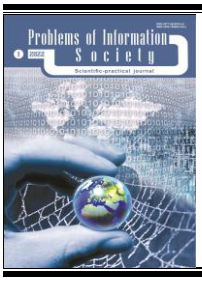

www.jpis.az

13 (1)
2022

Industry 4.0 and its aberrations

Gioacchino de Candia

Company de Candia – Via Salgari, 6 – 70038 Terlizzi (BA) - Italy

gioacchinodecandia@inwind.it

ORCİD: orcid.org/0000-0002-3506-8158

ARTICLE INFO

http://doi.org/10.25045/jpis.v13.i1.06

Article history:
Received: 15 October 2021
Received in revised form:
18 November 2021
Accepted: 22 January 2022

Keywords:
Industry 4.0
Innovation
Digital revolution
Cyber-security
Smart-technology
National Business
Plan 4.0.

ABSTRACT

The article analyzes the Program known as Industry 4.0, three years after its entry into force. Many shadows and few lights, which in the intentions of the Government that has launched this plan should positively revolutionize the Italian business and corporate structure, to produce a new "economic miracle". The program suffers from an excess of rules, often in contradiction with each other, that make the path of "Industry 4.0" extremely cumbersome. The unsuccessful attempt of the so-called "jobs act" is also added, which according to the "Renzi government" should have produced an improvement in the conditions of the workers, but which in fact did not produce beneficial effects in the labor market.

1. Introduction

Industry 4.0, today the National Business Plan 4.0, is born from the experience of France, Germany, Holland, United States, China (to quote the main countries) that have developed, since 2007, a long-term policy, with horizons between 2030 and 2050, for the relaunch of the manufacturing sector, widely considered the true antidote to low growth and the worrying loss of competitiveness.

The European Union (EU) itself, with alternate events, has adopted, since 2010, some Communications on industrial policy called "For a European industrial renaissance" (2014) which indicates the target of 20% of the contribution of manufacturing to European GDP to be achieved by 2020, as well as a strategy to develop European industry, focused on the so-called mainstreaming of industrial policy within the various European sectoral policy actions.

The integration between industry and innovation is even more evident in the contextual declination of specific strategies for research, innovation and technological development in the industrial policy plans adopted by almost all EU countries (and not only in Europe).

The Italian concept of Industry 4.0 is grafted onto the German High Tech Strategy (HTS 2007-2010) which sets the line on Germany's actions and investments in innovation. Similar experiences can be recognized in the Dutch Smart Industry, in the French Industry of Future or US Advanced Manufacturing.

For companies and national companies, it is a question of defining what the growth model to aim for should be, in relation to the various global challenges (so-called mega trends) and to equip oneself with the "toolbox" necessary to implement it. A complex exercise must be carried out, in which to rethink the role of the State as a guide to processes and to direct the governance structures, the legal and regulatory framework in place and the financial instruments (public and private) that allow the definition of an operating context in which companies can invest, grow, innovate and

provide employment on new technological, structural and organizational bases, consistent with changing trends.

Italy is also called upon to reflect (albeit belatedly) on the potential of a new manufacturing model, on the conditions for its national declination and on the necessary interventions in the short and medium-long term, so that the production system is the protagonist of change technological.

2. Industry 4.0

Industry 4.0 is now unanimously considered the "fourth industrial revolution". In fact, this profound transformation of the way goods are produced, of linking the services market to the manufacturing sector, as well as of creating innovative products has been in progress for some time. However, since in the country this process appears to have still a limited size and diffusion, its perspective is more medium-long term, with borders that are not yet completely clear, although there is a clear perception of a demanding challenge for companies and institutions and, at the same time, inescapable. In fact, the speed, pervasiveness and transversality with which digital technologies (but not only) are penetrating the operational reality of citizens, businesses and (more slowly) public administrations are such as to make the task of fully exploiting its potential, as a driving force for growth and competitiveness for the entire production system [1].

In more operational terms, Industry 4.0 involves the organization of production processes based on technology and on devices capable of autonomously communicating with each other along the value chain: i.e., a smart factory model, where computer-controlled systems manage processes physical, creating a virtual and parallel world to the physical one.

By attempting a work of simplification, factories should become cyber-physical places, where the real world and the digital world are integrated. Production, as it has long been imagined, will include direct machine to machine (M2M) interaction as well as "man-machine" and new technologies will integrate the objects, transforming them into intercommunicating systems with "intelligence".

