

# WESTERN AND NON-WESTERN INSTITUTIONAL MODELS IN TIME AND GEOGRAPHICAL SPACE

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## Abstract

In the 21st century change in the configuration of the global politico-economic structure is becoming increasingly evident. If we look at the agendas of international institutionalists' conferences, where the representatives of the so called *Big Four* (the United States, Great Britain, Germany and France) continue to dominate intellectually, we can find their anxiety about "major disruptions to the global balance of politico-economic power" ([https://winir.org/?page=events&side=winir\\_2018](https://winir.org/?page=events&side=winir_2018)). The growth of the economic giants in the East (primarily China and India) as well as Russia's political role, and the growing social and economic inequality in the majority of developed economies, contest the leadership of the Western institutional model of economic development. It becomes obvious that this model not only does not have a universal character, but it also does not show as many manifest advantages as has been thought previously. At the same time, an internationally recognised need to sustain peace and international trade, as well to address the problem of climate change, requires an ever greater integration at the global level. Under these conditions, understanding the institutional features of both poles of the returning bipolar world becomes not only a task of scientific research, but also acquires a very necessary practical significance. In this paper bipolarity is understood as a continuing representation on a global scale of two groups of countries that differ in their institutional structures and arrangements - this difference is identified by the general term "Western and non-Western models". The paper is devoted to the analysis of the features, factors of formation and the chronology of the coexistence of countries for which these institutional models are characteristic.

References to the economic and political features of Western and non-Western models can be found in many works. In the paper (Section 2) we mention the works of K. Marx, K. A. Wittfogel, K. Polanyi, W. Eucken, J. Kornai and S. Rosefielde. Among the works of recent years the most resonant are the theory of Open Access and Limited Access orders (D. North, J. Wallis and B. Weingast) and the theory of Inclusive and Extractive Institutions (D. Acemoglu and J. Robinson). The relevance and constraints of these theories will be considered briefly in the paper.

However, in our analysis we rely on an approach presented in the institutional matrices theory (IMT), or X and Y-theory (Kirdina, 2014 [2001, 2000]; Kirdina-Chandler, 2017), which is briefly described in Section 3. In this theory, Western institutional models are characterised by the predominance of the set of Y-matrix institutions, among them the institutions of market economy, federal political structure and individualistic ideology. Non-Western models are distinguished by the dominance of the set of X-matrix institutions, among them the institutions of redistributive economy, unitary-centralised political structure and communitarian ideology.

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For the first time the paper summarises the results of two interrelated studies concerning samples of countries with either a predominance of X- or Y-matrix institutions. Both studies were conducted under the guidance of the author in 2014-2017.

In the first study (Section 4), the influence of geographical factors on the institutional development of states was investigated. Using data mining methods, we analysed 115 statistical indicators for a sample ( $n = 65$ ) of countries with non-Western and Western institutional models - in terms of IMT they are called X- and Y-countries. The results revealed the effect of climatic characteristics in the location of countries on whether X- or Y- matrix institutions dominate. It is established that on territory with relatively mild climatic characteristics (optimal air temperatures and precipitation levels), as well as low natural hazard risks, countries with a dominance of Y-matrix institutions develop, i.e. they are characterised by Western institutional models. In turn, in areas where there are significant fluctuations in the amplitudes of precipitation and air temperature, and where average levels of temperatures and precipitation are relatively too high or too low, and the risks of natural hazards are quite high, X-matrix institutions, or non-Western institutional models, historically predominate.

In the second study (Section 5) we compared the long-term dynamics of gross domestic products (GDP) produced by X- and Y-countries. The Maddison Project Database (1820-2016) was used. The calculations were made for a sample of X- and Y-countries ( $n = 21$ ), which have produced 75-85% of world GDP for all the years studied. Comparison of the data made it possible to see the cyclical process of changing world leadership, i.e. in the prevailing dominance of X- or Y-countries in production of the world's products. In the 1820s, the X-countries were leading in the production of world GDP. Since the 1870's the domination of the Y-countries started, which began to produce more than half of the world GDP. The biggest gap between these two groups of countries was observed in the 1950s-1960s but since the 1970s it began to decline. After 2005, according to our sample surveys, X-countries began outperforming Y-countries by share of world GDP, and this advantage is gradually increasing – it was confirmed by World Bank data (1990-2017) for an extended sample of countries ( $n = 62$ ).

In conclusion (Section 6), it is noted that the change in the domination of countries with Western institutional models, as observed in the last decade, is accompanied by the radicalisation of public consciousness in these countries, as well as in the growth of international tension.

*Keywords:* INSTITUTIONAL MATRICES THEORY, X-Y-THEORY, WESTERN AND NON-WESTERN INSTITUTIONAL MODELS, INSTITUTIONAL APPROACH, EVOLUTIONARY APPROACH, COMPARATIVE ANALYSIS OF ECONOMIC SYSTEMS, WORLD ECONOMIC ORDER.

