the process of determining the nationality of TNCs, which is why according to the international law, TNCs pay taxes at the place of localisation of the headquarters. In particular, it leads to the emergence of an offshore zone, where the main income is based on the resources provided by the TNC for its development.

Another important problem of TNCs is the complex, branched, and often closed structure of final beneficiaries. This problem is also indicative of national corporations, but its scale became this large for the first time precisely on the international scene. In this regard, the results of the activities of international commercial organisations are worth mentioning: Transparency International regularly

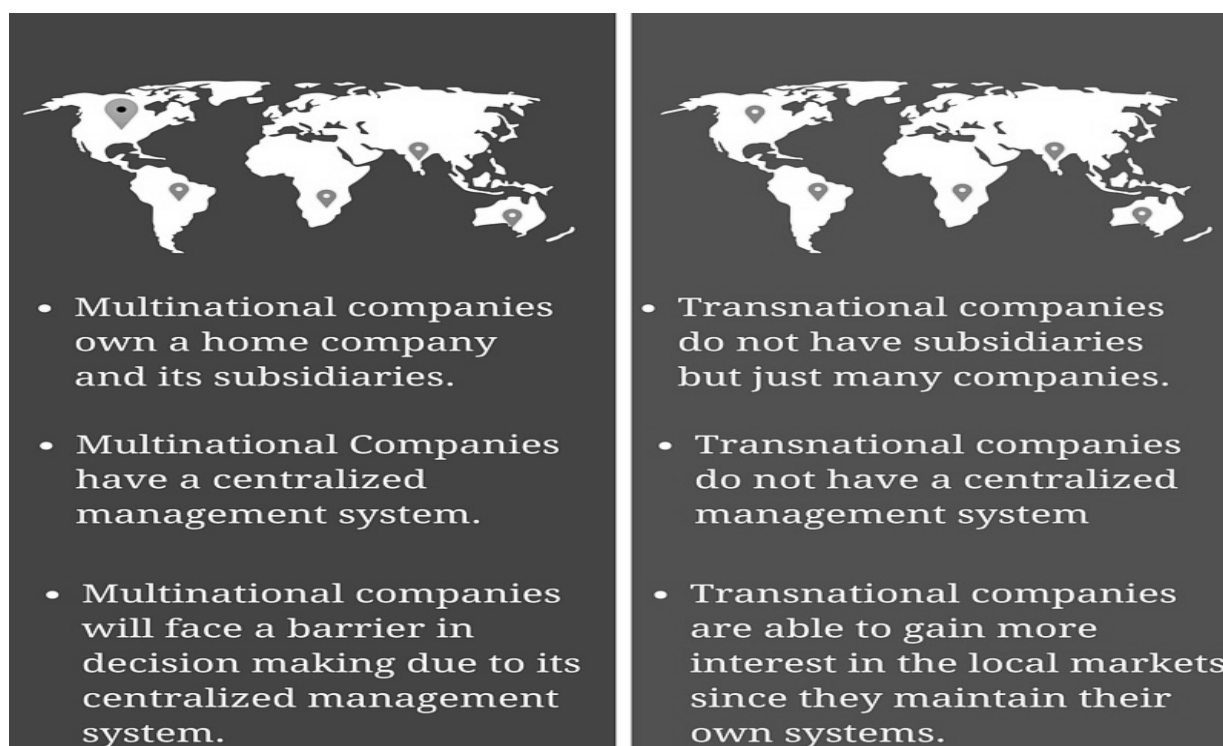


Fig. 8. Differences between MNCs and TNCs

Source: Redsearch. Multinational corporations meaning. URL: https://redsearch.org/images/p/multinational_corporations_meaning (accessed: 20.04.2019).

publishes reports on the transparency level in international corporations²⁰.

Some researchers note that working for the benefit of the international community, including international staff is a very distinctive feature of TNCs, as opposed to national companies working for the benefit of a separate state or an individual nation. In this regard, it should be mentioned that TNCs are much closer in adopting the philosophy of sustainable development than individual enterprises or national corporations; hence, TNC is a corporation working for the good of the world. In most cases, TNCs appear under conditions of a critical concentration of capital on the national market, and therefore, in search of a sales market, national corporations switch to other countries' markets and thus, become transnational.

It is interesting to note that in the international legislation (as in the Russian norms) there is no normatively approved definition of TNCs (laws are limited to the definition of 'corporation'). It happens since, unlike national corporations, TNCs

can change their location and relatively they can change their national identity [Tekutiev, 2017]. It means that if a country's, for example, the level of taxation does not suit TNCs, international norms allow them to change its jurisdiction. That is why, for the purposes of further research, if this does not create contradictions, we will identify the concepts of a corporation and a TNC (as well as their features). Features of a corporation as a more aggregated concept comply with the ones of TNCs; however, the international business community identifies several specific criteria by which MNCs can be distinguished from TNCs. These differences are presented in Fig. 8.

Another vital feature of TNCs is the presence of developed divisional organisational structures, which is due to their inclinations towards working on the markets of various countries and continents [Fomina, 2016]. For example, if a company from France plans to develop in Hong Kong, sooner or later, it will need to improve its organisational structure (usually linear-functional) into a divisional one (see the Fig. 9).

In addition to this, TNCs are well adapted for organisation matrixes. The experience of the Pixar and Google shows that the opportunities of distributed management in TNCs are higher, which makes it

²⁰ Transparency International. Transparency of corporate reporting. URL: <https://transparency.org.ru/research/v-rossii/prozrachnost-korporativnoy-otchetnosti-transperensi-ot-senila-prozrachnost-krupneyshikh-rossiyskikh-kompaniy-na-2-6-iz-10.html> (accessed: 20.04.2019).

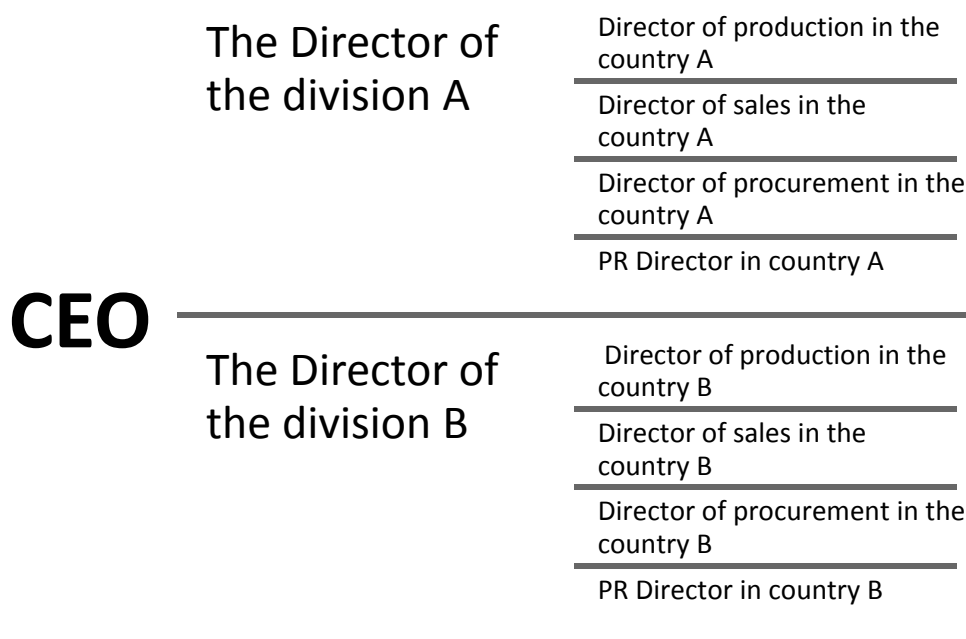


Fig. 9. Company's organisational structure

Source: Compiled by the author based on [Romachkin, 2016].

possible to effectively implement the ideas of “creative management”, “offices without superiors” and “brainstorming”. At the same time, the risks of TNCs' activities are also higher than natural risks. Apart from organisational risks associated with managing a complex organisational structure, there are some other risks which are very representative of TNCs. These are financial risks associated with changes in the global currency picture, production risks associated with a huge number of suppliers, contractors and customers, personnel risks associated with different levels of education, income, cultural development, administrative risks associated with the different investment climate and conditions of business management, environmental, etc. In the following, we will examine specific examples of TNCs in developed and developing countries²¹.

