

## **THE DIGITAL REVOLUTION AND JOB POLARISATION: AN INSTITUTIONAL, ECONOMIC, AND SOCIAL ISSUE**

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### **Abstract:**

*The last decades were marked by processes of in-depth changes: globalisation, the collapse of the communist systems in Central and Eastern Europe, a new post-industrial transition, and the economic and financial crisis brought along also the crisis of “sovereign debts”. All these occurred on the background of rapid digitalisation, computerisation, and automation processes of the economic sectors, the highest risks being born by the labour market and the main production factor: the human factor. Thus, as opposed to the previous stages, the gap between the economic and social risks to become higher in the absence of institutional reform and changes targeted mainly at institutions with impact on the labour market. The present paper intends to present the main issues with respect to economic and social aspects relevant to the process of resuming economic growth and to ensuring the sustainability of medium- and long-term development.*

**Keywords:** *digitalisation, institutional reform, economic growth, job polarisation, social development*

**JEL Classification:** *D02, E24, E69, J24, J59*

### **Introduction:**

The last decades were marked by processes of in-depth changes regarding globalisation as result of technological progress. This world process was accompanied by the collapse of the centralised, communist systems from Central and Eastern Europe; the new post-industrial transition triggered by the diffusion of digitalisation and computerisation in all fields and sectors of activity. These processes together determined a new economic transition under full development nowadays. The triggered challenges overlapped with the effects of a financial, economic and ‘sovereign debts’ (actually these were more three successive crises) crisis and last, but not least, with a

crisis of the social models, in particular at European level. These crises determined, at EU-28 level, the majority of member-states to impose austerity policies and measures that were expressed in wage cuts (Romania and even more dramatic in Greece), and even restrictions in investments, associated with measures of capital repatriation. These was mainly an issue for capitals invested up to that time in the new EU member-countries, and for cuts of investments in education, health, and social services.

The new economic transition is determined on one hand by the effects and impact of the financial and economic crisis on developed and transition economies, and on the other hand by the diffusion of digitalisation, computerisation and automation in all economic sectors – from agriculture to production and services.

At the same time, the diffusion of digitalisation, computerisation, and automation in all economic sectors has allowed to enterprises, companies, and by and large to the business environment to initiate actions for resuming (slow) economic growth by sacrificing jobs. Yet, the economic advantages – savings in the production process and costs diminishment with respect to the labour force – were not compensated by generating new jobs for the ones lost as result of the financial and economic crisis and of the increasingly intensive automation. Thus, a phenomenon occurred which was already predicted by Keynes in 1933<sup>1</sup>: respectively, the more advanced and in-depth technological progress is achieved, the more it contributes to job destruction at a speed much higher than the capacity of the economy and of the society to generate new jobs. The implications of these changes are significant as they change requirements in the field of education, health, social services, as well.

The current post-crisis period, continues to be significantly influenced by uncertainties and frailties, the main markets sending contradictory signals of hesitant growth followed by stagnation or even diminishments, while other markets are still struggling in an incipient post-crisis period, in particular in Eastern and Southern Europe.

One source of major concern for decision factors at European level is the development on the labour market, the more so as it is determinant also for the targets of the European Social Agenda and the Europe 2020 flagship initiatives of smart, sustainable, and inclusive growth.

The reason is that in the past, technological progress was followed by periods in which the industrial sectors developed activities and obtained outcomes based on these progresses, and thus could create new jobs at a

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<sup>1</sup> Keynes, J.M. (1933). Economic possibilities for our grandchildren (1930). *Essays in persuasion*, pp. 358–73.

relatively reasonable pace. However, nowadays, the rate of innovation and technological progress outpaces the recovery rate of the labour market. Traditionally, labour market growth was resumed about five years later than on other markets. This means that today economic growth no longer corresponds, on short- and medium-term with the recovery of the labour market as expressed in targets, like full-employment of 75% at European level according to the Europe 2020 Agenda. Practically, the labour market absorbed fully the impact and effects of the financial-economic and 'sovereign debts' crisis, as well as the ones of the swift digitalisation and automation rate. Therefore, this market becomes more selective about labour force demand: the employees are faced with the demand of satisfying new requirements about skills and competences, the type of jobs and positions to fill, and the tasks and duties to perform, etc. Secondly, it is increasingly more competitive, in particular in the case of EU where, the accession of the central and eastern European countries allowed for identifying new labour markets with high-skilled workers but cheaper in terms of labour force costs.