*JEL Codes:* B52, B31, C12, F02, P51

## 1 Introduction

Institutional theory, like modern economic science as a whole, faces a number of challenges. Among them is the search for recipes for overcoming growing social inequality (Voeykov, 2017) , studying the mechanisms for the formation and development of institutions, including those in economic systems that differ in the institutional sense from the typical market economy (Nekipelov, 2017), reducing the negative influence of the dominant ideologies on scientific research (Polterivich, 2017). This list can be supplemented with one more – studying changes in the configuration of the world economy. These changes cause "major disruptions to the global balance of politico-economic power" (see the agenda of the Fifth WINIR conference, Hong Kong, China, 14-17 September 2018).

Anxiety of modern political economists and institutionalists, among whom the representatives of *the Big Four* (US, Great Britain, Germany and France), that is, countries of the West, still play a leading role, is quite understandable. On the one hand, the economic power of the Eastern countries (primarily China and India) is growing, and Russia's political role is growing, which challenges the

West's habitual global domination. On the other hand, the growing social and economic inequalities in the major developed economies are recognised and criticised, as evidenced by the worldwide success of the 700-page bestseller Thomas Piketty's "Capital in the 21st Century." The growth of inequality is accompanied by increased discontent among the population of these countries over the internal economic situation in recent years.

These facts challenge the leadership of the Western institutional model of economic development. It becomes obvious that this model not only does not have a universal character, but it does not show as many obvious advantages as was previously thought. Other models, which are commonly called non-Western, declare their viability and prospects. It seems that the world is becoming bipolar again, and this makes us take a closer look at comparing alternative co-existing models, analysing the factors of their formation and development. In our opinion, it is the understanding of the "other" that gives hope for the necessary international dialogue, which is so important today. It is necessary for the maintenance of peace, the development of world trade for the benefit of all states, and for an adequate response to climate change on a planetary scale.

This paper is devoted to contributing to the task of understanding the features of historically co-existing Western and non-Western institutional models, which could facilitate such a dialogue.

The paper consists of introduction, four sections and conclusion. The second section outlines some approaches to the study of two types of economic and political systems, which we generalize in terms of "Western and non-Western institutional models." In the third section, these models are considered from the point of view of the theory of institutional matrices, or X- and Y-theory. The fourth section is devoted to the presentation of the results of a study on the influence of geographic factors on the formation of both types of models, which determines their location in space. The fifth section presents some data on the chronology of the coexistence of states for which these institutional models are typical. It allows us to make a hypothesis about a cyclical shift in the leading position of Western and non-Western countries. In conclusion, the impact of the current changes in the world configuration of the political and economic structure on the growth of international tension and the radicalisation of public consciousness in western countries will be noted.

## **2 On Western and non-Western institutional models: Prehistory**

For supporters of the modern economic mainstream, the idea of a market economy as a "universal form of economic organisation" was and is natural (Nekipelov, 2017. P. 23). The collapse of the socialist system only strengthened this idea for them.

However, outside the mainstream, for example in classical political economy, in the history of economic thought, or within heterodox economics, researchers demonstrate broader views and point to the presence of not only one but two types of dominant economic models that coexist and interact in time and space.

Let me recall that in his time Karl Marx pointed to the difference of property institutions, characteristic of the "Asiatic mode of production", from European one. If in Europe the historical basis of the economic model was private ownership of land and the exchange relations based on it, in Asia the state was the supreme owner of the land. When Marx analysed property relations in the Asiatic mode of production, he noted that, although there existed a private and communal possession and use of land, there was no *private property* in the European sense (Marx, 1939, p. 376-377. Cit. on: Venediktov, 1948. P. 62]. Like some of the other lawyers of his time, Marx pointed out that in the East - unlike the Roman civilisation - when small land communities merged into larger communities, including the state, ownership remained not with these small communities, but was passed to the "connecting unity." "The connecting unity (*Zusammenfassende Einheit* in Germ.), towering above all these small collectives," wrote Marx, "appears as the supreme owner ... : every single person is thus in fact deprived of property" (Cit. on: Venediktov, 1948. P. 68).

If Marx just pointed to the main feature of the difference between the European and Asian models - the type of ownership, then Karl Wittfogel in his famous concept of "hydraulic civilisations"

examined the latest model more thoroughly and found traces of it not only in Asian countries. Wittfogel's contribution is that he showed the interrelationships of the economic structures of eastern countries, where extensive public works predominate (in particular, in terms of the design and structures of irrigation and flood control systems), with centralised political structures (Wittfogel, 1959).

The development of the views of Marx and Wittfogel can be found in the works of their compatriot Walter Eucken. Eucken presented his views in his classic book "The Foundations of Economics" (first published in 1939 in German as "*Die Grundlagen der Nationalökonomie*"). According to Eucken, the large number of different economic orders that have existed in the past and exist in the present can be understood as varied compositions of two basic principles, namely, on the one side, the decentralised *co-ordination* of economic activities within a framework of general rules of the game, and, on the other side, the principle of *subordination* within a centralised, administrative system. "Traces of other economic systems - apart from these two - cannot be found either in modern economic reality or in the past; one can hardly imagine that they will be found in the future" (Eucken, 1989. P. 79; 1992. P. 118). He noted that particular elements of an economic system, for example in a centrally managed economy, sometimes dominate, and sometimes only supplement the overall picture. Thus, Eucken's contribution is that, noting the "mixed" nature of real economic systems, he nevertheless pointed to the dominance of one of the two models in economic life.

