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Secular Structural Processes. Unexpected Results

The economies of individual countries are increasingly integrated with their near – in terms of the main partners in foreign trade – and far environment, that is with countries supplying specific goods, necessary for production. It is impossible to run a business without constant analysis of what is happening outside the country, without keeping an eye even upon very distant areas. This fact is of fundamental importance for any economic policy. The processes taking place in the world economy system must be the starting point for any actions, both adaptive and protective against unfavorable events and processes (e.g. the flood of plastic garbage, transfer prices, etc.). These dependencies limit the scope of the state's activity, requiring a deep analysis of areas where its involvement is possible and effective. The experience of the old structural policy proves that direct interventions in the sphere of production don't have any potential left for the future. The issue of where it is possible now to accelerate the development through the influence of the state is one of subjects considered in this book. This part concerns one of the processes that seems to be viewed as a means of regulating activities. It is not so much a part of the economy as it is rather an area of social relations caused by economic mechanisms. This is a problem of growing property and social disproportions that cannot be reconciled with contemporary crucial values such as democracy and social solidarity. Counteracting this phenomenon is not the subject of the analysis presented here. That could be the next stage of work. Here, instead, the task is limited to answering the question: what and why contributes in the economy to the formation of income disparities. The author attempts to determine the reasons for the rich getting even richer and for the systematic reduction of the middle class in terms of income earned, embedded in the production mechanism itself. Particular emphasis was placed on inquiring how the processes of digitization, automation and application of artificial intelligence contributed to aggravation of this phenomenon.

Keywords: Income Disparities; Globalization; Digitalization; Securitization.

1. Introduction

Signum temporis of current transformations is an emergence of three factors which not only transform the economy but the society as well. These are:

- globalization

- securitization
- digitalization and artificial intelligence.

What these processes have in common is the surprising nature of their effects. Actually, they are not at all as suggested by our intuition or the so-called commonsense speculation. The observed phenomena turned out to be quite the opposite to what was expected. This was first discovered in the case of the globalization process.

Globalization, leading to deep international production specialization, should favor the use of local comparative advantages, raising the level of global prosperity. It turns out, however, that this process primarily took place in the group of highly developed countries, which moved towards an increasingly integrated production system, shaped inside an over-regional “global triangle” (North America, Europe, East Asia). Globalization has not contributed to the leveling of global income. Instead of the expected flow of capital from higher-developed countries to countries with lower GDP level, the reverse phenomenon, *i.e.* the so-called *up hill capital flow* (Prasad, Rajan and Subramanian, 2007) has been observed for years. As a result, differences between countries in the sphere of wealth of production assets have not decreased but deepened. It also turns out that globalization is also accompanied by increasing income differences within countries, especially in the less developed group. Jacek Tomkiewicz, basing on his own research and citing the work of Nomaan Majid, writes that: “the more open an economy is, the less the economic growth translates into a decline in poverty – rather than that, income inequalities grow faster” (Tomkiewicz, 2017, p. 29; Majid, 2010).

2. The Most Important Processes Shaping the Production and Distribution System

In purely economic sphere, the result of globalization is production dispersed all over the world. Complex products are assembled from components originating from various parts of the globe. This way, goods assembled somewhere, out of parts manufactured all over the world, lose their national identification in favor of identification with a supranational brand. This, in turn, leads to the internationalization of the management team, which at least has to represent cosmopolitan attitudes and a global, rather than national, point of view in its professional activities. In this situation, the role of states in shaping the

production structure as well as social relations within the enterprise becomes very limited. The amount of wages and their structure is increasingly a reflection of global and not national dependencies and conditions. You pay as the global labor market dictates. While national regulations may improve the situation in a single company, there is a risk of it being excluded from the international product flow network.

The results of digitization and robotization in the economy are equally surprising. At the end of the last century, it seemed that they would reduce the demand for labor. After all, robots replace people, so the more robots there are, the fewer workers are needed. This, of course, is true but only on a micro scale. If, in one place, machines reduce the number of jobs, they create them at another place. After all, technologically sophisticated devices have to be manufactured and serviced somewhere. Their installation and maintenance require expert knowledge and qualifications. Developing appropriate organizational units that perform such tasks inside each enterprise is unprofitable. Instead, specialized service companies and workshops are created, serving enterprises that use devices of a certain type. The situation is similar as in the field of car repairs and maintenance. There used to be universal garages, dealing with vehicles of any brand. Currently, they are being replaced by specialized workshops licensed by specific manufacturers. In addition, specialization takes place also within them (*e.g.* there are workshops dealing specifically with gearboxes, electrics, *etc.*). Thus, there are many types of service companies that must be ready to sustain the complex system of the economy. They are able to relatively quickly remove failures and make changes in the machine park. Without them there would be downtimes and shortages, causing a sequence of losses in its near and far surroundings. With the appropriate experience and knowledge, such companies allow for smooth implementation of new procedures and products needed. Therefore, outsourcing is an inseparable element of development.

The most spectacular are services provided by programming centers, structuring the production, automation, *etc.* The demand for them grows up over proportionally to GDP, and this increases their price. Sought after employees in this area, aware of their relative scarcity, dictate the terms of employment. This is not only about pay, but also about the right offer of living conditions, which involves expensive infrastructure (housing, cultural offer, sports and leisure, *etc.*). Individual regions and even countries must meet these requirements, otherwise they will experience a dangerous drainage of this currently most valuable staff as it will move towards centers with a better offer of work and general living standard.

