

The effects of digitalisation on the labour market: the case of Russia

Liliia Matraeva, Ekaterina Vasiutina and Alexey Belyak

Liliia Matraeva is a professor in the Economics department at the Russian State Social University in Moscow, Russia.

Ekaterina Vasiutina is a docent in the Economics department at the Russian State Social University in Moscow, Russia.

Alexey Belyak is an expert in the Economics department at the Russian State Social University in Moscow, Russia.

ABSTRACT

This article looks at the mechanism of formation of new institutional traps in the labour market under conditions of digitalisation of the economy. In particular, the effects of coordination, training and pairing, as well as cultural inertia and lobbying, are analysed as structural elements of institutional traps, which in the labour market create prerequisites for the consolidation of specific social norms that reduce the overall efficiency of the economic system. It proposes that, when all the effects are implemented synchronously, they complement each other in such a way as to contribute to the formation of institutional traps in the labour market when digital technologies are introduced. This leads to an escalation of risks in the labour market, against the background of an aggravated contradiction between supply and demand, leading to a self-sustaining structural imbalance associated with the introduction of digitalisation tools. The article draws attention to inertia in the process of adaptation of public institutions, which prevents the optimal institutional set up being reached, as there is a contradiction between the previously formed model of behaviour of economic agents and the system of management.

KEY WORDS

labour market, digitalisation, institutional traps, lock-in effect

Introduction: hypothesis of lock-in effect in the labour market

In the past, the problems of the inefficiency of institutions in institutional theory were considered to a greater extent in a static form (the theory of failures (fiasco) of the market, state and transaction costs). Nevertheless, individual researchers have noted the crucial role of history in the development of economies and the need to study the problems of the institutional system in terms of their dynamics. In particular, Karl Marx wrote that decision-making is based on circumstances that are 'given and transmitted from the past' (Marx, 1852:5). These same aspects of historical influence on the development of institutions were pointed out by Max Weber (1990) in his writings. During the 1980s, a separate area of institutional theory developed among those who study social institutions, analysing the effect of dependence on previous development (path dependence), associated with the name of Paul David (1985). David substantiated how an inefficient technological solution may be rooted in the economy and, even if there are creative conditions, may then become fixed in place. Douglas North, in turn, adapted the theory of Paul David, demonstrating the influence of the effect of dependence on previous development on the development dynamics not only of technologies, but also of socio-economic systems in general (Lesnyh & Ilyashenko, 2009). He pointed out that certain periods in the development of an economic system can be considered as a function of its previous development trajectory; therefore, socio-economic choice at certain turning points may lead to socio-economic ineffectiveness. Moreover, at the moment of determining the development path, a norm can be chosen which in the short term seems optimal, but in the long term is not only less effective than alternative norms but also becomes fixed, making further development impossible. We are talking here about institutional traps – a form of dependence on previous development.

The institutional trap can be considered as the formation and functioning of inefficient, but sustainable institutions, or norms of behaviour that reduce the overall efficiency of the economy (North, 1990). Most often, institutional traps are formed against the background of transformation processes that occur in a socio-economic system under the influence of various objective and subjective factors. Transformation entails institutional changes that can be implemented in two ways. The first is a classic variation of institutions – their spontaneous evolution under the influence of various factors. In this case, institutions are not planted 'from above', but arise 'from below'. The second method is associated with the intervention of the state in this process, and here the path of institutional development is associated with the import of institutions. Although an institutional trap can be formed in either way of implementing institutional change, it is more often correlated with the transplantation of institutions (Castells, 1998). However, practice has shown that evolutionary change can also trigger what Alchian (1950) refers to as an 'investment trap'. According to this approach, development proceeds on the basis of competition, as a result of which 'weak' institutions die out, and 'strong' ones survive, providing effective coordination of the actions of economic agents.

Needless to say, the presence of competition between institutions cannot be a sufficient condition for the progressive development of the economy. As shown in the works of North et al., the existing institutions that created the path limit further development and have a great influence on efficiency. Following this line of thinking, theories have been developed about how various dynamic processes may lead to the suboptimal development of economic entities, and economies in general, described by Kazakova (2012) as a 'gauge effect'. This theory postulates the premise that, once made, an institutional choice will affect further institutional development by limiting it to a specific pathway. North (1997) emphasised that the choices we make today or tomorrow are shaped by the past. In relation to general institutional changes, this question was raised by Veblen (1984) and is an essential concept in the works of North (1990, 2005). North relies on the studies of Arthur (1987, 1988, 1994) on self-sustaining mechanisms in economics. Arthur illustrates his ideas with the help of dynamic models, interpreted mainly as models of technological development. North notes that the mechanisms described by Arthur also play an important role in the evolution of institutions.

