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Social revolutions in pre-industrial and industrial societies.

Abstract

In this paper a new theory of revolution is proposed. The theory distinguishes two types of revolutions: the peasant revolution, which can occur only in pre-industrial society and the colour revolution, which can occur only in industrial society. The theory explains the causes and consequences of these two types of revolutions.

Perhaps, the social revolution is one of the most striking social phenomena, therefore the revolutions have always attracted attention of scientists. This interest is caused by the suddenness and massiveness of the revolutionary movement, which embraces the entire society and leads to global changes in it. It is unclear what causes the masses of people, who are far from politics, to unite and begin a decisive struggle against the authorities. The history of the study of revolutions is quite long and during this time the generation of scientists have created many theories. Below I consider those of them that seem to me the most important.

The earliest scientific theory of the revolution was proposed by Karl Marx. Marx thought that due to technological innovations the forces of production would gradually change. According to Marx the forces of production are factors of production: labour, technologies, raw materials, tools, machines and so on. The forces of productions must correspond to relations of production under which Marx understood mainly property relations. Thus changes in the forces of production require appropriate changes in the relations of production. However obsolete property relations are beneficial to the social strata (classes according to Marx), which have all power in society. Therefore a conflict arises between advanced classes that benefit from changes in property rights and reactionary classes that benefit from retaining old property rights. This conflict or class struggle inevitably leads to a social revolution. So according to Marx the revolution is a progressive phenomenon and as result of the revolution the property relations are progressively changed and the economy can develop without impediment. However, it is obvious that the Marx's theory of revolutions does not correspond to many undoubted facts. Marx believed that the socialist revolution, which would replace capitalism by socialism, must occur in the advanced capitalist countries. But it happened in such backward countries as Russia and China. In the cases when revolutions took place in countries, which according to Marx were feudal, progressive changes in legislation were insignificant, and profound changes in the economy began only after many years, as was the case in England and France that does not correspond to Marx' model. But, perhaps, the biggest shortcoming of Marx's

theory is that the class nature of the revolution is not confirmed by the history of many revolutions. Nevertheless, Marx's class perspective of the revolution theory long remained accepted by many scholars.

Obviously, the revolution is a conflict of authorities with the people. And the most important task of the revolution theory is to explain the causes of this conflict. Scientists of the early 20th century saw the causes of revolutions in a combination of random factors such as government deficits, crop failures, unsuccessful war, and wrong actions of the authorities, who infringe the interests of the masses¹. They did not try to create the theory of revolution. So their works “lacked broad theoretical perspective”² and were mainly descriptive.

After World War II, a second generation of revolutionary theorists paid more attention to the theoretical approach to the phenomenon of revolution. The main theoretical directions in this period were the following:

- frustration – aggression theory and cognitive psychology. J. Davies noted that before the revolution society develops quickly. However this growth, which he associated with modernisation, was followed by an economic downturn. He described such development as the ‘J-Curve’. The J-Curve caused public frustration. Revolutions are most likely to occur when a prolonged period of objective economic and social development is followed by a short period of sharp reversal³. For Davies J- Curve is the result of a combination of random factors, but below we will show that it is not so.

Later Ted Gurr reconceptualised this phenomenon as ‘relative deprivation’ – the main point of his revolution theory which he defined “... as a perceived discrepancy between men’s value expectancies and their value capabilities”⁴. Many scientists agreed that the main cause for revolution was the widespread frustration with socio- economic situation but everyone understood the reasons for this frustration in their own way.

- structural-functionalist theory. Scientists of this theoretical perspective thought that revolution is a result of disequilibrium of the state system. However they differed in their definitions of what causes disequilibrium. Among scientists of this group are Neil Smelser⁵, and Chalmers Johnson⁶.

- pluralist theory and interest group competition. The scientists of this group see revolution as an outcome of a struggle for power between competing interest groups. Some representatives of this theoretical perspective are S.P. Huntington⁷ and Charles Tilly⁸. However, conflicts in society have always been. Why conflicts are intensified during revolutions to such an extent that they lead

¹ for example Brinton (1965); Sorokin (1925).

² Goldstone (1980), p. 425.

³ Davies (1962), p. 6.

⁴ Gurr (2015), p. 13.

⁵ Smelser (1963).

⁶ Johnson (1966).

⁷ Huntington (1968).

⁸ Tilly (1978).

to the destruction of the state? As Jack Goldstone rightly observed “The array of changes is so great that these analyses seems to allow that revolution may happen at any time in any society undergoing rapid change” but it is not clear why revolution have been so rare⁹.

The third generation of revolution theorists are far more better grounded historically, and they are seeking not only to explain why revolutions occur but also to account for their divers outcomes¹⁰. First of all it is necessary to speak about the Skocpol’s theory of the revolution¹¹. Skocpol claims that “...revolutionary political crisis, culminating in administrative and military breakdown, emerged because the imperial states became caught in cross-pressures between intensified military competition or intrusion from abroad and constrains imposed on monarchical responses by the existing agrarian class structures and political institutions . The old-regime states were prone to such revolutionary crisis because their existing structures made it impossible for them to meet the particular military exigencies that each had to face in the modern era. Once the old-regime states had broken apart fundamental political and class conflicts were set in motion not to be resolved until new administrative and military organisations were consolidated in place of the old”¹².

So according to Skocpol when the old regimes fail to modernize, although it is necessary due to intensified military competition or intrusion from abroad, latent class conflicts, which are always present in a society, are exacerbated. A weakened state cannot resist them and the revolution begins. It is interesting to note that Skocpol uses the theory of Marx's class struggle as a basis for the revolutionary conflicts.

However, the "great revolutions " are characterized by such deep discontent, covering the whole society from top to bottom, that it is impossible to agree that the reason for it are class conflicts. Almost always such revolutions begin with the conflict between upper social stratum of the society and monarch. This is not consistent with the concept of class struggle. There must be a global cause of discontent for the whole society, which in any way concerns everyone.

The answer to this question was suggested by Goldstone¹³. From my point of view, the works of Goldstone are the highest achievement of the theory of revolutions to date. To investigate the cause of revolutions Goldstone uses the theory of "Great waves". The largest bibliography on the topic is collected in the book of Fischer¹⁴. This theory asserts that in historical retrospectives the population dynamics had an undulating character. During 12-13 centuries the

⁹ Goldstone (1980), p. 431.

