



Future of manufacturing  
**Italy:**  
**Policy developments on  
apprenticeship**

*Adaptation of national apprenticeship systems  
to advanced manufacturing*

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## Introduction

### Scope of the research

This country report is part of the study ‘Policy developments and practices of apprenticeships in selected EU Member States and world competing regions’ carried out in five EU (Denmark, Germany, France, Ireland and Italy) and two non-EU countries (Australia and the USA). This study is conducted in the frame of the Pilot Project ‘The Future of Manufacturing’, proposed by the European Parliament and delegated to Eurofound by the European Commission (Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs).

One of the objectives of this study is to provide an analytical overview of apprenticeship systems in the selected countries and to review changes to the current systems following labour market shifts, changes in employment, career and mobility patterns and technological and structural change. Particular emphasis is placed on the impact of new technologies and the need for a high skilled and adaptable workforce in manufacturing and advanced manufacturing.

This research is carried out in response to the increasing interest in apprenticeships among policy makers to tackle skills mismatches but also to integrate young people into the labour market. The appeal of apprenticeships is also growing particularly in a context where new technologies are transforming work organisation and production processes across all sectors, particularly manufacturing.

The findings from this research will feed the policy discussions around the role of apprenticeships for the future of manufacturing and inform policy making in the context of current or planned reform of apprenticeship systems and the necessary links to be established between education/training and industrial policies.

### Report structure

With a view to investigating country specific issues, the first section outlines the wider economic and labour market context in which the national apprenticeship system operates. The links between education/ training and industrial policies are also explored.

The second section describes the key features of the national apprenticeship system, including the regulatory framework, the governance structure, and the financing mechanisms and it provides some statistical data on apprenticeships and pinpoints the key challenges to the implementation and the development of the current apprenticeship system.

The focus of the third section is on the specific role of apprenticeships in relation to the advanced manufacturing industry in Italy. It examines the main requirements arising particularly from technological change in manufacturing and it explores recent reforms on apprenticeship systems together with the key drivers behind these policy changes. In doing so, it identifies success factors and barriers to the implementation and the development of apprenticeship systems.

This country report is based on a literature and document review, as well as qualitative semi-standardised interviews with selected key actors and stakeholders, namely the Ministry of Labour and Social Policy, the National Institute for the Analysis of Public Policies, the employer organization Confindustria, the Italian General Confederation of Labour and the Association for International and Comparative Studies in the field of Labour Law and Industrial Relations (see list of consulted stakeholders in annex 2).

## Key terms at a glance

As there is no official definition for advanced manufacturing in Italy, this report only refers to most relevant advanced manufacturing technologies in the Italian industrial context. The emphasis in regional policies for research and innovation (under the national Smart Specialisation Strategy) is generally on advanced production processes, mechatronics for advanced production systems, forecasting methods, modelling and simulation, ICT, sustainable production technologies and advanced materials<sup>1</sup>.

The use of apprenticeship as an instrument to improve the quality of technical and professional training and job placement for young people is a complex matter in Italy. It is a statutory-based instrument with different institutional competences depending on the apprenticeship type. National regulation (Legislative Decree 81/2015) identifies three types of apprenticeships: Level I (associated with professional qualifications, second-grade secondary school diploma), Level II (occupation-oriented apprenticeship) and Level III (higher apprenticeship). Levels I and III belong to the education and vocational training systems, whereby education is of State competence and professional training is constitutionally devolved to the regions. Responsibility for Level II is mainly assigned to the social partners (trade unions and employers' association), while regions are in charge of training outside companies.

Level II is by far the most widespread form of apprenticeship (96.4% of all apprenticeship contracts (ISFOL's calculations, based on INPS-Uniemens 2015 data). A major issue is the lack of certification standards that link the professional profiles in Level II to a system of qualifications recognised at national – and European – level. Despite the fact that institutions are working to connect over 2,500 profiles to the National Repository of Qualifications (established by the Legislative Decree 13/2013), currently none of them meets the criteria stated by the regulation (definition by learning outcomes; link to the ISTAT classifications of professions and sectors of economic activities; link to an EQF).