A similar effect as the two previously described is triggered by the securitization of the economy. It is also unexpected, because even in the second half of the twentieth Century it seemed that this process, which contributes to dissemination of property, will, at the same time, help to offset income. While not everyone agreed with it, for a long time there were no indications of stretching the income structure as a result of this process.

It turned out, however, that securitization, seemingly only constituting a dissemination of property, caused a profound reduction of the owners' influence upon the production process. As a result, the importance of ownership supervision has been minimized. In fact, the role of a valuating body is no longer played by any statutory body of the company – instead, it is played by the stock market where share prices become the basic dimension of an enterprise valuation. Thus the strategic role of the owner becomes a fiction. Managers of the company (management board, CEO) decide on what enterprise is and what it will be. This in turn defines the entire enterprise strategy to a large extent. Because share prices are the current measure of its effectiveness, the mission of the executive bodies is to control them so that they are as high as possible during any managers' term of office. While it was traditionally believed that the managerial staff should identify itself with the product (Bata shoes, Leica cameras or Electrolux vacuum cleaners being good examples), nowadays identification with profit and profitability prevails. This leads to widening and changes in the production profile that will follow the industry efficiency rankings.

Nowadays, it is repeatedly emphasized that capitalism in the Schumpeterian sense is no longer there. Entrepreneurship ceases to be related to the ownership of capital. The functioning of large enterprises is extremely rarely decided by such personalities as the Michelin brothers, Ferdinand Porsche, and in Poland – Kazimierz Szpotański or Hipolit Cegielski. The contemporary model is a billionaire who has a constantly changing portfolio of financial assets. He meets his advisers every few days. Then he listens to which items of this portfolio he should exchange for others. The criterion is, of course, the short-term effectiveness of the items in this portfolio, primarily – company shares. Apart from rare situations, the list of his business goals is limited to this one.

A typical capitalist does not manage these companies. In this process, he adopts passive attitude. He directs the energy not to the sphere of production but to the ongoing shaping of the portfolio. He chooses, and, in fact, accepts proposals to include assets in it, which currently offer a chance for the highest rate of return, getting rid of those whose prospects are poorer in this respect. However, he does practically nothing to increase their productivity.

High-rank managers, including CEOs, work on the value of the company. Their strategy depends on whether the company's shares will achieve high enough dynamics to attract interest of owners of financial capital. Therefore, they try to squeeze the company as much as possible in the short term so that the obtained results attract investors' money. They work on effects which can interest the investors immediately – *i.e.* on short-term profits. Long-term development strategies in this situation become secondary.

In the situation of limited demand, the most promising action to increase profitability is to reduce costs. In the long run, you can do it through appropriate investments, but this perspective is rendered secondary. The most decisive managers in the company have several-years contracts. Hence, time horizon is crucial for them and it's over that time that they should demonstrate high efficiency. In these conditions, the most effective way to increase that efficiency is to reduce costs, especially their main component – wages. Thus, within a standard, large enterprise there is a mechanism to suppress the growth of wages, which explains, partially at least, the stagnation of the income median.

Thus, it can be said that in large corporations there is the following sequence of events:

- owners of financial capital are looking for opportunities to invest large amounts of funds into companies, offering high and stable rates of return in perspective of several years,
- managers of corporations, to be attractive to the owner of financial capital, focus their activity primarily on reducing wages, because in this period it is the most efficient way to increase the rate of return on the company's liabilities (capital),
- the result of such an attitude of managers is strong inhibition of income growth, which translates into the inhibition of the demand of people living from hired labor, *i.e.* income near or below the median.

Of course, the economy isn't entirely made up of large corporations. Also, they don't account for the majority of employees. However, it is not their participation in the creation of GDP but the importance in shaping the governance patterns that matters. Here, they face no competition. They are business leaders. Newspapers write about them and universities study them. The others watch the "big boys", presuming that the methods they use are the best, for how else would they have achieved their position? Therefore, we are dealing with a broad imitation of managerial actions of large corporations in the rest of the economy. This also applies to the attitude towards the wage growth.

This phenomenon seems rather impossible to stop. The pattern of a company where savings are sought out, mainly in wages and employment, does not seem to have any viable alternative under today's intensified global competition. The resulting limitations in the growth of employees' income and the low demand they generate, it seems, must be accepted as an objective phenomenon. Some limitations are aided by the process of innovative enforcement („you do not modernize, you are out of the market”), which creates a growing demand for employees with very high qualifications and intellectual efficiency. Statistics, however, of total wages indicate that this is not a dominant part, because otherwise their significant increase would be observed.

3. The State and Threats of the Increase of Social Stratification

Changes in the inter-branch relations of the economy and the related employment structure should be treated as a natural consequence of development. As mentioned, little can be done in this dimension, because the risk of off the mark patterns of the production structure is very high. The economy can set up its internal relations by itself and although it can be assessed in different ways, it is better to refrain from direct interventions. However, things are different in the social sphere. It is difficult to remain indifferent to consequences as they seem to smash the very foundations of the universal value system. We are now dealing with secular processes that shape the social stratification. They seem to noticeably undermine the achievements of the modern era in terms of democracy and social peace. The former class struggle seems to come down to an increasingly harsh confrontation of the growing group of dissatisfied with a small group of beneficiaries of changes in the upper income deciles.

Income variation is a natural effect of every economy. The utopian patterns of universal equality were never found anywhere, starting with the “utopia” of Thomas More and Tommaso Campanella (“The City of the Sun”), not to mention communism, whose verification cost lives of millions. Relatively most successful implementations of such systems, in the form of Israeli kibbutzim, by now have undergone far-reaching erosion, which makes longing for universal equality one of the myths that currently play no part in the economy.

