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## **ROBOTIZATION OF MANUFACTURING PROCESS:**

### **ECONOMIC AND SOCIAL PROBLEMS AND LEGAL WAYS OF THEIR SOLUTION**

**Abstract.** It is substantiated that the decrease due to the robotization of manufacturing process of the number of working places, should aim the state for the need to revise the tax system and change the approaches to financing free access of citizens to public goods. The robotization and automation of manufacturing process must be taxed, and the appropriate funds should be directed at the social security of citizens. These funds should be directed in accordance with the newly adopted laws on professional, spiritual, cultural and physical development of the individual through the creation of a system of free access to public goods. The robotization and automation of manufacturing process should be aimed at facilitating and improving the lives and health of workers, in particular by reducing the workplaces in hazardous, harmful and difficult working conditions, which requires appropriate changes to labor legislation. Free from work time appeared due to robotization and automation of the manufacturing process should be aimed at the training of workers, and it should also get its regulatory consolidation. There are defended the following key ideas in the article: 1) taxation of roboters' work in proportion to reduced workplaces; 2) the formation, distribution and use of tax revenues from robotization should be subordinated to social goals based on the principles of «justice» and «social function of property». The funds from the taxation of robots should be aimed at ensuring standards of decent life such as: education, health, culture, security; 3) the states should stimulate the primary robotization of manufacturing processes conducted in hazardous, unsafe and difficult working conditions. For example, the manufacturing processes carried out in contaminated with harmful substances in the sites; underground work; work at low or high temperatures; heavy work related to lifting and moving loads etc.; 4) today it is necessary to reform the system of education and training of specialists in accordance with the perspective needs of labor market, where continuity of training should become the basis for professional development of the employee.

**Keywords:** robotization, automation, efficiency of production, working places, unemployment, local finances, employer, employee, state.

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## **РОБОТИЗАЦІЯ ВИРОБНИЧОГО ПРОЦЕСУ: ЕКОНОМІЧНІ І СОЦІАЛЬНІ ПРОБЛЕМИ ТА ПРАВОВІ ШЛЯХИ ЇХ ВИРІШЕННЯ**

**Анотація.** Обґрунтовується, що зменшення, за рахунок роботизації виробничого процесу кількості робочих місць, повинно націлити держави на необхідність перегляду системи оподаткування та зміни підходів до фінансування безплатного доступу громадян до суспільних благ. Роботизація і автоматизація виробничого процесу має оподатковуватися, а відповідні фонди коштів повинні спрямовуватися на соціальне забезпечення громадян. Ці кошти повинні спрямовуватися відповідно до новоухвалених законів на професійний, духовний, культурний і фізичний розвиток особистості через створення системи безплатного доступу до суспільних благ. Роботизація та автоматизація виробничого процесу повинні бути націлені на полегшення і поліпшення життя і здоров'я працівників, зокрема через зменшення робочих місць у небезпечних, шкідливих і важких умовах праці, для цього необхідно внести відповідні зміни до трудового законодавства. Вільний від роботи час, який з'являється за рахунок збільшення роботизації та автоматизації виробничого процесу, повинен спрямовуватися на навчання працівників, що також повинно отримати своє нормативне закріплення.

**Ключові слова:** роботизація, автоматизація, ефективність виробництва, робочі місця, безробіття, місцеві фінанси, роботодавець, працівник, держава.

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## **РОБОТИЗАЦИЯ ПРОИЗВОДСТВЕННОГО ПРОЦЕССА: ЭКОНОМИЧЕСКИЕ И СОЦИАЛЬНЫЕ ПРОБЛЕМЫ, ПРАВОВЫЕ ПУТИ ИХ РЕШЕНИЯ**

**Аннотация.** Обосновывается, что уменьшение за счет роботизации производственного процесса количества рабочих мест должно нацелить государственные органы на необходимость пересмотра системы налогообложения и изменение подходов к финансированию бесплатного доступа граждан к общественным благам. Роботизация и автоматизация производственного процесса должна облагаться налогом, а соответствующие фонды средств должны направляться на социальное обеспечение граждан. Эти средства должны направляться в соответствии с вновь принятыми законами на профессиональное, духовное, культурное и физическое развитие личности через создание системы бесплатного доступа к общественным благам. Роботизация и автоматизация производственного процесса должна быть нацелена на облегчение и улучшение жизни и здоровья работников, в частности из-за уменьшения рабочих мест в опасных, вредных и тяжелых условиях труда, для чего необходимо внести соответствующие изменения в трудовое законодательство. Свободное от работы время, которое появляется за счет увеличения роботизации и автоматизации производственного процесса, должно направляться на обучение работников, что также должно получить свое нормативное закрепление.