Therefore, a detailed analysis of the last decades is required based on a complex institutional, economic, and social approach. In this framework, levels of intervention can be identified that may contribute to resuming sustainable economic growth and to redefining the social models that are under question with respect to their own sustainability because of the crisis. None of these components will be able in the future to develop without taking into account the other two, this triangle covering multiple facets of the predominant phenomena: globalisation and digitalisation/automation on large scale.

Recent debates have underpinned that institutions are important for the main markets, and in particular for the labour market. Their impact on the labour market is translated into performances with respect to employment and to creating new opportunities for the active age population by generating new jobs, and for individual attitudes regarding the own insertion and integration on the labour market.

Moreover, reviewing and improving institutions is determinant for the good functioning of the social models proposed at European level.

### **1. Relevance of Institutions - Labour market and the imperatives of the knowledge-economy and society**

Institutions are the expression of the contract between society and government, and their concrete expression are the various (economic, social, etc.) organisations (North, 1990). The effectiveness and efficiency of institutions is reflected in the outcomes obtained on the market to which

they refer either directly or indirectly. Institutional transparency and low corruption levels are sine qua non conditions for ensuring the continuity but also the reform capacity of institutions. Next to formal institutions, informal institutions exist and they are built around a certain culture, including the institutional culture, mentalities, and habits. The way in which coherence is achieved between formal and informal institutions, is determinant for resuming economic growth and for ensuring the harmonious development of the society in the future. This fact is self-evident in particular during periods of significant transitions and reforms triggered by events, such as changes in the political and economic system (the case for Central and Eastern Europe in the last decades). Other relevant instances are financial and economic crises of considerable magnitude (the 2008 crisis outbreak), and significant industrial transitions with effects determining the shift of the economy as a whole.

The reform of institutions was an extended topic of discussion during the last decades at global and European level, especially since globalisation and the rapid EU enlargement made clear that institutions had to meet new challenges. The crisis contributed to highlighting several failures, such as the partial neglect of the (distress) signals from the social sphere. An instance of lacking attention paid to the social component in the Lisbon Agenda 2000 is the emphasis shift on employment and flexicurity, from job security and social protection. The new economic goals omitted to a certain extent the agreement with the social goals – respectively ensuring an institutionalised platform of dialogue between economy and society.

The crisis showed that undertaken structural reforms in each of the member-states were not deep enough nor fully implemented, or finalised accordingly. Moreover, it highlighted that the failure of strategies and policies to take into account the effects of the industrial transition triggered by the technological progress had complex outcomes. Such an example is the increase in the weight of the services' sector, and its transformation in directions entering into direct competition with the industrial production and traditional services (see 3-D type production in the machine and tools building industry, even in some instances in civil constructions, etc.). At the same time, digital platforms turn increasingly more into "services' suppliers" which mediate simultaneously between two types of services (one between company and consumer, and one directly between consumer and supplier/service provider guaranteed by the respective platforms based on 'ratings'). These developments alone could account for an increase in the polarisation of jobs from the viewpoint of skills and competences, as well from the one of present and future incomes. Add to this the change of entire sectors, including social and cultural ones; the emergence of direct and indirect displays within the economy of the "internet/network of things"

(bitcoin, Uber-type apps, etc. are but the beginning) and the future, in order to be sustainable, needs to be better reviewed and planned. The new strategies and measures must start with education and develop new and creative institutional frameworks to provide for safety networks for the as smooth as possible adjustment of different generations to the new requirements on the labour market.