However, while social egalitarianism is hardly an attractive social proposition now, the deterioration of the relationship between the poor and the rich increasingly provokes opposition. It is incompatible with the paradigm of equal opportunities that has replaced the myth of equality. A significant

part of society believes that these chances decrease along with the income stratification. Getting better social position becomes very difficult for people from poor families. American myth, according to which anyone can go from rags to riches, nowadays only causes amusement.

Well, the possibility of a smooth promotion, *i.e.* a situation where everyone has a chance to move up to the level above, requires a proper social system. It should ensure the continuity of the vertical social structure, in which the individual rungs are relatively close to each other and within fairly equal distances. Therefore, it is not right that after reaching a certain position it is necessary to make a jump in the efforts and determination incomparable to previous stages. Unfortunately, social transformations carried out by economic changes are heading towards the latter. There is a clear tendency towards the formation of a dualistic model in which two layers are evident: the very well-off and the poor who struggle to maintain the standard of living above the edge of social exclusion. The group whose income was between rich and medium wealthy is shrinking. What once was a solid pillar of society, *i.e.* the middle class, is becoming less and less important, as the number of this group is constantly declining. One particular effect of these processes is the increase, specific to this structure of employment and income, in the number of people employed periodically and the exchange of job offers towards low-paid positions.

In this situation, it is difficult to resist the vision of the return of the social model from before the industrial revolution. In the eighteenth Century, in France, as well as in other European countries, there were two social groups in terms of income: the aristocracy and the rest, including peasants in the country and craftsmen in towns. While the aristocracy was prosperous and often extravagant, the rest often (during crop failures) suffered hunger. The aristocracy was under the protection of the king (who even repaid its debts repeatedly) and the rest of the population went through subsequent famines. The spectacular (and this is important) exemplification of this structure was Versailles, consisting of the palace where the king and the aristocracy lived (numbering about 3,000), and the town of Versailles, almost entirely inhabited by the servants of the latter (1789–60,000) (La Grande Encyclopédie, 1902, p. 886). The current reality, in some countries, hardly differs from this pattern. The Russian oligarchy took the place of the former aristocracy. As much as 16% of the Russian population lives below the poverty threshold, 10% of the richest have 87% of the country's wealth (in the USA – 76% of the wealth, in China – 67%) (Walker, 2017). Similar relations are found in Latin American countries, otherwise known for frequent upheavals or even revolutions. The government is also the protector of the super-rich worldwide. Like aristocrats

ones, nowadays big corporations are paying less and less taxes in the country. Google company is a curiosity because although it has its headquarters in the USA, and even employs mainly citizens of this country (combining employment of 88,000) (Statista, 2018), it does not pay a federal tax there. The state tax is also deeply reduced (only in Iowa, the total reduction of this tax amounted to USD 48 million) (Sverdlik, 2015).

Neither the eighteenth Century nor the currently erratic income “pyramid”, however, arose due to the government’s regulatory action. It was shaped by much stronger factors, having universal character.

In the past, income diversification was a natural consequence of the feudal system, based on the “good birth” and property criteria. Of course, assets remain a criterion for social diversification, but what is important too is the ability to enter and to stay in the upper social layer to which, other than the owners of capital, the so-called top management, free professions and some employees of science also belong. The problem is that the entry costs more and more. Thus a vicious circle is formed, in which the question of how to become rich is answered – be rich in the first place.

Statistics show that the income of the poorer sections of the population is not growing up, although the GDP is. This is happening both in the USA and in the European Union.

Chart 1. Median income of people and GDP in the USA

Source: U.S. Bureau of Economic Analysis, 2018.

It is the divergence of the GDP growth curves and the poorer half of the population that means acceleration of the process of the rich part of the society

getting richer. Data in this area regarding the USA are widely known, and it does not seem necessary to reiterate them. It turns out, however, that this process takes place in the European Union as well, as can be seen in the chart below.

Source: OECD Statistics, 2018. Income Distribution and Poverty.

Both charts show that, in developed countries, the median income essentially does not grow despite GDP growth. It is stabilizing. This is happening both in the USA and in the nineteen wealthiest countries of Europe.

It is also interesting to observe that the stretching of the income structure of society does not occur along the entire length of the distribution. The changes occur in the second half of it and consist in an increasing takeover of the income volume by the richest. At the same time, what is in the poorer half, and thus below the median, essentially remains unchanged. It can be seen by comparing the tables below.

Although the data on the poorer half of society are very incomplete, there is no visible change in the relationship between the deciles and the median anywhere. On the other hand, the increase in the share of the richest decile is a common and significant phenomenon. This is of great social importance, but it also has economic and negative consequences for economic development.