Place and Role of TNCs in the Economies of Developing Countries and Countries with Economies in Transition

Currently, there is no single approach to the division of countries into underdeveloped countries, developing and developed ones. There are more common approaches of the UN, World Bank, WTO to ranking countries and territories. Although the current stages of development of TNCs are char-

acterised by globalisation, and the flow of capital from one area to another, (which in theory should level the gap between countries) and the development of national economies is still uneven. For many reasons, because of the policy of protectionism, many because of the different levels of natural resources (as the main factor of economic growth).

At present, countries are graded by level of development mainly on economic grounds: level of consumption, level of per capita income, potential and real GDP. However, there are no clear boundaries between one and another level. It is largely because the level of development of the country is something more than just its economy. For example, the presence of a large number of natural resources, but the concentration of them in the hands of a narrow stratum of the population does not make the country truly developed. However, the indicators of economic activity will be at a high level. It shows the imperfection of using only economic values, especially averages. In this regard, social and environmental factors are of special importance. That is why currently popular indicators such as the human capital development index, the quality of life index, happiness index, characterising the non-financial aspects of life in the country.

In general, this classification dates back to the era of colonialism, according to which the dominions belonging to the developed countries, the co-

²¹ UN. Transnational corporation and export competitiveness. URL: <https://www.un.org/ru/development/surveys/docs/investments2002.pdf> (accessed: 20.04.2019).

Table 3

Classification of countries by level of development for 2019 (compiled by the author)

Organisation	Country
Developed countries	
United Nations Organization	New Zealand, Singapore, Hong Kong SAR (China)
International Monetary Fund	New Zealand, Singapore, Hong Kong SAR (China)
World Bank	New Zealand, Singapore, Hong Kong SAR (China)
Developing countries	
United Nations Organization	India, Brazil, Israel
International Monetary Fund	Russia, Turkey, Armenia
World Bank	China, Republic of South Africa, Malaysia
Underdeveloped countries	
United Nations Organization	Congo (Dem. Rep), Somalia, Eritrea
International Monetary Fund	Congo (Dem. Rep), Somalia, Eritrea
World Bank	Congo (Dem. Rep), Somalia, Eritrea

Source: International Monetary Fund. World Economic Outlook. URL: <https://www.imf.org/en/Publications/WEO> (accessed: 20.04.2019). The World Bank. World Bank Country and Lending Groups. URL: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519#High_income (accessed: 20.04.2019).

lonial countries count as the developing countries, and the countries not involved in either of these classes — belongs to underdeveloped countries. However, we believe that a correct classification in current conditions should be based on the degree of raw material processing in the ascending and descending flows of the global value chain. In this regard, we can say with confidence that economies in underdeveloped countries are based on the use of agriculture (agricultural countries), developing countries of the lowest type, for example — on the use of natural resources, developing countries of the highest type — on the processing of the natural resources, the most developed countries are based on the use of IT technologies. Let us consider the main approaches to the classification of countries, which are presented in Table 3.

The division of countries, according to the level of development, is carried out in different international organisations on a territorial basis as well²². It is due, firstly, to the historical features of the activities of these organisations, secondly, the influence degree of the countries in an international organisation and thirdly, the line of activities of

international organisations (whether it is more focused on Asia, Europe or America)²³. However, regardless of the classification, the level of development as a whole is determined by economic factors: the classification of countries into a group usually affects their investment and credit rating (countries also have credit ratings as companies). The level of development of the country is also determined by the presence of TNCs, by the level of foreign direct investment in the economy, and by the degree of trans-nationalisation of national economies compared to competitors as well as. The main criteria based on which countries belong to a particular group include the following:

Economic: the level of taxation, administrative barriers, the indicator characterising the system of national accounts (GDP per capita, GNP, IRR, national saving etc.), the level of national investment (including direct), the consumer purchasing power, the inflation rate, the availability and accessibility of natural resources, a developed system of the service industry, the unemployment rate and labour market regulation, the level of development of the banking sector and the

²² Central Intelligence Agency. The world factbook. URL: <https://www.cia.gov/library/publications/the-world-factbook/appendix/appendix-b.html> (accessed: 20.04.2019).

²³ UN. Standard Country or Area Codes for Statistical Use. URL: <https://unstats.un.org/unsd/methodology/m49/> (accessed: 20.04.2019).

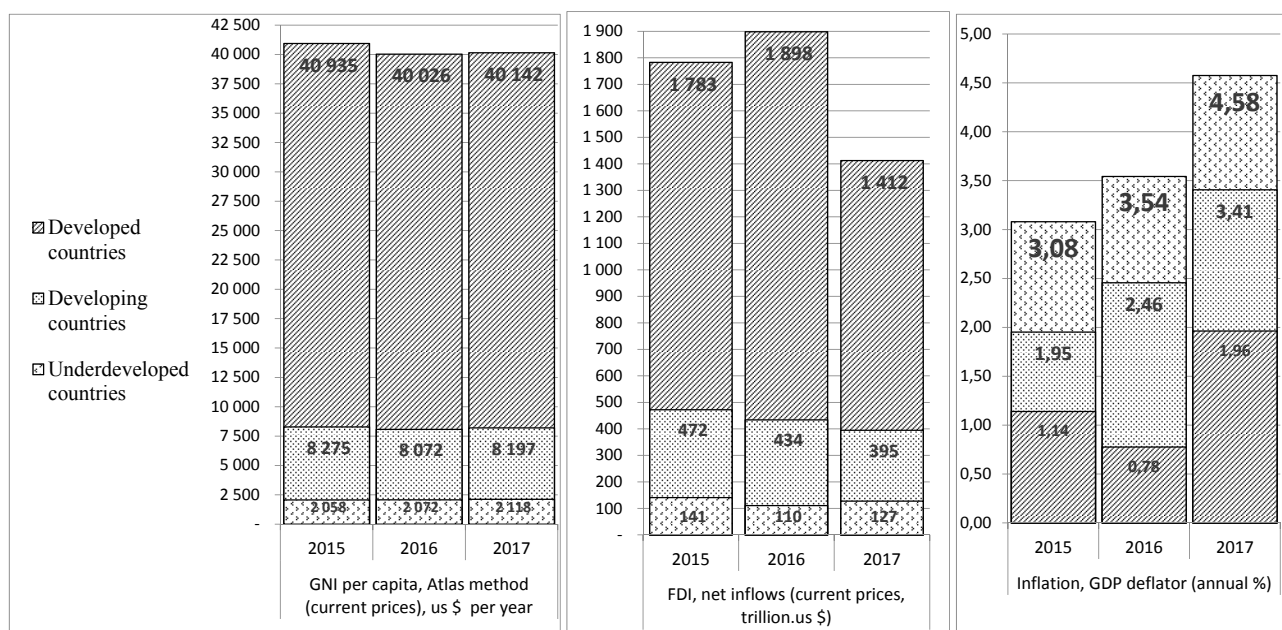


Fig. 10. Comparative characteristics of TNC activity on economic aspects of activity (2015–2017)

Source: Compiled by the author based on The World Bank. DataBank. URL: <https://databank.worldbank.org> (accessed: 20.04.2019).

accessibility of credit resources, the degree of liberalisation — protectionism (Fig. 10)

Infrastructural: the level of availability of electricity (water), fuel energy, transport accessibility, access to the Internet, logistics and material support

Social: the education system development, the level of democratic freedoms and the degree of openness of the market, health level, level of education, the degree of mandatory execution of the contract (including social), protection of the ecological environment, the development of social institutions (judiciary), the level of business protection. To characterise the level of doing business in the country and therefore classify it as one of the selected groups, we will use the methodology of the World Bank based on which we will conduct an inter-price study using the selected parameters: GDP (current US\$), GNI per capita, Atlas method (current US\$).