The foreseeable outcomes of these complex processes = lead frequently more to the idea of an actual 'economy shift' at global and European level. At EU-28 level, this situation is in full dynamic evolution process and contributing directly to increasing discrepancies, divergence and unequal competition between member-states not only on the clearly delineated lines of Euro Area and Non-Euro Area, but also between the New Member-States. Moreover, it can be noticed that this "gap" is generated on the fault lines of the post-socialist economic models built according to: (a) the Anglo-Saxon liberal model (the Washington consensus); (b) the Austro-German corporatist model; (c) some imitation attempts of the Scandinavian model. Next to analysing these models, it would be useful to examine also the higher or lower success rates in the NMS, and in the former cohesion and convergence countries in accordance with the models of the "mental geography"<sup>1</sup>. This would provide a better comparison basis not due to the immediate proximity, but rather according to comparable historical, institutional, and social circumstances and paths with relatively similar economic-social outcomes. Such a classification would (probably) bring closer, for instance, some of the countries from Central and Eastern Europe (Romania, Bulgaria) to those in the southern part of the continent (Greece, Spain, Italy, Portugal), while the countries of Central Europe (Poland, Czech R., Hungary) would be (possibly) closer to the Western models (Germany, Austria, the Netherlands, etc.). In this framework, these comparable features would better assist in designing the future economic and social models of the knowledge society. Such an investigation is not the objective of the present paper, and these ideas are mentioned for attempting a more comprehensive explanation regarding challenges for the labour market and human capital.

The "economy shift" is certainly occurring nowadays under the conjugated pressure of the combined action of digitalisation, automation, and demand for better, cleaner industries and services, while the nature of human factor contribution changes in terms of labour intensity. Therefore, in the superior valuing of human capital and of labour force resources appear increasingly

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<sup>1</sup> Gibson, Heather D. (2001): *Economic Transformation, Democratization and Integration into the European Union, Southern Europe in Comparative Perspective*, Palgrave.

higher differences and discrepancies between supply and demand underpinned by international, European and national analyses about the risks emerging because of rapid changes in labour force supply and demand. The main issues are represented by the increasingly complex demand as it relates to dedicated and specialised high-tech fields. These activity sectors imply superior valuing of cognitive, creative, and innovative competences built on a solid background of flexibility and self-valuing capacity. The European educational systems, despite successive reforms and new standards adopted in the majority of European countries, did not reach the point of optimum equilibrium required for a consistent, sustained, constant dialogue between all interested stakeholders from the economic, business, social and cultural environment. Yet, this would allow for a more realistic evaluation of the labour force demand and supply, on short-, medium and even long-term. At the same time, the slow process of institutional adjustment to the dynamics of the real economy and of the society 'on the move' is a contributing factor, as well, if not one of the most important ones, also for education and the educational/vocational offer.

## **2. Jobs' Destruction and Polarisation – A Global and European Risk**

The knowledge society is par excellence defined by the digital revolution. This brings about the vulnerability of entire social categories as result of the increased importance of cognitive occupations, and due to the incapacity of rapidly combining some concrete solutions for generating new jobs. This 'incapacity' is created by the environment where the (natural) attractiveness of companies to achieve savings and diminish costs based on automation is not accompanied by measures of stimulating the creation of new jobs. Therefore, the Keynesian idea was recently picked up again in a study realised by Osborne and Frey in the year 2013. The authors noticed that in the USA, as result of the recession, numerous jobs vanished and that it is improbable for these to be (re)created because of the intensive digitalisation and automation replacing labour force on certain segments. The financial and economic crisis had as effect the increase in the willingness of enterprises to resort to automation and robots for cost efficiency and achieving savings. Thus, the authors concluded that there are risks for approximately 47% from total occupations in the USA<sup>1</sup>, while equivalent calculations realised by the Bruegel think-tank from Brussels showed that

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<sup>1</sup> Frey, Carl Benedikt, Osborne, Michael A. (2013). The Future of Employment: How susceptible are jobs to computerization?, [http://www.oxfordmartin.ox.ac.uk/downloads/academic/The\\_Future\\_of\\_Employment.pdf](http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf)