The lack of national policy actions to connect apprenticeship with manufacturing is another important issue highlighted in the report. This matter has been so far left only to company and local initiatives.

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<sup>1</sup> In 2013, the Italian Ministry of Economic Development (MISE) launched, in agreement with the Italian Ministry of Education, University and Research (MIUR), the project 'Support to the definition and implementation of regional policies for research and innovation (Smart Specialisation Strategy)'. The Regional Smart Specialisation Strategies (SSS) are available at [http://www.agenziacoesione.gov.it/it/S3/S3\\_Regionale/Strategie\\_Regionali\\_di\\_Specializzazione\\_Intelligente.html](http://www.agenziacoesione.gov.it/it/S3/S3_Regionale/Strategie_Regionali_di_Specializzazione_Intelligente.html)

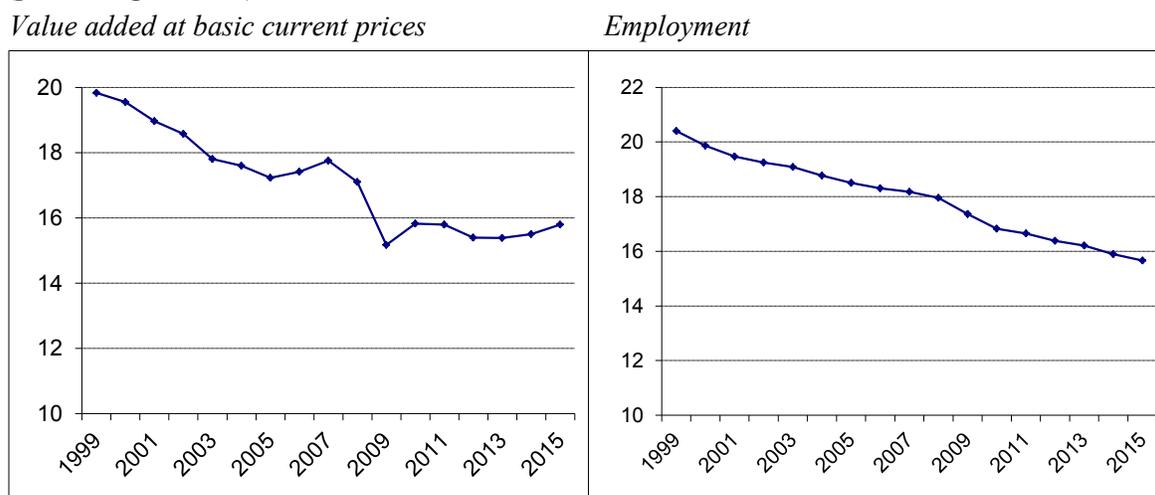
## Economic and labour market context

### Economic and employment role of manufacturing and key trends

Manufacturing in Italy has played a key role in economic development and still hold a leading position in terms of share of production output, turnover and overall employment. As reported by the national accounts data of the National Institute of Statistics (ISTAT), the value-added in 2015 is estimated at about €233 billion, amounting to 15.8% of the total Italian economy. In the same year, there were 3.7 million workers in manufacturing, accounting for 15.7% of the Italian workforce.

These results, however, come from an enduring period of decline (see Figure 1). The value-added generated in the manufacturing sector as a share of the total has decreased by 4 percentage points since 1999; at the same time the share of manufacturing in total employment has decreased by about 5 percentage points.

*Figure 1: Weight of manufacturing (excluding construction) on total economic activities (percentage values) 1999-2015*



Source: Istat, national accounts data 2017

Eurostat data (Table 1) confirm the above mentioned developments. Manufacturing activities in Italy lost more than 64,000 enterprises between 2008 and 2014 (-14%) and €100 billion of turnover between 2008 and 2015 (-10%). The number of employed decreased from 4.4 to 3.7 million (-10%) during the same period.