Whereas in economic theory it is a margin, in the society major groups of people basically agree with Saya's law, not necessarily knowing that it was formulated 150 years ago. It says that the rich create demand, just like the poor. Each monetary unit issued by their representatives has the same suction power in relation to the products being manufactured. Therefore, they create jobs, develop technology, *etc.*

Table 1. Share of 10% of the richest in the total income

	2001	2002	2003	2004	2005	2006	2007
USA	42.20%	41.20%	41.80%	43.70%	45.70%	46.50%	47.20%
France	34.50%	35.10%	34.50%	35.30%	34.50%	34.90%	35.60%
Germany	36.20%	36.10%	35.50%	36.00%	38.50%	38.40%	39.60%
Italy	33.00%	33.00%	33.00%	33.10%	33.20%	33.70%	34.10%
Japan	39.60%	40.60%	41.20%	42.10%	42.40%	42.80%	43.00%
Netherlands	21.70%	29.80%	29.80%	30.40%	30.70%	30.80%	31.70%
UK	41.40%	41.00%	41.40%	40.80%	41.60%	42.00%	42.60%
Sweden	28.90%	27.90%	27.70%	28.20%	29.80%	30.70%	31.70%
Switzerland	31.90%	31.20%	31.30%	31.60%	31.90%	32.60%	33.30%
	2008	2009	2010	2011	2012	2013	2014
USA	45.30%	43.50%	45.00%	45.20%	47.80%	45.60%	46.90%*
France	35.90%	35.40%	36.10%	37.90%	38.00%	36.40%	37.00%
Germany	40.00%	39.80%	39.70%	39.00%			
Italy	34.00%	33.90%					
Japan	42.30%	41.30%	41.60%				

* In 2015 this share amounted to 50.5%.

Source: Sverdlik, 2015.

Table 2. Relationship between fifth and first decile of income distribution (P50/P10)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
USA				2.7	..	..	2.7	2.6	2.7	2.7	2.7	
France				1.8	..	..	1.8	1.8	1.9	1.9	1.9	1.9
Germany							1.9	..	..	1.9	1.9	1.9
Italy								2.6	..	..	2.6	
Japan									1.8	1.8	1.9	1.9
Netherlands								1.8	1.8	1.9	1.9	1.9
UK	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2	2	2
Sweden			1.7	..	..	..	1.9	1.9	2	2		
Switzerland								2	..	2		

Source: Sverdlik, 2015.

Well, it is simply not true. Firstly, the rich have greater propensity to save. Secondly, the demand of the rich is different than poorer people's demand. Not only is the difference in the quality of goods sought after, but also the impact

of the expenditure of these groups on the intensity of production processes. In fact, the demand of rich people is less and less directed towards goods produced in the economy. There are currently two areas for this group where there is the highest expenditure dynamics. The first of these is the purchase of rare goods. For 10 years now we are witnessing the highest rate of return on the market of funds investing in works of art. It is 8% now, with the rate of economic growth oscillating somewhere around 0.5–1% (Alindogan, 2015). Another group is real estate market. The interest in it is illustrated by the increase in the housing price index.

Source: Eurostat, 2016. House price indices – euro area and EU aggregates; Index levels (2010 = 100), 2016Q4.PNG.

Source: Federal Housing Finance Agency. House Price Index Datasets. Purchase-Only Indexes (Estimated using Sales Price Data).

In the US, the increase in housing prices is a bit slower than in Europe, but since 2012, it systematically exceeds 5% annually.

The next area fed by the richest percentiles is speculation. Its area is growing, which is not indifferent to the economy and not necessarily because of possible price bubbles. Indeed, the conviction that in speculation, some win what others lose is only a partial truth. The problem is that speculation sucks up money. According to the calculations of the author three years ago, the amount of money absorbed only by trade in derivatives is an amount more or less the order of German domestic income (Sopoćko, 2016). That was it, three years ago. The increase in this amount was then around 6–7%. It can be said that a significant amount of money is actually sucked up by the needs of turnover itself.

4. Employment in the Era of Digitization

As already mentioned, the 21st Century is not a period when jobs are in short supply. In an age of unprecedented acceleration of automation, there is simply a deficit of employees. And not only in specific areas. The deficit is general. This is shown by current statistics and forecasts for the future.

Chart 5. Unemployment rate in the USA after World War 2

Source: Tradingeconomics.com. U.S. Bureau of Labor Statistics.

The lack of connection between the drop in new jobs and the unemployment rate is quite straightforward. Work resources in a modern, highly developed economy are growing (as potential) quite slowly, which is explained by the aging

of society. Potential employees are coming, but mainly not due to new births – rather to the extension of life expectancy. In addition, such reserves as the possibility of higher professional activation of women are virtually exhausted.

At least in the near future, there is no threat of unemployment calculated in absolute terms. For example, the U.S. Congressional Budget Office foresees, for example, full employment in 2020, that is the elimination of unemployment in its value to the level of NAIRU (Non-Accelerating Inflation Rate of Unemployment). This means closing the gap in the labor demand that arose as a result of the subprime crisis. In this way, in 2020, the value of potential GDP is to be the same as the actual one. It is accepted in this country that the potential for growth is practically determined by employment – until, of course, when the increase in labor demand begins to accelerate inflation.

Table 3. Selected levels and dynamics of GDP in the U.S. in billions of dollars, by value from 2005

GDP type	2010	Project 2020	Growth rate
Actual	13,0880	17,5129	3.0%
Potential	14,0171	17,5129	2.3%

Source: Dubina, 2017.

The table shows that the presented projection assumes a complete exit from the extreme of the economic downturn at the beginning of the next decade. It is connected with a higher use of the labor resource, which in the initial period was significantly below the NAIRU rate. Thus, by using this cyclical reserve, the growth rate of real income is more than of the potential one (by 0.7%). If this reserve was not there, GDP would grow, with the current inflation rate remaining, by 2.3% (Dubina, 2017).

The presented projection concerns a short period; however, that does not change its value. Because it is adopted by a government agency, it is important for future analyses. Such forecasts are usually the basis for government action, so they must be made very responsibly. In this case, it can be assumed that, based on the existing data, the U.S. government does not expect any increase in unemployment in the nearest future, which could be due to the automation of the work process. Similar conclusions can be drawn by observing a strong decline in this indicator last year in the European Union.