The methodology of the World Bank provides the ability to operate with data of both individual countries and entire territorial and territorial-economic complexes to objectively reflect the differences between developed, developing and underdeveloped countries. For this analysis, we selected a group of countries with high income — to characterise developed economies, countries with middle to middle-high income level to characterise the developing countries and countries with low income as

a characteristic of underdeveloped countries. This classification is quite objective since it is the level of income that underlies the division of countries and economies.

As can be seen from the above figure, to date, the situation with the level of trans-nationalisation of business and quality of life in the world varies significantly, which certainly contributes to the growth of social tension. Pay attention to the gap in per capita income in developed and underdeveloped countries — it differs by more than 20 times! It is primarily due to the high cost of labour and labour force for the citizens of developed countries. Besides, the development of judicial, administrative and tax systems contribute to increasing investors' confidence in companies from these countries. Needless to say, if the start-up of the "third world" country company has almost no chance to enter the international arena!

The active development of the business of the "Golden billion" creates a situation where 90 per cent of the world's wealth and resources in one way or another are in the hands of 10 per cent of the world's population. Therefore, the business environment in developed countries is such that rich enterprises become richer and poor companies become poorer. So middle-income countries tend to gravitate more towards developed than underdeveloped countries in terms of their performance. Indicators of foreign direct investment in the economy

Table 4
Comparative characteristics of TNC activity on infrastructure aspects of activity (2014–2018)

The time required to start a business (days)			
	<u>2016</u>	<u>2017</u>	<u>2018</u>
Underdeveloped countries	32.0	28.5	26.4
Developing countries	23.9	23.7	22.5
Developed countries	12.1	11.5	11.0
Tax revenues (% of GDP)			
	<u>2014</u>	<u>2015</u>	<u>2016</u>
Developed countries	15.3	15.3	15.3
Underdeveloped countries	12.2	11.9	11.7
Developing countries	12.0	11.7	11.5
Domestic credit provided by the financial sector (% of GDP)			
	<u>2014</u>	<u>2015</u>	<u>2016</u>
Developed countries	203.9	199.5	206.0
Developing countries	120.4	143.8	158.7
Underdeveloped countries	60.5	63.0	66.6

Source: Compiled by the author based on The World Bank. DataBank. URL: <https://databank.worldbank.org> (accessed: 20.04.2019).

can illustrate this. You can see that the difference between developing (transitional) countries and underdeveloped is more than 6 times, and the gap with developed countries is about 2.5–3 times.

A similar situation is observed with inflation indicators but in the opposite direction. One of the main indicators of a developed economy is a consistently low level of inflation — for developed countries it is up to 2 per cent yearly. For underdeveloped countries it is usually more than 4 per cent, and since the data are average for a group of low-income countries, they do not reflect that in some African countries inflation can be even more than 20–30 per cent, which is considered unsatisfactory for the economy. In general, developing countries seek to give TNCs as much access to national resources and finance as possible, in exchange for advanced technologies, when, in developed countries, such technologies already exist, and corporations compete at a higher level than simply for natural resources.

Such a gap is observed not only in the terms under consideration but also in other indicators of the economic sphere of activity. In particular, the volume of GDP in real and value terms in developed countries is also much higher: like the total number of enterprises, total income, value-added

in the global value chain, etc. Let us consider the comparative characteristics of infrastructure and social indicators, which are presented in Tables 4 and 5.

As can be seen from the table, the conditions for starting and doing a business start-up in developed countries is about 2 times better than in the rest.

This is due to the duration of licensing procedures, the number of necessary documents and the level of digitisation of state and municipal government. It is believed that the best condition for starting a business provides Estonia and Iceland, where your official business can be started in less than a week. The General trend is that the less developed the economy, the longer the time needed to open a business. It is mostly due to the level of corruption while making such decisions. It is believed that the Scandinavian countries are the countries with the lowest level of corruption; Russia is still in the lower half of the list, which does not allow attracting serious investors with serious intentions²⁴.

In turn, tax policy in developed countries shows the opposite trend: countries with developed economies have more stringent tax legislation, and the

²⁴ Transparency International. Corruption Perceptions Index 2018. URL: <https://www.transparency.org/cpi2018> (accessed: 20.04.2019).

level of the tax burden is higher than in other countries. One of the most illustrative examples is the tax system of the Scandinavian countries and the United States, where individuals can give up to 40–50 per cent of their income, and legal body — up to 70 per cent for tax payments. This system is considered to be more effective, as by means of active tax payments, the speed of money supply turnover increases, which in turn leads to the increased funding for citizens and businesses.

In turn, high velocity of circulation of finance and as a result, the high rate of properties turnover leads to the possibility of improving the ability of credit resources and, indeed, if in your business the rate of money turnover is high, you have more opportunities to take the borrowed funds and as a consequence, a longer shoulder the financial leverage.

For the economy, the developed countries, of course, are above the rest. Still, there is one interesting paradox that considering such indicators as the population, the birth rate, the average number of children in the family, less developed countries are above the developed ones. It is surprising that having so many people cannot convert quantity into quality. Therefore, describing the social indicators, it should be noted that although the expected lifespan in developed countries (more than 80 years) is significantly ahead of underdeveloped countries (about 50 years), they compensate for this lack of high fertility. However, mortality is also (as a result of the weak development of medicine) is high. In contrast, the total population attributable to underdeveloped countries is much lower (hence the problems of migration crises, social revolutions and conflicts that occur in these countries) (Table 5).

Social indicator of the corporation and the economy is the basis for determining the level of human capital. By human capital we mean: first, a set of knowledge, skills and abilities of employees of the corporation, and secondly, the existing human potential — a potential opportunity to improve their hard skills and soft skills, and thirdly, the interconnectedness and interdependence of the human environment with the technical and economic environment, providing an opportunity to improve the quality of key indicators of the corporation.

There are several ways to measure the level of human capital: the simplest is to calculate the additional economic effect that employees bring to the corporation because of the use of human capital

by 100 per cent. Another way is to consider human capital through the social aspects of the activity, all other things being equal. It is believed that employees with higher motivation, better health, greater interest in their work will invest their human resources more effectively and improve the quality of management in the enterprise.

One of the main indicators of human capital is life expectancy and, directly related to it, the duration of active working age. These indicators interact with the pension systems of the state and implemented private and public programs for persons of pre-retirement and retirement age, for example: “Moscow longevity” — a program aimed at creating a start-up among pensioners and teaching them the basics of entrepreneurship. Therefore, in developed countries, life expectancy during the period when an employee can generate income for his Corporation and his state is consistently higher on average. Many corporations implement the approach when after retirement age employees do not leave the company, and occupy the positions of business consultants, implement their considerable experience.

It is representative that life expectancy in such developed countries as Japan, Norway, Switzerland is on average higher (more than 80 years) than in countries with economies in transition (Russia, Brazil) on average more than 70 years and much higher than in underdeveloped countries (in some poorest countries 40 years is already considered the old age — Somalia, Eritrea, Western Sahara).

Life expectancy indicators are directly related to the birth rate, and this is natural because the economies with low income and low living standards are trying to compensate for their lag due to the high birth rate, but at the same time due to the underdevelopment of medicine, there is a high mortality rate (including child mortality). In developed countries, having 1–2 children is considered the norm, as the economic support of the state and parents and medicine can guarantee their well-being and quality of life. The economic doctrine of developed countries provides that the state, and sometimes corporations, assume the main burden of care about families when, as in underdeveloped countries, children become a pillar of family well-being — when the state is not in a position to do so.

For the above reasons, there are differences in social indicators between developed and underdeveloped countries.