*Table 1: Number of enterprises, turnover and persons employed in the Italian manufacturing sector, 2008-2015*

	2008	2009	2010	2011	2012	2013	2014	2015	2015/2008 (%)
<b>Number of enterprises (thousand)</b>	460	439	427	425	417	407	396	n.a.	-13.8*
<b>Turnover</b>	0.98	0.78	0.87	0.92	0.91	0.87	0.87	0.88	-9.8

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(trillion euro)									
<b>Number of persons employed (million)</b>	4.4	4.2	4.0	3.9	3.8	3.7	3.7	3.7	-16.8

Note: \*2014/2008

Source: Eurostat, *Annual detailed enterprise statistics for industry, NACE section C, 2017*

Compared to the whole manufacturing, medium high- and high-technology manufacturing sectors (Table 2) are characterised by greater robustness. The Italian system lost 4,560 enterprises (-9%) between 2008 and 2014, the turnover loss is limited to 7.0% and the number of employed persons increases slightly, as well as their percentage over total employment.

*Table 2: Number of enterprises, turnover and persons employed in the Italian medium high- and high-technology sector, 2008-2015*

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2015 /2008 (%)
<b>Number of enterprises</b>	50,669	50,057	50,037	49,847	48,040	47,242	46,109	n.a.	n.a.	-9.0*
<b>Turnover (million euro)</b>	347,436	279,698	310,598	328,133	322,116	315,879	322,997	n.a.	n.a.	-7.0*
<b>Employed persons (thousand)</b>	1,376.3	1,368.9	1,303.5	1,304.0	1,323.7	1,310.6	1,330.9	1,371.1	1,384.2	0.6**
<b>Percentage of total employment</b>	6.0	6.0	5.8	5.8	5.9	5.9	6.0	6.1	6.1	

Source: Eurostat, [Annual detailed enterprise statistics for medium high- and high-technology manufacturing, 2017](#)

Note: NACE 20, 21, 25.4, 26-29, 30 (excluding 30.1), 32.5; \* 2014/2008; \*\*2016/2008

Despite the decline suffered in recent years in terms of employment, turnover and added value, manufacturing still represents the most important part of the Italian economy, according to the national statistical office (ISTAT, 2015).

Nevertheless, the use of advanced manufacturing technologies<sup>2</sup> is likely to increase. According to the most recent Innobarometer report (2015), 30% of Italian enterprises have used or plan to use advanced technologies. This is, however, a lower percentage than the EU28 average (35%). Furthermore, Italian firms are bucking the EU trend: 13% of enterprises have used but do not plan to use advanced technologies (EU28 average: 10%); only 1% has not used but plans to use advanced technologies (EU28 average: 6%); and more than half (56%) have not used and do not

<sup>2</sup> Innobarometer (2015) considered as 'advanced manufacturing technologies' the following: sustainable manufacturing technologies (technologies which use energy and materials more efficiently and drastically reduce emissions); ICT-enabled intelligent manufacturing (technologies which digitalise the production processes); high performance manufacturing which combines flexibility, precision and zero-defect (for example high precision machine tools, advanced sensors or 3D printers).

plan to use advanced technologies (EU28 average: 49%). Accordingly, Italy is defined as a ‘moderate innovator’ in the European Innovation Scoreboard (2016).

## Overview of industrial policy initiatives addressing advanced manufacturing

The industrial policy actions addressing advanced manufacturing in Italy are included in the Industria 4.0 national plan, which identifies nine technology drivers. These are advanced manufacturing solutions, additive manufacturing, augmented reality, simulation, data integration, industrial internet, cloud, cyber-security, big data and analytics (MISE, 2017a). As stated by the Ministry of Economic Development (MISE), the plan aims at creating a favourable environment for Italian firms through a set of strategic and complementary measures to foster investments and innovation for the competitiveness of the national industrial system (MISE, 2017b).