In Japan, where unemployment has traditionally been at a very low level, now records are being set in this respect. This is happening in the country with the highest achievements in the field of robotic construction and automation of technological processes.

Chart 6. Unemployment rate in the EU

Source: Bowman, 2017.

Chart 7. Unemployment in Japan

Source: Trading Economics, 2017.

These empirical data in no way confirm the tendency to reduce employment as a result of the 21st Century industrial revolution. On the other hand, the logic of running replacement processes requires caution. In perspective of a few or maybe a dozen or so years, the trend may reverse. Therefore, the scenario in which the number of job offers in general will decrease should not be rejected. Currently, however, there is no so-called “hard data” in this respect.

For now, in the global economy of automation and digitization, there is a decrease in unemployment (!), with the simultaneous increase in the number of various warnings about its imminent growth. The latter are not as much as systemic in nature, but rather stem from the observation of new technology products. While it is even possible to count how many jobs automation replaces, it is difficult to estimate how many, directly and indirectly, it simultaneously creates. It is relatively easy to determine trends in existing occupations, it is almost impossible to determine the increase in jobs due to the use of breakthrough inventions. How many people will you need for autonomous vehicles to maintain the infrastructure and to protect them against interference? How many people will find a job in creating and distributing virtual reality software and devices, *etc.*? For the time being, it is not possible to answer these questions reliably.

Digitization and automation create problems that will have to be solved with the help of qualified employees. It is important that these processes do not get out of control, to protect the system from viruses, hacker attacks, *etc.* The need to create new computer software will probably still exist for a long time. Therefore, this will provide jobs for programmers, but also for the personnel necessary for servicing existing computers, defending them against hacking, *etc.*

It seems that when assessing and analyzing possible scenarios of the application of digitization and automation, one should deviate from the approach set out in the question: what it replaces. These two phenomena do not replace elements of the production system, they change the whole system. And so, they are not limited to replacing, for example, routine, manual work. This approach does not reflect the essence of change. As M. Osborne and C. Frey write (Osborne and Frey, 2011) "... the key aspect is not so much the use of computers, but broad changes in the organization that IT technology allows for. The most productive companies reorganize the decision-making, motivational, information flow, and recruitment system and other components of the organization to get the most out of the new technology." Profound changes are taking place, in which some jobs disappear, others appear. What the balance of these changes will be – it is difficult to predict. There are too many variables, degrees of freedom and information gaps. We do not know all the possibilities of a new technology, nor the limits of its adaptation by people. Therefore, the current trend of creating jobs due to new technology (and not their reduction) is taking place and is also has logical justification. And there are events that trigger whole sequences of changes in the areas that deal with industries where they are directly observed. Computers replace activities, but a whole infrastructure is created around them. According to the aforementioned authors, 1 dollar spent on computers

requires 10 dollars turned into the functioning of the network, peripherals, *etc.* Specialized employees are needed for that.

As it turns out, the characteristic feature of the current changes in employment is not the reduction of jobs, but their restructuring. In some areas, employment will probably fall, in others it will increase, however, the balance of changes seems to be positive. In the USA, it is estimated that despite quite deep shifts in job offers, the future is rather optimistic. Indeed, employment is expected to increase, and predicted to do that faster than before. While the employment growth in 2006-2016 amounted to around 0.5% annually, in the next decade 0.7% is forecasted, compared to a 0.6% increase in labor force (BLS News Release, 2017). Therefore, in the next decade, there are more jobs than there are people at working age. In addition, all this will take place under conditions of high productivity growth. According to the BLS, it is to amount to 1.6% *per annum* in the decade 2017-2026, against a significantly weaker one (1.2%) in the previous decade (BLS News Release, 2017). According to official American forecasts, the phenomenon of job losses due to automation and artificial intelligence is not expected in this country. Similarly, in the Euro zone, where unemployment is expected to decline in this decade¹.

The situation regarding the possible reduction and demand for work due to the automation and digitization of the process can be seen as a divergence of two worlds:

Real. The latest empirical data do not indicate a reduction in the volume of jobs, but even an increase in their offers.

Social awareness. There is a widespread expectation that automation and digitization will increase unemployment.

4.1. Structural Changes

According to American data (Bureau of Labor Statistics – BLS), in the 30 most-threatened occupations, 11.5 million jobs will be lost by 2026. These include locomotive operators, watchmakers, call center employees, secretaries, mail workers, employees of the copy rooms, *etc.* The average earnings in these occupations fall within the limits of 30-50 thousand USD per year².

On the other hand, a significant increase in jobs in other occupations is expected. The largest – in the following:

¹ The ECB predicts that within 5 years in Eurostat unemployment will decrease from the current (4Q 2017) 9.1% to 7.9%. ECB Unemployment rate forecast.

² Bureau of Labor Statistics. Employment projection. Table 1.5 Fastest declining occupations, 2016 and projected 2026, October 24, 2017.

Table 4. Expected increases in employment in selected occupations in 2016–2026

installers of photovoltaic panels	105.30%
service engineers for wind turbines	96.10%
home medical assistance	46.70%
personal care	37.40%
medical assistants	36.00%
nurses	33.40%
statisticians	33.40%
therapists	30.80%
software programmers	30.50%
mathematicians	29.40%

Source: BLS News Release, 2017.