The enormous availability of data and information, moreover, will be able to influence the production process, business models and the creation (replacement or elimination) of products without distinction. Schematically, the main Smart Technologies on which the industry of the future should be based are represented by:

- Wearables (Wearable Device) sensors and actuators are incorporated in physical assets (clothing and accessories) and are able to use wireless networks to communicate and exchange information between them, but also to increase the ability to read and view physical reality, facilitating the production process;
- Big data analytics, i.e., the tools and methodologies dedicated to the processing and processing of large and various masses of data to be used to adequately and efficiently configure the industrial process;
- Internet of Things, as an ultra-fast connection of objects, machines and men, thanks to which information on products and the operation of machinery is exchanged;
- Cloud Manufacturing, the industrial declination of cloud computing (widespread internet) for on-demand and open access to IT resources supporting production processes and supply chain management;
- Advanced automation, advanced (or humanized) machines and robots able to interact with humans or carry out productive functions autonomously and flexibly (assembly, assembly, etc.);
- Additive manufacturing, 3D printing that allows the production of goods "according to" material, as opposed to the traditional production by subtraction, using innovative production processes and innovative materials, so that the products are "printed" during production.

Undoubtedly, Industry 4.0 significantly impacts production processes and business models. First, increasingly widespread investments in new digital technologies within the factory and more generally within the production chain will enable us to achieve objectives of effectiveness and efficiency. This should reflect positively on production costs and, consequently, on profits, while bearing in mind the weight of the initial investment for company budgets, in particular SMEs.

The availability in real time of enormous masses of information will allow to: monitor the flow of the demand; adjust production levels, maximizing the time of use of industrial assets; reduce the time; optimize warehouse stocks; planning and improving logistics services; develop new products.

Among the positive effects, there is also the possibility of reducing the energy consumption of businesses, thanks to a more efficient management of consumption loads, a reduction in the energy losses of networks and machinery, etc.

As for the products, the new production technologies and the integration of information devices within the goods will further pave the way for intelligent, connected and customizable products (just think of Google glass, technical fabrics used in sports that can provide indications on performance, etc.). Therefore, innovation and creativity become the pillars of an increasingly extreme "customization", which looks not at consumers in a broad sense, but at the consumer as an individual. This is an extremely interesting profile for the Italian production system, which has the strengths of Made In in its craftsmanship and creativity.

It is evident from this brief description that the industry of the future, called Industry 4.0 or not, has its main production factor in information: acquiring, processing, sharing and exploiting information is fundamental to strengthen or create relationships of more stable and qualified supply chains, produce products that are increasingly "sewn on" and integrate traditional and holistic service offerings into traditional manufacturing.

According to this model, global competition, at least for some productions, will no longer be played, or less, on the cost factor, which for a long time has been the basis for business relocation choices (labor) but will be played on quality, on the collaboration between the different companies of a supply chain, as well as on the territorial specializations.

As far as human capital is concerned, an industry dominated by new technologies and a natural tension towards innovation must be able to find on the market human capital with the necessary and adequate skills to constantly feed the technological advancement and renewal of the production process. Starting from the basic school up to the University, training in subjects typically "STEM" (Science, Technology, Engineering, Math) takes on a key role in order to build a pool of qualified skills and feed the innovative process [2].

Furthermore, it is necessary to underline how much of the debate on Industry 4.0 is absorbed by the effects on employment, deriving from the progressive replacement of man with machines, which could render some professional figures obsolete, activating demand for new profiles. From this point of view, the starting point is that every industrial revolution has led to the disappearance of some professional figures while also stimulating the birth of new figures. It is, however, evident that it will be necessary to know how to effectively manage, with adequate tools and policies, the temporary support, training and re-employment of people, which will be affected by these transformations in the labor market.

Finally, Industry 4.0 sets specific issues related to the management and regulation of information and data. The immateriality that characterizes this new manufacturing sector model requires adequate legislative and legal solutions regarding the construction of operational standards and platforms, to allow the effective interoperability of the various subjects of a supply chain. It requires a strong involvement of the institutions in the definition of tools and rules for the protection of industrial intellectual property, personal data, or in creating competent structures in the field of cyber-security.

3. Regulatory framework

To date, Italy has equipped itself in part with a corpus of laws built *ad hoc*, partly exploiting existing laws, which attempt to regulate Industry 4.0.