The mechanism for the formation of an institutional trap is associated with drastic changes of a technological, organisational, structural and social nature occurring in the economic system. The digitalisation of the economy encompasses a range of processes that will affect social institutions, requiring their transformation and adaptation to the changing paradigm of economic development. Here it is important to understand that the reactions of key indicators of digitalisation to corrective actions depend in principle on the existing institutions, although it is usually assumed that these reactions are invariant with respect to institutional organisation for a wide class of systems. However, the fact that digitalisation leads to significant changes in the institutional structure is even more important. Institutions, both formal and informal, are formed in society in an evolutionary way, over a long period of time; therefore, a priori, they are more inert compared to those processes that are drivers of key changes that can lead to the emergence of inefficient institutional behaviour which reduces or completely blocks positive externalities from digitalisation.

The main aim of this article is to analyse the distribution channels of the institutional trap in the labour market in the context of digitalisation. It starts from the assumption that theoretical and methodological approaches to assessing institutional traps in the labour market associated with digitalisation are inextricably linked with the transition to a new type of economy, and that this dictates a need to develop a new form of regulation of basic institutions or to grow new institutions with characteristics that will ease their passage through the transition period. However, as noted, the institutional structure has the property of inertia; Veblen describes the inertia of institutions as: 'habits of thought, points of view, mental attitudes and aptitudes, or what not, are therefore themselves a conservative factor'. In other words, resistance to changes follows from the nature of institutions as such (Veblen, 1984:191). According to many scientists, institutions are solidly rooted, causing stable expectations of a system of rules and customs (Hodgson, 2003). Williamson (2000) attributed the level of 'social inclusion' to the most inertial level of the institutional hierarchy, which includes customs, traditions, ethical standards, religion. Thus, in the scientific literature there is

a widespread view that the greatest inertia of informal institutions results from a significant time gap between the onset of change and the transformation of new ideas into a familiar way of thinking (Ustyuzhanina, 2015). Institutional inertia is based on a defensive reaction to the institutional and technological innovations that threaten to destroy it (Mokyr, 1992). The more intense the key changes in the economy, the more likely it is that any further development will be characterised by inertia.

Digitalisation as a process leads to just such key changes and it can be assumed that the adaptation of labour market institutions will occur with a significant time lag. The lack of synchronisation between market and institutions will create the prerequisites for the formation of an institutional trap, which, in turn, like the 'landslide effect', increases contradictions, reduces overall socio-economic efficiency and blocks the mechanisms of self-adjustment of the institutional system to current conditions. It is for this reason that this article aims to analyse the mechanism of formation of the institutional trap in the labour market and its individual elements under the influence of digitalisation processes.

According to Polterovich (1999), a number of mechanisms can trigger a blocking of socio-economic development and reduce the effectiveness of the functioning of the system as a whole, including a coordination effect, a learning effect and a conjugation effect, as well as cultural inertia and lobbying. Depending on how these effects are realised in the period of system transformation, it is possible to determine whether the basic institutions 'resist' the undergoing reforms or whether a new, more optimal institutional contour is being formed.

Methodology

In writing this article, the authors drew on the postulates of neo-institutional economic theory: first, that social institutions matter and, secondly, that they can be analysed using standard tools of economic theory (Kapelyushnikov, 2009; Auzan, 2011). This article pays special attention to the aspect of the formation of the institutional environment in the labour market in the context of digitalisation. The authors focused on two aspects: the new 'rules of the game' in such a market and its 'traps' – norms that are inefficient but persist (inefficient institutions) and which are self-sustaining in nature.

Our analysis is further based on the observance of the principle of 'methodological individualism', according to which society is considered as the sum of individuals, and in the study of social and economic phenomena and processes their dynamics can be reduced to the study of the behaviour of that society's constituent individuals.

Our study used a content analysis method aimed at analysing the semantic content of text arrays within the subject of the study which made it possible to combine individual conclusions about this problem with formulating the authors' own position on the issue, using CiteSpace software (Huang & Chang, 2015).

Results and discussion

Polterovich's, deployment algorithm of the institutional trap includes a number of effects, all of which, it can be argued, are currently relevant in the context of the

digitalisation of the labour market. Moreover, they can be considered not as separate ‘failures’ of state policy in the adaptation of public institutions, but as a system in which the individual elements complement each other, creating a single negative synergistic effect. As a result, there is a high risk that this trap will occur.

How the coordination effect is manifested

The *coordination effect* occurs if an individual or a small group loses when they deviate from the relevant stereotype of behaviour, while the simultaneous transition of all agents to an alternative standard would increase social welfare. Under the conditions of digitalisation, the coordination effect is of particular importance, since the speed and scale of technological change is unprecedentedly high. Moreover, the realisation of the benefits from this process is possible only under the condition that, at all levels of the meso and macroeconomic systems, the transition to digitalisation will be more or less symmetrical, and the readiness of subjects at the micro level corresponds to the standards of the incorporated changes.