Arwa Mahdawi in her article from January 26, 2017 lists the five occupations most endangered by the automation, the chances of automation in parentheses (Mahdawi, 2017): telemarketing (99%), credit rating specialists (98%), legal office personnel (98%), cashiers (97%), taxi drivers (89%), fast-food cooks (81%). The least endangered are, according to this newspaper: psychotherapists (0.3%), personal coaches (35%), nutritionists (0.39%), doctors and surgeons (0.42%), clerics (0.81%).

Some of these items are quite surprising, such as banking analysts or legal office personnel. Hardly anybody is currently able to comprehend the scope of the appearing computer applications. Some of them have moved out of the search phase, finding conjunctions, comparing with a given pattern, *etc.* The era of self-learning systems is coming, allowing for the process of writing pleas or detailed analysis of the client's standing and chances of maintaining income to pay off the debt. On the other hand, the professions considered in this article as essentially non-threatened seem to be compatible with intuition. We have not yet found ways to make computers feel empathy, be good advisers on aesthetic issues or direct films. It is possible to computerize activities, but it is difficult to shape the personality of an electronic partner this way and get such features of its functioning, which people are used to (humor, inventiveness of reports, willingness to interest the interlocutor). In these professions where direct contact with people is the starting point for business success the machines will probably take over only a marginal part of the work being done.

Automation and artificial intelligence seem to relatively quickly master the sphere of production of goods, although certain areas of the sphere (design, public relations, creation of promotional activities) will remain outside it for

a longer time. Workers will pass there, but it must be remembered that the area from where they can go is shrinking. In the industry, where robotization is marking its presence more and more noticeably, in the OECD countries, only 22% of employees are currently employed, 18% in Great Britain, 17% in the USA. In China, an industrial area of the world, 22% of all employees are employed in the industry (World Bank, 2017).

In the sphere of services, automation has made and probably will make significant progress, especially in transport and trade. On the other hand, employment growth can be expected in certain service areas. It's all about professions requiring interpersonal contacts. The enrichment of upper income decile (more on that further in the text) must increase the demand for services in the field of body care, recreation as well as services usually performed by household members (cleaning). It's hard to imagine robots making manicure or cleaning Sèvres porcelain. It will rather remain the domain of crafty human hands.

Considering all employees, significant changes in the occupational structure are expected. This process began even earlier, in the 1990s, when automation and digital control appeared on a large scale. In the decade to come, it is expected that 14% of the world's population will have to change jobs (2.6 billion people). The greatest needs of changes will occur in highly developed countries: the USA – at least 32%, Japan – 46%, Germany – 33%. In total, in developed countries, it is expected that 1/3 of all employees will change occupations, compared to around 9% in developing countries (Manyika, Lund, Chui *et al.*, 2017, p. 11).

These quantities define the scale of the social stress. Changing the occupational profile, for obvious reasons, requires a lot of effort (new qualifications, implementation in new activities, conversion of perception to other areas). However, if it concerns a significant part of employees (from one third to a half), it generates a sense of danger for everyone. From the point of view of the relationship employer – employee, this is not a good situation for the latter. The bargaining power, and the motivation to negotiate working conditions and pay, are poor. There are psychological reasons for concern about keeping a workplace in a situation when more and more people are being laid off. That is, those who will be objectively needed in the conditions of new technologies will also be afraid. The data presented a little further show that work will not be difficult to come by at all, at least not more difficult than at present. However, the transition from one job to another does not have to be immediate. Loans, though, have to be paid regularly, just like rent. In both cases, there is a growing tendency on the expenditure side. Households are

becoming more and more indebted, and rents, as prices of real estate increase, go up as well.

In perspective of at least one generation, the social situation in this area does not seem to change. So far, current trends are very strong. Increasing wage disparity has clearly occurred in the econometric analysis of the wage stratification process carried out by the author (Jaworski and Sopoćko, 2017). Data from 2002-2015 indicate that the increase in national income causes very rapid enrichment of the upper deciles of the income structure, and stagnation, or even a decline of income in the poorer part of society. The indices of income elasticity against GDP calculated on the OECD Statistic database show that the median income of the population does not keep up with the increase in national income. The value of β in regression equations for individual countries is always below unity, and sometimes it is negative (UK – 0.92, Germany – 0.691, France – 0.831, USA – 0.995, Italy – minus 0.472, the Netherlands – minus 0.631, Japan – minus 0.341³). In turn, the elasticity of the highest decile income in relation to GDP in all the countries studied is above unity, and sometimes above two (Germany –2.148, France –1.365, Great Britain 1.298, USA –2.336 Italy – 1.034, the Netherlands – 1.466, Japan – 1.843⁴).

These data for Europe, in the face of relatively low GDP growth, practically stagnate the income of the poorer part of society. In the USA, the GDP growth rate was higher than in Europe and Japan, but this cannot be considered a positive phenomenon, because it was related to the increase in income disparities. The median income in this country over the 15 years of the 21st Century was lower than at the end of the last decade of the 20th Century⁵.

Under these conditions, the assessment of the labor market in the next 10 years, considered as the period of expansion of automation and digital control, does not appear unambiguous. Unemployment in developed countries shows a downward trend but the majority of society does not benefit from it. The rich are getting even richer faster and faster, half of the population remains at a stable level of real income. Benefits from the growth of labor productivity are not likely to affect it. The new technical revolution contributes to that. Here is the forecast of wage dynamics in the U.S. for individual deciles of its structure:

³ The significance test for this parameter of regression function was above 0.9.

⁴ Parameter values calculated with a confidence limit exceeding 0.95.