These rules can be summarized in the following list:

- agreements for innovation;
- nuova Sabatini;
- centers of competence;
- technology transfer centers;
- development contracts;
- training tax credit 4.0;
- R&D tax credit;
- guarantee fund for SMEs;
- hyper and super depreciation;
- patent box;
- innovative startups and SMEs.

In detail, agreements for innovation concern a series of incentives for companies of any size, with at least two approved budgets, which carry out industrial, agro-industrial, artisan or service industry activities, as well as research activities.

Proponent companies may also submit projects jointly between themselves and/or with research organizations, up to a maximum of five co-proponents. In such cases, projects must be implemented through the use of the network contract tool or other contractual forms of collaboration such as, for example, the partnership agreement and the consortium.

It finances projects concerning industrial research and experimental development activities aimed at creating new products, processes or services or at significantly improving existing products, processes or services, through the development of one or more of the technologies identified by the European Union Framework Program [4] for research and innovation 2014 - 2020 "Horizon 2020", such as:

1. information and communication technologies (ICT);
2. nanotechnology;
3. advanced materials;
4. biotechnology;
5. advanced manufacturing and processing;
6. space;
7. technologies aimed at achieving the following objectives of the "Society Challenges" priority set by the Horizon 2020 Program.

Research and development projects must include costs and eligible costs not less than 5 million euros and not exceeding 40 million euros, have a duration not exceeding 36 months and be started after the presentation of the project proposal to the Ministry of Economic Development.

The relevant legislation is contained in the Ministerial Decree of 28 November 2017 of the Ministry of Economic Development (MISE) and subsequent additions [8].

Nuova Sabatini is a measure of MISE that supports investments to buy or lease machinery, equipment, facilities, capital goods for production and hardware, as well as software and digital technologies.

The micro, small and medium-sized enterprises (SMEs) that benefit from the application are eligible for the benefit:

- they are duly constituted and registered in the Business Register or in the Fishing Companies Register;
- they are in full and free exercise of their rights; they are not in voluntary liquidation or subject to bankruptcy proceedings;
- the aids considered illegal or incompatible by the European Commission are not included among the subjects that have received and subsequently not reimbursed or deposited in a blocked account;
- they are not in conditions such as to be firms in difficulty;
- they are based in a Member State, provided they open an operating office in Italy by the deadline for completing the investment.

All productive sectors are admitted, including agriculture and fishing, with the exception of the following:

- financial and insurance activities;
- export-related activities and for interventions subject to the preferential use of domestic products with respect to imported products.

The facilities are complex and consist of the granting by banks and financial intermediaries, adherents to the Addendum to the agreement between the Ministry of Economic Development, the Italian Banking Association and Cassa Depositi e Prestiti SpA, of loans to micro, small and medium enterprises to support the investments envisaged by the measure, as well as a contribution by the Ministry of Economic Development, related to the interests on the aforementioned loans.

The investment can be entirely covered by bank financing (or leasing). The loan, which can be backed by the guarantee of the "Guarantee Fund for small and medium enterprises" up to 80% of the amount of the loan, must be:

1. lasting no more than 5 years;
2. for an amount between € 20,000 and € 2 million;
3. entirely used to cover eligible investments.

The contribution of the Ministry of Economic Development is a contribution whose amount is determined in an amount equal to the value of the interest calculated, conventionally, on a loan for duration of five years and of an amount equal to the investment at an annual interest rate equal to:

- 2.75% for ordinary investments;
- 3.575% for investments in digital technologies and in waste tracking and weighing systems (investments in so-called "Industry 4.0" technologies).

The reference legislation is varied, as the *nuova Sabatini* refers to various existing laws regarding corporate financing and tax credit, as well as the rules for granting and paying the contribution in relation to bank loans and specific articles of the Budget Laws, approved by the Italian Parliament over the last four years.

Competence Centers promotes the establishment of highly specialized places on Industry 4.0 issues, in the form of public-private partnerships. The competence centers will have to carry out guidance and training activities for companies, as well as support in the implementation of innovation projects, industrial research and experimental development aimed at the realization by new users, in particular SMEs, of new products, processes or services (or their improvement) through advanced technologies in the Industry 4.0 area.

It is aimed at public and private operators (businesses and other economic operators, including those that carry out financial and/or insurance intermediation, national or regional trade associations, etc.) with the participation of at least one research organization.