¹⁰ *Ibid*, 426.

¹¹ Skocpol (1979).

¹² *Ibid*, p. 285.

¹³ Goldstone (1991).

¹⁴ Fisher (1996).

population of Europe grew and reached its maximum by the middle of the 13th century. Then came the crisis (famine, epidemics and wars), because agricultural production has ceased to meet food needs, as a result the population of Europe declined. From the middle of the 15th century the population began to grow again which lasted until the middle of the 17th century. Then there was a new crisis and a decline in the population. From the middle of the 18th century, a new wave of growth began¹⁵.

The maximum of each wave was accompanied by uprisings and revolutions because standards of living of the majority of population were at biological limit. For example in the middle of the 14th century in England was the Peasant Revolt, in the middle of 17th century there was English revolution or English Civil Wars. In France in the middle of the 17th was the Fronde in the end of the 18th century there was the French revolution. Goldstone notes that state breakdown was widespread in certain periods of early modern history¹⁶ when population reached maximums.

Goldstone showed brilliantly how population growth under absence of land reserves caused dispossession of land for peasantry¹⁷; that growth of prices made it impossible for the Crown to carry out its main duties¹⁸ and how the fiscal crisis and attempts of the Crown to balance budget caused elite opposition to the king¹⁹. Thus the Goldstone's model explains perfectly why there were periods of time when revolutions and rebellions occurred in several countries. In addition, it explains why before the revolution discontent becomes universal. Peasants can not live on plots that are too small, inflation caused by population growth erodes real value of taxation and lead to bankruptcy of the Crown while the impoverishment of the masses of the population inevitably leads to economic difficulties.

However Goldstone's model doesn't explain two very important facts. First it is not clear why in some cases, when population growth reached its maximum, there was a revolution in a country, and in others cases there were only local uprisings. It is evident that the demographic changes had not the same effects everywhere, for example in the middle of the seventeenth century in England there was a revolution while in France it was only uprisings (Fronde). Goldstone is well aware of the need to explain this phenomenon. He explains this difference by different transformation of the political institutions and economies in different countries²⁰. To illustrate this idea he uses the image of a group of buildings on the plain where the earthquake occurred. Some building will topple, other will crack but remain standing. State institutions are

¹⁵ Braudel (1984), p. 617.

¹⁶ Goldstone (1991), p. 173.

¹⁷ *Ibid*, pp.72-74.

¹⁸ *Ibid*, pp. 94-98.

¹⁹ *Ibid*, pp. 99-101.

²⁰ *Ibid*, p. 174.

like these buildings on the plain²¹. However in the case of buildings, the reason for the different effects of the earthquake is obvious - it is differences of their construction. In the case of state institutions it is necessary to show in details what factors give them stability during the period of shocks, and which, on the contrary, contribute to their fall. Goldstone writes that after revolution in the middle of the seventeenth century English state was rebuilt after new more flexible lines therefore the English state easily overcame the demographic shocks of the middle and second half of the eighteenth century. In contrast in France there was not any change in the basic system of the state institutions. Therefore "... when a new wave of population pressure appeared in the eighteenth century the English state was able to stand the stress whereas French state crumbled"²².

I would like to note that the middle of the eighteenth century was the beginning of the industrial revolution in England, therefore it is impossible to say that this wave of population growth has passed for England untraceably. Further, it is unclear why in England in the middle of the fourteenth century population growth caused the Peasant revolt in 1381, while in the middle of the seventeenth century there was a revolution. Does this mean that the English state institutions from the fourteenth century to the seventeenth century deteriorated? If so, what exactly was the deterioration? The Goldstone's theory does not give answer to the question.

Second fact which Goldstone's model doesn't explain is a new type of revolution which came into existence since twentieth century. So called "great revolutions", as the English, French, Russian and Chinese, are perfectly explained by population growth theories. But revolutions in 1989-1991 in the Central and East Europe and subsequent revolutions in the countries of the former USSR occurred when there was no significant population growth, but on the contrary, the population in these countries often decreased. The nature of the revolutionary process was completely different. Revolutions have become non-violent and often bloodless. If before a revolution ended with the establishment of dictatorship, now they are directed against the dictatorship for the democratization of the country. Goldstone does not propose theory explaining this type of revolution and urge to create new theories that explain the diversity of the types of revolutions²³.

It is this new theory of social revolution that I propose in this paper. I believe that we will never understand the phenomenon of revolution if we consider it in isolation. Revolution is a result of social development and only when we understand the reasons for the development of society we will understand the causes of revolutions. The theory of social progress, which I propose, explains the reasons for the progress, and hence the causes of the

²¹ *Ibid*, p. 175.

²² *Ibid*, pp. 175-176.

²³ Goldstone (2001).

revolution. The main element of this theory is the concept of the level of development of population. *The level of population development represents the ability to solve life problems.*

The level of development is a complex of skills and knowledge that people acquire in order to make for living. These qualities are not congenital but acquired in the process of raising children and young people. All peoples have the same ability to progress, but the difference in living standards in different countries gives the impression that there are people more capable of progress. In the nineteenth century, most Westerners were sure that they lived better than the rest of world because they had innate qualities for better life that served as grounds for racial theories and fascism. Today, racial theories are not acceptable, but the difference in living standards and state institutions in different countries is obvious. This difference is a result of different levels of development because any life problem may be solved at very different levels. The higher is the level of development the higher are *level of needs of population and standards of living.*

The growth of the level of development is caused by complicating of labour process. A child from an early age is trained for a future adult life. It is done by his parents, peers, public environment, social institutions and so on. The nature of this training depends on the nature of the work that he will do when earn a living. Anthropologists noted that early agriculturists often punish their children by beating them while hunters and gatherers never do so. For hunters and gatherers it is enough for living to follow their instincts but for agriculturists it is of importance to train children to overcome their instincts and do that is necessary. The hunter will get the results of his work immediately, while agriculturist will reap the harvest after some months. But if agriculturist does not plow the earth and does not sow seeds in time, in the winter he will starve. That is, the work of an agriculturist demands discipline, which is not necessary for a hunter. Therefore agriculturists should accustom their children to discipline.

