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Factorial Analysis of Economic Growth within International Labor Migration Dynamics

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Author's contribution

The study was designed, analyzed and discussed by the author. The author takes full responsibility for the whole study including data collation, manuscript drafting and editing.

Original Research Article

ABSTRACT

International labor migration as determinant of the current stage of world economy progress, as a symbol of labor market globalization and industrial relations universalization has been actively studied by representatives of different scientific schools and directions of economic theory. Proposed approaches and models form basis for practical research of international migration, identify patterns of migration processes that contribute increasing of capacity to form and to forecast migration dynamics and preventive adaptation of national migration policies to tendencies of global labor market.

At the same time provision of National economic growth (often in conditions of limited resources and natural abilities, of global dynamic increasing and so on) is an important socio-economical function of modern governments and national development strategies.

Due to these aspects definition of the theoretical principles to increase a stimulate effect of labor factor (national and foreign) economical usage seems extremely important and relevant.

This paper analyzes role of natural-resources, financial and labor factors in stimulation of economic growth of the modern states; studies relationships between stimulating role of natural resources, finance and labor with levels of modern countries' economy development. For conducting this research secondary statistical data (World Bank, UNESCO) on economical and social performances of 72 modern countries and global economic dynamic for last 8 years was used, and

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original authors' system of aggregated indicators was created and offered.
Based on achieved results findings about fundamental reasons of international migration; transformation of labor factor's role in providing an economical progress of the states; efficiency of positive impact of manufacturing factors (domestic and attracted from international markets) were offered. These recommendations can be considered as a theoretical platform for creation and further development of National Migration policy and countries effective positioning in the global labor market within transnational labor movement.

1. INTRODUCTION

Factors for national economy development within the frames of complex global economic system, as well as conditions for long-term economic progress in turbulent market environment have always been prior areas of science research [1-3].

Analysis of economic growth and factors affecting it; consideration of economic cycles, alternating economical ups and downs stages; studying of the role of labor resources in ensuring an economic dynamic of modern states now are a basis of social-economy forecasting and serve as a theoretical principle for national economic policy formation and development.

Economic growth as criteria of national economic and social system development is an original result of Governmental economic activity is an indicator of National well-being and is a guarantor of economic independence. Stability of economic growth, it's dynamic and qualitative content can demonstrate a real economic health of society.

Today, economic growth is a central problem of macroeconomic policies of all nations and states. On the one hand, the national states are intertwined by complex cross-border economic relationships with the participation of MNCs and international economic regulators. On the other hand, even in the conditions of economic globalization the dynamics of economic growth preserve asynchronous, own deterministic by external economic conditions and by domestic resource potential, by local criteria of economic development reached before.

The purpose of the study is to determine (based on the analysis of countries' macroeconomic indicators) an importance of three factors (natural resources, human and financial resources) to ensure a dynamic of economic growth of the modern states in short term (2004 - 2012).

In connection with this purpose following research objectives were set:

O_1 - to analyze an impact of natural-resource potential on countries' economic growth based on calculation of economic efficiency of natural resources using in modern national economic systems;

O_2 - to correlate stimulating role of labor factor and economical performance of the modern states (for example, national GDP per capita) and to test an importance of national and foreign labor in providing of countries' economical growth;

O_3 - to examine stimulation role of natural resources and finance potential in different groups of modern countries (such as rich and poor, natural resources' saturated and non-saturated and so on) and to evaluate an effect of "diminishing utility" of each kind of resource for economic growth;

O_4 - to analyze a correlation between indicators of stimulating roles of three factors for economic development and indexes of international migration development in the modern countries;

O_5 - to define conditions for countries' positioning on the global labor market and factors of their successful participation in international labor movement (following principles and goals of National economic sovereignty and safety);

O_6 - to propose a principal model of National migration policy creation and development.

To conduct the study following hypotheses were identified:

H1 - The dynamic of economic growth of the countries causes a disproportionate change of economic value of labor, natural

and financial resources in economic progress.

H2 - The financial aspect of economic growth is most susceptible for effect of diminishing utility, while the labor factor of economic growth is out of this pattern.

H3 - Labor factor (including a factor of innovativeness) is the most important for economic growth of developed countries (with medium or low rate of economic growth).