However, already at this stage there are many problems indicating a high likelihood that inefficient institutions may become fixed, forming an institutional trap of this type. In the Russian economy, these are primarily a historically slow rate of changes in the technological structure of society, a long period of economic development without an IT system and the inefficient development of domestic digital and information programmes that influence the labour market greatly. With this development, a skilled workforce does not have time to master the new skills necessary for use in the digital economy. Restructuring is required for the entire system chain: education, training and human resource management. Training of IT specialists is carried out at a slow pace, secondary vocational education in the training system differs sharply from the real needs of production, and the higher education system trains specialists using obsolete equipment. In this phase, the trap of insufficient development is formed, which does not allow for the possibility of the development of the economic sectors due to the total lack of qualified personnel (Senokosova, 2018). The Russian labour market is already rigid, with contradictory conditions associated with the systemic imbalance of demand and supply of qualified personnel in the long term, causing significant incoherence in the labour market. When looked at in terms of type of occupation and professional groups, it is evident that there is a shortage of qualified personnel for a number of professions and specialties. With conflicting signals from the labour market, families are in no hurry to change their educational priorities and orient applicants away from the professions they view as sought-after, such as economists, managers and lawyers (Matraeva et al., 2018; Larina, 2017).

As can be seen from Figure 1, this problem is not only relevant for Russia. The rapid digitalisation of the economy has led to a situation whereby more and more small and medium-sized businesses across Europe are having problems finding people with the appropriate skills and qualifications in the field of digital technologies. Not only officials and experts in the labour market of separate European countries, such as the United Kingdom and France, but also representatives of the European Commission, speak of the need to take urgent action to improve the digital literacy of the population. According to the National Institute of Statistics of France, more and more companies in

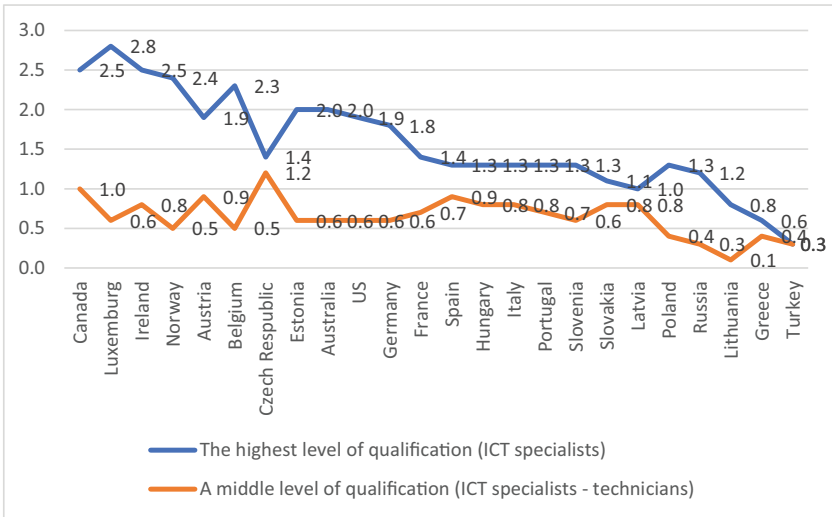


Figure 1: ICT specialists by skill level and country

Source: Abdrahmanova, Gohberg & Kevesh, 2017.

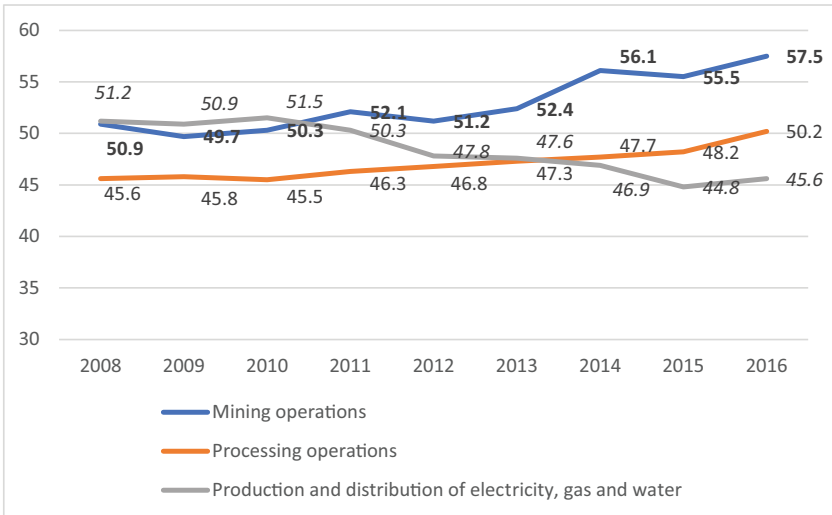


Figure 2: The degree of depreciation of basic production assets (%)

Source: Center for Strategic Research according to Rosstat.

that country are complaining about a shortage of workers with the necessary digital skills (Hvostik, 2018).

At the same time, the trigger of digitalisation in almost all sectors of the economy and social sphere is the transformation of technological foundations, where data and

software products become the main tool for creating added value and a key mechanism for managing all technological processes. The transition of industry to digital technologies requires, on the one hand, significant investments in fixed production assets that would correspond to technological maturity and, on the other hand, an intensification of R&D costs.