**Ключевые слова:** роботизация, автоматизация, эффективность производства, рабочие места, безработица, местные финансы, работодатель, работник, государство.

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**Introduction.** Increasing productivity of production is more often achieved by robotizing the manufacturing process at the enterprise. The industrial revolution that took around people's lives began with the creation of a steam engine and today it has come to the use of machines and artificial intelligence in manufacturing processes. Today the robotization of the manufacturing process covers not only the industry, but also the scope of services, such as: servicing in the food industry, automation of educational services, e-administration, etc. Trends in increasing the number of robots involved in production processes indicate that this process will inevitably lead to a reduction in the number of working places, a reduction in tax revenues, and thus generate problems of employment, filling the budgets of different levels. In general, the robotizing of the manufacturing process around the world requires the governments of the countries to resolve a number of social and economic issues that inevitably accompany the process of robotizing through the revision of national legislation.

**Research analysis and problem statement.** The problem of robotizing the manufacturing process in the context of economic efficiency, social security of the population, providing citizens with job, filling the state budgets becomes global character. The ways of solving these problems are focused by governments and leading scientists and managers around the world, including: Jeremy Corbin, Bill Gates, Daron Acemoglu, Mark Zuckerberg, Johannes Moenius, Jacob Passy, Tshildizi Marwala, Joao Guerreiro, Sergio Rebelo, Pedro Teles etc.

**The purpose of the article** is to justify the need to involve legal instruments for solving economic and social problems that arise in the process of automation and robotization of manufacturing process.

**Research results.** The desire to abate the work of workers and increase the efficiency of production has created a global problem in the modern society for ensuring employment of the population and adhering to the vital level of social standards of human life. Similarly to the regulations of the Art. 43 of the Constitution of Ukraine, which stipulates that «everyone has the right to work, including the possibility of earning by a job and it's freely chosen or freely agreed by him» [1], such provisions are contained in the fundamental laws of different countries of the world, regardless of whether, which level of social and economic development the state has, the basis of its economic basis is the production of goods, works and services. It is a production that provides citizens with the opportunity to earn their living for themselves and their family members, it is production through the system of taxation of profits of enterprises, institutions, organizations and incomes of citizens forms the filling of budgets of different levels, and the production creates conditions for communication of individuals in the work process, their socialization and personal development.

The loss of manufacturing process, as it is today, through the automation of manufacturing process and the increase of robots in the process of goods production, works and services will increase the enrichment of wealthy people and the impoverishment of the poor people. At the same time, the loss of citizens' income will result in the fact that they will not have money to buy produced goods, works and services, and a decrease in the profitable part of the budgets will affect the ability of states to hold state authorities in particular in order to ensure law and order and security in the state. An increase of unemployed people in connection with the growth of unemployment will affect not only the social disturbances of citizens, but also the level of socialization of a person in society and its ability to communicate and develop in the process of collective labor.

Economists point out that «Eighty million U.S. jobs are at risk from automation... Bank of England chief economist Andy Haldane, speaking at the Trades Union Congress in London, said 80 million U.S. and 15 million U.K. jobs are in danger of being taken over by robots. Haldane added the jobs that are most at risk from automation tend to have the lowest wage. In other words, technology could act like a regressive income tax on the unskilled. It could further widen income disparities» [2]. The awareness of a number of these growing problems in society has formed a number of ways to overcome them through the review of taxation systems.

Thus, Bill Gates is convinced that in the case when the robot gets a job that belonged earlier to a person, then such work of the «machine» should be taxed. «But you can't just give up that income tax because that's part of how you've been funding that level of human workers,» he said. «Some of that can come on the profits that are generated by the labor-saving efficiency there. Some of it can come directly in some type of robot tax. I don't think the robot companies are going to be outraged that there's going to be a tax [3]». In this case, drawing attention to solving current problems of personnel shortage, Bill Gates emphasizes that «that robots are beneficial in freeing up people from doing certain types of labor and instead allowing them to work in fields where there is a shortage of people, such as teachers and people who care for the elderly and people with special needs» [3].