H4 - Financial resources are the most significant for economic growth of developing countries (with medium or high rate of economic growth).

H5 - Natural resource potential is less important for economic growth of the countries with big natural resources potential (effect of diminishing utility).

2. THEORETICAL BASE OF THE RESEARCH

Modern scientific approaches to labor migration are often based on studies of Lewis on economic development in the conditions of unlimited labor supply [4]. According to this approach economic system of the modern states consists of two sectors - capitalist and non- capitalist. The first one is based on manufacturing; is concentrated on profitable activity and capital increasing, and acts as a labor force employer. The second sector is initially saturated by manpower, but is not a highly profitable form of commercial activity.

Growth of capitalist sector of national economic system, logically leads to the pumping of labor force from non- capitalist spheres. A specificity of geographical concentration of capitalist and non- capitalist sectors determines the directions and intensity of domestic or international migrants' flows.

Later, neoclassicists [1,5-8] have continued to analyze the international (and domestic) labor migration, based on the ideals of the market and market equilibrium. Another approach founded by Todaro considered problems of market functioning (failures and imperfections of market mechanisms, such as unemployment), which are (according to the author approach [9]) the main causes of international and internal migration flows formation and development.

Problems of migrants' selection became a basis for new approach to labor migration theorizing, that is based on human capital concept. This approach was formed in early studies of Mincer (1974) and Becker (1975) [2].

Development of human capital theory was a changing of vector in international labor migration theorizing from macroeconomic determinants of current socio- economic process to the set of its micro-factors related with human nature.

Basing on results of scientific research [1,5-7] and [10] factors stimulating an international labor migration can be classified into two types. First type has economical origin and can be objectively evaluated and analyzed (eg, differences in wages in the place of migrants origin and destination, cost of migration and so on). Second type - socio-economical - is weakly objectively measurable (eg, country's attractiveness for labor migration in terms of socio-economic criteria - dynamics of economic growth, unemployment , domestic and external debt of the country, number of migrants in the national economic system, equality of social benefits distribution and so on). Last one has pure social nature and is not amenable for objective evaluation (families' impact, migratory traditions, existence of migrants' Diasporas, special programs, bilateral agreements between countries of origin and destination, and so on).

3. METHODOLOGY OF THE STUDY

To conduct the study we used a secondary data - statistical data of World Bank (2004 – 2012) available on the World Bank official website (www.worldbank.org).

To assess the role of financial factors of economic growth we calculated an index that aggregates: level of capitalization of the national economy, national annual balance of payments, level of capitalization of the country's leading stock exchanges, level of liquidity of the national economic system, level of investment in fixed assets [11].

Finally, for evaluation of impact of labor factor on national economical growth we used following macroeconomic indicators: capacity of country's labor market, productivity of labor, GDP per employed person, rate of unemployment, national structure of employment.

Further these indexes were estimated in dynamic (2004 -2012) and were correlated to rates of economic growth of the modern states.

3.1 Evaluation of Stimulate Impact of Traditional Factors for States' Economic Growth

The results of stimulating economic growth impact of natural resources, financial and labor factors are presented in Table 1, 2 and 4. Taking in account that balanced value of each of three analyzed factors in countries' economic progress should be about 33%, we can note that the highest role of natural-resources in economic progress belongs to rapidly developing countries of the Asia-Pacific region, North Africa and Latin America.

At the same time, countries with advanced economic systems and modest dynamics of economic growth (such as European Union, the United States), as well as small countries geographically deprived of natural-resource basis (such as Kyrgyzstan or Armenia) have small stimulate impact of this factor.

In order to test a hypothesis of diminishing economic efficiency of natural-resources for economic growth, we made a comparative analysis of groups of different countries.

The first compared group presents countries with largest and smallest (among the analyzed countries) territories (land is one of the most important natural resource). Results of comparative analysis (Table 2) show that stimuli role of natural resources in ensuring of countries'

economic growth is not reducing together with growth of their natural resource potential. However homogeneity of this group is very low. For example, the value of natural resource potential in economic growth of geographically large Peru and Saudi Arabia differs in 4 times!).

Testing natural resources' impact on economic growth of the countries - traditional exporters of natural resources (hydrocarbons and metals), we can also see a low correlation between degree of this impact and countries' resource potential.