An analysis of the dynamics of the renewal of basic production assets in the industry of the Russian economy reveals that, at present, the technological infrastructure is not being created, depreciation amounts to about 50% in various sectors of the economy and investment activity is not sufficient even for the current stage of technological maturity.

Spending on R&D in industrial enterprises is also at a very low level – in 2015, according to the OECD, it was only 0.3% of GDP (G20 Innovation report, 2016). For comparison, the same indicator in China was equal to 1.54% of GDP, in the USA 1.79% and in Japan 2.72%. In other words, in absolute terms, R&D spending in industrial enterprises in China and the United States is almost 30 times higher than in Russian industry (see Figure 3).

Analysis of the adaptation rate of the real sector in terms of upgrading equipment and technologies shows that in countries where rates are close to those in Russia, the manufacturing sector is not ready to accept or train ‘digital’ workers for the new positions that are emerging. Under the conditions of digitalisation there is a need not only for modern jobs to be created in a timely manner, but also for them to be capable of further transformation over time to take account of the changing nature of technological tasks. In other words, it is also the case that there is a trap of ‘backwardness’ in relation to capital production.

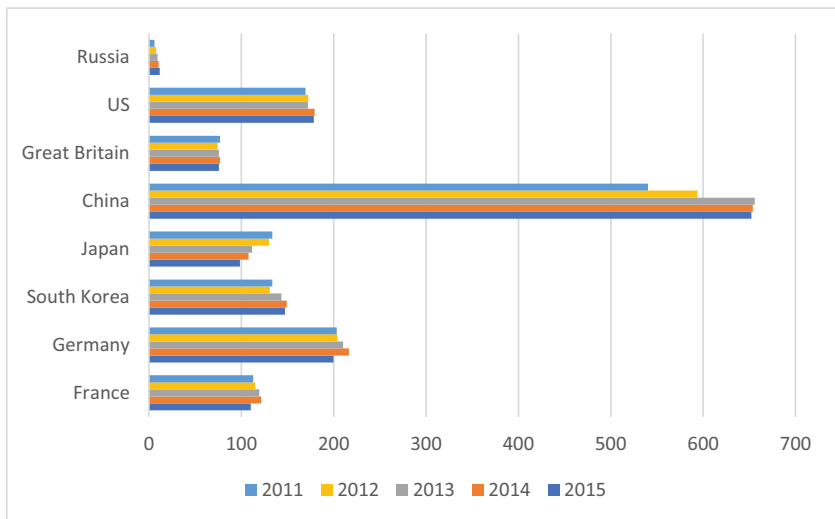


Figure 3: The volume of high-tech exports of separate countries, million USD (current prices)

Source: Center for Strategic Research (World bank data).

Traps relating to the learning effect

At this stage, *the learning effect* manifests itself, consolidating ineffective standards of behaviour, and the *institutional trap* acquires a self-sustaining character. It blocks the development of effective institutions, since the existing standards and behavioural models reproduce the old technological structure, failing to form a demand for a labour force with competencies corresponding to the digitalisation processes. In turn, even those companies and sectors of the economy that are leaders in digital change cannot reach the required level of digital maturity due to the total deficiency of professional personnel. In other words, a key element in the deployment of an institutional trap mechanism is an imbalance in the level of development of human capital and technologies that are used in the country's economy. In technologically backward production, there is no demand for innovation; therefore, there is not a sufficient demand for highly qualified personnel who are not involved in production, are not rewarded properly and remain unemployed. Potential innovators in the digital sphere cannot find positions that satisfy their ambitions and, searching for somewhere where the right opportunities are available, they move abroad, contributing to the so-called 'brain drain'. Because of this, firms do not practise innovation and production technology remains backward. In such an economy, a kind of vicious circle is being formed – there are no incentives for either accumulation or the formation and consumption of human capital assets. As a result, the low level of development of technologies does not allow other factors of production to open up, including human capital assets, leading to low labour productivity. A low return on investment in education reduces the incentives to invest in fixed assets, society does not see the point in improving the quality and increasing the amount of human capital assets and the educational sector is degraded.

In order really to accept the challenge of the digital economy, enterprises will have to recognise investment in human capital as an asset, rather than as equity. Investment forms a closed cycle between new technologies and the upgrading of qualifications: the introduction of new technology stimulates business growth, which in turn ensures the creation and expansion of jobs and the full use of the capabilities of motivated and flexible workers, who constantly update their professional skills. Conversely, gaps in skills – both among employees and among the top management of an organisation – can significantly hinder the adoption of new technologies and business growth.