Namely, on the one hand, the robotization of manufacturing processes in all areas of social production raises the problem of the loss of employees of their jobs, on the other hand, the robotization of work process can solve existing problems, both with a personnel shortage, and for example, the problem of ensuring healthy working conditions. We assume that reducing the number of jobs in hazardous and not safe conditions of work, such as: chemical production, underground work, works at low or high temperatures can be undertaken by robots. However, in those spheres of activity where a person enriches his life experience in the process of work, develops and affirms as a person, it is hardly an employee wants to be unemployed. Consequently, the socio-economic

problem needs to be solved for ensuring the well-being of the population and identifying ways of involving people in socially useful work in an automated society.

Tshildizi Marwala in her work «On Robot Revolution and Taxation»: «Tax collection is the most significant way in which government generates its revenue. Tax is used to run the state, to pay civil servants, to run public schools and hospitals to maintain roads as well as to pay social grants. These are public goods because they are society's investment into the stability and prosperity of a nation» [4, p. 4]. In her research the author substantiates «if the government gives a tax rate of 0% it will collect no tax at all. If it gives a tax rate of 100%, people will have no incentive to work, and the taxes collected will be zero. Somewhere between the effective tax rate of 0% and 100%, there is a tax level that results in the maximum tax collected. Without automation this maximum tax collected will be a certain number. If we automate our factories without changing the corporate tax rate, then the tax collected will decrease. If we automate our factories and responsibly increase corporate tax rate, we can end up with the amount of tax collected which is higher than that collected without automation» [4, p. 5—6]. It is necessary to agree with Tshildizi Marwala's affirmation that the industrial revolution should not lead to a fall in living standards, and suggests to solve this problem by increasing the corporate income tax, but in such way that it does not lead to a reduction in tax revenues by reducing incentives for corporations [4, p. 5].

Some politicians such as Britisher Jeremy Corbin also advocate the taxation of robots, and this approach should be operated as «for the benefit of society as a whole» [5]. That is, the taxation of the robots' work as one of the source of income for the subsequent allocation of these funds to ensure the welfare of citizens in general can be an acceptable strategy to overcome arising in the process of roborization problems. In the context of such approach, there is a need to review the tax legislation.

At the same time, it is necessary to agree with the opinion of Johannes Moenius. He said taxing robots will reduce income inequality during the transition to a more automated society, no doubt. But for the income and wealth inequality issue, it is simply the wrong tool [5]. Such opinion is not unique, in particular, there are conducted the economic calculations of US tax system models using the after-tax income function proposed by Feldstein (1969), Persson (1983), and Benabou (2000) and estimated by Heathcote, Storesletten and Violante (2017) showed «that without changes to the current U.S. tax system, a sizable fall in the costs of automation would lead to a massive rise in income inequality. Even though routine workers keep their jobs, their wages fall to make them competitive with the possibility of automating production. Income inequality can be reduced by raising the marginal tax rates paid by high income individuals and by taxing robots to raise the wages of routine workers. But this solution involves a substantial efficiency loss. A Mirrleesian optimal income tax can reduce inequality at a smaller efficiency cost than the variants of the U.S. tax system discussed above, coming close to the levels of social welfare obtained in the first-best allocation. An alternative, less ambitious, approach is to amend the tax system to include a transfer that is independent of income. With this transfer in place, it is optimal in our model to tax robots for values of the automation cost that lead to partial automation. For values of the automation cost that lead to full automation, it is not optimal to tax robots. Routine workers lose their jobs and live off government transfers» [6, p. 40—41].

That is, the taxation of robots can have the following consequences:

- Loss of production efficiency;
- Reduction of wages for employees of simplest professions;
- Restructuring of human life support at the expense of state transfers.

But such consequences can hardly be named as a desired result of automation and robotization of manufacturing processes. At the same time, such consequences point to the formation of a number of problems from the introduction of robotization the manufacturing process. The first one is the loss of production efficiency that, to a certain extent, reduces the attractiveness of the business itself as a way of generating profit. Secondly, it is the loss of employees of the simplest professions, the ability to provide themselves and members of their family with a decent life, and thus a reduction in revenues to the corresponding budgets of the state. And the third

problem, which by its nature is social, is a decrease in the economic activity of the population, which will further affect the level of social communication of people, their aspiration for self-affirmation and development. Under conditions of providing human life with state benefits without any human effort, such a policy can form a generation of non-initiative citizens who can only consume without engaging in socially useful activities.