Karl Polanyi, the well-known economist, historian, and anthropologist of Austro-Hungarian origin, went further in the study of non-market economic systems. In his book of 1977 "The Livelihood of Man" published *post mortem*, Polanyi explored in detail the forms of integration of economic processes in different historical epochs for many countries. He relied both on the results of his own research and on the works of B'ucher, Toennies, Thurnwald, Malinovsky, Weber, Durkheim, M. Rostovtzeff and other noted historians, sociologists and anthropologists. As is known, in his analysis Polanyi distinguished three main types of economic integration: namely, redistribution, exchange, and reciprocity. (Some authors stress that the household was also considered by him as a fourth one; for example, see Kasai, 2017). Analysing reciprocity, which manifests itself on a national or local scale, Polanyi (1957; 1977. P. 36) did not see it as the basis for forming a particular economic type of society, whereas he used redistribution and exchange to classify a multitude of national economies. Following Eucken, Polanyi confirmed, and further substantiated with his anthropological research, the existence of two equivalent, parallel-functioning market (exchange) and redistributive (centralised) institutional complexes. Also, he explored more deeply the mechanisms of the functioning of those economies that are called redistributive. Even more definitely than Eucken, Polanyi pointed out that in any society one of the two forms of economic relations dominates, while the other takes a complementary position (Polanyi, 1963).

The political economy of socialism of the mid-twentieth century developed mostly in the USSR and also offered its version of two types of economic models. Soviet economists (and, after them, many other researchers mainly from socialistic countries) called such models 'capitalist' and 'socialist', and analysed their specifics in detail. The contribution of the representatives of the political economy of socialism was that, following the logic of Marx in his analysis of the European model (capitalism), they studied the socialist model as a unity of their economic, political and ideological components (which today are called institutions). The Hungarian political economist of the Soviet period Janos Kornai (Kornai, 1980) proposed his version of two models. In his interpretation, alternative economic models are connected either with "soft" (under socialism) or with "hard" (under capitalism) budget constraints.

Let us reference to one more author developing his own concept of two models of economies. In 2002, Steven Rosefielde (US) first published his book about market *self-regulating* category A economies and *culture-regulated* category B economies (Rosefielde, 2008). His book was published twice (in 2005 and 2008), as well as translated into Russian (in 2004) and Chinese (in 2007).

Most of these authors consider that two types of economic models rule in the world, simultaneously coexisting in different countries. Another common feature of the concepts presented above (with the exception, perhaps, of the political economy of socialism) is that when generalising known historical facts, they do not make a value judgement and do not rely on ideological ideas.

These approaches (which are ideologically neutral) are different from new, but already very popular, theories of representatives of the neoclassical economics which also present alternative socio-economic models. We are talking about the theory of open access orders and limited access orders (North et al, 2009) and the theory of inclusive and extractive institutions (Acemoglu, Robinson, 2012). Other researchers stress that these theories are based on certain ideological guidelines, which allow authors to consolidate "scientifically established facts" into a single whole (Polterovich, 2017/ P. 57)<sup>2</sup>. However, in our opinion, the obvious ideological bias of these theories is rather an obstacle to the search for scientific truth. It explains why the authors' (of these two theories) interpretations of historical facts and comparisons cited in these theories are actively criticised. This is especially true of the theory of Acemoglu and Robinson (see, for example, Diamond, 2012; Arslanov, 2016). The value judgements in both these theories are also shown by the fact that these models – which include open access orders in the theory of North and his colleagues or societies with inclusive institutions as in Acemoglu and Robinson's theory - characterise Western countries<sup>3</sup>, and they are presented in the framework of these theories as more developed and advanced.

### **3 Western and non-Western institutional models in the Institutional matrices theory (IMT)**

In our analysis of Western and non-Western institutional models, we will rely on our own approach based on the institutional matrices theory (IMT), or the X- and Y-theory (see Matritsa institutsional'naya v sociologii, 2003; Institutsional'nykh matrits teoriya, 2010).

IMT has been elaborated by the author since the late 1990s. It develops and justifies the theoretical hypothesis of two stable systems of basic institutions (institutional complexes) that determine the nature and character of the development of societies. For the first time the term "institutional matrix" was defined by Karl Polanyi (Polanyi, 1977), then it was used by Douglass North (North, 1990), further development of this concept is presented in IMT (Kirdina, 2014 [2000, 2001]; Kirdina-Chandler, 2017)<sup>4</sup>.