There is another trap associated with the effect of learning, which can manifest itself in the redistribution of the structure of qualifications of employees. Scientists began to note a similar effect when analysing the influence of the computer revolution on the labour market, against the general background of an increase in wages and a growing inequality in their distribution. For example, Krueger (1993) found that workers using computers earned about 10–15% more than others, but at the same time he noted an increase in the cost of education for such workers. More recent studies have shown that computers have been associated with a shift in the occupational structure of the labour market: computerisation has reduced the wages of workers who perform routine tasks, but at the same time, their qualifications have decreased (Autor & Dorn, 2013) although their labour productivity has increased. These changes were most observed in the USA where they were labelled a 'U-shaped [curve] in qualification

level, demonstrated by the fact that the quartiles with the lowest and highest qualification levels rose sharply with relative employment, while the quartiles in the middle of the distribution decreased (Frey & Osborne, 2017). In other words, structural shifts were primarily compensated for by the growth of low-skilled, and 'cheaper' jobs, where computer knowledge was routine. The training and education of such specialists does not take much time, and therefore the market responds almost immediately to them, absorbing structural unemployment primarily by means of low-skilled jobs (Matraeva, Vasyutina & Shpilina, 2019). In the USA, however, this category of workers has a relatively high level of wages, supported by increased marginal productivity. Meanwhile, the increase in wages of highly skilled workers was partly due to the fall in the price of performing routine tasks using computers. The result was an increasingly polarised labour market, with a growth of employment in routine computer work with a relatively high income and high labour productivity and a growth of teaching aids for professions requiring an average qualification level. This model is not unique for the United States and applies equally to a number of other developed economies (Goos, Manning & Salomon, 2009).

We can observe similar trends at play in the adoption of digitalisation in Russia. In the first place, structural unemployment appears to be compensated by a growth in routine information professions, and a likelihood that in the future, when this demand reaches saturation, the market will require (as the computerisation experience has shown) an increase in marginal productivity from workers in this category to maintain a relatively high level of wages. These are professions which require possession of certain information skills, but not highly advanced data processing expertise. An example of such low-skill 'digital' workers is supplied by taxi drivers working for the online Yandex platform, but the category also includes other workers in the service sector using digital tools, including state services. An example of the 'middle' stratum for whom wage reductions are forecast is provided by the banking sector. Meanwhile, the salary of highly skilled professional IT specialists, who require advanced knowledge, is likely to increase, since there is a high need to improve the quality of management, decision-making, legal research, against the background of an exponentially increasing amount of information. It should be noted, however, that the demand for such highly skilled specialists at the top of the digital economy will be very limited; they require a higher level of education (which is expensive to provide) but not all of them can become highly paid.

In this situation, the labour market will become polarised due to the shrinking of middle-skilled professions and their redistribution towards low-skilled ones, in a context where the qualification requirements will change. Even low-skilled specialists will have to possess the IT skills, paradoxically, even janitors.

Possible effects of the conjugation effect

The next stage in the deployment of the institutional trap relates to the *conjugation effect*. Over time, the emerging standard interacts with many other rules embedded in the institutional system. As a result, refusal to follow the standard will entail a chain of secondary changes and, consequently, high (conjugated) transformational costs for adjustment of the entrenched standard (Polterovich, 1999). By increasing

transformational costs, the effect of conjugation also contributes to the standard becoming further entrenched.

In the conditions of digitalisation, the conjugation effect consists in the fact that the delay in the creation of new high-tech jobs occurs simultaneously with the launch of the process of eliminating the old ones. According to the results of the World Economic Forum's research, technological breakthroughs quickly shift the boundaries between professional tasks performed by people and those that are performed by machines and algorithms. Digitalisation encourages companies to use new and emerging technologies to achieve higher levels of production and consumption efficiency, access new markets and intensify competition, while almost 50% of companies expect automation to reduce their full-time employees by 2022 based on existing job profiles of their employees today (OneVoxPress, 2020).

Some studies predict that, in the next 10–20 years, about 50% of professions will cease to exist (Frey & Osborne, 2013), and in a group of nine European countries leading in digitalisation, such as Denmark, Sweden, Finland, by 2020 the number of new jobs will exceed the number of reduced jobs by 1.6–2.3 million (Banke, 2018).

On the other hand, 38% of surveyed companies expect to expand their workforce to increase productivity, and more than a quarter of them expect that production automation will lead to the creation of new jobs in their enterprise. Extrapolating these trends until 2022, the World Economic Forum has estimated that digitalisation will entail a reduction of approximately 75 million jobs, with 133 million new ones being created because of the redistribution of labour between people and machines (OneVoxPress, 2020).

Two opposite trends are clearly manifested here: first, a large-scale decrease in the demand for some professions, since in the digital paradigm their functions are automated or become redundant; and secondly, a large-scale increase in new goods and services, and the associated new tasks and roles for workers generated by the adoption of new technologies and other social changes (World Economic Forum, 2018). Forecasting changes in employment by occupation is now a concern for scientists in almost all developed countries, starting with the work of Frey and Osborne (2013), who estimated that occupations accounting for about 47% of employment in the United States in the next 10–20 years could be fully automated. Based on the methodology proposed in this work, similar forecasts appeared for other countries: Finland (Pajarinen & Rouvinen, 2014), Germany (Brzeski & Burk, 2015), and for the countries of the European Union as a whole (Bowles, 2014). Essentially, these studies project that the labour market will be transformed in accordance with the Blanchard model, within which it is possible to minimise the effects of structural changes on the labour market by optimising the flows of released labour, which is automatically absorbed by the emerging new segments of the digital economy. However, within the institutional trap, there is a gap between the reduction of some jobs and the emergence of new ones, while an education system that is deformed by inefficient norms and standards only aggravates this contradiction.