Benefits are granted in the form of direct spending contributions in relation to:

- establishment and start-up of the center of competence, to the extent of 50% of the expenses incurred, for a total amount not exceeding 7.5 million euro;
- innovation projects, industrial research and experimental development presented by companies, to the extent of 50% of the costs incurred, for a maximum amount not exceeding 200 thousand euros per project.

The relevant legislation is contained in the Directorial Decree of 29 January 2018 [6].

The Technology Transfer Centers carry out training and technological consultancy activities, as well as the provision of technology transfer services to companies in the areas of operations identified by the Ministry of Economic Development, including:

- additive manufacturing;
- augmented reality;
- internet of things;
- cloud;
- cybersecurity;
- big data analysis.

The certification will be issued by *Unioncamere*.

The relevant legislation is contained in the Directorial Decree of 22 December 2017 and subsequent additions [5].

The Development Contract, introduced in the regulation by article 43 of the decree-law of 25 June 2008, n. 112, and operational since 2011, represents the main facilitation tool dedicated to supporting large-scale strategic and innovative production investment programs.

The complex legislation governing the instrument has undergone, over the years, substantial changes aimed at guaranteeing faster access procedures and a better response to the needs expressed by the national productive fabric.

The legislation currently in force (decree of the Minister of Economic Development of 9 December 2014 and subsequent amendments) valid for the 2014-2020 programming period, allows the financing of:

- industrial development programs, including programs concerning the processing and marketing of agricultural products;
- development programs for environmental protection;
- development programs for tourist activities which may include, for an amount not exceeding 20% of the total investments to be made, programs for the development of commercial activities.

Within the aforementioned programs, the instrument can also finance research, development and innovation programs, as well as infrastructure works within the limits set by the implementing legislation.

The total amount of expenses and costs eligible for the subsidies must not be less than € 20 million, or € 7.5 million if the program concerns exclusively the processing and marketing of agricultural products.

Development programs can be carried out by one or more companies, Italian or foreign, of any size (compatibly with the community regulations applicable from time to time). The development program can also be implemented jointly, including through the use of the "network contract" tool.

Training tax credit 4.0 is intended to stimulate business investments in staff training in matters concerning the technologies relevant to the process of technological and digital transformation of companies envisaged by the "National Business Plan 4.0", known as "enabling technologies".

Addresses:

- companies' resident in the territory of the State, regardless of the legal nature, the economic sector to which they belong, the size, the accounting regime and the system for determining income for tax purposes;
- non-commercial entities that carry out commercial activities relevant to business income;
- companies residing abroad with permanent organizations in Italy.

Substantially the benefits relate to the tax credit in the amount of 40% of the expenses related to the employees involved in the training activities admissible, limited to the corporate cost referred to the hours or days of training, incurred in the taxable period eligible and up to a maximum limit of € 300,000 for each beneficiary, agreed by collective or corporate collective agreements.

The legislation is substantially contained in the Interministerial Decree of 4 May 2018 [9], with various references to circulars from the MISE and the Revenue Agency [9].

The R&D Tax Credit serves to stimulate private spending on Research and Development to innovate processes and products and guarantee the future competitiveness of companies.

Addresses:

- all subjects in possession of business income (companies, non-commercial entities, consortia and business networks) regardless of the legal nature, company size and economic sector in which they operate;
- Italian companies or companies residing abroad with a stable organization in the national

territory, which carry out their own Research and Development activities or commission Research and Development activities;

- Italian companies or companies residing abroad with a stable organization in Italy, which carry out Research and Development activities on commission by companies' resident abroad.

The advantages are many and concern the tax credit in the amount of 50% on incremental expenses in Research and Development, recognized up to an annual maximum of 20 million € / year per beneficiary and calculated on a fixed basis given by the average of the expenses in Research and Development in the years 2012-2014. The tax credit can be used, even in the event of losses, to cover a wide range of taxes and contributions.

All expenses related to fundamental research, industrial research and experimental development can be facilitated: costs for highly qualified and technical personnel, research contracts with universities, research institutes, companies, start-ups and innovative SMEs, amortization rates for instruments and equipment of laboratory, technical and industrial skills.

The measure is applicable for research and development expenses, which will be incurred in the 2017-2020 period.