The institutional *matrix* (from Latin word matrix - womb, primary model) is defined as the historically established stable triplex of interrelated basic institutions (institutional complexes) that regulate the functioning of the three main social subsystems: the economy (economic sphere), political sphere and ideological sphere. Basic institutions, while maintaining their inherent basis, manifest themselves in a variety of historically changing institutional forms, the specifics of which are determined by the history and cultural context of specific societies.

Analysis of extensive empirical material, from the most ancient states of Egypt and Mesopotamia to modern countries, has shown that, as a rule, one of two institutional matrices consistently dominates in the structure of a society: either the X- or Y-matrix. They differ by the content of the underlying institutions that form them.

The following basic institutions (institutional complexes) are characteristic of the X-matrix:

- in the economic sphere - the institutions of "a redistributive economy" (the term introduced by K. Polanyi). Redistributive economies are formed by a set of such institutions as 1) supreme conditional ownership; 2) cooperation; 3) employed (unlimited term) labour; 4) redistribution

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<sup>2</sup> Victor Polterovich believes that "the complexity of social systems, their variability and the impossibility (except for rare situations) of carrying out laboratory experiments lead to the fact that general concepts that claim to explain reality and practical significance are forced to rely on ideology" (Polterovich, 2017. P. 57). Therefore, these two theories seem to him as examples of scientific theories. We hold the opposite view on the role of ideology in the social sciences and believe that their inherent ideological bias is the "original sin" that social science must overcome (Kirdina, 2008. P. 21-22). The development of the evolutionary approach, the complexity economics and the synergetic paradigm in economic theory is very conducive to this.

<sup>3</sup> "Most countries that have made the transition to open access, or at least met the threshold  $\leq$  to be an open access society – S.K-C.  $\Rightarrow$ , are located in Europe or founded by Europeans" [North et al, 2011. P. 42].

<sup>4</sup> IMT was repeatedly presented in scientific literature, as well as in Wikipedia, so we confine ourselves here to a brief summary of it.

(accumulation-coordination-distribution as K. Polanyi explained); 5) cost limitations, or X-efficiency (as H. Leibenstein noted) as feedback loops. In redistributive economies the centre regulates the movement of goods and services as well as the formal and informal rights of their production and use;

- in the political sphere - the institutions of a unitary (unitary-centralised) political order. Among them the institutions of: 1) administrative-territorial division; 2) vertical hierarchical authority with the centre at the top; 3) appointments; 4) general assembly with the rule of unanimity; 5) appeals to higher levels of hierarchical authority as feedback loops;

- in the ideological sphere - the institutions of communitarian ideology. It expresses the idea of preference toward collective shared public values over individual, sovereign private values, the priority of "We" over "I". This set of institutions includes: 1) collectivism; 2) egalitarianism; 3) order; 4) the well-being oriented labour motivation; 5) integralism-holism-continuity as principles of common thinking.

Institutions of the X-matrix dominate in Russia, and in most countries of Asia and Latin America.

The Y-matrix is formed by the following basic institutions (institutional complexes). They perform similar functions, but in a different way, namely:

- in the economic sphere - the institutions of a market economy. Among them are: 1) private ownership; 2) competition; 3) contract labour; 4) exchange (buying-selling); 5) profit maximization, or Y-efficiency (term introduced by H. Leibenstein);

- in the political sphere - the institutions of the federative (federative-subsidary) political order. These include the institutions of 1) federative-territorial structure (federation); 2) self-governance and subsidiarity; 3) elections; 4) multi-party system with the rule of a "democratic" majority; 5) legal suits as feedback loops;

- in the ideological sphere - institutions of individualistic ideology. It proclaims the preference toward individual values over collective ones, the priority of "I" over "We", the primacy of individual rights and freedoms over those of communities. They are institutions of: 1) individualism; 2) stratification; 3) freedom; 4) pecuniary-oriented labour motivation; 5) specialisation-reductionism-discreteness as principles of common thinking.

The Y-matrix institutions prevail in the countries of Europe, North America, Australia, New Zealand.

Throughout the history of states, as a rule, the predominant position of either the X- or Y-matrix in the institutional structure of societies is preserved. This coincides with the concepts of most of the above-mentioned authors (among them Marx, Polanyi, Eucken, Rosefelde). Whereas the institutions of one matrix predominate, the institutions from the alternative matrix - in IMT they are called complementary institutions (institutional complexes) - play a necessary, but auxiliary role, "complementing the whole" institutional social structure. As in genetics, where the dominant gene, suppressing the recessive gene, sets the manifest signs of a living organism, so the institutions of the predominant matrix determine the nature of the institutional environment that develops in society. The predominant matrix sets limits for the action of complementary, auxiliary institutions of the alternative matrix. Progressive development of society requires a constant search for an optimal balance between the institutions of the predominant and complementary matrices, as well as the prevention of *institutional dissonances* (Kirdina-Chandler, 2017a).

Based on the concept of IMT, Western institutional models are characterised by a predominance of Y-matrix institutions, among which are institutions of market economy, federative (federative-subsidary) political order and individualistic ideology. Non-Western models are distinguished by the dominance of X-matrix institutions, among them are the institutions of a redistributive economy, unitary (unitary-centralised) political order and communitarian ideology. This existence of non-Western (corresponding to the dominance of the X-matrix institutions) and Western (corresponding to the dominance of the Y-matrix institutions) institutional models was the basis for two interrelated research projects, results of which are presented below. The projects were conducted under the guidance of the author in 2014-2017.