Finally, only testing of the correlation between stimulating impact of natural resource potential and level of countries' economic development (GDP per capita) confirms that the role of natural resources in economic growth of developed countries is significantly lower than in developing ones.

Data in Table 2 shows that countries with the lowest GDP per capita remain extremely high role of natural resources in ensuring own economical growth. This can be explained by simply lack of other sources for economic progress (for example, financial resources or skilled labor) in the poorest countries. At the same time, in rich countries, even with high natural resource potential (eg, Norway, the U.S., Australia) factor of natural resources impact has not a leading role. Therefore, we can conclude that economic progress of rich countries is providing by their natural resource potential for only 20%. At same time dynamic development of the world poorest countries bases on their natural wealth for more than half.

Table 1. Stimulate impact of natural resources on economic growth of the modern countries (Leaders and outsiders), 2012

No	Leaders	Index of stimulating impact of natural resources[1]	NO	Outsiders	Index of stimulating impact of natural resources
1	Philippines	82,83	58	Sweden	24,84
2	Peru	77,28	59	Slovakia	24,66
3	Colombia	76,5	60	Belgium	24,61
4	India	75,83	61	USA	24,29
5	Morocco	73,22	62	Venezuela	23,71
6	El Salvador	73,09	63	Latvia	22,8
7	Sri Lanka	72,51	64	Kazakhstan	22,53
8	Thailand	67,95	65	Finland	21,34
9	Panama	67,14	66	Canada	21,13
10	Montenegro	63,86	67	Saudi Arabia	20,92
11	Indonesia	62,4	68	Australia	19,86
12	Tunisia	61,05	69	Norway	18,32
13	Brazil	58,71	70	Kyrgyzstan	12,27
14	Vietnam	58,35	71	Armenia	9,78
				Average Index	23,1

[1] *Maximal Index (100%) means that country is developing only due to own natural resource potential*

Table 2. Comparison of natural-resource factor's impact on economic growth of biggest/smallest and richest/poorest Countries[1], 2012

Index of stimulating impact of natural resources	TOP-5 countries with smallest territories[1]		TOP-5 countries with biggest territories	Index of stimulating impact of natural resources
67,14	Panama	1	Peru	77,28
30,46	Ghana	2	Colombia	76,5
33,52	Singapore	3	India	75,83
33,24	Denmark	4	Indonesia	62,4
72,51	Sri Lanka	5	Brazil	58,71
42,95	**Average**			**46,5**
Index of stimulating impact of natural resources	TOP –5 Richest economies		TOP – 5 Poorest economies	Index of stimulating impact of natural resources
9,48	Iceland	1	Kyrgyzstan	12,27
9,48	Norway	2	Paraguay	25,47
9,78	Australia	3	Ghana	30,46
12,27	Canada	4	Zambia	35,04
18,32	Finland	5	Jordan	52,14
19,01	**Average**			**53,4**

The data in Table 3 shows the highest role of financial factor in economic growth of developing countries, both with huge natural-resource potential (such Ukraine, Venezuela, Kazakhstan) or without it (such Uruguay, Armenia, Kyrgyzstan); and also high inverse correlation between the value of stimulation impact of financial potential and capital's saturation of the countries. It is noticeable that countries with high financial saturation have extremely low capital's impact on their economic growth.

On the one hand, this obviously proves an effect of declining economic value of capital. On the other hand, significant differences of economic efficiency of capital stimulate its trans-boundary movement (stimulated mainly by rich states);

Finally, Table 3 demonstrates that despite of extremely high demand for capital from developing countries, within all analyzed countries an average stimulating impact of financial factor is much lower than stimulating impact of natural- resources. This can be explained by high mobility of capital and by high concentration of capital in three global centers of capitalism with maintenance of extremely needs for capital in many developing countries [12].

Table 4 shows a highest stimulate role of the labor factor mainly in developed countries of the West with high labor productivity and innovative, high technological structure of national economies, contributing a further growth of labor efficiency.

At the same time, economically under developed countries, including agrarian states of Africa,

Asia and Latin America, are growing mostly not due to their labor force potential [5,13].