Thus, the complicating the nature of labour leads to profound changes in the behaviour of the population so *structure of a population's employment is the essential criterion for determining the level of social development.*

In pre-industrial countries, the majority of the population works in agriculture, so the complication of labour is determined by the intensification of land use. For example agriculture is much more intensive land use than hunting and gathering. However, the intensification of land use in pre-industrial societies leads to a fall in labour productivity because law of diminishing returns, so intensification is only possible as a result of population growth²⁴. Thus, progress in pre-industrial societies is controversial because it is possible only under the fall of labour productivity. Progress in such societies is forced by

²⁴ Boserup (1965), p. 4

population growth, when the area of land per capita is reduced below the limit necessary to ensure a standard of living corresponding to the level of development. This limit can be named a *critical population density which is determined by natural conditions and the intensity of land use*. Land of every country may be considered as a *reservoir with human capacity equal to the critical population density times the land area*. The ratio of population density of the reservoir to critical population density returns a *critical coefficient* of the reservoir. Critical coefficient indicates the degree of social tensions in the reservoir. The higher the critical coefficient the more active the population.

A rise in the critical coefficient causes the growth of social tensions, the acceleration of economic development, and strengthening of power of state.

The reservoir is full when the population density is equal to the critical density or critical coefficient equal to 1. Further population growth leads to a decrease in the standard of living below the correspondent level of development that forced population to more intensive agriculture.

Each filling of the reservoir forces the population to intensify land use. If this happens the level of development of the society grows and it progresses. As progress occurs only when the reservoir is full thus *more capacious reservoir will lag behind less capacious reservoirs*. However, the more populous society has more opportunities for division of labour, the bigger its market is, and the more progress the society can achieve. Thus after filling the more capacious reservoir will outstrip the less capacious one. This thesis makes it possible to understand why countries develop at different rates.

Every great wave of population growth in European history is a result of the filling of European reservoirs. When the population exceeded the critical level peasantry was forced to intensify land use. However, there was always a certain limit of intensification, beyond which the peasants did not want to go because fall in labour productivity. This limit led to the stopping of the intensification therefore population ceased to grow and began to decrease. Thus the every great wave of population growth was formed.

However, agriculture cannot intensify infinitely. Eventually, further intensification becomes impossible due to natural, economic or social conditions. For example, it was impossible for residents of the Asian and African deserts to shift to agriculture. In these zones, nature has early set the limit for intensification of land use and they are even today used for nomadic cattle breeding. When all opportunities for intensification of agriculture have been exhausted the filling of reservoir will be the *last one*. The last filling of reservoir is a cause of a revolution.

Before the revolution the population is always growing rapidly, as a result, more and more people are becoming redundant in agriculture. They look for jobs in trade and industry. The growing prices of agricultural products stimulate the intensification of agriculture. Thus before revolution the country's economy is developing rapidly, often at a record pace. However, not all can find

a job in industry and trade therefore more and more beggars, vagabonds, and robbers appear. Growing food prices while wages lagged behind causes discontent among the labourers, triggering social tensions. In order to control these processes, the society needs a strong central power. Thus the power of monarchy becomes absolute.

However, sooner or later there comes a time when the all opportunities for intensification of agriculture have exhausted i.e., the reservoir is filled last time while population continues to grow. The critical coefficient becomes too high, real incomes of the majority of population decreased often down to biological limit that causes difficulties for economy. Impoverished peasants cannot pay rents and taxes. Landlords cannot buy as much industrial goods as before. The Treasury is also forced to reduce the purchase of many goods and services. As a result, the profits of merchants and artisans are declining. Numerically increased nobility cannot enter the public service, as did the generations of their ancestors. Instead of supporting government, elite opposed it. Absolute power of monarch turned to persistent conflict with society's elite. Thus the theory of progress explains the Davies' J-Curve, that is a rapid economic growth with following a sharp fall just before the revolution.

Population continues to grow and with every year life becomes worse. If earlier, when filling the reservoir, the intensification of land use was the way out of the difficulties, now it is impossible because all opportunities for the intensification are exhausted. That is why at the last filling of the reservoir social discontent reaches the maximum, which leads to the revolution. In England, real wages fell to the biological limit at the end of the sixteenth century and remained at that level until the beginning of the revolution²⁵. More than forty years it was necessary that the population of the country, unsuccessfully trying to improve their lives, came to the extent of despair, when the revolution became inevitable.

In this situation society is looking for a way out of the deadlock. To do this you need to understand why life has become so bad and what needs to be done to change it for the better. In this way ideology of the future revolution is formed. The ideology must be understandably for broad masses of population, the majority of who are ignorant, illiterate peasants. All revolution ideologies may be of two sorts: it can be religious ideology, as it was in the Netherlands in the 1570s, in England in the 1640s, and in Iran in the 1980s or leftist ideology as in France in the 1790s, in Russia in the 1910s, and in China in the 1930s and 1940s.

The main thesis of any religious ideology is simple: people by their sins angered the Almighty God and he punishes them. In order to make life better we need to repent and live according to the laws of God. God wants from

²⁵ E. A. Wrigley, R.S. Schofield (1997), Table A9.2 pp. 642-644.

people to be pious and if the people are corrected their life will improve. The authorities, both secular and ecclesiastical, are the main sinners. They themselves do not want to repent and prevent others from doing so. Therefore, the authorities must be replaced by one that will force society to live according to God's laws.

In Europe, the emergence of heresy, and later Reformation was always before the revolution. Since that time nothing has changed and today's Muslim extremists are revolutionaries. They want to create god's kingdom on the Earth, where all true believers will be happy. For such great aim, all the tools are good like bomb explosions, killing innocent people, etc. The Muslim extremism is typical revolutionary ideology.

The main thesis of any leftist or communist ideology is simple too – many people are poor because few are very rich. Wealth is enough for all but distributed unequally. Redistribution of property is necessary to make the life of majority of people better. It is interesting to note that both ideologies are interdependent: very often the religious ideology presuppose the property redistribution because God doesn't like rich while to live in poverty is good for salvation of soul. The leftist ideology practically always includes religious elements: blind faith in holy scriptures of prophets like Marx, Lenin or Mao Zedong, cult of revolutionary martyrs, sacred rituals and singing of hymns.