#### 4 Western and non-Western institutional models in space: the effect of geographic factors

In the first research project, the influence of geographical factors on the institutional development of states was studied. The task was to understand what geographic factors are important (if any) in determining whether Western or non-Western institutional models predominant in countries.

One knows that the "geographical hypothesis" has been discussed for several decades in the works of modern institutionalists. Different points of view and econometric models are presented to test this hypothesis: "institutions rule" or "institutions do not rule (but geography)" (*Gallup et al*, 1999; *Hausmann et al*, 2005; *Lorenz et al*, 2005; *Mellinger et al*, 2000; *Parent, Zouache*, 2009, 2012; *Plummer, Sheppard*, 2006; *Rodríguez-Pose*, 2013; *Rodrik*, 2003; *Rodrik et al*, 2002, 2004; *Sachs*, 2003a, 2003b; *Saha*, 2013; for more details, see *Kirdina*, 2016. P. 138-143).

Despite the different positions, the common factor is that the authors use, as a rule, a reductionist approach in the analysis of institutions. It consists of the fact that only a few of them are taken into account in analysis - usually just economic institutions. They do not take into account the characteristics of *embeddedness*<sup>5</sup> (inclusiveness, rootedness) of economic institutions in social "non-economic" life. However, institutional structures have, in our view, a holistic nature, so we should consider them as an interconnected whole.

Our task was to overcome the limitations of such a reductionist approach. Therefore, we used a representation of the institutional structure in the form of interacting institutional matrices which, in our opinion, is more effective to verify the "geographical hypothesis. On this basis the study was conducted, the results of which are presented below (for more details, see *Kirdina, Kusnetsova, Sen'ko*, 2015).

The analyses are not based on linear econometric models with several explanatory variables. We used statistical modeling with data mining procedures and an original method of classification that allowed us to identify the nonlinear character of the relationship between the investigated parameters. Procedures for statistical evaluation of the reliability and sustainability of the results were also used.

In this study, data mining techniques analysed 115 statistical indicators for the sample of X- and Y-countries (n = 65), which together account for 90% of world GDP. As sources of information, known statistical databases containing geographic indicators were used<sup>6</sup>.

In the course of the study, a group of indicators was singled out, whose influence on the nature of the institutional models emerging in states turned out to be decisive. These are the climatic characteristics that determine the location in geographical space of X and Y-countries. Among them are temperature (t), precipitation levels and the risks of natural disasters (see Table below).

It is established that in territories with relatively mild climatic characteristics (optimal air temperatures and precipitation levels), as well as low risks of natural disasters, states with the dominance of Y-institutions are formed. In other words, with optimal geographical conditions Western institutional models develop. In turn, in regions where there are significant fluctuations in the amplitude of precipitation and air temperature, and also where average temperatures and average precipitation levels are very high or very low, and the risks of natural disasters are high, the X-matrix institutions historically predominate. In other words, in relatively unfavorable natural conditions, non-Western institutional models predominate that allow countries to develop in a given geographical environment (see Table).

Why did climate indicators and associated incidence of exposure to natural disasters come to the forefront?

We give the following explanation. The history of any state begins with the stage of settled agricultural production. Representatives of different sciences - from archaeologists and historians to

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<sup>5</sup> The term *embeddedness* is introduced by Karl Polanyi and is developed by economist-sociologist Mark Granovetter.

<sup>6</sup> Data sources [www.worldbank.org](http://www.worldbank.org); [www.cia.gov](http://www.cia.gov); [www.gapminder.org](http://www.gapminder.org); <http://faostat3.fao.org>; <http://www.indexmundi.com>; <http://en.wikipedia.org>; <http://unstats.un.org>; <http://www.world-nuclear.org>; <http://www.bp.com>; <http://minerals.usgs.gov> (the structure of the data is presented in more detail in: (*Kirilyuk, Volynsky, Kruglova, Kuznetsova, Rubinstein, Senko*, 2015).

economists, culturologists, sociologists, etc. - come together in this. Societies can survive if they, first of all, have learned to sustainably provide their population with food and protect it from the impact of the environment, regardless of the vagaries of nature. At the dawn of the first states, it is in the agrarian sphere that certain social technologies (institutions) begin to take shape that organise the society for survival on a given territory. In other words, it is in agrarian eras that very adaptive mechanisms are formed, thanks to which it is possible to take possession of nature and use it for social needs. Karl Polanyi once again pointed out that "the social organisation of appropriation of the surrounding energy and power ... determines the institutional matrix" (Polanyi, 1977: xxxii).

Table.