Table 5
Comparative characteristics of TNC activity on social aspects of activity (2014–2017)

Life expectancy at birth, total years			
	<u>2014</u>	<u>2015</u>	<u>2016</u>
Developed countries	80.4	80.3	80.4
Developing countries	74.9	75.1	75.3
Underdeveloped countries	67.4	67.6	67.9
Urban population growth (annual percentage)			
	<u>2015</u>	<u>2016</u>	<u>2017</u>
Underdeveloped countries	2.6	2.6	2.6
Developing countries	2.2	2.1	2.1
Developed countries	0.8	0.8	0.8
Childbearing rate, total (number of births per woman)			
	<u>2014</u>	<u>2015</u>	<u>2016</u>
Underdeveloped countries	2.8	2.7	2.7
Developing countries	1.8	1.8	1.8
Developed countries	1.7	1.7	1.7

Source: Compiled by the author based on The World Bank. DataBank. URL: <https://databank.worldbank.org> (accessed: 20.04.2019).

Also, it should be noted that developed, developing and underdeveloped countries also differ in the number of registered corporations, as well as small and medium-sized businesses. For developed countries, the norm is the share of small and medium-sized businesses (SMEs) to 70–80 per cent of GDP. Let us compare this figure with the Russian economy, and we will see that the share of state monopolies is, on the contrary, up to 80 per cent in the national budget. The same is true for the number of registered legal entities. In the US, which is the largest economy in the world, only legal entities registered more than half a million corporate property standards, not to mention small non-corporate organisations. These statistics are related directly to the economic, infrastructure, and even social aspects, as American pensioners with a lot of free time and money often open their small business, which also makes its contribution to the national economy.

Thus, we see that all three groups of indicators are related to each other and determine the logic of the economy of TNCs in developed countries. Unfortunately, the process of merging national economies and levelling the quality and standard

of living in different countries is extremely slow. Therefore, we hope that our proposal, dedicated to the growth of trans-nationalisation in the markets of Brazil and Russia, will help to increase not only economic but also social efficiency of the business in the regions under consideration.

One of the most striking examples illustrating the concept of the relationship of these indicators is the experience of Siemens (production of electronics and railway transport). In early 2018, Siemens offered the French locomotive manufacturer Alcon mutually beneficial cooperation on the mutual purchase of shares, that is, the German company buys shares of the French, and the French, in turn, buys the German shares. It would make it possible to create the largest European railway Alliance and take a privileged market share, with the corresponding creation of jobs, tax increases, high value-added and other benefits for the infrastructure, economic and social sphere.

However, the European Antimonopoly Agency refused the possibility of such a transaction, arguing that it would create a restriction for the largest Chinese manufacturer of railway transport. Note that both European companies protect the rights of

the European Union, but the requirement of Anti-monopoly legislation is higher than the economic interests of the whole region. In the practice of a country with developed corporate legislation, many cases can be found where even positive prospects for the localisation of TNCs have been limited by the interests of local communities.

In American practice, one of the clearest examples are reservations — special economic territories in which the indigenous peoples of America (Navajo, etc.) live, where the activities of companies not owned by Navajo are prohibited. Moreover, even if in the surrounding area this activity is not permitted, for the Navajo Indian company, this activity will be allowed (for example, a gambling establishment (casino) in reservations).

In Russian practise, such restrictions have been developed in the form of external economic sanctions with the EU and the US, as a result of which companies that are not localised on the territory of the Russian Federation have received a ban on the import of their goods from abroad. It was especially true of engineering (equipment for oil refining, chemical industry, etc.), the military-industrial complex and food industry. These restrictions are largely related to the level of imports in the national markets of the countries concerned. In Russia, the share of imported machinery is 90–95 per cent, chemical industry 70–80 per cent, pharmaceutical industry 60–70 per cent, food about 50 per cent. That is why restrictive measures “hurt the most” in these industries.

After analysing the presented figures, you can see the differences between developed, developing and underdeveloped countries, this is due, firstly, to the varying degree of involvement in the global value chain, secondly, the level of protectionism, and thirdly, the development of national business. However, it should be noted that for the purposes of this analysis, the approved data for the appropriate groups of countries were used. The Atlas conversion method was used to eliminate the side effects of the exchange rate, especially for the period of 3 years. The essence of this method consists, firstly, in the use of the average, not the moment exchange rate (for the previous 2 years), and secondly, the adjustment of the exchange rate at the level of inflation, taking into account its difference with the inflation of the big 5 countries (G-5: France, Germany, UK, Japan, USA).

To account the impact of inflation on economic parameters, we used the GDP deflator. It is the ratio

between nominal and real GDP. As you know, positive inflation reduces real GDP in relation to nominal GDP. Similarly, inflation affects the exchange rate: positive inflation reduces the real exchange value of money. Based on this, the conversion rate of the Atlas can be represented as a Formula 2²⁵:

$$CRa = \frac{Ex}{I - IG5}, \quad (2)$$

where:

- CRa* — a conversion rate of the Atlas
- Ex* — average exchange rate for 2 years
- I* — inflation rate in the country I selected
- IG5* — inflation rate in the G-5 countries.

As a rule, the conversion rate is used when the exchange rate is weak or extremely subject to changes in relation to the world’s leading currencies (euros, dollars, etc.). In turn, the GDP deflator is calculated by Formula 3:²⁶

$$Q = \frac{GDPn}{GDPr}, \quad (3)$$

where:

- Q* — deflator index;
- GDPn* — nominal GDP;
- GDPr* — real GDP.

Let us consider the key differences between the business environment of TNCs in developed and underdeveloped countries. We deliberately do not consider developing countries, as they are close to developed countries in terms of their conditions. The principal difference between the business environment in developed and underdeveloped countries is the degree of influence of TNCs on the national economy and national business Table 6.

No matter what country we consider, any company carries out its activities on the stability curve, and the risk curve characterises the level of internal and external threats to the company. At the seed stage, the risks are maximised as is the maximum possible initial investment. In the next stages of early growth and expansion, risks gradually reduce

²⁵ The World Bank. World Bank Atlas method. URL: <https://web.archive.org/web/20160303202552/http://econ.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20452009~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html> (accessed: 20.04.2019).

²⁶ The World Bank. World Bank Atlas method. URL: <https://web.archive.org/web/20160303202552/http://econ.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20452009~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html> (accessed: 20.04.2019).

Table 6
The key differences developed countries and underdeveloped countries by sector

Area (aspects)	Developed countries	Underdeveloped countries
Level of access and barriers to entry the market	Full access to the national market	The dominant "eagles" TNCs in the economy
The banking-credit sector	Low cost of credit	Low-interest rates on loans for TNCs
Tax sphere	High level of the tax burden	Preferential or offshore taxation
Availability of natural and other resources	Full and free access to fuel and energy resources	Full access and even capture of local natural resources
Regulatory-administrative sphere	High level of administrative regulation	The high degree of lobbying in national legislatures
Sphere of the system of national accounts	Lack of dominance in GDP (most of the burden falls on small businesses)	System-forming role of TNCs in the formation of national GDP
The infrastructure sector	Creation of additional infrastructure services through the use of subcontractors	Lack of dominance in GDP (most of the burden falls on small businesses)

Source: Compiled by the author.

to a minimum level and then begin to grow again, increasing to a medium-high level. At the mezzanine and IPO stages, the opportunities for further development are due to the company's exit from the stability zone and its transition to a new level, within which the secondary public offering stage is possible, as well as an additional issue of shares and their issue from the lender. In Fig. 11, we present the general dynamics of the level of development and risks of TNCs in the process of investment risk.

You can see from this figure that countries and TNCs are essentially the 'black boxes' of the economy at the entrance, which has raw materials, and the output of finished products. Since the systems under consideration are fundamentally open, their mandatory element is the accounting of market signals to the input and output flows, as well as the construction of the inverse relationship circuit with subsequent corrective action. Any system consists of many elements, for the considered, the main subsystems are labour (people-staff), material (equipment, transport, and buildings), resources (raw materials, semi-finished products, intellectual property, etc.).