In addition to these basic types of revolutionary ideology there is still nationalist ideology. It arises when the reservoir, in the last filling stage, is under the rule of another state. Then the way out of the difficulties is seen to expel the aliens who are to blame for these difficulties. However, the nationalist ideology is never the main in the revolution and it is always complementary to either religious ideology or the leftist one. This was the case in the Netherlands and China.

Revolution in a pre-industrial society is a peasant revolution because peasantry consists in such society majority of population. Almost always the revolution begins at the top of society. The upper social strata are unhappy with the absolute power of monarch and want, using mass discontent, to redistribute power in the state in their favour. Conflict very quickly descends down the social pyramid. Whether the lower social strata are involved in the revolution depends on their military strength. In the Middle Ages the main military forces were the knights and the majority of the population had almost no value as warriors. With the advent of firearms, the importance of lower social strata began to increase. But until the eighteenth century cavalry on battlefields was far most important than infantry because low effectiveness of firearms of the time. It was needed to have considerable income to buy a battle horse, arms, equipment and have enough spare-time to have training. For example, in time of English revolution horse fit for cavalry cost more than any journeyman could

earn in a year²⁶. Therefore, in the Early Modern Times the lowest social strata had little impact on revolutionary process and revolutions of this time have not a class nature as, for example, the revolutions in England and the Netherlands. Nevertheless it was peasant revolution because already in the early Modern Time the main revolutionary force was the middle class, most of which was the upper strata of the peasantry. For example, the majority of Cromwell's troopers were yeomen and yeomen's sons²⁷.

Every step down caused radicalisation because the lower is a social stratum the more radical it is. Regardless of the revolutionary ideology, the lower social strata really want only to raise its standard of living by political means. According to the theory of progress the standard of living may be raised only by growth of the level of development of population. Therefore any peasant revolution is doomed to failure, because its main goal is unattainable.

As the low stratum is involved in the revolution process, they begin to force revolutionary leaders to make changes in base economic regulations: redistribution of property, first of all, land; expropriations, the fixing of prices, etc. For example, this was the case in the French, Russian and Chinese revolutions, where the lower strata of the population played a major role, but so was not in the English revolution, where the lower strata did not influence the revolutionary process.

Changes in economy lead to civil war, because higher social strata lost their wealth. The society is divided not only by class but also geographically. Different regions of the country are in different state in time of the revolution. Some regions are at the stage of the last filling of the reservoir and they are the centres of the revolution. Other regions may have a low critical coefficient and therefore have no revolutionary public mood. These regions will support counter-revolutionaries in the future civil war. For example in Russia the south of the country is the steppe regions with big human capacity. In time of revolution they were far to be filled therefore were a base for counter-revolutionary "White" forces.

As a result of intervention in the economy and civil war, living standards deteriorate rapidly. At the same time, political struggle and civil war encourage anarchy and criminality. At this time, the population becomes disenchanted with the revolution as a means to improving life, and society seeks order at any cost. The social need for the centralization of power leads to personal dictatorship, which has power much more absolute than the pre-revolutionary monarch had. Who will win the struggle does not matter. The matter is not personal qualities but social need for strong hand to suppress anarchy. Such was an end of any peasant revolution: Cromwell in England, Napoleon in France, Stalin in Russia, Mao Zedong in China and Khomeini in Iran.

²⁶ H. N. Brailsford (1961), p. 149.

²⁷ H. N. Brailsford (1961), p.145.

So we defined the first type of revolution – the peasant revolution. Such a revolution can occur only in the pre-industrial country, where peasants account for at least 50 per cent of the population. Ideology of the peasant revolution is either religious or communist, and the realization of this ideology makes it impossible to achieve the main goal of this revolution – to raise the standard of living of the population. The peasant revolution usually culminates in personal dictatorship and the repression of all the revolutionary liberties achieved. The cause of the peasant revolution is always last filling of reservoir. Therefore, peasant revolutions always occur on the crest of a large wave of population growth, which corresponds to the concept of Goldstone.

However, if in the case of the filling of reservoir, opportunities for intensification of land use are not exhausted, there will be no revolution, but rebellion. Therefore in England in the fourteenth century there was the Peasant Revolt and in France in the seventeenth century there was Fronde. Revolutions occurred in these countries on the crest of the next Great waves when the all opportunities for intensification of agriculture have been exhausted.

Since small reservoirs are filled faster than more capacious ones, the revolutions have previously occurred in them. Therefore, during the great wave of the fifteenth-sixteenth and seventeenth centuries there was the earliest revolution in the Czechia (Hussite Wars 1419–1434), then in the south of Germany (German Peasants' War 1524-1525), then in the Netherlands (Dutch Revolt 1568–1648) and then in England (English Civil War 1642–1651). In all these revolutions the ideology was religious one and the earliest Reformation was Bohemian Reformation, then Lutheranism and the last it was Calvinism.

This principle is valid for one country if it is large enough. For example in France, the peasant revolution in the south of the country occurred in the sixteenth century because the south of the country has a much smaller capacity than the north. It was the French Wars of Religion with religious protestant ideology - Calvinism. The French revolution in the end of the eighteenth century was a result of the last filling of the northern reservoir.

If we remember the metaphor of Goldstone, first of all the earthquake topples the smallest buildings and the bigger the building, the later it collapses. The Goldstone theory does not explain this phenomenon, while the concept of the last filling of the reservoir explains it perfectly. Subsequent peasant revolutions also took place in accordance with this principle: in France, Russia and China that is, the larger the reservoir, the later came its last filling and, as a result, the revolution.

The countries of the Indian subcontinent are currently in the risk zone. There are the most capacious reservoirs in the world. The peasant revolution has already occurred in Nepal and Sri Lanka, the smallest countries of the subcontinent. There is a great danger that they will occur in Bangladesh, Pakistan and in India. The Green revolution has greatly increased the capacity of these reservoirs, but population of the countries is growing rapidly while the

opportunities for further intensification of agriculture will inevitably be exhausted.

During the peasant revolution the population of a country begins to decline. It happens due to increased mortality from fighting, as well as famine and epidemics, but usually the main reason for that is decline in fertility. As a result of the decrease of the critical coefficient, population activity falls sharply. The lack of political activity of the population gives even greater strength to the authoritarian regime that came to power in the end of the revolution. The decline in economic activity of the population leads to economic decline during this period.