**Some climate indicators for X-countries (non-Western institutional models) and Y-countries (Western institutional models)**

Indicators	Countries	«Relatively cold» X-countries*	Y-countries***	«Relatively hot» X-countries**	Average for all countries	Statistical significance of partitions (F- criterion)
People affected by natural hazards, %		1.9	0.1	1.3	0.9	0,0040
People affected by drought, per 100 000 of population		27.3	8.0	49.0	33.5	0,0381
People affected by floods, per 100 000 of population		78.3	6.6	37.6	29.8	0,0042
Average air temperature for the year, °C		6.4	9.3	23.1	16.2	<0,0001
t in October, °C		8.1	9.8	23.6	16.9	<0,0001
t in November, °C		0.4	5.4	21.4	13.3	<0,0001
t in December, °C		-5.6	2.2	19.4	10.5	<0,0001
t in January, °C		-8.2	0.9	18.8	9.4	<0,0001
t in February, °C		-6.2	1.9	19.9	10.6	<0,0001
t in March, °C		0	4.5	21.7	13.0	<0,0001
t in April, °C		6.6	7.8	23.6	15.9	<0,0001
t in May, °C		12.3	11.7	24.9	18.7	<0,0001
t in June, °C		16.7	14.8	25.7	20.7	<0,0001
t in July, °C		19.6	16.9	25.8	21.8	<0,0001
t in August, °C		19.3	16.6	25.8	21.7	<0,0001
t in September, °C		14.7	13.9	25.2	19.9	<0,0001
Precipitation in May, mm		87	57	120	93	0,0039
Precipitation in June, mm		146	60	142	111	0,0050
Precipitation in July, mm		219	57	145	118	0,0003
Precipitation in August, mm		194	57	146	116	0,0006
Precipitation in September, mm		131	55	141	107	0,0017
Precipitation in October, mm		62	61	134	99	0,0019
Precipitation for the year, mm		1100	760	1328	1089	0,0090
Precipitation amplitude for the year, mm		194	52	159	121	<0,0001
t min for year °C		1.0	4.6	17.4	11.0	<0,0001

\* «Relatively cold» X-countries (6 in total): China, North Korea, Nepal, Republic of Korea, Russian Federation, Japan

\*\* "Relatively hot" X-countries (35 in total): Bolivia, Brazil, Cambodia, Colombia, Cuba, Ecuador, Guatemala, Honduras, Dominican Republic, Egypt, Guatemala, India, Indonesia, Jordan, Malaysia, Mexico, Myanmar, Nicaragua, Pakistan, Paraguay, Peru, Saudi Arabia, Syria, Sudan, Thailand, Tunisia, Philippines, Sri Lanka, Ecuador, Ethiopia, South Africa.

\*\*\* Y-country (24 in total): Austria, Argentina, Bulgaria, Belgium, Great Britain, Hungary, Greece, Denmark, Germany, Spain, Italy, Canada, Morocco, Netherlands, Norway, Poland, Portugal, Romania, US, Turkey, Finland, France, Chile, Sweden.

It is obvious that the agrarian sphere is highly susceptible to the influence of climate. History shows that in different climatic zones, agriculture developed in different ways. Examples of arid

Egypt with centralised forms of farming and fertile Mesopotamia with its initial market forms of coordination are well-known examples (for more details see Kirdina, 2014. P. 89-98).

The transition from agrarian to industrial and subsequent stages of social development did not abolish but absorbed the institutional developments of previous eras<sup>7</sup>. The mechanisms of cumulative causality (T. Veblen), path dependence (P.A. David, S.J. Liebovitz, S.J. Margolis, etc.), blocking effects (D. North), sociocultural evolution (J.E. and G. Lenski), etc., as revealed in economics and sociology, supported the development of social technologies and the dominant position of an institutional matrix that arose at the dawn of the history of the state. Finally, the irreversibility "the arrow of time" (A. S. Eddington) does not allow us to ignore the differences that have arisen in the previous stages of social development.

In addition, we draw attention to the importance of climate for the reproduction of the human population itself. Studies are known to explain the role of moderate climatic conditions as a blocking factor for diseases (see, for example, Malik, Temple, 2006). Therefore, the very size and distribution of a population across a territory, its density and forms of social organisation, as well as the institutions formed on their basis, differed in different climatic conditions.

## **5 Western and non-Western institutional models over time: cyclical change of dominance**

What is the chronology of the coexistence of countries characterised by Western and non-Western institutional models or, in other words, in which the institutions of the X- or Y-matrix dominate? To answer this question, we decided to investigate the comparative long-term dynamics of gross domestic products (GDP) produced by these two groups of countries.

The appeal to GDP is due to the fact that this indicator, despite growing criticism of it, is perhaps the only consensus indicator on the basis of which - albeit indirectly - one can judge the "might" of each country in comparison with others. The need to study the long-term dynamics forced us to refer to the data of the well-known tables of Angus Maddison (Maddison Project Database, 2018), which shows the long-term dynamics of comparable GDP levels in some countries up to 2016, measured in millions of international, Geary-Khamis, 1990 dollars. As presented in the database Maddison data from the XII century until 1820 are scattered and incomplete - they cover only a small number of countries. Therefore, 1820 was adopted as the starting reference point beginning with which there are data on a wide range of countries, which makes it possible to create a fairly representative sample of them.