The Industria 4.0 national plan involves all the aspects of the innovative firm’s life cycle by offering support in terms of investments, the digitalisation of the production process, the growth of worker productivity, the training of relevant skills, and the development of new products and processes. The plan is structured around three main guidelines: i) technologically neutral operation; ii) horizontal implementation, avoiding vertical or sector-based actions; iii) promotion of enabling factors.

The 10<sup>th</sup> Commission<sup>3</sup> of the MISE defined a multi-stakeholder steering committee for Industria 4.0 (I4.0), which involves government agencies (the Presidency of the Council of Ministers, Representatives of regional governments and various Ministries<sup>4</sup>), leading Italian universities, the Conference of the University Rectors, research centres (mainly National Research Council institutes), the National Promotion Bank (*Cassa Depositi e Prestiti*), employers’ associations (*Confindustria*) and trade unions (including CGIL, CISL, UIL, UGL). The CGIL representative interviewed as part of this study expressed a positive opinion about the plan, which may help boosting the Italian advanced manufacturing. Yet, a limitation is the lack of labour market measures and policies in the plan.

The actors involved are expected to coordinate and cooperate to implement the strategic and complementary measures specified in the plan. Strategic measures focus on two dimensions: ‘innovative investments’ and ‘skills’. Innovative investments aim at stimulating private investment in I4.0 technology drivers; increasing private expenditure in R&D and innovation; and expanding open innovation relations between mature companies and high-tech start-ups. Skills measures are aimed at spreading the I4.0 culture through *Scuola Digitale* (digital classes at primary and secondary schools) and *Alternanza Scuola Lavoro* (work-related learning) programmes; developing I4.0 skills through vocational training by strengthening *Istituti Tecnici Superiori* (vocational schools); financing of I4.0 technological clusters and industrial PhDs; and creating competence centres and digital innovation hubs.

Complementary measures concern enabling infrastructure (creation of the ‘Ultra Broadband’ and definition of IoT open standards) and additional public support measures (channelling private debt/equity and venture capital to support the I4.0 transformation; supporting public guarantee schemes on investments; reinforcing internationalization of Italian companies; strengthening the productivity-salary taxation exchange and decentralised negotiation).

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<sup>3</sup> The commission is dedicated to productive activities, trade, and tourism (*X Commissione attività produttive, commercio e turismo*).

<sup>4</sup> Economy and Finance; Economic Development; Education, University and Research; Labour and Social Policy; Agriculture; Environment and Protection of Land and Sea).

The most important financial and fiscal instruments designed to implement the measures and reach the targets are the following:

- hyper-depreciation and super-depreciation schemes (increasing rate for investments in I4.0 technologies to 250% from 140%)
- tax credit for research and development and innovation expenditure (increase of tax credit rate to 50% for *intramoenia* expenditure and up to € 20 million per taxpayer per year)
- extension of the Sabatini Law, which supports firms that require bank financing for investment in new capital goods, machinery, equipment, and digital technologies (this is addressed to all Italian SMEs, regardless of the economic sector in which they operate)
- a guarantee fund providing a public guarantee to support firms and professionals that have difficulties in accessing bank credit (up to the 80% of bank financing, max 2.5 million euros per applicant)
- financial support of I4.0, venture capital and start-ups: This consists of many initiatives, such as 30% tax deduction for investments up to € 1m in innovative start-ups and SMEs; enablement of sponsor companies to buy fiscal losses of participated start-ups; reduction of capital gain taxes for medium/long term investments on listed and unlisted SMEs; *acceleratori di impresa* programme to subsidise the establishment and growth of new companies focused on I4.0 technologies; establishment of dedicated investment funds for the industrialization of high-tech ideas and patents.

Furthermore, in the context of skills' measures, the plan promotes and funds the creation of digital innovation hubs at regional level. They are expected to be multi-stakeholder networks (start-ups, research centres, industrial players, SMEs, universities, industrial clusters, investors, associations, government and incubators) with a backbone made of 'I4.0 Competence Centres'. The hubs will operate as contact points for companies, research institutions and public/private investors. The competence centres involve leading Italian universities and major private players. They are mission-oriented and focused on facilitating I4.0 projects in all domains. They are expected to provide training and raise awareness; offer technical advice for SMEs; launch and support technological development and innovative projects.