The benefit can be combined with:

- super-amortization and over-amortization;
- *nuova Sabatini*;
- patent box;
- incentives for the capitalization of companies (ACE);
- incentives for investments in start-ups and innovative SMEs;
- Central Guarantee Fund.

The purpose of the Guarantee Fund for SMEs is to facilitate access to the financial resources of small and medium-sized enterprises by granting a public guarantee which is placed side by side and often replaces the real guarantees brought by companies.

Thanks to the Fund, the company has the concrete possibility of obtaining financing without additional guarantees (and therefore without surety costs or insurance policies) on the amounts guaranteed by the Fund, which does not offer cash contributions.

According to the latest surveys, over 99% of companies had access to financing with coverage of the Fund in the absence of the presentation of collateral.

The Guarantee Fund for SMEs is an instrument established by Law n. 662/1996 (art. 2, paragraph 100, letter a) but operational since 2000. Following the entry into force of the aforementioned law, the MISE has produced a series of Decrees, aimed at updating the methods used by companies to access to the same fund [20].

Hyper and super amortization support and incentivize companies that invest in new capital goods, in tangible and intangible assets (software and IT systems) functional to the technological and digital transformation of production processes.

It is addressed to all the holders of business income, including individual enterprises subject to IRI, with fiscal headquarters in Italy, including permanent business organizations resident abroad, regardless of legal form, company size and sector in which they operate.

The advantages are:

- hyper-amortization - 250% overvaluation of investments in new tangible assets, devices and technologies enabling transformation into 4.0 purchased or leased;
- Super-amortization - 130% overvaluation of investments in new capital goods purchased or leased; for those who benefit from hyper-depreciation there is the possibility of also benefiting from a 140% overvaluation for investments in intangible capital goods (software and IT systems).

Hyper and super-amortization are regulated by the following rules: Law 28 December 2015, n. 208 [22], Law 11 December 2016, n. 232 [23] and Law 10 December 2014, n. 183 [21].

Patent box is a special tax relief scheme for income deriving from the use of copyrighted software, industrial patents, designs and models, as well as processes, formulas and information relating to experience acquired in the industrial, commercial or scientific field protectable.

Individuals with business income can exercise the option, regardless of the type of accounting adopted and the legal title under which the use of the assets takes place.

The option must be exercised in the tax return relating to the first tax period for which it is intended to opt for the same, it is valid for five tax periods, it is irrevocable and renewable.

The relevant legislation is contained in the MISE Decree of November 28, 2017.

Startups and innovative SMEs represent a package of standards, which can be used by newborn companies (startups) and companies already existing on the market, which fall within the definition of SMEs.

The reference regulations are confusing and contradictory.

4. Jobs act

Within the package of regulations that attempt to regulate Industry 4.0, the legislative body called jobs act, approved by the Italian Parliament between 2014 and 2015, was inserted during the so-called "Renzi Government", deus ex machina of this operation [3].

This term informally indicates a reform of the "labor law in Italy", aimed at making the labor market even more flexible. The provision was adopted with the aim of reducing unemployment, stimulating companies to hire. According to the "Renzi Government", the jobs act would have created over a million jobs.

The term derives from the acronym "Jumpstart Our Business Startups Act", referring to a US law, promulgated during the presidency of Barack Obama in 2011, in favor of small businesses through access to financial funds. In Italy the term was instead used, due to contamination with the English word job, to define a set of normative interventions in the field of work of a more general nature.

There are many normative references: Decree-Law no. 34/2014, Law n. 183/2014 and Legislative Decrees n. 22/2015, 23/2015, 80/2015, 81/2015, 148/2015, 149/2015, 150/2015 and 151/2015 [10, 21, 12, 13, 14, 15, 16, 17, 18, 19].

In summary, this body of laws applies to workers hired with a permanent employment contract starting from the date of entry into force of the decree (i.e., from 7 March 2015) as well as conversion cases, following the entry into force of the decree, fixed-term contracts or apprenticeships in permanent contracts. For other contracts, however, Article 18 of the Workers' Statute continues to apply.

The decree states that, in the event of dismissal without a justified objective reason, the employer will have to pay the employee a compensation equal to two months' salary for each year of work in the company, from a minimum of 4 to a maximum of 6 months of compensation for companies with less than 15 employees and from 12 months to 24 months of compensation for companies with more than 15 employees.