The key conclusion and idea of this figure is as follows: revolutionary (abrupt growth), that is, an abrupt (instantaneous) transition to a new level of development is fundamentally impossible without a critical accumulation of innovation and qualifica-

tion level in each of the systems, and not only in one of them. Therefore, it is not possible to talk about the improvement of human capital or a financial Corporation in isolation from its production and technological and organisational and managerial level, the potential of which must first be measured (evaluated) before any process of innovation.

All these processes that determine the differences in developed, developing, and underdeveloped countries are caused by processes of trans-nationalisation. Trans-nationalisation is a flow of capital from regions and companies where they are present in excessive quantities in countries and companies where there is a lack of various forms of capital. This process allows more efficient use of existing factors of production. There are the following types of trans-nationalisation:

Corporate — represents an increase in the role of TNCs in the international economy

Economic — represents an increase in the role of TNCs in the economic and international activities of countries and regions. In this consideration, economic trans-nationalisation appears to be a more mature stage in the internationalisation and development of the global value chain.

There are the following theories of business trans-nationalisation; most of them are aimed at studying foreign direct investment (FDI) in the economy. It is believed that a large part of FDI is

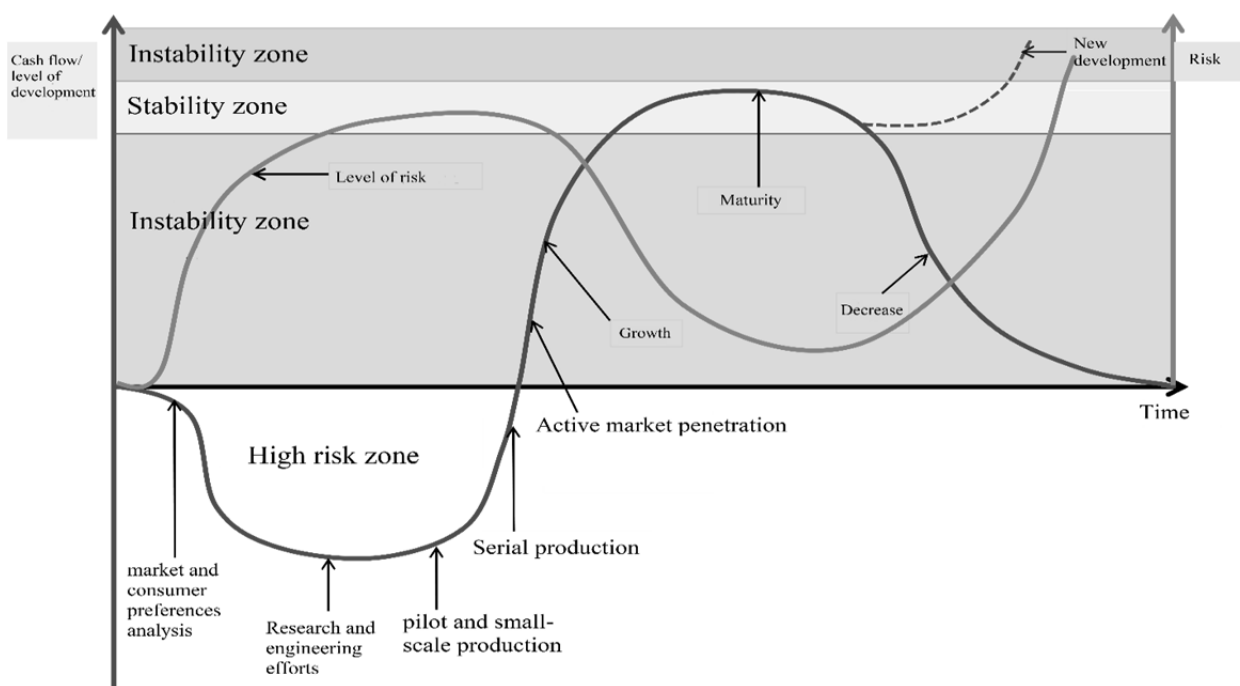


Fig. 11. General dynamics of development and risks of TNCs in the process of investment risk

Source: Compiled by the author.

either corporate (private) or unitary (state-owned) TNCs. Such theories first emerged in the 50s and 60s of the 20th century and sought to explain the abrupt increase in FDI and the share of TNCs in world GDP. The development of scientific schools of trans-nationalisation by the end of the 20th century led to the development of several scientific schools (theories):

J. Dunning theory (electrical theory) [Dunning, 1979]

S. Hymer and Ch.P. Kindleberger theory (transnational companies and imperfect competition)²⁷

R. Vernon theory (life cycle of TNCs) [Vernon, 1966]

H. Kojima и T. Ozawa theory (flying geese paradigm)²⁸

J. Johansson theory (internationalisation theory)²⁹.

Most of the theories are based on the analysis of factual material concerning the activities of TNCs in the world from the 1950s to the present. Given the fact that in developing countries, the share of

TNCs starts to rise, the actual features of activities often differ from practice activities in the USA and Western Europe. Because of this major trend at the beginning of the 21st century is the study of the theory and practice of TNCs in developing countries and countries with economies in transition. Brazil and Russia, as in our study, belong to such countries. To quantify the level of impact of TNCs on local businesses and the economy in general, we use the index of trans-nationalisation.

The transnationality index is mainly used for three types of TNCs:

Horizontally integrated — TNCs that produce identical or similar products

Vertically integrated — TNCs that combines the entire production chain in a GVC (from the purchase of raw materials to the sale of finished products)

Separate TNCs (diversified) — TNCs whose units are not connected by production, the units remain independent, while the headquarters performs the functions of a strategic regulator.

To properly understand the impact of TNCs on the economy, it should be noted that they can exist in the main organisational and legal forms: U-forms, D-forms, H-forms, M-forms, and even X-forms. Each of these forms determines the degree of influence and subordination of the company's division relative to Central management. Currently, the most common form is D (from the word divisional) in

²⁷ Massachusetts Institute of Technology. Essays in the theory of international capital movements. URL: <https://dspace.mit.edu/handle/1721.1/12132#files-area> (accessed: 20.04.2019).

²⁸ Infeconomy. Paradigm of 'flying geese'. URL: <http://www.infeconomy.ru/ininv/970-1-r.html> (accessed: 20.04.2019).

²⁹ UNCTAD. Transnational corporations. URL: https://unctad.org/en/docs/iteit12v8n2_en.pdf (accessed: 20.04.2019).

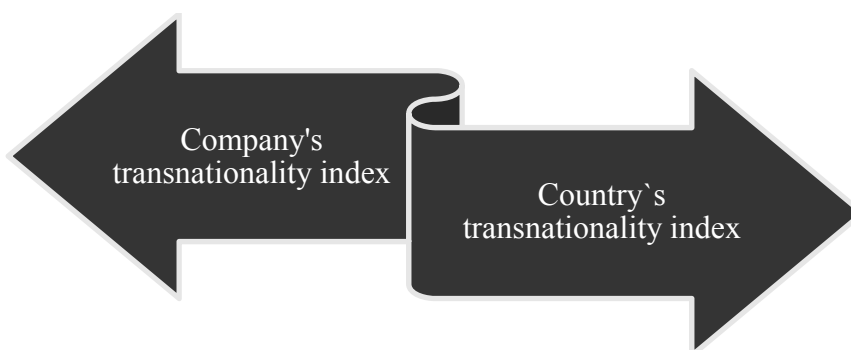


Fig. 12. Two main forms of the transnationalization index

Source: Compiled by the author.

which the value of the transnationality index will be the most significant.

If we speak about the trans-nationalisation index, we should note that it can exist in two main forms (Fig. 12).

The company's transnationality index shows the extent to which TNCs are involved in the production of products and services in a country other than the country of headquarters. As an example, the customs rules for determining the countries of origin of the goods, which determine what customs duties and quotas will be used in relation to the products depending on the country in which it was produced – this becomes relevant when the products go through many stages of processing in different countries. Suppose, for example, drug substances were purchased from Pakistan, mixed in China, packaged in Russia, but all the equipment is manufactured in Austria (blister card and plastic are Austrian, the tablet is Pakistani, and the substance is Chinese, but packaged in Russia). The question arises – what country of origin are the pills? Especially if these works were done under the contract with the Indian Pharmaceutical Corporation.