Lastly, governance and awareness measures aim to generate interest in I4.0 opportunities and create shared public-private governance, mainly through dissemination actions.

Another relevant national initiative is 'Smart Factory' (*Fabbrica Intelligente*)<sup>5</sup>, which is one of the 12 national technology clusters established by the Ministry of Education, University and Research (MIUR) with the departmental decrees (*decreti direttoriali*) 257Ric/2012 and 1610/2016. According to the MIUR, the term cluster refers to an '*organized aggregations of enterprises, universities, other public or private institutions that are operating in the innovation field, organized in more public-private aggregations, including the already existing technological districts, present in various territorial ambits, managed by a specific coordination and management body, focused on a specific technological and applicative ambit, suitable for contributing in the international competitiveness of both reference territories and of the national economic system*' (MIUR notice, art.1 §4).

The 'Smart factory' cluster aims at supporting technological development and strengthening national specialisation in robotics, new materials, advanced devices, virtual prototyping and applications of digital solutions in all manufacturing phases (design and planning, production, business organisation and distribution). Its mission is manifold and consists in:

<sup>5</sup> More information on the cluster is available at <http://www.fabbricaintelligente.it/en/>

- proposing, developing and implementing a strategy based on research and innovation for the transformation of the Italian manufacturing sector towards new products-services, processes and technologies
- creating a stable and more competitive national manufacturing community in the design, execution and development of research
- linking national and regional research policies with international ones with the aim of improving enterprises' and regions' possibilities of using European research funds.

The accomplishment of the strategy covers six activities: 1) realisation of applied research projects; 2) creation of opportunities of technological transfer, circulation and sharing of knowledge, networking; 3) contribution to the effective use of competences and equipment by sharing research infrastructures and through workers' mobility; 4) support and facilitation of smart and sustainable entrepreneurship, mainly based on research results; 5) support to technological forecasting activities on regional, national and international scale in the smart factory sector; and 6) support to the growth of the human capital<sup>6</sup>.

### **Employment and training challenges linked to technological change and automation**

Medium-term dynamics of employment as analysed by the [European Commission's KETs Observatory](#) indicates a positive or very positive forecast for nanotechnology and industrial biotechnology (+107.67% and +51.65%, respectively), other technologies for which an employment increase is expected are advanced manufacturing (+18.17%) and micro- and nano-electronics (+6.44%). A negative trend is forecast in photonics (-13.95%). According to the most recent data (2013), employment share is higher for advanced materials (10.78%) and advanced manufacturing technologies (9.39%), followed by micro- and nano-electronics (7.72%), photonics (7.21%), industrial biotechnologies (6.65%) and nanotechnology (6.25%).

According to the regional profiling provided by the [Regional Innovation Monitor](#) there are several economic sectors and innovative technologies linked to advanced manufacturing that are driving the transformation of Italian industry at regional level. When taking into account the most important regions in terms of industrial employment and turnover (Lombardy, Veneto, Emilia-Romagna, Lazio, Piedmont, Tuscany, Campania), the sectors with a competitive advantage are aerospace, automotive, life-sciences and biomedical industry, and the so-called 'Made in Italy' (in particular specialised textile and the agri-food sector). Leading technologies are mechatronics and robotics for advanced and sustainable manufacturing systems and processes, ICT, modelling, simulation, forecasting methods and tools, advanced mechanics and materials.

However, while the Industria 4.0 plan and the 'Smart factory' cluster represent important industrial policy initiatives to keep pace with technological change, challenging mature technologies in the manufacturing sector, no major initiative of comparable breath has been undertaken as regards labour and training policies. The so-called Jobs Act of 2015, which reformed the labour market and adjusted the previous regulative framework of apprenticeship, did not establish any link with industrial policies and the many challenges posed by technological change and automation.