However, after some time the population begins to grow again and the reservoir is filled once more. But the peasant revolution will not happen this time. The elite of the society already knows what a revolution is and will not lead it. Therefore, only uprisings in certain regions and cities of the country can occur. Further development of the country can go on one of two main ways. This could be a transition to an industrial society or a transition to a stationary state.

For the transition to the industrial society after the peasant revolution it was absolutely necessary that in the country there were sufficient and available for mining coal fields. For the development of any industry it is necessary to supply enough energy, and to provide such energy up to the middle of the twentieth century could only coal. Of course in the modern world coal can be substituted by other sources of energy. If there was no coal in the country, or it was not possible to mine it under the available technologies, the country would transit to stationary state. The number of people in the country would fluctuate at the critical density level and if there is no population growth in pre-industrial society, there is no progress. In this state the country can be hundreds and thousands of years, and the level of population development would not change i.e. progress would stop.

If in a country after the peasant revolution there are available coal deposits then the industrial revolution can begin. The Industrial Revolution will begin only when a new wave of population growth after the peasant revolution will again lead to the filling of the reservoir. That is why in England the industrial revolution began in the middle of the eighteenth century when the population of all Europe grew. In France, this wave of population growth led to the peasant revolution because the French reservoir had a larger human capacity than English, hence it was filled later.

The population growth above the critical level creates mass of redundant population in villages. So, in the country there are a lot of enough disciplined, though unskilled people, ready for any work. There is enough energy to develop the industry. Only in this way the beginning the transition of population from agriculture is possible.

Thus *the industrial revolution is process of transition of labour force from agriculture to non-agricultural activity*. Non-agricultural labour is usually more complex than any kind of agricultural labour. It is very important to note that this complication is qualitatively different than what happened during the intensification of agriculture. Never before in the history of mankind was the majority of population of a country engaged in such complex labour activity as work in industry, commerce or services. When people employed in non-agricultural sectors become more than 50 per cent, industrial society has arisen. According to the theory of progress, such a completely unprecedented complication of labour for the majority of the population of the country should lead to an unprecedented increase in the level of needs and standard of living.

However qualitatively change in the level of development of population will begin only 25-30 years after the majority of the population started working in non-agricultural sectors. This time interval is necessary in order new generation have grown up. This new generation has grown and was brought up in quite other conditions as the generation of their parents grew.

These people have such a high level of development which never had any society before. Level of development corresponds to the standard of living therefore income per head begins to grow that happens 25-30 years after the transition of the majority of the population to non-agricultural sectors. Also from this time the birth rate begins to decline. It is also a result of grown level of population development because on the one hand, the growing level of population development requires a rise in the cost of raising children; on the other hand it clashes with higher consumption by the parents themselves. Therefore, the number of children in families is declining.

Another consequence of the grown level of population development is that the people demand more political and economic liberty. This is a requirement of people with a high level of development. For self-realization they need freedom for doing business, freedom of speech, opportunity to influence the political process. However, such people, i.e. the middle class, constitute still a small proportion of the population. The vast majority are ill-educated and unskilled masses. They don't need freedom because they don't know how to use it for their own good.

The state that emerged after the revolution is an authoritarian state and its institutions are aimed to suppress political freedoms. In addition, state institutions have been created in pre-industrial society and do not provide economic freedom, because under the weak development of market relations it was not important. The concentration of power in the hands of officials creates conditions for corruption and corruption is simply horrifying in such societies.

State of affairs in the country fills with indignation people of high level of development, but their struggle for freedom does not find support in the broad masses. The authorities, through repression, suppress the few protests fairly easily. However, sooner or later cyclical economic crisis severely worsens the

situation in the country. The economic downturn is exacerbated by bad work of bureaucracy and restrictions of economic freedom. For now the discontent spreads to the lower strata. The appeals of the middle class to overthrow the authoritarian regime are supported by the general population and no regime can resist. So there is a revolution, which is very different from the peasant revolution. Such revolutions were called "colour revolutions". The term has been applied to revolutions in several countries of the former Soviet Union and the Balkans during the early 2000s.

The difference between the colour revolution and the peasant revolution is as follows:

1. Colour revolutions occur only in industrial societies, i.e., where less than 40 per cent of the population is employed in agriculture. Thus, the society in which a colour revolution happens by the level of development is qualitatively above a society in which a peasant revolution occurs. Higher level of development determines higher level of solution of life problems. This thesis defines the following differences between the colour revolution and the peasant one.
2. The purpose of the peasant revolution is to raise the standard of living by political means, which is impossible. The goal of the colour revolution is to achieve political and economic freedom, which is quite feasible. However the main forces in the colour revolutions are very different. A smaller, middle-class group consists of the more educated – students, small businessmen and white-collar workers. They want economic and political liberty as a way to make their fortune. A second, larger group consists of the more backward strata: peasantry and unskilled workers, recent urban arrivals from the countryside. They want higher living standards through political means.
3. As a result of the colour revolution there is no dictatorial regime on contrary to peasant one. Although the colour revolutions are most often achieved victory, they can never achieve full freedom. Middle class is too small and the majority still wants to raise the standard of living by political means. Therefore, after the colour revolutions usually come to power populists, who promise the majority of the population what these people wants, although it is impossible. It is a populist democracy and the colour revolution is only the beginning of a long political struggle for freedom and democracy.
4. The colour revolution may occur no earlier than 25-30 years after the transition to the industrial society. For example in England the transition had happened about 1800. But only in 1832 the Chartism movement for political freedom had begun. Another example is Russia where the transition to industrial society had occurred in the beginning of the 1960s and the colour revolution had happened in 1991.

Thus the theory of progress explains the facts that the concept of Goldstone cannot explain. Moreover, it provides a theoretical basis for forecasting development of countries, in particular, such phenomena as a colour revolution. Next, I will try to use these theoretical tools for forecasting the development of Iran.

Iran.