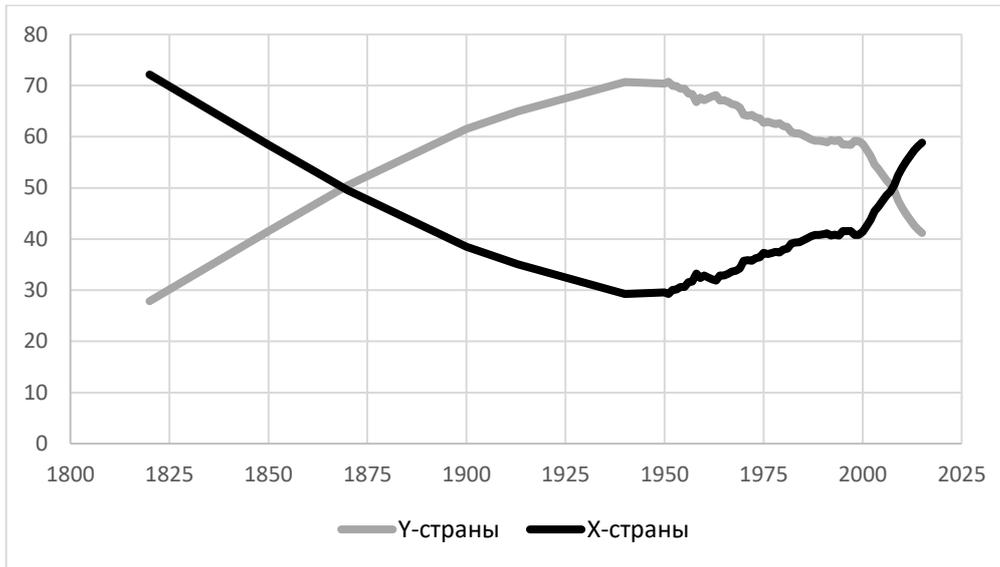
Taking into account the available data, a sample of countries was created, which included both types of institutional structures. Countries with the dominance of the institutional X-matrix are illustrated by China, India, Brazil, Japan and the countries of the former USSR, or the Russian Empire (since Russia in Madison's database was not separately distinguished until the 1920s). Countries with the dominance of the Y-matrix in our sample include 12 Western European countries, namely Austria, Belgium, Great Britain, Germany, Denmark, Italy, Netherlands, Norway, Finland, France, Sweden and Switzerland, and 4 countries outside Europe - Australia, New Zealand, Canada and US. The listed countries of both categories together produced and produce at least 75-85% of the world GDP, which makes our sample quite representative for the analysis of processes at the global level.

A graph showing the dynamics of the total share of GDP with western (Y-country) and non-western (X-country) institutional models, for the period 1820-2016, is presented in Fig. 1.

This graph allows us to see a cyclical process, during which the dominance of countries with a different type of institutional model is changing. In the 1820s (and earlier, according to a number of historians, see, for example, (Frank, 1998]), global GDP was produced predominantly by X-countries, but and since 1870, the share of the Y-countries grew to more than half of world GDP.

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<sup>7</sup> In this case, it is not important if the formation of states is a result of slow progressive growth or as a result of intermittent evolution and non-linear development (for more details, see Abrutyn, Lawrence, 2010). It is important that it is irreversible.



**Fig. 1. Proportions of total GDP of countries with non-Western (X-country) and Western (Y-country) institutional models, 1820-2016, % (they are 100% in total).**

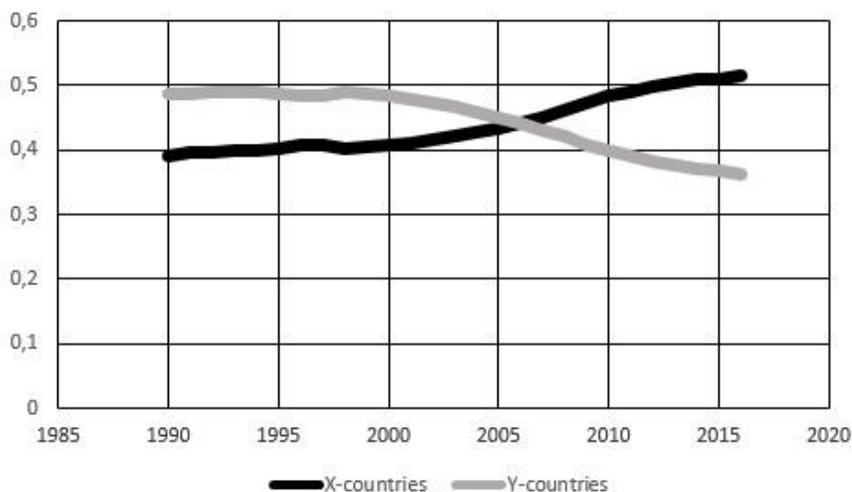
The maximum gap between the two groups of countries occurred in the 1950-1960s, but since the 1970s it has declined. Approximately from 2008, according to our calculations, the X-countries again began to take the lead, that is, to exceed the Y-countries in GDP production, and in the following years this gap has been gradually increasing.