The same report indicates that by 2022 at least 54% of all employees will require significant retraining and advanced training. Of these, about 35% are expected to require additional training for up to six months, 9% retraining lasting up to 12

months, and another 10% additional training lasting with a period of more than a year (Frey & Osborne, 2013:37). The 2018–22 period should be seen as a window of opportunity for adapting the labour market to new technological challenges in order to increase the creation of economic value through new activities, improve the quality of work in traditional and new professions, and improve the skills of employees so that they can fully realise their potential to address new highly valued challenges in the digital economy. At the same time, technological changes and shifts in blue-collar occupations and professional structures are transforming the demand for skills at a faster pace than ever before. To achieve such a positive vision of the dynamics of emergent jobs it is necessary to reform the education system, which, in the context of an institutional trap, does not contribute to building links between new technologies and methods of teaching the necessary skills through innovative and creative partnerships.

At the same time, an analysis of the strategic documents of the Russian Federation shows that, despite the apparently low adaptation of the labour force to digitalisation processes, the targets set by government agencies as benchmarks for long-term development involve job reduction in administrative work. The proposed model indicators for optimising state and municipal services based on the expanded use of information technologies provide for a reduction in budget expenditures on the wages of departmental employees involved in the provision of state and municipal services by 2021 by 30% compared with 2018. Thus, state initiatives contribute to an even greater realisation of the conjugation effect.

The consequences of cultural inertia and lobbying

Finally, we turn to the third mechanism for securing norms and standards: *cultural inertia*, the unwillingness of agents to change stereotypes of behaviour that have proved their viability in the past. For the Russian economy, this mechanism is highly relevant, strongly influencing the reproduction of skills that meet more with the requirements of habit than of technological expediency. This view is confirmed by the results obtained in a public opinion poll on the quality of state and municipal services provided by the Ministry of Economic Development of the Russian Federation in 2018 (Solodukha et al., 2018). A decrease in satisfaction rates with the quality of state and municipal services was observed in those regions that actively promoted the use of online or 'electronic' forms. The analysis showed that electronic forms were associated by users with a decrease in satisfaction rates. This was first because of the extra effort ('consumption costs') involved in applying for and receiving a service by electronic means: it was necessary to understand the interface and manually enter the data and this required certain skills and abilities. Compared with self-completion of electronic forms, direct contact with the state (municipal) authority is considered easier because it is accompanied by 'shifting' some functions to specialists, minimising the number of errors and time expenditure required of the citizen.

Secondly, the study found that there was an 'effect of resistance to change', associated with a reduction in the number of channels for receiving services. Shifting the focus exclusively to the electronic form was regarded by consumers as a refusal by state and municipal authorities to perform their duties. Representatives of the business

community considered that there was a transfer of functionality to users, which they regarded as a reduction in the quality of state and municipal services.

In some regions, resistance to change was hidden in the mentality of the inhabitants: in the traditional state system, a large role was assigned to contact work with visitors, to which they were relatively accustomed, with the individualisation of a service considered to be an indicator of its quality. In certain cases, citizens are willing to sacrifice a lot of time in order for their cases to be considered individually by a living person, who can take into account nuances that are difficult to perceive, rather than by an electronic device, which acts strictly according to predetermined scripts and requires particular skills relating to registration, filing a request and obtaining the result.

Cultural inertia is something that requires, first of all, an improved education system, which increases the population's sensitivity to technological changes and shortens the time of adaptation.

When attempts are made to change an ineffective norm, the corresponding transformational costs are unevenly distributed among the agents. This circumstance, as well as cultural inertia and the uncertainty of the value of the transformational costs, leads to the emergence of pressure groups that impede changes in the existing norms, lobbying to maintain the status quo.

Conclusions

If we recognise that institutions are formed in society in an evolutionary way over a long period of time, we must also recognise that, by their nature, these institutions are more inert than the processes that are drivers of key changes. This can lead to the emergence of institutional traps, the effects of which reduce the benefits that can be derived from digitalisation. Considering these effects, the authors of this study formulated and systematised the possible negative manifestations of these traps on the labour market in the process of the emergence of the digitalisation of society.

First, the possible manifestation in the labour market of the effect of insufficient development is associated with an inability to ensure the dynamics of development of sectors of the economy due to lack of qualified personnel.

Secondly, a steady contradiction is formed, connected with the systemic imbalance of demand and supply for qualified personnel. In some countries, the speed of adaptation of the real sector for upgrading equipment and technologies is not enough, and the manufacturing sector is not ready to accept 'digital' workers into employment.