According to the interviewed experts and stakeholders from the Italian research institute Adapt, the Ministry of Labour and Social Policies (MLPS), and the National Institute for the Analysis of Public Policies (INAPP, former ISFOL), the primary challenge is linked to the capability of the

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<sup>6</sup> For further information see the cluster web site at <http://www.fabbricaintelligente.it/en/about-us/mission/>

national education and training system to radically renew settings, contents and methods. There is a pressing need to modernise the current VET system (Teselli, 2016). The representatives from INAPP and MLPS suggested that a national steering committee should organically restructure the system – jointly with the regions, which are in charge of a large part of the VET<sup>7</sup> – and grant equal opportunities to young people, regardless of the region they come from.

Without these adjustments, the more recent initiatives to align training more closely to labour market needs (such as Law 107/2015, which promotes the school-work alternation and the apprenticeship dual system experimentation) may have no impact.

The interviewed CGIL representative assessed positively Industria 4.0 because it shifts industrial policy from unconditioned tax benefits to tax benefits conditioned on the adoption of innovative technologies. However, the key challenge concerns employment policies; a ‘generational pact’ (*patto generazionale*) is what is urgently needed, that is, a policy that would lower the retirement age of mature workers in order to facilitate young people’s transitions to the labour market. According to the CGIL representative, the government has not implemented so far any effective labour policy: the youth unemployment rate (those aged 15-24) stands at 35.2% (ISTAT, 2017). Labour market barriers for young people also have a negative effect on the introduction of innovative skills in enterprises. The ‘generational pact’ should mediate between the experience of senior workers and the innovative resources of young people entering the labour market.

In addition, CGIL states that there is a strong demand from enterprises for science and engineering professionals and technicians. The VET policy makers should rediscover the manufacturing identity and vocation of the Italian production system to satisfy this need; industrial policies should address and support innovative efforts in automation and advanced mechanics.

Technical VET pathways should be relaunched through major public investment aimed at improving the quality of training and creating a tighter link between VET providers and local innovation systems. The interviewed Confindustria representative underlined that a policy boosting investments in innovation of industrial districts in Southern Italy is crucial to integrate local VET and production system and create effective dual-learning practices.

These issues are still more challenging when the divide between Northern and Southern Italy is taken into account. The youth unemployment rate (those aged 15- 24) in northern Italy is 29.3% and it reaches 53.9% in southern regions, (ISTAT data, 2016). Also, the difference in the NEETs rate indicates a significant imbalance: 18.4% in northern regions, 35.3% in southern regions (ISTAT data, 2015).

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<sup>7</sup> The state is in charge of the *Istituti Professionali di Stato* only.

## Overview of the apprenticeship system

### Definition of apprenticeship

As there is no clear-cut definition of apprenticeship in Italy, this report refers to the operative definition provided by the current regulation (Legislative Decree 81/2015).

Apprenticeship in Italy reflects key aspects highlighted in the Cedefop definition (2015, p. 5). For example an apprenticeship is a ‘... *systematic, long-term training alternating periods at the workplace and in an educational institution or training centre...*’. However, the Legislative Decree 81/2015 mostly focuses on the contractual dimension, while the training aspects stand in the background. Cedefop further states: ‘...*an apprentice is contractually linked to the employer and receives remuneration (wage)*’. In Italy, an apprenticeship is not possible without a contract that complies with the Legislative Decree 81/2015 and with the national sectoral collective bargaining agreements. Finally, the Cedefop definition states that ‘*An employer assumes responsibility for the company-based part of the programme*’. In Italy, both the employer and the education/training institution are in charge of the training, to varying degrees, depending on the type of apprenticeship.

Furthermore, an apprenticeship in Italy is an open-ended contract with the purpose of training and fostering the employability of young people divided into three types (or levels), each with different aims and targets (summarised in Table 3).