According to the theory of progress the development of the country is determined by its natural conditions. The high mountains, hot and dry climate of Iran make only 12 per cent of the country suitable for agriculture. Therefore the capacity of reservoir is small. Besides, lands suitable for agriculture are a collection of mountain basins, often separated from each other with high mountains. Thus, the Iranian reservoir is disintegrated into many small reservoirs each with very small capacity. According to the theory of progress the smaller the reservoir the more quickly it is filled. Thus the small reservoirs develop faster. Indeed, in the territory of Iran agriculture appeared very early and some of the first states on the Earth arose here.

Further growth of the critical coefficient led to the merger of these states into one and territorial expansion. Thus one of the first world empires, the Achaemenid Empire came into being. However as the Iranian reservoirs had a very small capacity opportunities for further intensification of agriculture were exhausted very early. In this case, according to the theory of progress, the country must either transit to an industrial society or shift to a stationary state. For the transition to an industrial society it is absolutely necessary to have sufficient and accessible coal deposits in the country. Iran's coal proved reserves are near 1.1 billion tons; however, they were not accessible in the technology of the time. Therefore Iran transited to the stationary state very early.

As it always happens in a stationary state, the population fluctuates, then slightly exceeding, and then sinking below the critical density. The development of the country is also cyclically repeated: when the population density grows, approaching the critical density, the country's economy is on the rise, the state power is intensified, the country is waging successful wars, sometimes capturing the land of neighbours. However, when population density exceeds the critical level, incomes of the population fall, often below the biological limit. Famine, epidemics and uprisings begin in the country. The population is beginning to decline rapidly, the state is entering a period of decline, the government is weakened, and the country can collapse. Then the population begins to grow again and the process is repeated. In the history of Iran, massive migrations to Afghanistan and Central Asia were also important, as evidenced by the close kinship of languages. Such migrations strongly and

for a long time reduced the critical coefficient, that led to the weakening of the Iranian state.

In Iran, small oases of land where agriculture was very intensive, surrounded by dry steppes, semi-deserts and deserts, where agriculture is impossible and the population of which was engaged in nomadic cattle breeding. Thus, in Iran the population with rather high level of development side with the population whose level of development was low. Hence the amazing unity of high culture with savagery in Iran's history. As mentioned above, in Europe up to the middle of the cavalry on battlefields was far most important than infantry. Iran was in a stationary state hence it lagged behind Europe. Therefore in Iranian history the leading role of nomads continued up to the end of the eighteenth century when the Qajar dynasty had come to power.

In the second half of the nineteenth century another filling of the reservoir began in Iran. The growing critical coefficient created increasing hardship for the masses of the population. As always, it caused the search for a solution to growing problems. As it was in Europe in the 16-17 centuries this decision was sought in the new religion. One of the manifestations of these searches was the emergence of Babism. The growing critical coefficient was as always accompanied by rising prices and famines. In 1870-1871 as a result of the Great Famine in Iran died around 1,5 million people that consisted 20 – 25 per cent of the population of the country²⁸.

Growing social tension manifested itself in a series of protests that took place in response to the sale of concessions to foreigners, the strongest of which was Tobacco Protest of 1890-1892²⁹. In 1905-1911 The Persian Constitutional Revolution occurred. This revolution was very different from such peasant revolutions as the French, Russian, Chinese ones and Iranian Revolution of 1979. The main feature of this revolution was the weak mobilization of the masses, their relatively low activity. The only exception was Iranian Azerbaijan, whose inhabitants behaved in the way the people behave during the revolution. The cause for such development of the revolutionary process is that Iran was in a stationary state during this period. This means that there were social mechanisms in the Iranian society that inhibit population growth. Therefore, the critical coefficient was not as high as it happens in the peasant revolutions and the activity of the people was not so strong. That is why the revolution was led by the middle class. The goals of the revolution were moderate and progressive. There was not a revolution ideology, redistribution of property and other intrusions in economy. Due to weak mobilization of the masses the shah's regime was not toppled although this was helped by the intervention of England and Russia. Nevertheless, the Constitution, the Parliament, the publication of private newspapers, etc. were introduced in Iran.

²⁸ Yeroushalmi (2009), p. 327.

²⁹ Keddie (1966), p. 131.

Iran starts to leave stationary state after World War II due to oil revenues that manifested itself in population growth. In a stationary state, population growth is hampered by high food prices and low wages. This makes it impossible for some workers to feed the family. Therefore the age at marriage and the number of never married are growing that reduces fertility and hence the population growth. Oil revenues on the one hand increase wages while on the other hand increase food imports. As a consequence, the population of Iran since the 1940s had begun to grow faster and faster.

In 1951-1953 in Iran occurred pre-revolution headed by Mossadegh. Such pre-revolutions occur when the tension in the society is not strong enough to begin the peasant revolution. Usually from the beginning of the pre-revolution to the beginning of the peasant revolution takes 25-28 years. This interval is equal to the length of the Kuznets' wave (long swing)³⁰. It is based on the average age of marriage or the average age of the birth of first child, depending on whether the society has adopted birth control in marriage or by marriage. In Iran, 26 years have passed since the beginning of the pre-Revolution (1952) before the beginning of the Peasant Revolution (1978). By the way, between the Constitutional Revolution (1905) and the Pre-Revolution (1952) passed 47 years, the period equal to the length of Kondratieff's wave, which consists of two Kuznets' waves. Knowledge of such periodicity allows to predict more precisely the possibility of revolutions.

The time that passed between the pre-revolution and the beginning of the peasant revolution was the time when social tensions escalated. The top social strata of the Iranian society knew it well. That is why Shah undertook a series of reforms that were called the White Revolution. Shah really did almost everything possible to prevent the social revolution and to avoid bloodshed. He understood that the main source of tension in Iranian society, as well as in every pre-industrial society, is landless peasants, so the essence of the White Revolution was a land reform³¹. However in the conditions of the last filling of the reservoir it is impossible to reduce the number of landless peasants significantly by any land reform. Land reserves have long been exhausted and redistribution of land cannot increase critical population density.

The only way to prevent a revolution is to create the conditions when the redundant rural population finds work in industry and trade. However the majority of population were unskilled and illiterate villagers. To ensure the work for such people it was needed large enterprises with a lot of unskilled labor for example in construction and mining. The problem is whether there is enough money in the state budget for the creation and maintenance of such enterprises, which will undoubtedly be ineffective.

Iran received huge oil revenues, but the population growth was very large. To accommodate population growth is possibly only in those countries

³⁰ Kuznets (1930).