Of course, the basis for the countries themselves will be spelt out in the contract, but according to international rules, which are higher than the normative level of the contract between individual companies, the country of origin will be the country where more than 50 per cent of the added value of the product is produced. For regulation of these relations of TNCs in international trade, there is a FEACN – commodity nomenclature of foreign economic activity and Incoterms – determining the moment of transfer of risk liability and payments from one counterparty to another.

For determination of the Transnationality Index, it is necessary to know three indicators:

The ratio of the total value of property abroad to the total value of assets in the Corporation (the share of foreign assets)

The ratio of revenue received abroad to total revenue of TNCs (share of foreign sales)

The ratio of personnel abroad (in subsidiaries, branches, and representative offices) to the total number of employees in the corporation (the share of foreign personnel).

The general formula 4 for calculating the Transnationality Index of TNCs will be⁵⁰:

$$\left(\frac{Af}{At} + \frac{Bf}{Bt} + \frac{Pf}{Pt} \right) = \text{TNI}, \quad (4)$$

where:

TNI – Transnationality Index of a company

Af – foreign assets of TNC

At – total assets of TNC

Bf – foreign revenue of TNC

Bt – total revenue of TNC

Pf – foreign personnel of TNC

Pt – total number of employees of TNC.

The maximum value of this index can be 1 (100 per cent), the closer this indicator is to 1, the more this company meets the characteristics of TNCs. Accordingly, the closer the index to 0 – the less the company meets the status of TNCs.

The Transnationality Index for given country characterises the level of influence of TNCs on the economy of the country or region in consideration. To calculate the trans-nationalisation of the country we need to know the following metrics: level of FDI and its share in the total investment of the country; the level of GDP of the country; the share of TNCs'

⁵⁰ Russian Foreign Trade Academy. Transnationality Index. URL: http://www.vavt.ru/glossecon/glossecon/LSPECDAC_8 (accessed: 20.04.2019).

branches in the volume of production in natural and cost expression; the percentage of employment in TNCs of total employment in the country.

Therefore, the transnationality index of the country will be calculated as follows (Formula 5):

$$\frac{\frac{FDI}{C} + \frac{FDIa}{GDP} + \frac{POb}{TPOc} + \frac{TEb}{TEc}}{4} = TNI, \quad (5)$$

where:

TNI — Transnationality Index of the country

FDI — total FDI, C — the capital of the country

FDIa — FDI accumulated in the country

GDP — a Gross domestic product of the country

POb — production output in the branches of the corporation

TPOc — total production output in the country

TEb — total number of employees in the branch

TEc — total number of employees in the country.

The closer this indicator is to 1, the higher the impact of TNCs on the country's economy; the closer this indicator is to 0, the lower the level of influence of TNCs on the country's economy.

These indicators of the degree of trans-nationalisation are monitored by various international organisations, in particular, UNCTAD. According to the report on the activities of TNCs and global investments in 2018, the main trend of business trans-nationalisation is the increase in the political component and the growth of barriers to trade between countries. As a result, in 2017, FDI in the whole world decreased by ¼. First of all, it affected countries with economies in transition and underdeveloped markets. For prevention of this trend from developing in the future, it is a need for sustained growth in the activities of TNCs in emerging markets.

In the context of the 4th industrial revolution, TNCs are beginning to actively purchase the scientific achievements of developing countries. It leads to the change of global value chains, and as a result, countries having higher value FDI and TNI become the new technological leader. A key issue for developing countries and countries with economies in transition is to overcome the structural constraints of infrastructure development and to enable the strategic and long-term trans-nationalisation of business. By regions of the world the main trends of trans-nationalisation are as follows:

The decline in global FDI by \$ 1.43 trillion is the main reason for the restriction of M&A Processes by the European Commission and the US Antimonopoly service

FDI stagnation in developing countries — the value of FDI remains consistently low after the previous fall

The decline in FDI in underdeveloped countries in Africa is caused by natural and climatic problems: drought, agricultural decline

FDI to the most developed countries decreased by more than 1/3 (700bn) due to the decline in corporate restructuring activity, as well as negative expectations of investors about the change in the political situation in Europe (Brexit).

Consider the general dynamics of FDI by country group in Fig. 13.

From Figure 13, the following conclusions can be drawn:

1. Currently, there is the uncertainty of international investors in the field of geopolitics, which causes instability of investors' expectations from the world economy.

2. Forecasts of dynamics for 2019–2020 show relative instability due to further uncertainty about the dynamics of prices for natural resources (oil, gas, coal, gold), which may have been caused by a decrease in the credit ratings of the main importers of these resources (Middle East, Russia), as a result, even in a positive scenario, the dynamics of investments will still remain below the global average over the past 10 years.

3. Reducing the role of GCV in global investment dynamics due to tax and customs reforms in the EU and the US.

4. The decrease in return on investment — in recent years it has decreased from 8.1 per cent to 6.7 per cent annually, and the decline is observed in all regions of the world. It may affect long-term FDI in the world.

5. Such processes affect the primary sector of the economy, services, and manufacturing, which account for more than three-quarters of the world's GDP. Herewith, for underdeveloped countries, FDI is, in fact, the only source of survival, as it provides more than half of the GVC in the regions.

Gradually, one can see the shift of the GVC from material forms to intellectual and information forms, which in the works of domestic and foreign scientists is defined as “digital economy” and “digital technologies in the economy”. The existing system

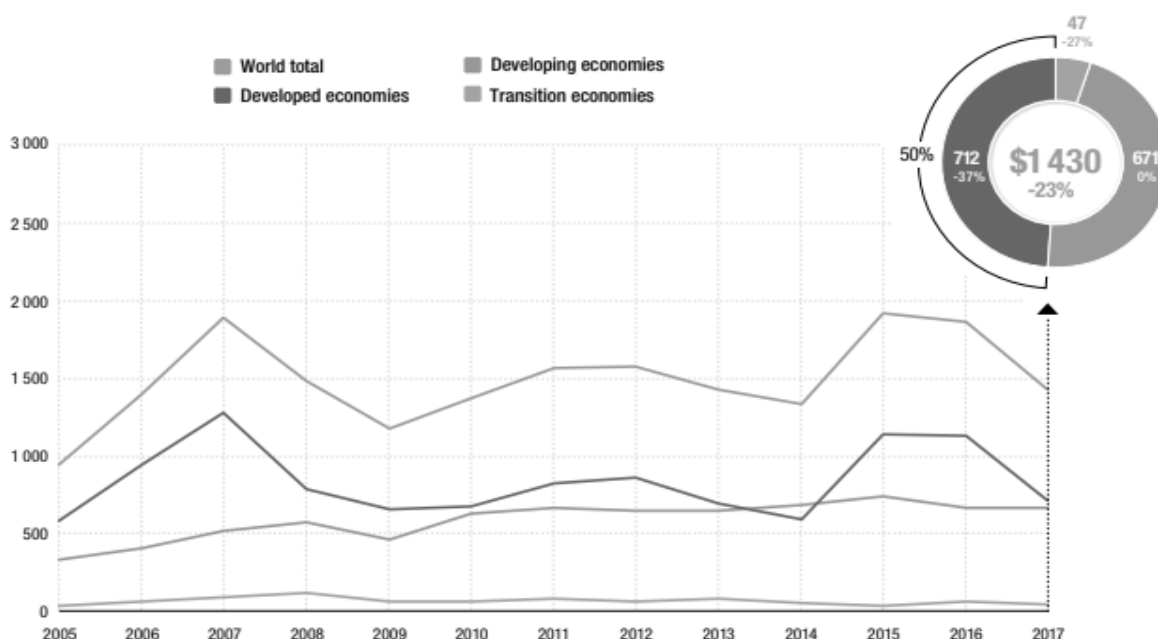


Fig. 13. FDI inflows, global and by a group of economies, 2005–2017 (Billions of dollars)

Source: UNCTAD, FDI/MNE database. URL: www.unctad.org/fdistatistics (accessed: 20.04.2019).

of world economy shows that about hundreds of the world-leading TNCs included in such ratings as S&P 500, FTSE 100, Fortune Global 500, Dow Jones define the culture and processes in the world economy. That is, they provide most of the added value in the field of GVC.

Let us consider in more detail the level of transnationalisation of countries and regions, which we present in Fig. 14.

As you can see from this figure, the negative FDI dynamics shows a negative trend in almost all countries and regions, and it is logical that the largest investor and recipient of FDI in the US and Chinese economies. France, Germany, Indonesia show the positive dynamics and the CIS countries, including Russia, are in the negative trend, as well as almost all countries of Southern and Eastern Europe, which are more affected by the global financial crisis began in 2012. It is characteristic that most of the recipients of FDI are the developing countries and developed countries are among the larger investors.

On average, the return on investment is growing after the decline in the level of development of the country, and this is understandable. In business, there is a practice called “risk-free” whereby investments in riskier assets are offset by higher returns (taking into account discounting and the accumulated future value of the annuity). For example, deposits in banks that are lower-rated promise higher returns than investing in risk-free government bonds. In this regard, for developing

countries, we can recommend the search for new sources of financing, namely portfolio investment, long-term loans, short-term credit, subsidies, debt refinancing and so on.

At present, the structure of financial flows from the three types of countries under consideration can be described as follows: for developing countries and countries with economies in transition take about 40 per cent of the GVC, underdeveloped countries — about 15–20 per cent of the GVC, and developed countries account for 35–40 per cent of the GVC. In this regard, we see a prospective investment in real production and the real economy, which should increase international trade operations and their profitability.

Further, we will consider in more detail the economies of Russia and Brazil, as for Brazil, the participation rate in GVC as a percentage of exports is about 41 per cent (Latin American countries), and for Russia more than 50 per cent as for a country with an economy in transition, while the average growth rate of participation in the GVC of these countries and regions that they represent is on average higher than in developed countries.

Despite the development of science and technology peak of which occurred at the beginning of the 20th century (conveyor, the basis of nuclear technology, breakthroughs in pharmaceuticals, electric car), they were used to a large extent for military purposes. As a result, there was skew and a decrease in the stability of the global production system. Two

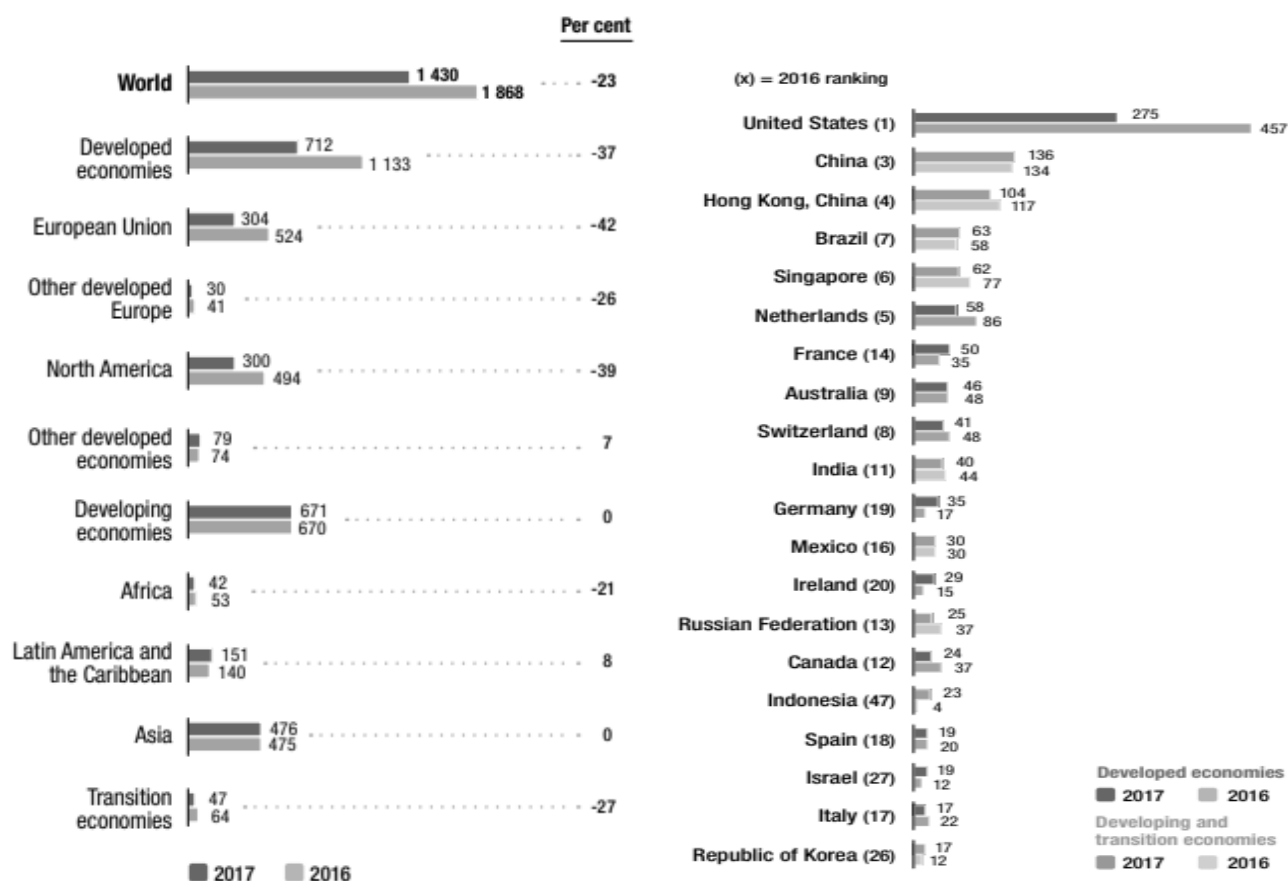


Fig. 14. FDI inflows, by region and top 20 host economies, 2016–2017, (Billions of dollars)

Source: UNCTAD, FDI/MNE database. URL: www.unctad.org/fdistatistics (accessed: 20.04.2019).

world wars led to the almost complete annihilation of production areas and production capacities of the warring countries (industry of Japan, Germany were almost destroyed). This led to a decrease in the global population and a decrease in migration due to the closure of the territory (the Berlin wall).

Paradoxically, the almost complete destruction of production was at the same time the push for further development. The most striking example is the Japanese “economic miracle” and the development of the economies of the “Asian tigers” (Singapore, Malaysia, Hong Kong), whose industry and economy were recreated from scratch, with special attention paid to the service sector, which according to most investors is the engine of further economic development (first, production should be created, and on its basis should develop related services — this point is the most sustainable in the world economy).

In this context, I would like to note the current trends in Russia — the increasing role of the digital economy and digital marketing in the activities of TNCs. However, contrary to the popular opinion of many modern authors, the digital economy cannot

and should not be a central element of sustainable development of the Corporation, it is rather appropriate to talk about digital technologies in TNC technology, because otherwise if it is now digital in view of the development of IT technologies, it should have been “electric economy”, “steam economy” and so on in the past. But we know perfectly well that there were no such economies. Therefore the activities of the Corporation should be considered from the standpoint of their real assets, since in the opposite point of view “removing the plug from the outlet” should actually stop the whole process of development, however, corporations that “bake bread will continue to bake bread”, and those that “sew panties will continue to sew panties”.