Thirdly, it is likely that structural imbalances will develop in the workforce in relation to job quality. While routine information professions will compensate for some structural unemployment, the demand for highly qualified specialists will be very limited. In this situation, the labour market will become polarised due to the shrinking of middle-skilled occupations and their redistribution towards low-skilled work.

Fourthly, there is likely to be a surge in unemployment due to a gap developing between the reduction in some traditional jobs and the emergence of new ones.

Fifthly, cultural inertia of the population associated with a lack of desire and ability to adapt to technological changes can lead to the emergence of pressure groups whose lobbying impedes changes in the existing norms and standards.

However, it should be understood that the current conclusions were extrapolated from trends that have formed in the labour market at present. On the one hand, our study did not take into account the impact of proactive government policies, which can become a corrective factor that removes institutional contradictions at a certain stage of development. On the other hand, the intensity of the manifestation of the institutional trap depends on how synchronously its individual elements are realised. The blocking effect takes place when several factors are present concurrently – when they are manifested simultaneously, are complementary to each other and become institutionally fixed.

In conclusion, we would like to note that it remains to be seen how digitalisation will affect the labour market. Nevertheless, in our opinion, the focus of researchers on possible unemployment and the fear of its manifestation are somewhat exaggerated. It would be more useful to pay greater attention to changes in the quality of the workforce and structural changes associated with an increase in demand for low-qualification occupations. These remain topics for future scholarly studies. One possible way forward might be to address the rapid increase in the volume of information by using digital means of surveying the evidence, such as CiteSpace or similar software, allowing researchers to identify the main trends in scientific dialogue.

© Liliia Matraeva, Ekaterina Vasiutina and Alexey Belyak, 2020

REFERENCES

- Abdrahmanova, G.I., L.M. Gohberg, M.A. Kevesh (2017) *Indicators of the Digital Economy: 2017: Statistical Compilation*. Moscow: Higher School of Economics.
- Alchian, A. (1950) 'Uncertainty, evolution and economic theory', *Journal of Political Economy*, 58 (3):211–21.
- Arthur, W.B. (1987) 'Self-Reinforcing Mechanisms in Economics' in P.W. Anderson, K. J. Arrow and D. Pines (eds) *The Economy as an Evolving Complex System*, Santa Fe Institute Studies in the Sciences of Complexity, Santa Fe, NM: Addison Wesley Publishing Company:9–28.
- Arthur, W.B. (1994) *Increasing Returns and Path Dependence in the Economy*. Ann Arbor, MI: University of Michigan Press.
- Autor, D.H. & D. Dorn (2013) 'The growth of low-skill service jobs and the polarization of the US labor market', *American Economic Review*, 103 (5):1553–97. DOI: <http://dx.doi.org/10.1257/aer.103.5.1553>.
- Auzan, A.A. (ed.) (2011) *Institutional Economics: A New Institutional Economic Theory*. Moscow: Infra-M.
- Banke, B. (2018) 'New wave of the digital revolution' In B. Banke, V. Butenko, I. Kotov, G. Rubin, S. Tushen & E. Sycheva, *BCGDIGITAL*. <http://russiaonline.info/story/new-wave-of-digital-revolution51>.
- Bowles, S., G. C. Loury & R. Sethi (2014). Group inequality, *Journal of the European Economic Association*, 12 (1): 129–52. DOI: <https://doi.org/10.1111/jeea.12037>.
- Brzeski, C. & I. Burk (2015). Frankfurt: ING DiBa Economic Research. <https://www.ing.de/binaries/content/assets/pdf/ueber-uns/presse/publikationen/ing-diba-economic-analysis-die-roboter-kommen.pdf>.
- Castells, M. (1998) *The End of the Millennium*, vol. 3 of *The Information Age: Economy, Society and Culture*. Cambridge, MA, and Oxford: Blackwell.
- David, P.A. (1985) 'Clio and the economics of QWERTY', *American Economic Review*, 75 (2):332–7.