Correlation between labor factor's stimulating role and national labor force potential (a number of employees in the national economic system[2]) confirm an independence of stimulate role of the labor factor on the countries' saturation by workforce [14].

So, China (country with largest labor potential) and Montenegro has almost similar criteria of labor stimulating value. Consequently, an economic efficiency of labor does not reduce in countries with rich labor resources. An effect of declining economic efficiency of the labor factor does not demonstrate.

4. ESTIMATING OF PROBABILITY OF INTERNATIONAL MIGRATION FLOWS

Further study of international migration trends will be conducted only on the basis of modern states' macroeconomic indicators (excluding any social and political relations between the pair of states). It has to be noted that the study considers only the problems of mass international migration, because an evaluation of highly qualified personnel international migration within the neoclassical model is not possible.

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[2] *Correlation between indexes of labor potential's stimulating impact and number of employed population is -0,08*

Table 3. Impact of financial factor on the stimulation of economic growth of the modern countries (leaders and outsiders), 2012

No	Leading countries	Index of stimulating impact of financial factor	No	Outsiders	Index of stimulating impact of financial factor
1	Uruguay	92,47	58	Belgium	4,44
2	Armenia	87,58	59	Japan	4,37
3	Kyrgyzstan	86,19	60	Malaysia	4,21
4	Paraguay	69,07	61	Spain	4,08
5	Ghana	64,1	62	France	4
6	Georgia	61,96	63	Chile	4
7	Latvia	59,26	64	Netherlands	3,46
8	Macedonia,	59,08	65	Norway	3,24
9	Ukraine	57,84	66	Denmark	3,14
10	Zambia	57,58	67	Australia	2,76
11	Costa Rica	52	68	Canada	2,73
12	Venezuela	51,19	69	Sweden	2,45
13	Slovakia	50,86	70	United States	2,32
14	Kazakhstan	45,91	71	UK	2,23
				Average Index	**19**

Maximal Index - 100% - means that country is developing only due to own financial potential

Table 4. Impact of the labor factor on economic growth of the modern countries (leaders and outsiders), 2012

No	Leading countries	Index of stimulating impact of labor potential	No	Outsiders	Index of stimulating impact of labor potential
1	Norway	78,44	58	India	9,77
2	Australia	77,39	59	Ecuador	9,6
3	Canada	76,14	60	Sri Lanka	9,38
4	Finland	73,93	61	Bolivia	9,01
5	United States	73,39	62	Kenya	8,7
6	Sweden	72,71	63	Zambia	7,38
7	Iceland	72,27	64	Pakistan	7,36
8	Saudi Arabia	71,94	65	Georgia	7,1
9	Belgium	70,95	66	Vietnam	5,7
10	France	65,63	67	Paraguay	5,46
11	Netherlands	64,79	68	Ghana	5,44
12	Singapore	64,71	69	Armenia	2,63
13	Denmark	63,62	70	Uruguay	2,46
14	Japan	62,07	71	Bangladesh	2,39
				Average Index	**22,4**

Maximal Index - 100% - means that country is developing only due to own labor potential

As the main objective factors of international labor migration (group A) in the study were highlighted:

1. Average wages in the country of destination (as a main factor attracting foreign migrants). It should be noted that this study is based on equality of migrants' and locals' labor;
2. Average cost of living in the destination country (study is based on the assumption that foreign migrant workers are fully socialized in the host country; and have living costs similar with locals).

A difference between average wage and average living cost in the country of employment determines an amount that migrants can save or send home. Essentially, this amount is an economic reason of migration. If the difference between wage and living cost in the country of employment is less or similar with average salary in the country of migrant's origin, international labor migration loses any economic meaning.

For example, an average salary in Japan by World Bank statistics is less than in the U.S.A. (2522 USD per month compared to 3236 USD per month[3]).

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[3] *Data of World Bank // www.worldbank.org*

However, the minimum living cost, for example, in California is 1258 USD per month, and, consequently, a Japanese worker can save/send home less than can earn at home. Obviously, there are no any economic reasons of mass labor migration from Japan to the U.S.

Comparing with previous studies of international migration [3,13,15] this study considers level of purchasing power in different countries and significant differences of local prices.

Correction of value of wages, remitted by migrant to relatives was made considering differences in the level of nominal national GDP and national GDP by purchasing power parity (PPP) of every state.

For example, basing on the nominal GDP and GDP (PPP) of Turkey (0.8 trillion USD and 1.36 trillion USD in 2013) 1,000 USD remitted by Turk from Berlin to his family, will be equivalent to 1720 USD in Istanbul (taking into account the differences between German and Turkish prices).

A similar multiplier for India (in 2013 India's nominal GDP is 1.8 trillion USD and GDP (PPP) is 5 trillion USD) is equivalent to 3.1. It means that 1000 USD earned by Hindu, for example, in the United States is equivalent to 3100 USD in India.

Similarly (depending on the place of expected salary's spending) the consumer attitudes to the same amount of money change in various countries around the world and that directly affect on structure and dynamics of international labor migration.

Statistical studies of international migration, widely known in the scientific community [5], [11], [14] and [16], consider wages in the countries participating in migration exchanges in their absolute terms. This in our opinion does not fully reflect a real situation in international flows of workers.

4.1 Average cost of Migration is also Important Factor of International Labor Movement

The value of the average cost of migration can be objectively evaluated on individual basis (each personal worker knows how much he or his family spent on the necessary procedures, documentation, ticketing and so on). But consideration of the value of this factor in relation to the whole country (mass migration) is significantly hampered, firstly, by purely individuality of migration decision-making process; secondly, by personalization of job search process in the destination country; and thirdly, by absence of required information.

In this connection and in context of the present study the migration costs were estimated based on the complexity of visa requirements for citizens of the country of origin in the destination - country and on the minimum price of air ticket to the country of destination [5,6,17].

The proposed technique can be used to estimate a probability of migration from one country to another (based on their macroeconomic indicators) as well as to predict migration flows in one specific country.

For example, as we can see from Table 5 a probability of migrant flow from Ukraine to Belgium is much higher than flows from Asia Pacific region or Turkey (even the average salary in Ukraine is bigger than Thai or Indian).

Similar findings can be made for California (USA) in Table 6. They show meaningless of labor migration from Japan to the USA.

As we can see from Table 7 migration flows from Ukraine, Belarus, Kyrgyzstan and Moldova will be mostly probable for Russia.

4.2 Theoretical and Practical Results of the Study

Analyzed three main factors for economic growth of the countries (natural-resource, capital and labor resources), we can conclude that modern states are greatly differ by degree of importance of each factor in their economic progress. It is interesting to note that a catalytic role of capital significantly reduces together with growth of States' capital-saturation. At the same time, labor potential and natural resources potential retains their high stimulating role even with increasing of countries' saturation.

Table 5. Estimating of probability of migration flows to Belgium

No	Countries of origin	Belgium – Average wages – 3035 $ Living cost – 1610 $Multiplier PPP – 0,98			
		Average salary[1], $	Multiplier PPP[1]	Migration cost[1]	Total index[1]
1	Philippines	227	1,7	420	4,4
2	Thailand	471	1,65	290	4,29
3	Turkey	1731	1,72	400	9,5
4	Ukraine	659	1,92	113	35,6
5	India	255	3,1	313	21,4

Table 6. Estimating of probability of migration flows to California (USA)

No	Countries of origin	California (USA) – Average wage – 3263 $ Living cost – 1258 $ Multiplier PPP – 1			
		Average salary, $	Multiplier PPP	Migration cost	Total index
1	Japan	2522	0,94	615	0,18
2	Thailand	471	1,65	630	9,4
3	Brazil	758	1,15	980	2,3
4	Mexico	603	1,4	210	13,7
5	Russia	1135	1,2	820	2,9
6	Philippines	227	1,7	670	5,0

Table 7. Estimating of probability of migration flows to Russia

No	Countries of origin	Russia – Average wage – 1135 $Living cost – 435 $Multiplier PPP – 1,2			
		Average salary, $	Multiplier PPP	Migration cost	Total index
1	Kazakhstan	750	1,17	164	3,04
2	Ukraine	659	1,93	75	10,93
3	Kyrgyzstan	279	2,22	130	7,28
4	Belarus	954	2,32	100	9,88
5	Azerbaijan	548	1,35	172	3,36
6	Moldova	364	2,06	166	5,27
7	China	609	1,61	465	1,48
8	India	255	2,95	390	3,21

An analysis of macroeconomic indicators of the modern states also allows making several conclusions:

Extremely high positive correlation (0.88) is between stimulating role of labor factor and GDP per capita of the modern states. At the same time there are almost identical negative correlations between the stimulating role of natural resources and financial factors with GDP per capita in the modern states (-0.47 and -0.49 respectively).

This statistical finding directly confirms an important economic transformation – an economic growth of the country has increasingly provided not by natural and financial resources (including borrowed ones) but by productivity and quality of the labor force (both own and borrowed from abroad).

Allowing a possibility of feedback (a reducing of the role of high-skilled labor in economic growth determines simplification of national economy and its further impoverishment) we can make an extremely important finding for countries that actively attract low-skilled labor (including Russia, UAE, and Thailand).

Qualitative economic progress of the country due to involvement of unskilled workers is impossible in the long term! With a growth of number of arriving migrants national economic progress continues to be provided only by financial and natural resources of the countries. In conditions of rapidly decreasing of stimulating effectiveness

of capital, as well as limited natural resources potential of the country, this strategy has a dead end, is enable to change country's positioning in the structure of international division of labor, can't guaranty discovery and development of new resources for economic growth.

- taking in account a specific of macroeconomic indicators of the countries of global avant-garde, a negative correlation between stimulating role of the labor factor and dynamics of economic growth of modern states (-0.42) seems logic. Meanwhile a correlation between economic role of natural potential and financial resources and dynamics of economic growth in the world is a positive (0.31 and 0.19 respectively). It can be concluded that states are growing fastest due to their natural resource potential (high economic dynamics is traditionally peculiar for developing countries). While an importance of the labor factor is more typical for countries with low dynamics of economic progress (usually developed ones).
- finally , analyzed a correlation between indicators of stimulating roles of three factors for economic development and indexes of international migration in the modern countries, we can determine that the maximum positive correlation is between a stimulating role of the labor factor and dynamics of international migration (0.51). At the same time relationship between economic role of natural-resources and financial factor and dynamics of international migration is negative and relatively low (-0.33 and -0.18 respectively).

These results suggest that countries developing mostly due to natural or financial resources now practically do not attract foreign workers, or even supply workers on the global labor market. At the same time, countries with high labor productivity, with a great stimulating effect of labor on their own economic growth are the main global receptors of migrants.

5. CONCLUSION

Gained result leads to the definition of main problems of the contemporary world labor market functioning.

Global migrant workers' receptors traditionally have limited capacity for own economic growth (often dynamics of their economic growth is timely less than dynamics of migration flows'

increasing). In these conditions, the national systems of these countries are required to increase labor productivity as the most important factor and stimulator of economic growth (as was proved a stimulating effect of natural-resource and financial potentials in economic growth in these countries is insignificant).

In this connection, economic success of these countries will depend on the performance of two important conditions:

- The effectiveness of measures to ensure an influx of highly skilled professionals that are capable to positive impact on growth of labor productivity in the country later (for example, carriers of education, skills, abilities, technologies, and so on);
- The effectiveness of tools to ensure a greater concentration of local population on increasing of their own educational and professional level (with the further application of these skills in productive activities) by providing unskilled jobs to foreign migrants.

A presence of two directions of National migration policy of the modern developed countries permits a presence of international migration both of high-skilled and unskilled workers. And it requires defining of differentiated effective migration policies within an offered model from every state.

Also proposed method to determine probability of international labor migration basing on comparative analysis of modern states' macroeconomic indicators allows to:

- forecast the migration flows from different countries and territories worldwide;
- compare the national economical systems by a probability of their converting into the countries of origin or destination of migrants in conditions of world economic progress;
- create national migration policy (both in the countries receiving and sending migrants); strengthen its flexibility and differentiation; adapt the national migration policy to requirements of current migration relations, monitor its the dynamics and so on.

Finally, the proposed model of estimation a probability of international migration flows formation as a complex system, aggregating objective indicators of modern states economic and social development, costs of migration decision - making, is interesting from a scientific point of view as an attempt to study a phenomenon of international labor migration, to

define causes and effects of migration dynamics changes in the global and national economic conditions.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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