The more complicated is the situation with digital marketing. Often considered the BRICS countries, the investment attractiveness of the territory for TNCs is considered exclusively from advertising positions, that is, replacing the real production economic conditions with propaganda. Even analysing the sites of investment agencies of the territory — leaders in terms of investment attractiveness (in Russia — it is Moscow and the

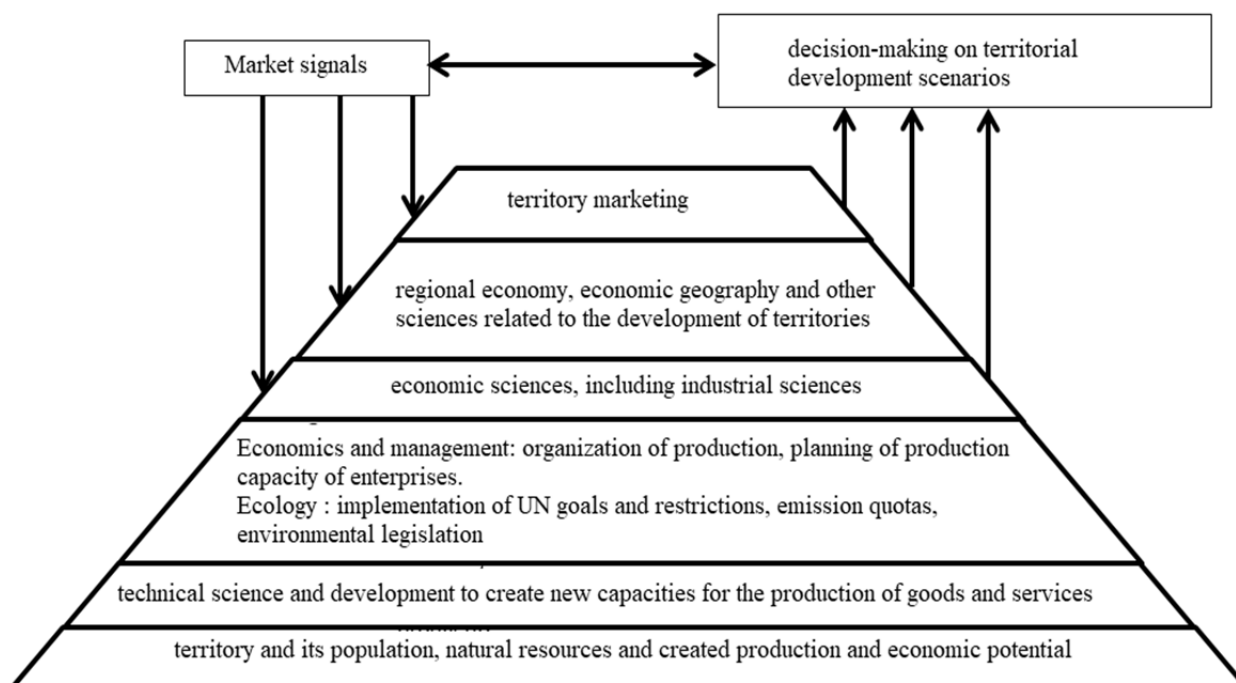


Fig. 15. Place of marketing territories in the General system of Sciences

Source: Compiled by the author.

Republic of Tatarstan), among the indicators characterising the territory there is no production! The length of roads and the share of water resources are clearly not related to them, so we decided to clarify this situation; marketing, advertising (digital marketing) are actually “cherry on the cake”, while competent investors choose the territory where they will have their production facilities (Fig. 15).

As follows from the figure, when the evaluation of the performance of TNCs in the countries it is necessary to show first of all how they have affected the real level of living of the population in the country (real social efficiency); how they have developed small business and innovative entrepreneurship in the country (economic efficiency); how they were able to increase the flow of funds in the state budget (budget efficiency). That is, regardless of the topic of the graduate qualification work, the impact of TNCs on the economy and society should be real, not digital (virtual), and this is the main indicator of the quality of the work performed.

Conclusions

1. The role of TNCs in global value chains (GVCs) is considered. TNCs more effectively spend the available factors of production, forming ascending and descending connections from the creation to the sale of goods, forming part of its value-added. The defining role of TNCs in the globalisation

processes of the twentieth century, which are still taking place, but now in developing countries and countries with economies in transition, has been identified.

2. The key approaches to the concept of “transnational corporation” are studied: production, financial, legal. For the purposes of this work the conclusion is made about the use of the classical definition of the UN, according to which TNCs should operate in 2 or more countries, to implement the general policy and strategy of development of the group (e.g. holding), but also have an organisational and administrative, legal and financial-economic impact on downstream business units.

3. The differences between the concepts of “transnational corporation” and “corporation” are characterised. TNC is a corporation, but not every corporation is a TNC, that is, TNC is a narrower concept. If the corporation is localised in one country and carries out the detail in other countries (including branches, representation, dependent subsidiary companies) in that case, the corporation can be classified as transnational.

4. A schematic diagram of the TNCs development in the country in terms of a systematic approach has been developed. TNCs are an open system, influenced by many stakeholders, forming the institutional, organisational, economic basis of TNCs’ work in the country. At the same time, the development of TNCs determines the

development of the surrounding meso- and macro-environment and depends on it; that is, this process is bi-directional.

5. The differences between the concepts of “transnational corporation” and “multinational corporation” are revealed, namely, that TNCs do not have a centralised management system within a divisional structure (headquarters is responsible for the policy and overall strategy of the subsidiaries and affiliates group); TNCs are not involved in subsidiary relations, but own assets around the world; TNCs are more focused on the socio-environmental and economic interests of local markets and the local community, they are more flexible in terms of linking goals and maintaining their interests (if necessary, it is possible to change the country of localisation).

6. The synergistic effect of the activities of TNCs is analysed. As a result of combining assets and business units under a single management, firstly, the efficiency of work increases, and secondly, the value of the group of companies increases. The peculiarity of these processes is that the total efficiency and cost of business units is more than a simple arithmetic sum when considering the indicators of their work separately.

7. The key socio-economic and institutional performance indicators of developed, developing, and transition economies are considered. The difference in the standard of living, the economy and the business environment in these countries are clearly shown. It is shown by what criteria the UN, the International Monetary Fund and the World Bank classify countries into the above categories.

It is shown that Russia and Brazil belong to the category of developing countries.

8. The dependence of TNCs development in an integrated life cycle approach, sustainability, and risk activities is shown. It is clearly demonstrated that in fact, both countries and TNCs are essentially “black boxes” of the economy at the entrance, which has raw materials, and at the exit, which has finished products. Due to the fact, that the systems under consideration are fundamentally open, their mandatory element is the accounting of market signals to the input and output flows, as well as the construction of the inverse relationship circuit with subsequent corrective action. As a result — a revolutionary (abrupt growth), that is, a sharp (instant) transition to a new level of development is fundamentally impossible without a critical accumulation of innovation and qualification level in each of the systems, and not only in one of them.

9. The analysis of the economic policy of Russia and Brazil is carried out. It can be concluded that the serious impact of the global financial and economic crisis on the economies of the countries in question, GDP, foreign trade turnover, inflation, unemployment have deteriorated, which increases the role of TNCs as engines of economic development in overcoming these crisis phenomena.

10. The key problems of the activities of Russian and Brazilian TNCs themselves are identified: high level of corruption and transparency, low level of investment in innovative development, insufficient influence on the international markets situation, loss in the TNCs competitiveness from leading developed countries.

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Анализ влияния ТНК на экономику развивающихся стран и стран с переходной экономикой

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Аннотация. Формирование и экспансия ТНК, особенно в развивающихся странах и странах с переходной экономикой, обусловлены, прежде всего, сложной сетью международных производств и локализацией деятельности на перспективных рынках за счет прямых иностранных инвестиций (ПИИ). Эти процессы с каждым годом все больше становятся одной из ключевых составляющих мировой экономики. Задачами настоящей работы являются описание сущности и содержания понятия «транснациональная корпорация», выявление ключевых факторов и характеристик современного транснационального бизнеса в развивающихся странах и странах с переходной экономикой, а также рассмотрение места и роли ТНК в названных странах.

Ключевые слова: ТНК; ПИИ; глобализация; БРИКС