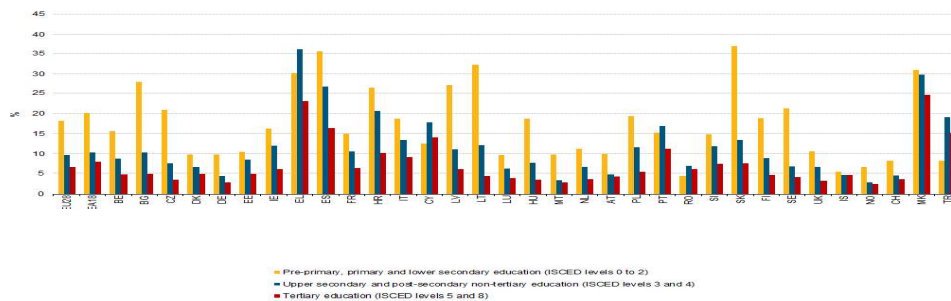
the same risks vary between 47% for Sweden and Great Britain and up to 62% for Romania in the field of occupations<sup>1</sup>.

Evidence can be found in the fact that if in the period preceding the crisis over 30 million new jobs were created (before 2008), after this year about six million jobs disappeared, unemployment continuing to record two digit shares, with a peak of 11% unemployment at EU-27(28) level in the year 2013. The issue of unemployment continued to have severe outcomes, the last statistical data indicating for August 2015 a level of the seasonal adjusted unemployment of 11.0 %, representing a relative decrease from 11.5 % in August 2014 for the Euro Area. All in all, at EU-28 level, the unemployment rate was of 9.5% in August 2015, remaining stable as compared to July 2015 and on decrease from 10.1% in August 2014<sup>2</sup>. These unemployment trends are comparable to the more frequently mentioned gap between the northern and western member-states, and those from southern and eastern Europe, the lowest unemployment rates being registered in Germany (4.5%), Czech R. (5.0 %) and Malta (5.1 %), and the highest in Greece (25.2 % in June 2015) and Spain (22.2 %) (Eurostat data). The same trend is shown also at global level confirming to a certain extent that the current economic recovery is not necessarily correlated also with a similar recovery of jobs' and occupations. Moreover, it underpins the relevance of some possible new reforms required at institutional level for more effectively relating and correlating labour market to the developments on markets subjected to the impact of digitalisation and automation. If the development of the unemployment rate is analysed from the viewpoint of the educational levels, it can be noticed that it reflects accurately the increasingly more marked trend of occupations' polarisation. Moreover, their evolution indicates an increased narrowing of the mid-skills segment, with lower increases for the low-skills segment and constantly higher increases for the high-skilled segment at European level, both in the member-states and in the European countries not included in the EU-28.

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<sup>1</sup> <http://bruegel.org/2014/07/the-computerisation-of-european-jobs/>

<sup>2</sup> [ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment\\_statistics#Main\\_statistical\\_findings](http://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics#Main_statistical_findings)



**Figure 1 Unemployment rates in the EU-28 and candidate/associated countries according to educational level**

Source:<http://ec.europa.eu/eurostat/statistics->

[Unemployment\\_rate\\_by\\_level\\_of\\_educational\\_attainment%2C\\_2014\\_%28%25%29.png](http://ec.europa.eu/eurostat/statistics-views/main-tables/unemployment_rate_by_level_of_educational_attainment%2C_2014_%28%25%29.png)

One of the most important reforms, illustrated by *Figure 1*, refers to the interplay between education and labour suggesting the possible set up of new institutions and complex innovative formulas to ensure better coordination, at formal and informal level, between already present or new institutions with impact on the labour market. This approach requires consistent and integrated policies and measures regarding the economic and social goals. It would allow including the youths that either feel tempted to abandon school in early stages, or who have already left the educational system and cannot be found on the labour market, and do not feel inclined to resume education or pursue vocational training (the so-called NEET youths). This reform is necessary, and lifelong learning is the core inflexion point for which new communication and cooperation models should be identified. The reform in view of better collaboration with the economic sector for ensuring the successful transition from school to work must include sets of legislative initiatives, policies, and measures approaching both issues identified within the educational system, and the ones identified by the main stakeholders on the markets that can create and supply jobs. These markets are those facing deficit, or those that will face deficits. For instance, the deficit in the field of health is currently of 7.2 million health workers (2013 value), and will reach an estimated 12.9 million in 2035<sup>1</sup>, while other related fields will register also considerable deficits. Another stakeholder to be involved are communities at regional and local level as, especially as result of the crisis, they begin to be an increasingly important “player” in particular due to their ability of generating local, intra- and inter-regional innovative solutions.