The presented problems demonstrate not only the necessity of restructuring the tax systems of the world in the conditions of automation and robotization of processes, but also proves the need to overcome these problems in such way as to minimize the risks of losses of economic activity of the population, to avoid reducing tax revenues to the budgets and maximize the growth of production efficiency.

In the context of this, we agree with the thesis that «the strategy of enterprise development, which ensures the stable rate of its growth and effective functioning in the long perspective, is always based on a complex of innovations, namely the use of scientific and technological advances in the field of technology, organization, management etc. Consequently, the strategic management of enterprise is focused on achieving the future results through the innovation process. Namely: the innovative strategies are the basis of modern management in a context of constant environmental change» [7, p. 91]. That is, it is impossible to stop the automation and robotization of the manufacturing process, but it is necessary to revise the strategies of economic activity of economic entities and to do it based on the principles of «justice» and «social function of property» enshrined in the Declaration on Social Progress and Development adopted by the General Assembly of the United Nations. This international act also determines that means and methods for achieving social progress and development should be the «fair distribution of national income» achieved through the use of the tax system and public expenditure as an instrument for the equitable distribution and redistribution of income to promote social progress [8].

For completeness of presentation of material, it should be noted that there was discussed the plan for the introduction of guaranteed income of citizens in the amount of \$ 2,500 Swiss francs (\$ 2,520) in Switzerland. However, the main part of the population was opposed, and one of the key arguments was that «fewer people would choose to work» [9]. In the European Union, the robotics industry emphasizes that automation and robotization of the manufacturing process are the main innovations, and therefore the adoption of laws on the taxation of robots will have negative consequences. The European Parliament, in discussing this issue, adopted a resolution proposing to refuse the idea of robot taxation. At the same time, the abandonment of the idea of robots taxation has left without solving the problem of negative consequences in the labor market [10]. The restructuring of supply and demand in the labor market, and thus, the loss of part of jobs through the introduction of automation and robotization of manufacturing processes, regardless of the issue of taxation, must be solved in the near future. This requirement is dictated by the time and rate of scientific and technological progress. In particular, today it is necessary to reform the education system in order to prepare future workers for work as will take place in 10-20 years. At the same time, we do not support the idea of abandoning the taxation of the robotization of the manufacturing process because the increase in unemployment caused by automation and robotization will not only displace people from workplaces, but also reduce tax revenues from taxation of individuals' profits, and automatically increase the cost of mandatory funds of mandatory state social insurance against unemployment, in particular the costs of retraining workers who have lost their jobs.

Jacob Passy emphasizes the need for educators to be involved in the process of forming a new generation of employees; in particular, he emphasizes the need for retraining and the involvement of employers in this process. At the same time, the author notes that «the occupations most at-risk because of automation range from retail salespersons and fast food workers to administrative assistants and accountants. Meanwhile, people working in fields like nursing or education will have a better shot at staying employed as software becomes more prevalent in the workplace» [11]. Thus, in optimizing the tax revenues to the budgets due to the taxation of the robotizing of manufacturing processes in parallel, it is necessary to revise the system of training specialists in educational institutions.

In general, the discussion on ways to overcome the negative effects of the robotization of manufacturing process should develop in the context of social values, where the person, his life, health and safety are the highest social values. To a certain degree, we agree that the introduction of guaranteed income of citizens, formed from tax revenues from the robotization of the manufacturing process is not the best idea, but the complete refusal to tax the work of robots makes it impossible to obtain state income from robotics and the introduction of innovative technologies. The very essence of the modernization of manufacturing processes is to facilitate the working conditions, and to obtain socially significant results from these processes by society. Everything created by a person to satisfy his vital and spiritual needs in the end should provide decent living conditions for a person. If robotics of the manufacturing process liberates a large number of workers and creates conditions for increasing free time, it should be turned to favor of the person himself, in particular, this time must be used for the physical, cultural and spiritual development of the individual.