The new rules also provide for the possibility of having recourse to quick conciliation, in which the employer offers a monthly salary for up to a maximum of 18 months for each year of seniority. The rule also modifies article 18 of the Workers' Statute, which in the current formulation provides for redundancies for dismissals without a justified reason, ranging from a minimum of 12 to a maximum of 24 monthly payments or reintegration in the workplace, but yes only applies to companies with more than 15 employees.

Similar protections are also provided for discriminatory and disciplinary dismissals for which the non-existence of the disputed fact is proven (for which the reinstatement of the employee is imposed).

According to a statement released on 26 September 2018 by the Press Office of the Constitutional Court, the Council declared the illegitimacy of article 3, paragraph 1 of legislative decree n. 23/2015 [13], in the part not modified by the subsequent Decree-Law n. 87/2018 (so-called "Decree Dignity") regarding the criterion for determining the indemnity due to the worker unjustifiably dismissed, determined only on the basis of length of service [11].

5. Current situation

Three years after the entry into force of the package of rules governing Industry 4.0, the situation appears to be nebulous, as there is no real monitoring of public spending carried out for the benefit of companies, which have benefited from Industry 4.0.

To date, access to financial resources, tax benefits and budgetary support has been granted by "preferential routes" to large industrial groups, such as the Marcegaglia Group, the FCA Group and a few others.

These are those companies that have long equipped their corporate structure and their budgets so that they are eligible to access the plethora of regulations, which today attempts to regulate the National Business Plan 4.0.

In fact, these companies have pushed the previous government to implement all the necessary "reforms" that are in line with the needs of these large industrial groups. For most other types of businesses, access to such facilities is extremely cumbersome, as is impossible.

To this end, the "jobs act" is inserted, which almost completely erases the art. 18 of the Workers' Statute, made dismissal without just cause possible and de-penalized. This has led to a further gap between the private and public employment world. In fact, in the Italian Public Administration the aforementioned art. 18 continues to be in force, making it impossible for dismissal without just cause for this category of workers.

The entry into effect of the "jobs act" has caused the further precarization of the private labor market, encouraging companies, especially SMEs, to dismiss employees hired on permanent contracts, in favor of younger staff contracted by the term and with forms more "flexible".

Moreover, the increased bargaining power of companies has not translated into an increase in wealth for the country, so much so that the Italian GDP in the three-year period 2016 - 2018, in real terms, has decreased.

From the technological point of view these last years have not registered any progress, also because the Public Administration continues to pay the many delays accumulated in the management of the computerization of public offices. To this is added a distorted application of the laws concerning privacy, which takes away from the citizen, therefore the tax payer, even control over his own sphere of activity and related relations with the Public Administration.

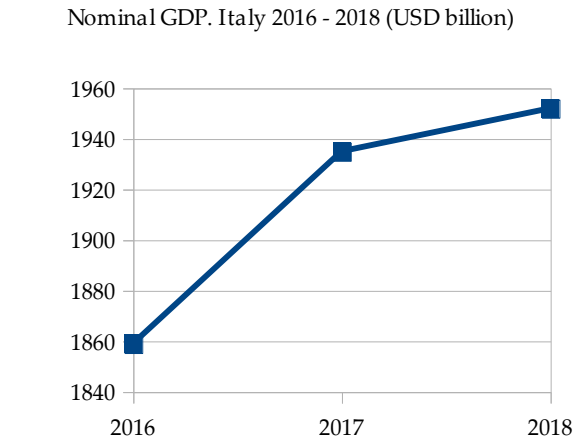

Fig 1. Nominal GDP. Italy 2016-2018(USD billion)

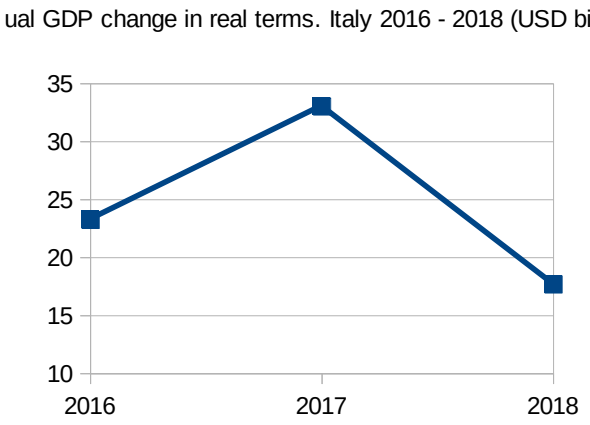

Fig. 2. Ual GDP change in real terms. Italy 2016-2018(USD billion)