The verification of this conclusion was tested in a wider sample of countries (n = 63) using data from the World Bank for the period 1990-2017. The basis for the sample were the results of countries identified with the dominance of X- and Y-matrices, presented in (Kirdina, Kuznetsova, Sen'ko, 2015):

- countries with the dominance of the X-matrix (non-Western institutional models) include Brazil, Egypt, China, Laos, Mexico, Myanmar, Nepal, Peru, Korea, Russia, Philippines, Japan, Bolivia, Venezuela, Vietnam, Guatemala, Honduras, Dominican Republic, India, Indonesia, Jordan, Iraq, Lebanon, Libyan Arab Jamahiriya, Lebanon, Malaysia, Pakistan, Paraguay, Saudi Arabia, Sudan, Thailand, Tunisia, Sri Lanka and Venezuela (n = 38);

- countries with the dominance of the Y-matrix (Western institutional models) include Austria, Belgium, Great Britain, Denmark, Germany, Spain, Italy, Netherlands, Norway, USA, Finland, France, Sweden, Argentina, Bulgaria, Hungary, Greece, Canada, Morocco, Poland, Portugal, Romania, Turkey, Chile, South Africa (n = 25).

The ratio of GDP of these two groups of countries and their share in world GDP are shown in Fig.2.



**Fig. 2. GDP of countries with non-Western (X-country) and Western (Y-country) institutional models, within the total world GDP, %, 1990-2017.**

Comparing the data of both graphs, one can confidently say: before our eyes, the global configuration of the main players in the world economy is changing. The results obtained confirm earlier ideas about the cyclical nature of the correlation between the "centre and periphery", or the dominant poles in the global world. "We are once again in one of the alternating periods of hegemony and competition in the world economic system, which heralds an updated shift of hegemony westward across the Pacific (The World System ..., 1998. P. 47). About the same time the Norwegian scientist Erik Reinert writes: "The world enters a new era - an era marked by two significant changes. The first is the beginning of the end of the domination of the West – although this is not the end of the West. The second is the Asian "Renaissance", because the 21st century will be the century of Chinese and Indian economic systems"(Reinert, 2013. P. 47; see also Frank, 1998).

At the same time, researchers pay attention to the interdependence of the two groups of countries. The "rise of Europe" in the XIX century cannot be explained without taking into account the role of trade with Asia, Africa and Latin America - the global world system as it was then. Similarly, the modern resurgence of Asian countries is associated with redefined trade in resources, technology and people between Asian and Western countries.

## **6 Conclusions and discussion**

The demolition of the long-term trend of the dominance of states with Western institutional models observed in the last decade is accompanied by the radicalisation of public consciousness in these countries, as well as the growth of international tension.

As a rule, radicalism increases in crisis or transitional historical periods, when a habitual order of things is threatened. Its manifestations can be seen in "nervous" politics, social protest actions, sensationalisation in media reports, and in the dissemination of radical scientific concepts (see more about it Kirdina-Chandler, 2017b). Radicalism is characterised by uncompromising rejection of the current situation, and the process of intensifying irreconcilable sentiments, insecurity of existence, and adherence to extreme views. Radicalism is accompanied by an accentuation of external threats, either explicit or imaginary, or by sharp criticism of existing institutions, ideas, rules and social order within a country that take the form of political struggle.

Some experts believe that when there are fundamental changes in the existing order or economic balance between countries, when it comes to the redistribution of "centres of power" and requests for new "conditions of the game" are made, when military threats are growing either explicit or imaginary, then the likelihood of local and even global conflicts increases in tandem. We believe that the results of scientific research show that these changes occur naturally and that we are talking about the natural cyclical processes that always exist and accompany our lives, and understanding this can help smooth out possible international tension.

Global institutional cycles in the bipolar world are expressed not only in changes in the balance between X- and Y- countries, but are also associated with the dynamics of organisational forms reflecting the depth of the interconnections inside each of the poles of the global bipolar world. Looking back at the common past of mankind and looking ahead to its common future, we can assume that each of the poles will further develop into an increasingly interconnected structure, that is, the development of various types of international alliances within each group of countries. There will be a strengthening of the bipolarity of the world, which will help to reduce chaos and strengthen the stability of international relations. This is one of the possible positive predictions.

Another prediction is that over time, the ideological unity of the X-countries, which have non-Western institutional models, will be realised and articulated. The Y-countries, which are characterised by Western institutional models, have a common ideological platform developed over the previous decades for interaction in the form of common values shared by the peoples of these countries, which are called democratic, liberal, etc. The X-countries are only on the way to this consolidation on the platform of their common, shared values which the institutional matrices theory, with its terminology that is neutral in terms of culture and civilization, can help in this process. Thus, it can contribute to the emergence of a more balanced and harmonious cyclically developing world.

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