⁵ Vide **Table A-2**. Selected Measures of Household Income Dispersion: 1967 to 2016, United State Census Bureau 2017.

Chart 8. Expected rate of wage growth (%) in individual wage deciles in the U.S. in 2016–2030

Source: Manyika, Lund, Chui, Bughin, Woetzel, Batra, Ko and Sanghvi, 2017, p. 89.

This chart shows the already mentioned phenomenon of the drop in the income in the middle groups, in the face of, in fact, their stabilization (in total) in the group of 1/3 of the poorest. A definitely high growth is expected in the group of the highest earners. In Germany, stabilization is expected in 2/3 of the total population, divided according to income, and an increase is expected in the highest-earning third part. In Japan, real incomes fall is expected in general, but the largest in the middle group and the smallest among the best earners (Manyika, Lund, Chui *et al.*, 2017, p. 88).

Due to the differences in social welfare systems and the redistribution of income, the assumptions regarding the strength of changes in its structure in developed countries must be cautious. However, the thesis about the deterioration of the middle class in the period of changes that seem to occur in the next generation period now has a rational and empirical basis.

5. Conclusions

Social change seems to be currently heading towards a bipolar society, that is one in which there is a group of rich people and the rest – not at all poor, but separated from the former by a significant income band. This means reduction of the middle class (in statistical terms), which, unlike in previous epochs, is becoming less and less significant for the development of civilization. The main

driving force behind this process is the ongoing revolution of digitization and automation. Contrary to recent expectations it does not reduce the number of jobs. However, there is a deep restructuring of employment, which rewards people with high intellectual abilities, significant knowledge and expert qualifications in a disproportionally high manner. Others are also needed, but in this group it is easy to replace one man with another, whereas in positions with high requirements this procedure is much more difficult and this results in high wages. The possibility of their leaving creates a threat of destabilization of the manufacturing process, natural in the case of the loss of specialists who are key to smooth operation of factories and service delivery systems.

Undoubtedly, the aforementioned revolution will acknowledge the increase in the volume of social prosperity, it's just that the change mainly benefits the highest income deciles. This creates a gap not only in the level of individual consumption, but also in access to social benefits, in particular health and education. Where they are paid for, they become a barrier to migration between social strata, and the pattern of a society of equal opportunities shifts more and more into the realm of illusion. In countries where access to these services is widespread, the bipolarity of social development risks appears to be smaller, though they will rather not disappear. High differences in the standard of living also contribute to other phenomena, such as inequalities in the disposal of the assets, including production, which has further significant social consequences.

References

- Acemoglu, D. and Robinson, J. (2013). *Why Nation Fail. The origins of Power, Prosperity and Poverty*. London: Profile Books Ltd. (p. 73–75).
- Alindogan, M. (2015). *Van Gogh's painting sells for \$66M, nearly six times its 2003 price*. AOL News, 6 May. Acquired from: <http://www.aol.com/article/2015/05/06/van-gogh-s-painting-sells-for-66m-nearly-six-times-its-2003-pr/21180474/>.
- Allen, R.C. (2009). Engels' pause: Technical change, capital accumulation, and inequality in the British industrial revolution. *Explorations in Economic History*. <https://doi.org/10.1016/j.eeh.2009.04.004>. Acquired from: <https://www.nuff.ox.ac.uk/Users/Allen/engelspause.pdf>.
- BLS News Release. (2017). *Employment projections 2016-26*. U.S. Department of Labor, 24 October. Acquired from: <https://www.bls.gov/news.release/pdf/ecopro.pdf>.
- Bowman R. (2017). *Unemployment in the Eurozone has fallen to its lowest level since 2009*. World Economic Forum, 3 August. Acquired from: <https://www.weforum.org/agenda/2017/08/unemployment-falls-optimism-rises-in-eu/>.
- Brynolfsson, E. and McAfee, A. (2011). Why Workers Are Losing the War Against Machines. *The Atlantic*, 26 October.