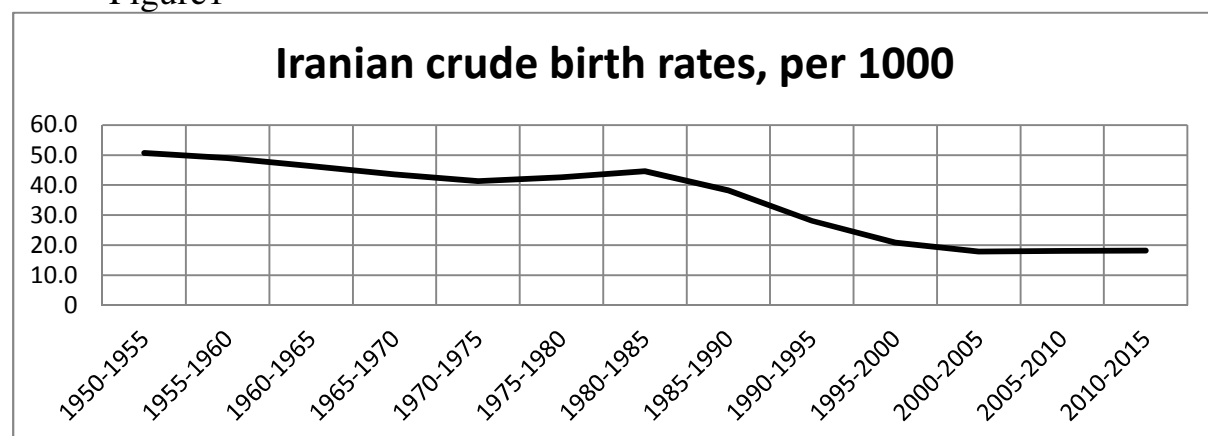
³¹ James (1970), p.33.

where the ratio of oil revenues and population was such, as for example, in Saudi Arabia or Kuwait. Certainly it was not the case of Iran. Besides Shah wanted to make Iran an industrial country and invested big money in high-tech projects: nuclear power plants, the world's largest petrochemical plant, metallurgical plants of a new type etc. Proportionally invested money such enterprises required a few employees but with very high qualification.

Iran's successes before the revolution were impressive. The manufacturing sector grew at average real annual rate of about 14 per cent during 1963-1978, it was the second highest in the world after South Korea³². However the population growth in these years was impressive too. From 1956 to 1976 the population of Iran increased from 18 955 000³³ to 33 662 000³⁴, or 77,6 per cent.

As a result the mass of redundant rural population migrated to the cities but could not find a job there. The migration to the cities before revolution was very large. According to census in 1966 in the cities lived 38,7% (9.8 million people) of the country's population³⁵. In 1976 the urban population reached 46.9% (15.8 million people) of the total population³⁶. So in 10 years, mainly as a result of migration, the urban population has grown by 6 million. Most of these people became low-paid workers and urban unemployed. According to official data living standards 54 per cent of Iranian families were below the poverty line³⁷. It was a very difficult time for the vast majority of Iranians. However, it could not be otherwise, since the revolution would not have occurred. The figure 1 shows Iranian crude birth rates.

Figure1



Source: <https://esa.un.org/unpd/wpp/Download/Standard/Fertility/>

As we can see crude birth rate had fallen just before the revolution. This indicates that at that time a high critical coefficient has caused such a deep

³² Amuzegar (1977), p.6.

³³ National and province statistics (1961), xv.

³⁴ Demographic yearbook (1980), p. 191.

³⁵ National census (1969), r.

³⁶ Demographic yearbook (1980), p. 191.

³⁷ Amuzegar (1977), p. 255.

decline in the standard of living of most Iranians that many have been forced to abandon their desire to marry and have children.

The beginning of the revolution was accelerated by the fact that after a long period of rapid economic growth in 1976 Iran was struck by a sharp albeit short economic crisis. The crisis caused a major cutback in construction, which brought massive unemployment that especially affected recent migrants to the cities³⁸. So the high critical coefficient was exacerbated by the economic crisis just before the beginning of the revolution. Obviously, this has drastically increased the degree of social tension in society.

The Iranian revolution, like any other, has its own features. For example, manifestations of discontent were concentrated in cities, while in the villages there were almost no peasant uprisings so characteristic of other peasant revolutions. This is the specificity of Iran's development before the revolution. The government has invested huge sums of money from oil revenues into the economy and this facilitated massive migration of redundant populations from villages to cities. In such way the social tension in the villages diminished. Such opportunities for migration to the cities before the revolution was not for peasants in France, Russia, or China, so in these countries were uprisings in the villages. Nevertheless Iranian people, who moved to the cities and were engaged here in unskilled labor, kept the level of development of peasants, so the Iranian Revolution was a peasant revolution.

As every peasant revolution Iranian Revolution had its ideology. The ideology was religious as well as ideologies of European revolutions in the sixteenth and seventeenth centuries. The difference was that in Europe the revolutionary ideologies were reformatory, that is, in such way the search for a way out of the deadlock of last filling of reservoir manifested itself. In Iran the religious ideology was Islam. The choice of Islam as a revolutionary ideology by the Iranian population was logical.

The backwardness of Iran in comparison with the leading countries of the world on the eve of the revolution is obvious. Therefore, the revolutionary ideologies so characteristic of Europe of the seventeenth century were not anachronistic for Iran. Besides, in the Iranian revolution the religious ideology was complemented by strong ideology of nationalism. It is no wonder that this was so because Iran has long been on the position of semi-colonial territory of England and Russia. Therefore, the ideology of the Iranian revolution could not be communist one, because communism was associated with the Soviet Union, that is, with a hostile country.

In the aftermath of the Second World War, Iran's dependence on the West was significant. That Shah understood as modernization of the country, for the masses was its westernization. The reasons for the deterioration of the standard of living of the masses, caused by the last filling of the reservoir, were seen as a

³⁸ Keddie (1983), p. 588.

retreat from religion and traditions. The way out of the deadlock was seen in the return to Shia Islam as a national religion. People believed that it was to assuage the wrath of Allah and improve their lives.