Jobs’ polarisation is usually expressed in terms of income, but the division according to the criteria of low-, mid- and high-skill requires also the inclusion of other criteria that would reflect developments regarding job requirements, types, quality, and continuity perspectives of the occupation

<sup>1</sup> <http://www.who.int/mediacentre/news/releases/2013/health-workforce-shortage/en/>



and not of the job as such. The classification according to the type of occupation: routine or non-routine, foreseeable automation, or not, and other such criteria might provide information about the sustainability of the job, etc. In this respect, Author attempted identifying reasons why the most affected segment is the mid-skilled. Therefore, he suggests the following classification in four major occupational categories: (1) sales; (2) office-administrative; (3) production, crafts, repairs; (4) operators, manufacturers and workers. All these categories include both routine, repetitive tasks, and non-routine, non-repetitive tasks. Yet, he notices that while the main feature of the mid-skilled segment is the one of repetitive routine activities based on regulations and procedures (easily assumed by automation and robots), there are cognitive and creative components in office and administrative activities, as well as in sales occupations. At the same time, he mentions that polarisation is heightened by the non-routine, non-repetitive activities, which in their turn can be abstract/cognitive and manual. If for the first higher-education is imperative, along with analytical and problem-solving skills, intuition, creativity and innovativeness, the manual activities are found in the field of "emotional intelligence", respectively requiring interpersonal communication skills, situational, verbal and visual adaptability. We would argue that considering the field in which these low-skilled non-routine occupations are found (home health care and related, social services, etc.), some requirements such as intuition, and swiftness are required if timely problems/situations need to be solved.<sup>1</sup>

### **Instead of conclusions**

It is obvious that for remedying the worrying imbalances on the labour market displayed by increasing or (at best) stable unemployment rates, and by the destruction of jobs lacking the creation of new jobs institutional interventions are necessary. These should be directed to evaluating and updating the contractual forms that characterise the labour market, probably a first necessary step, considering the trends displayed by recent generations. Many youths tend to maximise their income opportunities by in point collaboration with start-ups and/or innovative companies and industries, and abandon increasingly more the success pattern of the past, that is employment with multinational corporations. This would imply, as well, the educational system and the cooperation of this system with the main stakeholders and reconfiguring social systems for more flexibility and easy adjustment to changes in the economic environment. This approach is necessary as the formula of in-point and limited time, even optional

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<sup>1</sup> Author, David. "The Polarization of Job Opportunities in the U.S. Labor Market." *The Hamilton Project* and *The Center for American Progress*, April 2010, pp. 1-40.

collaborations, exceeds what traditional approaches qualify as contracts for determined periods of time, or part-time work. The collaboration with innovative creative companies, industries, and with start-ups provide to the young generations the framework for personal and professional development in a new, particularised and individualised context, ensuring the chance of the individual to maximise his/her incomes for the entire period of active life. Still, this type of economic behaviour bears also risks for the social insurance systems, in general for the taxation system and even for the individual at the time of retirement if not satisfactorily managed<sup>1</sup>. In this context, it is necessary to underpin the importance and relevance of innovation for the institutional and social field, fact also highlighted by the Europe 2020 Agenda. The current state-of-affairs indicates that the increased attention paid to economic growth, to competitiveness was largely detrimental to concerns in these fields. Managing a sustained dialogue between the decision factors of these two fields might ensure a favourable climate to achieving social investments, which would assist in better managing the human capital caught inevitably in the “conundrum” between the changing economy and the incapacity of the relevant institutions to reform accordingly considering the deep social effects.

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