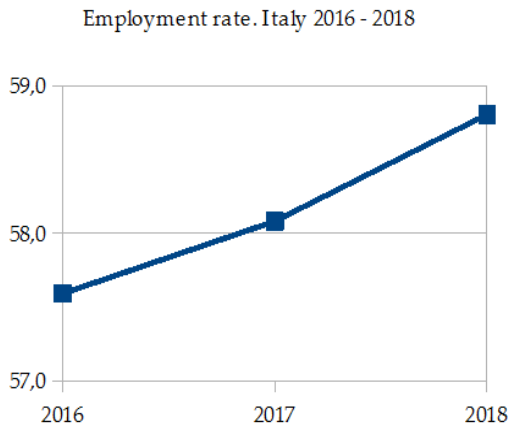

Fig.3. Employment rate Italy 2016-2018

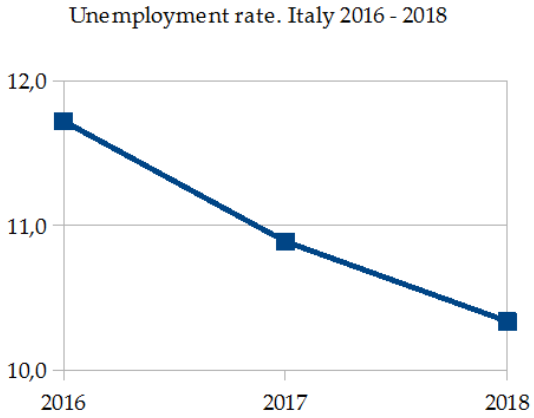

Fig.4. Unemployment rate Italy 2016-2018

The labor market, on the other hand, is always depressed. The 2016-2018 three-year period, against a slight improvement in the employment rate and the consequent decrease in the unemployment rate, was affected by a decrease in permanent contracts (of around 130,000 units) together with the decrease in self-employed workers (almost 80,000 units in less).

The jobs act, therefore, has not reached the "publicized" goal of one million new jobs and further destabilized the Italian labor market, already tried by years of labor law maladministration.

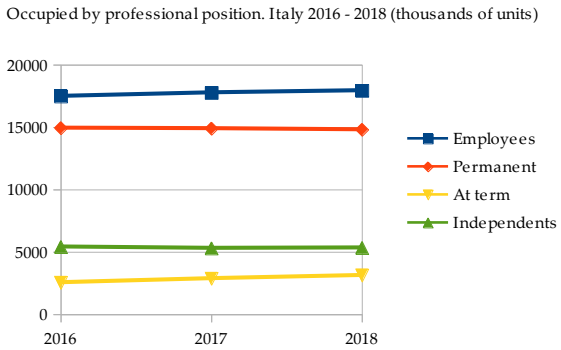

Fig. 5. Occupied by professional position. Italy 2016-2018 (thousands of units)

Conclusions

The process relating to the Industry 4.0 program (National Business Plan 4.0) is still ongoing and far from being concluded.

From the data presented, the poor ability of the Plan to produce a new "industrial revolution", as it was in the advocates' program, clearly emerges.

Even the labor market has not seen a revival, but a further collapse.

Therefore, remains the weakness of a Plan that discounts the "aping" of other programs, already in progress for some time in other countries (such as Germany, Holland, Great Britain) that have the necessary basic characteristics, so that it feeds the hope that a shovel Plan can take root positively in their respective countries.

The Italian government that approved it, far from being able to implement a real and effective economic programming, preferred, as in the past, to awkwardly procure foreign best practices.

Add to this, negatively, the operation in the area of employment law known as jobs act, which has had the opposite effect expected by the so-called "Renzi Government".

The obvious criticalities already emerged in Italy also occur in other countries. The United States has exploited 18% of their potential from digital technologies, while Europe has taken advantage of only 12% and other advanced economies even less. In Germany as in many other countries, "Industry 4.0" still expresses a concept relating to "what could be" rather than to what it is today. Therefore, the push towards a digitalization of the industry should not be understood as an immutable data.

We should not forget the growing disorder due to the current accumulation mechanism of global capitalism, which is closely linked to the dissolution of the state as a 'mediator' between capital and labor in the era of neoliberalism, a process that the latter in all parts of the world has contributed to the growth of disparities and inequalities.

Therefore, Industry 4.0 represents a phase of oligarchic globalization, where only the economically strongest nations and the richest 20% of the population, and in particular 1%, can have actually positive expectations, since not even the policies of liberal mold in support of welfare find more space on the political agenda. As a result, we are witnessing the dissolution of classes and class consciousness.

In Germany the protection of workers' rights has remained relatively stronger for workers with stable contracts of large manufacturing companies, but millions of workers are trapped in a condition marked by low wages and very little chance of progress.

At this point it is necessary to address, albeit briefly, the question of the vital inputs for the digitalization of the economy.

This is a problem that has so far not been adequately addressed by economic policy makers, industry representatives, or trade unions. Although the costs of the transition to "Industry 4.0" are considered to be such that they can be managed without major problems at least by the largest companies, even if the impact on workers is largely ignored by both governments and unions, it is necessary to underline that the future of "Industry 4.0" will depend very much on how the prices of metals and of all the materials necessary for the production of technological products, as well as of oil, will behave when economies around the world will invest in an increasingly massive way: 1) in the production of renewable energy; 2) in electric mobility; 3) in digital production; 4) how much consumers will continue to buy all types of mobile devices (such as smartphones and tablets); 5) from what the Governments will continue to invest in the technological-military sector.

It should not be forgotten, in fact, that all these new technologies, therefore the industries that produce them, depend crucially on the availability of oil and 'rare metals' such as copper, nickel, silver, uranium and in particular from the so-called "rare earths" such as indium, gallium, germanium, lithium and many others.

In conclusion, only a handful of ignorant people could deny that limits to economic growth are being faced for various reasons. It follows the need on the part of those who should avoid building our future on the same socio-economic and environmental model as that developed so far.

However, the limits to growth deriving from the current levels of pollution produced by capitalism are ignored and will probably continue to be ignored until a "point of no return" is reached, such that the entire economic, social and natural system collapses.

Limits to economic growth could manifest even before this collapse due to stringent constraints inherent in the availability of natural resources and this could have an impact on the capitalist accumulation process, as in the past, which will be

accompanied by geopolitical tensions, which will lead to conflicts and probably planetary wars.

While approaching the achievement of the "critical point" for the ecological system and the peak of production with relative consumption of huge natural resources, including the rare metals necessary for the development of "Industry 4.0", those who wanted to move a radical criticism to this state of things should come to terms with the conclusion that it will not be possible to build large and powerful international alliances between social movements and workers (against the global power of billionaires and multinationals) until we continue to resurrect models and political solutions of the last century (based on on infinite growth in a finite planet) in order to solve the current catastrophic planetary perspectives.

References

1. Confindustria (2016), Indagine conoscitiva su "Industria 4.0": quale modello applicare al tessuto industriale italiano. Strumenti per favorire la digitalizzazione delle filiere industriali nazionali, Parliamentary hearing Production Activities Committee Chamber of Deputies, 22 March 2016
2. Mckinsey Global Institute (2017), Artificial intelligence, discussion paper
3. Mckinsey Global Institute (2017), Jobs lost, jobs gained:workforce transitions in a time of automation
4. Framework Program of the European Union for Research and Innovation 2014 - 2020 "Horizon 2020" Workers' Statute, Law 20 May 1970, n. 300
5. Directorial Decree 25 October 2017 (MISE)
6. Directorial Decree 29 January 2018 (MISE)
7. Ministerial Decree 9 December 2014 (MISE)
8. Interministerial Decree 28 November 2017 (MISE)
9. Interministerial Decree 4 May 2018
10. Decree-law 20 March 2014, n. 34
11. Decree-law 20 July 2018, n. 87
12. Legislative Decree 4 March 2015, n. 22
13. Legislative Decree 4 March 2015, n. 23
14. Legislative Decree 15 June 2015, n. 80
15. Legislative Decree 15 June 2015, n. 81
16. Legislative Decree 14 September 2015, n. 148
17. Legislative Decree 14 September 2015, n. 149
18. Legislative Decree 14 September 2015, n. 150
19. Legislative Decree 14 September 2015, n. 151
20. Law 23 December 1996, n. 662
21. Law 28 December 2015, n. 208
22. Law 11 December 2016, n. 232