Under such conditions, modernization of the state's economy by increasing the level of robotization of the manufacturing process should be based on the following ideas:

- The first, the taxation of robots' work in proportion to reduced workplaces;
- The second, the formation, distribution and use of tax revenues from robotization should be subordinate to social goals based on the principles of «justice» and «social property function». Funds from the taxation of robots should be aimed at ensuring standards of decent life such as education, health, culture, security. Citizens must have access to social benefits, not to money;
- Thirdly, the states must stimulate the primary robotization of manufacturing processes conducted in hazardous, dangerous and difficult working conditions. For example, the manufacturing processes carried out in contaminated with harmful substances in the premises; underground work; work at low or high temperatures; heavy work related to lifting and moving loads, etc.;
- Fourth, today it is necessary to reform the system of education and training of specialists in accordance with the perspective needs of the labor market, where continuity of training should become the basis for professional development of the employee. And here it is important that in the learning process, a person should have access to social benefits without losing their living standards, and it should be achieved at the expense of means from the taxation of the robotization of the manufacturing process.

To implement these ideas, in particular in Ukraine, it is necessary to review the system of relations between the state, employers and employees at least at the level of collective agreements and acts of social partnership at the national, sectoral and territorial levels. We also note that today in our state issues of robotization in manufacturing processes is not acute as in developed countries of the world, and this is due to more economic problems and the lack of funds for the modernization in manufacturing. The cost of labor in Ukraine is also low, but this does not mean that today it is necessary to have a strategy of minimizing risks from total automation and robotization of manufacturing processes. This, in turn, convinces us that already today, Art. 158 «The duty of the owner or his authorized body to facilitate and improve the working conditions of employees» of the Code of Labor Law of Ukraine should be supplemented with Part 2 of the following content: «The owner or an authorized body of this body must first of all introduce measures that include the automation and robotization of manufacturing process to eliminate hazardous and harmful health conditions». The purpose of such implementation of automation and robotization of manufacturing process should be facilitate and improve the working conditions of workers.

As to the need to prepare workers for work in specialties that are less vulnerable to the process of manufacturing robotics, primarily the education and public procurement system must be revised. And it is important that the simplest specialties belonging to professions with a significant risk of disappearance from the labor market should be replaced by more advanced, which include not only vocational training but also at least the training at a junior specialist level. Such basic training of young people should provide for the formation of young people self-training skills in conditions of continuous education. Such basic skills should provide workers with the possibility of

professional development through non-formal vocational training, which according to paragraph 7 of Art. 6 of the Law of Ukraine «On Professional Development of Employees» is carried out with their consent directly from the employer in accordance with the employer's decision at his expense, taking into account the needs of his own economic or other activities.

Regarding the revision of the system for tax revenues to the budgets of corresponding levels, it should be noted that these funds are needed to provide people with a standard of living that is in line with international social standards, and it is from robotization of manufacturing process of the state that should receive social benefits not only because of reduction of workplaces in hazardous, harmful and difficult conditions of work, but also by increasing people's free time from work, which should be directed to getting new knowledge. That is, if the robots displace a person from work, he has more free time. This time, according to our mind, should be used for learning. It is necessary to provide such opportunity by directing tax revenues from robotization to finance free access of citizens to social benefits such as: education, health care, security, etc. And in this context, we support the assertion that «modern legal state must, firstly, guarantee the rights of citizens to support their life at the minimum level, but normal for human life; secondly, to create equal conditions and opportunities for all citizens for self-realization, and, consequently, self-defense from life's problems; thirdly, to guarantee the right to social security in case of illness, unemployment, disability, orphanhood, old age or other circumstances independent of the person of disability» [12, p. 254].

**Conclusions.** Firstly, the reduction through the rotation of the manufacturing process of the number of work places, should target the state to review the tax system and change the approaches to financing free access of citizens to public goods. Such changes can be introduced by changing the current legislation.

Secondly, robotization and automation of manufacturing process, which is accompanied by the firing of people from work, must be taxed, and appropriate funds must be directed at social security of citizens. The leading states of the world have justified that state-guaranteed basic incomes of citizens from taxation of robots contain high social risks for a person as a social being, and therefore tax revenues should not be allocated to the payment of money. These funds should be directed in accordance with the newly adopted laws on professional, spiritual, cultural and physical development of the individual through the creation of a system of free access to public goods.

Thirdly, the robotization and automation of the manufacturing process should be aimed at facilitating and improving the lives and health of workers, in particular by reducing jobs in hazardous, harmful and difficult working conditions, for which it is necessary to amend the Code of Labor Laws of Ukraine. Free from work time, which appears due to increased robotization and automation of the manufacturing process should be aimed at the training of people, which should also get its regulatory consolidation.

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