Table 3: Types of apprenticeships in Italy

Level	Full Definition	Mission	Part of public education/ VET system	Age Limits	Recognition for NQF/EQF purposes
Level I	Apprenticeship for the professional qualification and diploma, the second-grade secondary school diploma and the certificate of higher technical specialisation ( <i>apprendistato per la qualifica ed il diploma professionale</i> )	Dual-System Integration	Yes	15-25	Yes
Level II	Occupation-oriented apprenticeship ( <i>apprendistato professionalizzante or contratto di mestiere</i> )	Job Placement	No	18-29 <sup>8</sup>	No
Level III	Apprenticeship for higher training and research ( <i>apprendistato di alta formazione e ricerca</i> )	Dual-System Integration	Yes	18-29	Yes

Source: Authors' own elaboration, based on Legislative Decree 81/2015 and state-regions conference agreement of 1 October 2015

The main difference is between occupation-oriented apprenticeships at Level II (*apprendistato professionalizzante*) and training apprenticeships at Level I and III (*apprendistati formativi*). *Apprendistato professionalizzante* is largely occupation-oriented and is, by far, the most widespread form of apprenticeship (see section ‘Major statistical data and trends’). It leads to one

<sup>8</sup> Age limits do not apply to workers who benefit from mobility allowance or unemployment benefit and can be recruited in Level II for professional qualification or requalification purposes (Legislative Decree 81/2015, art. 47, paragraph 4).

of the professional profiles defined in collective bargaining agreements, where a specific paragraph is dedicated to apprenticeships. The profiles (more than 2,500, as reported by INAPP), however, are not directly recognised for NQF/EQF purposes. The interviewed INAPP representative confirmed that none meets the criteria set by the Legislative Decree 13/2013 to be included in the National Qualification Repository (this issue will be further discussed in the ‘Key challenges’ section). Following the Council recommendation of 20 December 2012 on the validation of non-formal and informal learning (2012/C 398/01), the policy makers have prepared the ground for the recognition of Level II learning for NQF purposes. Nevertheless, despite the legislation efforts (Law 92/2012, Legislative Decree 13/2013, Ministerial Decree 30/06/2015), the recognition of Level II learning is currently granted only at regional level. In practice, the apprentice obtains one of the occupational profiles listed in the collective bargaining, which is valid only within the training company. The apprentice who wants a certification of the profile is required to take a formal exam. The certificate is valid only in the issuing region, and it may not be recognised outside that region, in case the criteria that inform the certification in the issuing region and the destination region do not match. In this event, the candidate will have to fulfil a supplementary training in the target region.

Training apprenticeships (*apprendistati formativi*) are part of VET pathways and other educational pathways; as such, they lead to the attainment of a qualification, certification or diploma linked to the NQF/EQF. Pathways and qualifications are detailed in Table 4.

Table 4: Apprenticeship, qualifications and in-company training in Italy

Level	Related VET and educational pathways	NQF	EQF Level	In-company training extent over total training hours
Level I	Initial Education and Professional Training, 3 years ( <i>Istruzione e formazione professionale, IeFP</i> )	Professional qualification	3	40-50% at least (proportion increases as apprenticeship progresses)
	Education and Professional Training, 4 years ( <i>IV Anno</i> )	Professional diploma	4	50% at least
	Post-secondary vocational education ( <i>Istruzione e formazione tecnica superiore, IFTS</i> )	Higher technical specialization certificate	4	50% at least
	Vocational institutes ( <i>Istituti Professionali</i> )	Second-grade secondary school diploma	4	30-35% at least (proportion increases as apprenticeship progresses)
	Technical institutes ( <i>Istituti Tecnici</i> )	Second-grade secondary school diploma	4	30-35% at least (proportion increases as apprenticeship progresses)
Level II	n.a.	n.a.	n.a.	The extent of in-company training is defined by the collective bargaining. Off-the-job training cannot exceed 120 hours during 36 months.
Level III	Higher technical schools ( <i>Istituti tecnici</i> )	Higher technical diploma	5	40% at least

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	<i>superiori</i> , ITS)			
	Higher education pathways	Tertiary education certificate/diploma	6 or higher	40% at least

Source: Authors' own elaboration, based on state-regions conference agreement of 1 October 2015

*Centri di Formazione Professionale* (CFP) are private VET providers accredited by the regions and offer the *IeFP* and *IV anno* pathways. There is no available data on the number of CFPs at national level.