The Iranian revolution developed as usually every peasant revolution develops: gradual mobilization of the masses, intensification of confrontation with the Shah's government, until finally the government began to retreat. This demoralized the police and the army and led to rapid victory of the revolutionaries. As always it happens, this led to the struggle for power between the various groups involved in the Revolution and revolts in the national outlying districts. Next the concentration of power in the hand of Khomeini and his supporters followed. The concentration of power was inevitable because the population was afraid of anarchy. The fact that the power came into the hands of Khomeini, of course, was not accidental. The ideology of the revolution was religious; he was a significant religious figure and a longtime enemy of the Shah regime. Of course, his personal qualities and desire for power were important. Then the terror followed against all political opponents and the final consolidation of the new revolutionary regime had occurred.

Although the regime's ideology was religious and therefore conservative, it pursued a leftist economic policy that corresponds to the theory of progress. The regime spent a quarter of the budget in subsidies to the poorer population – direct subsidies for bread, rice, sugar, cheese, fuel and cooking oil and indirect subsidies for electricity, sanitation and piped water³⁹. The prices for certain basic necessities (cheese, rice, cooking oil and detergents) which were sold against rationing coupons were less than prices of free market in 12 -18 times⁴⁰. Although the average real income of households in the post-revolutionary period declined considerably in comparison with the pre-revolutionary era, the subsidies provided stable income for the poorest social strata. Given that their level of development remained low, it inevitably led to a rise in fertility. As we see on Figure 1 it happened after the revolution.

The leftist economic policy has created an inefficient economy in which public sector consists about 60 per cent, with heavy dependence on oil and gas revenues which consists of 60-70 per cent of government revenue, with very high inflation and unemployment and widespread corruption. The rapid population growth, despite rising oil prices and the redistribution of oil and gas revenues among the masses, inevitably led to impoverishment of the population. Therefore, since the 1990s, the government has radically changed demographic policies from pro-natalism to birth control. Birth rate began to fall in 1987 and after 2000 remained stable. I note that government policy can effectively reduce fertility only if the level of development of the population has grown enough for that.

³⁹ Abrahamian (2018), p. 185.

⁴⁰ Amuzegar (1997), p. 73.

In addition, since 1989 and especially since 1997, the Iranian leadership has taken a number of reforms to make the economy more effective. However, Iranian society remains a typical post-revolutionary society, with considerable restrictions on political and economic freedom. According to the theory of progress in such a society the colour revolution is possible. Certainly the regime can by means of reforms remove all restrictions of freedom, then the colour revolution will not happen. However, it is not the case, because the limitations of freedom are very advantageous to many people in power.

So, the colour revolution in Iran is probably inevitable. Thus the next crucial question is – when may it happen? According to the theory of progress the probability of a colour revolution begins to grow rapidly in 30-35 years after the majority of the country's population is transited to work in non-agricultural sectors, as was said above. The theory also asserts that from that time real income per capita will grow rapidly while fertility will decline. However, these indicators in the modern world are strongly distorted. The government can start an aggressive policy of declining fertility even if the population does not want it yet. In the case of Iran, real incomes depend heavily on oil and gas revenues and fluctuate depending on the oil market situation.

It is difficult to define the exact date when the majority of the population have transited to non-agricultural sectors. Under high critical coefficient many peasants usually are part-time workers in industry and trade. It impossible to define - have they became workers or remained peasants? Nevertheless, we can determine quite precisely is a society industrial or not. If urban population of a country consists more 50 per cent, it is certainly an industrial society. No doubt the transition to an industrial society must have happened before that date, because in villages there are people who are engaged in non-agricultural work. However in the case of Iran the time interval between these two dates could not be long, because large oil revenues made it easier for peasantry to migrate to cities.

According to census in 1976 Iranian urban population consisted 46,9 per cent⁴¹. In 1986 the figure was 54, 3 per cent⁴². Thus in our calculations we can accept the date of Iran's transition to the industrial society 1980-1985. This date correspond to the fact that by around 2005 total fertility rate had reached the lowest value and from that time remained stable⁴³. That is, since the transition to industrial society has passed 20-25 years and the new generation has grown and began to marry.

If our reasoning is correct, the probability of a colour revolution in Iran has become quite large since 2015. In 1999 there were the most widespread public protests. The protests begun as student's protests with unemployed youths joining the students. The protests were against closure of a reformist

⁴¹ Demographic yearbook (1980), p. 191.

⁴² National census (1986), Table B p. 2.

⁴³ <https://esa.un.org/unpd/wpp/Download/Standard/Fertility>

newspaper and the main requirement was more freedom, for which the protesters demanded a change of regime in the country. Next mass protests, the so-called Iranian Green movement, happened in 2009. The protests were against manipulations of votes during president election. In 2011-12 a new wave of mass protests happened. Finally in the end of 2017 –beginning of 2018 a series of public protests occurred in various Iranian cities. The protests were initially against the high price of goods and commodities but later protesters proclaimed anti-government slogans.

Thus, in the development of the protest movement in Iran, a certain pattern is observed. In the beginning, the protesters were almost exclusively students, that is, people with very high levels of development. Step by step the social base of protests expanded. In 2017 protests were not started by students, but people with lower levels of development and the cause of protests were economic problems and corruption. It can be noted that the development of protests goes in accordance with the theory of progress. The further increase in the level of development of the population of Iran will inevitably lead to increased dissatisfaction with the regime and then to its downfall that will happen in the near future.

However, the level of development of Iran's population is too low for a full democracy and populists will inevitably come to power. People with such level of development will not be able to manage the country well. The country will be in turmoil and even anarchy until a charismatic leader, who establishes an authoritarian regime, comes to power. Such cycles will recur and the level of freedom will gradually increase. Only when the level of development of the population will be high enough Iran will be a democratic prosperous country.

Thus the theory of progress provides a theoretical basis for forecasting of the development of different countries, taking into account their features. The theory describes the main path of development, but the specific conditions can strongly affect the development of any country. As we saw in the example of Iran, large oil revenues can greatly accelerate the development of the country. Therefore, in Iran, the transition to an industrial society occurred no more than 15 years after the peasant revolution. For example, in China, where there is no income from oil exports, development is much slower. Although the peasant revolution here occurred much earlier, the transition to an industrial society happened only about 2000. Hence, the colour revolution will happen in China later than in Iran.

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