- Frey, C.B. & M.A. Osborne (2013) 'The future of employment: How susceptible are jobs to computerisation?', *OMS Working Papers*, 18 Sept. https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf.
- Frey, C.B. & M.A. Osborne (2017) 'The future of employment: How susceptible are jobs to computerisation?', *Technological Forecasting and Social Change* (Elsevier), 114 (C):254–80.
- G20 Innovation report (2016) <https://www.oecd.org/china/G20-innovation-report-2016.pdf>.
- Goos, M., A. Manning and A. Salomons (2009) 'Job polarization in Europe', *American Economic Review*, 99 (2):58–63.
- Hodgson, G.M. (2003) 'The hidden persuaders: Institutions and individuals in economic theory', *Cambridge Journal of Economics*, 27 (2):159–75.
- Hvostik, E. (2018) 'The European labor market is not keeping pace with digitalization', *Kommersant*, 21 Oct. <https://www.kommersant.ru/doc/3777351>.
- Huang, M. and C. Chang (2015) 'A comparative study on detecting research fronts in the organic light-emitting diode (OLED) field using bibliographic coupling and co-citation', *Scientometrics*, 102 (3):2041–57. DOI:10.1007/s11192-014-1494-1.
- Kapelyushnikov, R.I. (2009) 'Plurality of institutional worlds: Nobel Prize in Economics 2009', *Economic Journal of the Higher School of Economics*, 1:12–69.
- Kazakova, V.I. (2012) 'Kontseptualizatsiya "path dependence" v sovremennoy sotsialnoy nauke' (Conceptualization of 'path dependence' in modern social science) in R.E. Alekseeva (ed.) *Upravlenie v sotsialnykh sistemakh. Kommunikativnye tekhnologii*, 3 (in Russian), Nizhny Novgorod, Nizhny Novgorod State Technical University Alekseeva: 6–16.
- Krueger, A.B. (1993) 'How computers have changed the wage structure: Evidence from microdata, 1984–1989', *Quarterly Journal of Economics*, 108 (1):33–60.
- Larina, T., I. Vygolova & L. Benkovskaya (2017) *Statistical Study of the Human Resources Potential of the Regional Labor Market*. Orenburg: OGAU Publishing Center.
- Lesnyh, V.V. & V.V. Ilyashenko (2009). *Institutsionalnaya ekonomika* (Institutional economy). Yekaterinburg: Izd-vo 'Uralskiy rabochiy' (in Russian).
- Marx, K. (1852) *The Eighteenth Brumaire of Louis Bonaparte*. New York: International Publishers, 1963.
- Matraeva, L., E. Vasiutina, S. Erokhin & O. Kaurova (2018) 'A dynamic model in the labor market: Reasons of imbalances at the transition stage of the economy', *European Research Studies Journal*, 21 (3):206–17.
- Matraeva, L.V., E.S. Vasyutina & T.M. Shpilina (2019) 'Lock-in effect of digitization in the labor market' in *Education Excellence and Innovation Management through Vision 2020 Proceedings of the 33rd International Business Information Management Association Conference (IBIMA)*, Granada: IBIMA, 1230–7.
- Mokyr, J. (1992) 'Technological inertia in economic history', *Journal of Economic History*, 52 (2): 325–38.
- North, D.C. (1990) *Institutions, Institutional Change and Economic Performance*, Political Economy of Institutions and Decisions. Cambridge: Cambridge University Press.
- North, D.C. (1997) *Instituty, institutsionalnye izmeneniya i funktsionirovaniye ekonomiki* (Institutions, institutional changes and the functioning of the economy). Moscow: Fond ekonomicheskoy knigi 'Nachala' (in Russian).
- North, D.C. (2005) *Understanding the Process of Economic Change*. Princeton, NJ: Princeton University Press.
- Nureev, R.M. (2010) 'Rossiya posle krizisa: Effekt kolei' (Russia after crisis: Gauge effect), *Journal of Institutional Studies*, 2 (2): 7–26 (in Russian).
- OneVoxPress (2020) 'By 2022, with industrial automation, 133 million new jobs will be created worldwide'. <https://onevoxpath.com/2019/06/26/by-2022-with-industrial-automation-133-million-new-jobs-will-be-created-worldwide/>.
- Pajarinen, M. & P. Rouvinen (2014). *Computerization Threatens One Third of Finnish Employment*. ETLA Brief 22. <http://pub.etla.fi/ETLA-Muistio-Brief-22.pdf>.
- Polterovich, V. (1999) *Institutional Traps and Economic Reforms*. Moscow: CEMI RAS and NES.

- Senokosova, O.V. (2018) 'The impact of digitalization on the labor market', *Economy and Business*, 10 (2):81–4. DOI10.24411/2411-04-04-2018-10093.
- Solodukha, P.V. et al. (2018) *Annual Sociological Survey of the Satisfaction of Citizens with the Quality of Public and Municipal Services Provided by the Bodies of State Authority and Local Government*. Research report No. GU-73-OF/D21, 14 May. Moscow: Ministry of Economic Development of the Russian Federation.
- Ustyuzhanina, E.V. (2015) *Institutsionalnaya ekonomika* (Institutional economy). Moscow: Izdatelstvo REU im. G.V. Plekhanov (in Russian).
- Veblen, T. (1984) *Teoriya prazdnogo klassa* (Theory of the idle class). Moscow: Progress (in Russian).
- Weber, M. (1990) *Izbrannye proizvedeniya* (Selected Works). Moscow: Progress (in Russian).
- Williamson, O.E. (2000) 'The new institutional economics: Taking stock, looking ahead', *Journal of Economic Literature*, 38 (3): 595–613.
- World bank data (n.d.) <https://data.worldbank.org/indicator/TX.VAL.TECH.CD>.
- World Economic Forum (2018) *The Future of Jobs Report 2018*. Geneva: World Economic Forum. http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf.