

Origin of poverty in industrialized countries

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Abstract: The possible reasons of poverty in industrialized countries are considered in article on the example of Russia. The model is built on the principles of sociomechanics that use the representation of people as objects with a continuous structure. They can be characterized by means of the interaction between them. This approach allowed us to build a "model of Carlssons - Svenssons - Johanssons," which gives a good matching with the official data on poverty. The main causes of poverty are defined. Existence of a large number of children in low-income and therefore less educated families is one of them. The low wage in such families also because of deficiency of education is another reason of poverty. Thus, education is the most effective way of fight against poverty.

Keywords: poverty, economic development, education

INTRODUCTION

The problem of poverty draws to itself attention since antiquity. Different views on poverty and its origins reflect all diversity of social models. It occurs because no model can be constructed and no social problem can be solved without solving the problem of poverty. This question is highly relevant for Russia since the problem of poverty hinders economic development. The number of people "living difficult" among the respondents surveyed by VTsIOM was 47% in 1994, was 30% in 1998, that number was 51% by 2002. This value didn't decrease below 50% and it made up 68% in 2013 [1].

LITERATURE REVIEW

The set of the works devoted to poverty, is published, and they are devoted to various aspects of poverty.

For example, R. Rothstein [2] believes that low-income children often have no health insurance and therefore no routine preventive medical and dental care, leading to more school absences as a result of illness. However, this is only one aspect of poverty.

Ph.Bartle [3] indicates that poverty includes a lack of access to services like education, markets, health care, lack of decision making ability, and lack of communal facilities like water, sanitation, roads, transportation, and communications.

On the other hand, by words A. Shah [4] human development is about much more than the rise or fall of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests.

The most complete picture of the causes of poverty gives a site of Stanford Center Poverty & Inequality [5], which lists 35 such factors.

One of the main reasons consists that poor became reproduce themselves. That is, children of poor parents, most likely, too will be poor, since they have no opportunity to get an education. The similar tendency takes place at rich, but with plus, their children become richer than parents. Next, authors of editorial article write that it is possible to claim unambiguously that only small part from 30% of poor is capable to change a situation to the best. Poverty became already destiny not only for them, but also for their children and for children of their children for the vast majority. The standard of living for them can worsen only as, because for example, social elevators which could bring them out of poverty [6], are absent in Russia today.

However, each author expresses assumptions that differ significantly from opinions of other researchers. Receiving of constructive representation about the reasons of emergence of poverty will to allow fight against its reasons and its consequences more effectively.

MATERIALS AND METHODS

Necessary data from literature have been used for receiving comparable results. Official statistical data, and also data from various researchers were applied. Besides, opinions from various alternative sources were involved in research process.

Theory

For receiving possibility of the accounting of all factors having impact on the end result, and for a

possibility of forecasting, it is necessary to be guided by more or less non contradictory theory of this question. In this article sociomechanics, that is representation of people as objects with continuous structure which are different interaction among themselves [7], was used as such theory.

Let's imagine a certain young man from a certain Central European country. We will conditionally call it Sweden, but it is clear that to the real Sweden it has same relation, as to other industrialized countries. Let us call a young person, for example, Per Carlsson. The young man was born in a poor family, which is not able to give him an education. In addition, he doesn't receive an initial erudition and craving for knowledge, because this was not accepted in their family. His parents divorced when the young man was still absolutely youthful, so that the mother raised the little Per alone, working on three low-paying jobs. Accordingly, she could not be given to a child much attention, and he grew up uncommunicative and with problems in the psyche. Having no qualifications, he also got a low-paying job, and subsequently married a girl from the same social stratum. After the birth of their first child he took a second job in the evenings, but he worked there for short time due to excessive overload. After the birth of her second and third child, he tried to start his own business, but he did not succeed, and only he got into debt because of low skill and erudition in this. It was necessary to close business, and for return of money again had to take a second job, but money began to leave to offset the debt. Per became drinking out of despair thereby supplying a bad example to the young Maline, Birgit and Bjorn. Each of them also didn't go far, without having the corresponding conditions in a family where conditions of "bad start" were realized. Each of these offspring's of Per Carlsson got a unskilled and underpaid job, in due time married a representative of the their social group and begot of three children, which have repeated the way of grandfathers and parents.

Another family by the name Johansson gave to the offsprings absolutely other entry conditions. Anders Johansson starts to work in a factory for the production of computer games, where, after graduation, he was promoted from private engineer to director. Then he redeems a controlling stake using accumulated with high salary money and he becomes the owner of the factory. His son Mark devoted some time study of the leftist ideas, but soon came to his senses. He got a job the programmer on fatherly factory, in parallel he was engaged at institute and he was visited a public library. Having acquired necessary knowledge and having graduated from the institute, he moved on to a large factory for the production of computers. He achieved not only leadership positions at this factory in the course of career growth, but also met and later married the daughter of a factory director Anne-Marie.

The third family by the name Svensson occupies an intermediate position. Alex Svensson graduated parochial school, but then entered the university and studied at the expense of means of charity foundation. At that he is moonlighting then at a construction site, then at a fish unloading in a fish processing plant. Catching up in the evening, he received an additional qualification in the new technologies. Having worked a little on the firm by new inventions, he founded a small own business with three colleagues, supplying its products parent company. Having married the student of university Marta, the daughter of the parish priest, he became the exemplary family man, having given birth two scions which were named in honor of musicians Jimmy and Freddie.

Now we will try to consider a model "Carlsson-Svensson-Johansson" in terms of possible regularities. Let the annual income of the first Carlsson is on average, μ_1 crowns a year. Frau Carlsson I works part-time and receives, on average, ν_1 kroner a year. Given the availability of the younger generation of Carlsson II, their per capita income will be $(\mu_1 + \nu_1) / 5$. The second generation of Carlssons will have average per capita revenue $4(\mu_1 + \nu_1) / 8$. We will assume existence of equality of all average per capita income in this group of citizens. In case of its absence we consider the average income for all members of all generations of the family. The third stage can be considered as $6(\mu_1 + \nu_1) / 11$, fourth - as $8(\mu_1 + \nu_1) / 14$, and, respectively, the fifth - as $10(\mu_1 + \nu_1) / 17$. General view of the dependence corresponds to $2n(\mu_1 + \nu_1) / (2 + mn)$. The sum such series is equal

$$\sum_{n=1}^{\infty} 2n / (2 + mn)$$

$n=1$

It is calculated by approximate calculations as follows.

We will make replacement: $y=2/n$, $x=y+m$.

If n varies $(1, \infty)$, then x varies $(2, \infty)$, i.e. the sum transformed into a series of

$$\sum_{x=2}^{\infty} (1/x).$$

$x=2$

And it is a regular series (see p.16, formula 0.131 a source [8].

$n \rightarrow \infty$

$$\sum_{k=1}^{\infty} 1/x = C + \ln n + 1/2n - \sum_{k=2}^{\infty} A_k / [n(n+1) \dots (n+k-1)] \quad (1)$$

Using data from the same source and applying numerical approximation, it is possible to receive $A_k = 0,0531n^2 - 0,2465n + 0,359$ (2)

As a first approximation

$$\sum 1/x \approx 1 / [2x(x+1)] \quad (3)$$

After inverse substitution

$$\sum 2n / (2 + mn) \approx 1 / m^2 \quad (4)$$

Then the total average income of all people from the group of Karlssons will be equal

$$D_k = (\mu + \nu)(C + \ln n + 1/2n - 1/2 m^2) \quad (5)$$

Here C is the Euler's constant which equals 0,577.

If to construct dependence of change by years of a living wage on the basis of data from practice, then it obeys the formula $y=at+b$.

For Russia, for example, it is $y = 0,995t - 0,019$.

Poverty level of families of Carlssons will amount to

$$B_1 = (\mu_1 + v_1)(C + \ln n + 1/2n - 1/2 m_1^2) / (at+b) \quad (6)$$

Similar formulas for a families of Svenssons will look as:

$$B_2 = (\mu_2 + v_2)(C + \ln n + 1/2n - 1/2 m_2^2) / (at+b) \quad (7)$$

Similarly for a families of Johanssons:

$$B_3 = (\mu_3 + v_3)(C + \ln n + 1/2n + 1/ m_3^2) / (at+b) \quad (8)$$

If we assume that the economy of conditional "Sweden" consists of three of these families, which

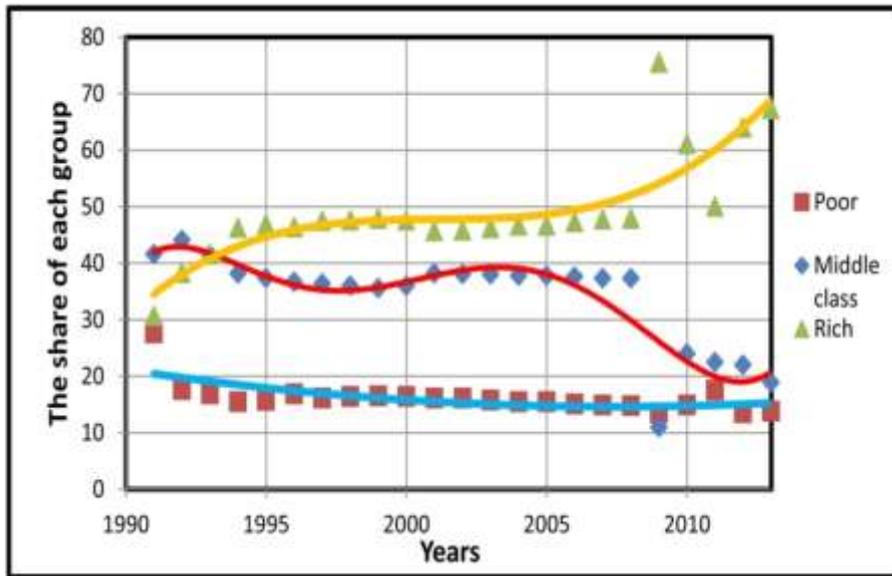
repeated in appropriate amounts, the gross national income citizens will make their sums by stages.

The following indicators for the income can be received by multiplying at the share of the income of citizens in a gross national product

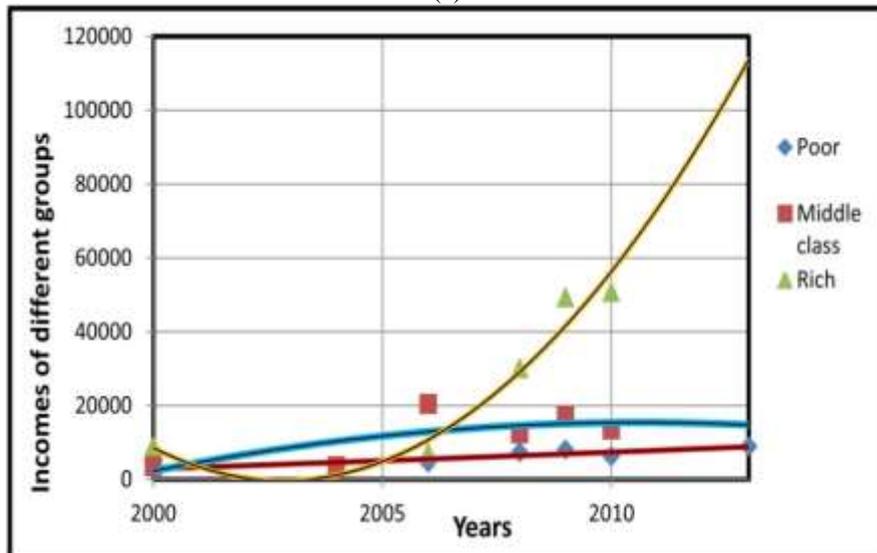
$$B_{\Sigma} = \sum B_i \beta_i \quad (9)$$

where β_i - a share of this category of citizens the country.

Two indicators specified in a formula (9) were calculated on the basis of data from sources [9-12]. The results are presented in Fig. 1.



(a)



(b)

Figure 1. Dependence of parameters by time for each of groups. a) dependence the share of each group, b) – dependence for the income of each group

Numerical approximation for the first case (a) yields the following result:

Poor $Y_p = 9,112t^2 - 1,700t + 0,262 \quad (10)$

Middle class $Y_c = - 8,961t^2 + 0,548t + 0,420 \quad (11)$

Rich $Y_R = - 1,816t^2 + 0,845t + 0,346 \quad (12)$

Regularities for different groups differ more strongly for the income.

Income of the poor

$$Y_{cd} = 0,010t^2 + 0,107t + 0,057 \quad (13)$$

Income of middle class

$$Y_{pd} = -0,386t^2 + 0,631t + 0,045 \quad (14)$$

Income of the rich

$$Y_{Rd} = 3,66t^2 - 1,598t + 0,168 \quad (15)$$

We use the concept of generation to convert the number of generations to the current time. We take into account an indication of K. Mannheim [13], that the duration of the generation is defined as 30 years, since the person learns basically the first 30 years and he departs from the public life by 60 years. K. Lorentz held the same opinion also. He formulated and proved

the "law of three generations", which due to the biological characteristics span a century [14]. Then $t = t/30$.

We will substitute all the values to the formula (9). We take into account the condition of $m_1 = 3$, $m_2 = 2$ and $m_3 = 1$ and we apply a correction factor of 1000 for multiplication accounting for the various components that are measured on a scale from 0 to 1. We use the approximate formulas:

$$\ln t/30 = -3,014t^2 + 5,657t - 6,154 \quad (16)$$

$$15/t = -0,268t^5 + 0,8402t^4 - 1,011t^3 + 0,5857t^2 - 0,167t + 0,0206 \quad (17)$$

RESULTS

The received results are presented in Fig. 2.

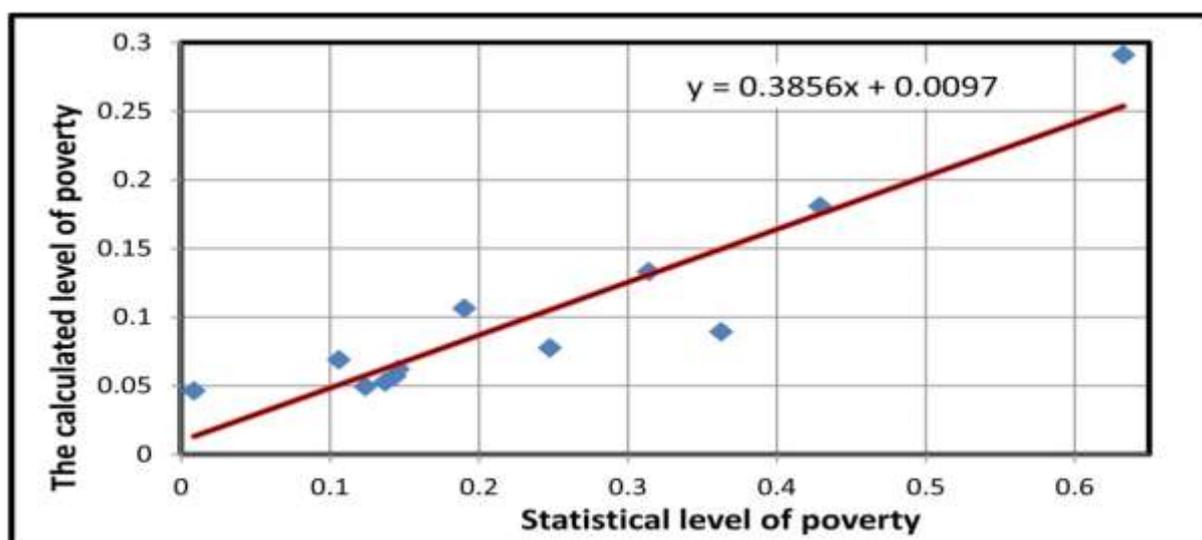


Figure 2. Comparison of statistical and calculated values of poverty

The coefficient of correlation 0,847 is significant at all significance levels exceeding level 0.01. The equation of regression has an appearance $B_{calc} = 0,386B_{st} + 0,01$. The coefficient at a variable is close to 1/3 that is the straight line does not very far from the bisector of the coordinate angle, and a small value of the constant term shows that it passes near the origin. In combination with high coefficient of correlation it means that the offered model well describes time dependence of poverty in Russia.

DISCUSSION

However, many experts consider that official data on poverty aren't absolutely correct, and real indicators of poverty are significantly higher. So, for example, in the source [15] it is claimed that sociological data are, as a rule, unstable and based on a subjective self-assessment that complicates carrying out reliable measurements in long prospect. V. Zhukovsky [16] specifies that the real indicator of level of poverty

in the Russia exceeds official "the politically correct version" of Rosstat by 3-5 times. It is possible that the trend's movement is different. If so, then this trend can be accounted for using the known data on the subsistence level. But these data cannot be considered complete. There are data that real inflation is much greater than the officially announced [17], and a real living wage falls over time.

CONCLUSION

If you take the official data, then the good agreement between the calculated results with statistical data on poverty shows that a higher number of children in low-income and, therefore, less educated families is the determining cause of poverty. Low income in these families also due to poor education can be regarded as a second cause of poverty. Therefore, it is education that can be considered one of the most effective measures to eliminate poverty.

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