- Brynjolfsson, E. and McAfee, A. (2014). *The Second Machine Age. Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York: W.W. Norton & Company.
- Deloitte. (2016). *Art & Finance Report 2016*. Luksemburg: Deloitte, ARTTactic. Acquired from: <https://www2.deloitte.com/content/dam/Deloitte/at/Documents/finance/art-and-finance-report2016.pdf>.
- Dubina, K.S. (2017). Full employment: an assumption within BLS projections. *Monthly Labor Review*. U.S. Bureau of Labor Statistics, November, <https://doi.org/10.21916/mlr.2017.30>. Acquired from: <https://www.bls.gov/opub/mlr/2017/article/full-employment-an-assumption-within-bls-projections.htm>.
- Employment protection. (2017). U.S. Bureau of Labor Statistics. Acquired from: <https://www.bls.gov/emp/tables/emp-by-detailed-occupation.htm> (24.10.2017).
- European Central Bank. (2018). *ECB staff macroeconomic projections for the euro area*. March. Acquired from: <https://www.ecb.europa.eu/pub/pdf/other/ecbstaffprojections201803.en.pdf>.
- Eurostat. (2016). House Price Statistic _ House Price Index. Acquired from: https://ec.europa.eu/eurostat/statistics-explained/index.php/Housing_price_statistics_-_house_price_index_euro_area_and_EU_aggregates_Index_levels_2010_100_2016Q4.PNG.
- Jaworski, P. and Sopoćko, A. (2017). *Impact of income distribution on the economic growth*. Conference Oxford University and Bilbao University, 28–29 June.
- Kelso, L.O. and Hetter, P. (1967). *Two-Factor Theory. The Economics Of Reality: How to Turn Eighty Million Workers into Capitalists on Borrowed Money and Other Proposals*. New York: Random House.
- Kurland, N.G. (2001). A New Look at Prices and Money: The Kelsonian Binary Model for Achieving Rapid Growth Without Inflation. *The Journal of Socio-Economics*, 30(6), 495-515. [https://doi.org/10.1016/S1053-5357\(01\)00121-4](https://doi.org/10.1016/S1053-5357(01)00121-4). Acquired from: https://www.researchgate.net/publication/4932117_A_New_Look_at_Prices_and_Money_The_Kelsonian_Binary_Model_for_Achieving_Rapid_Growth_Without_Inflation.
- Mahdawi, A. (2017). What jobs will still be around in 20 years? Read this to prepare your future. *The Guardian*, 26 June. Acquired from: <https://www.theguardian.com/us-news/2017/jun/26/jobs-future-automation-robots-skills-creative-health>.
- Majid, N. (2010). On the Income Dimension of Employment in Developing Countries. Employment Sector. *Employment Working Paper* No. 72. International Labour Office. Geneva. Acquired from: http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/--analysis/documents/publication/wcms_151802.pdf.
- Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., Ko, R. and Sanghvi, S. (2017). *Jobs Lost, Jobs Gained: Workforce Transitions In A Time Of Automation*. McKinsey Global Institute, December. Acquired from: <https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.ashx>.
- Osborne, M.A. and Frey, C.B. (2013). The Future of Employment: How Susceptible Are Jobs to Computerisation? Oxford Martin School, University of Oxford, *Working Paper*, 17 September.
- OECD Statistics. (2018). Income Distribution and Poverty. Acquired from: <https://stats.oecd.org/Index.aspx?DataSetCode=IDD>.
- Piketty, T. (2015). *Kapitał w XXI wieku*. Warszawa: Wydawnictwo Krytyki Politycznej.

- Prasad, E., Rajan, R. and Subramanian, A. (2007). The Paradox of Capital. *Finance & Development. A quarterly magazine of the IMF*, 44(1).
- Rotman, D. (2013). How Technology Is Destroying Jobs. *MIT Technology Review*, 12 June. Acquired from: <https://www.technologyreview.com/s/515926/how-technology-is-destroying-jobs/>.
- Rzońca, A. (2014). *Kryzys Banków centralnych. Skutki stopy procentowej bliskiej zera*. Warsaw: C.H. Beck.
- Saez, E. and Zucman, G. (2014). Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data. *NBER Working Paper 20625*, October.
- Sopoćko, A. (2015). *Mit pieniądza. Realna gospodarka wobec iluzji polityki monetarnej*. Warsaw: PWN.
- Sopoćko, A. (2016). Polityka emisji pieniądza procesie zrównoważonego wzrostu. In: J. Kleer, K. Prandecki (eds.), *Ekonomiczna pozycja Europy w świecie*. Warsaw: Komitet Prognoz „Polska 2000 Plus”.
- Spannagel, D. (2015). *Trotz Aufschwung: Einkommensungleichheit geht nicht zurück. WSI-Verteilungsbericht 2015*. WSI-Mitteilungen, 8. Acquired from: https://www.boeckler.de/wsi-mitteilungen_62503_62548.htm.
- Statista. (2018). *Number of full-time Alphabet employees from 2007 to 2017*. The Statistics Portal. Acquired from: <https://www.statista.com/statistics/273744/number-of-full-time-google-employees/>.
- Stierli, M., Shorrocks, A., Davies, J.B., Lluberas, R. and Koutsoukis, A. (2015). *Global Wealth Report 2015*. Zurich: CREDIT SUISSE AG Research Institute, October. Acquired from: <http://publications.credit-suisse.com/tasks/render/file/index.cfm?fileid=F2425415-DCA7-80B8-EAD989AF9341D47E>.
- Sverdlik, Y. (2015). *Iowa Officials Approve Tax Breaks for Google Data Center Expansion*. Knowledge & Networking Division of Informa PLC, Data Center Knowledge, 17 April. Acquired from: <http://www.datacenterknowledge.com/archives/2015/04/17/iowa-officials-approve-tax-breaks-for-google-data-center-expansion>.
- Tomkiewicz, J. (2017). *Dynamika i struktura dochodów w warunkach globalizacji*. Warszawa: PWN.
- TradingEconomics. (2017). Acquired from: <https://tradingeconomics.com/japan/unemployment-rate>, 26 December.
- TradingEconomics. (2018). Acquired from: <https://tradingeconomics.com/united-states/unemployment-rate>, 3 August.
- United State Census Bureau. (2017). *Table A-2. Selected Measures of Household Income Dispersion: 1967 to 2015*. Acquired from: <https://www2.census.gov/programs-surveys/demo/tables/p60/256/table4.xls>.
- U.S. Bureau of Economic Analysis. (2018). *Real Gross Domestic Product [GDPC1]*. FRED, Federal Reserve Bank of St. Louis, 3 September. Acquired from: <https://fred.stlouisfed.org/series/GDPC1>.
- Walker S. (2017). Unequal Russia: is anger stirring in the global capital of inequality? *The Guardian*, 25 April. Acquired from: <https://www.theguardian.com/inequality/2017/apr/25/unequal-russia-is-anger-stirring-in-the-global-capital-of-inequality>.
- World Bank. (2017). Employment in industry (% of total employment). Acquired from: <https://data.worldbank.org/indicator/SL.IND.EMPL.ZS?view=chart>