*Istituti professionali* are second-grade secondary schools run by the state or private institutions, or – in rare cases – local authorities. Besides the five year standard pathway, the *istituti professionali* (vocational institutes) can also work in a subsidiarity regime vis-à-vis *IeFP* and *IV Anno* pathways, providing training in regions where there is no CFP training. According to ISTAT data (updated to 2014), there are 1,546 *istituti professionali* in Italy, 21.9% of the total number of second-grade secondary schools. Private institutions run 8.4% of the *istituti professionali*.

Post-secondary education and training is organised in two different pathways: higher technical education and training programmes (*Istruzione e Formazione Tecnica Superiore*, IFTS) at Level I or apprenticeship programmes at Level III provided by higher technical institutes (*istituti tecnici superiori*, ITS). IFTS are post-secondary vocational education providers, such as CFPs, second-grade secondary schools, firms and universities. According to the most recent available data (ISFOL, 2016b, data referred to 2015), 142 IFTS courses have been activated.

The ITS are set up as foundations promoted by *istituti tecnici* or *istituti professionali* and involve other training (public and/or private) institutions, companies, and local authorities. They provide tertiary education and training courses. According to INDIRE monitoring, there are at present 93 ITS providing 370 courses (INDIRE and ITS, 2017)

There are educational institutions that can provide apprenticeship programmes as well - for example *istituti tecnici* at Level I and universities at Level III.

According to the Legislative Decree 81/2015, the apprenticeship contract may not provide for piecework pay and it has to comply with a number of provisions guaranteeing the presence of an in-company mentor, the registration of both the documentation of professional qualification and delivered training in the 'citizen's training booklet' (*libretto formativo del cittadino*)<sup>9</sup>, the possibility of placing the apprentice as many as two levels lower than the category entitled under the collective labour agreement or, alternatively, establishing a percentage of the salary and length of service in a phased manner and the possibility of financing the training through joint inter-corporate funds (Law 388/2000, art. 118; Law 276/2003, art. 12), including through agreements with the regions. Furthermore, there is also the possibility of recognising the contract for professional qualifications and skills acquired for the purpose of further education as well as courses in adult education, and the possibility of extending the apprenticeship pathway in the event of illness, accident or other cause of involuntary withdrawal for more than thirty days, in accordance with collective agreements. The collective bargaining may define the forms and procedure for the conversion of the apprentice into standard worker (*conferma in servizio*) at the end of the course. Such conversion may not introduce new or increased costs for public finance. Common social security and social assistance rules (such as those regarding insurance against occupational accidents and occupational illnesses; health insurance; maternity; family allowance), and protection against unfair dismissal also apply.

<sup>9</sup> The *libretto formativo del cittadino* can be compared with the European Skill Portfolio but it is managed through a public support service of 'skills audit' at the regional level.

The individual training plan (*piano formativo individuale*, PFI) defines in- and out-company training duration, distribution, methods for provision<sup>10</sup>, qualification and employment level. The PFI is proposed by the training institution and agreed by the company for Level I and Level III apprenticeships. With regard to Level II, duration, distribution and methods for provision are stipulated in the collective bargaining agreements and the PFI is filled in by the employer. After the completion of the apprenticeship pathway, the apprenticeship contract may be converted into a standard open-ended contract if the employer and the apprentice wish so.

## Regulatory framework and institutional context

The current regulatory framework for apprenticeship is set out in Legislative Decree 81/2015, which is one of the implementing decrees of the most recent labour market reform – the so-called Jobs Act. The policy makers have made several attempts to change the apprenticeship system over the last 15 years. This process led to the current threefold system of apprenticeship, where Level I and Level III are integrated with VET and – partially – with second-grade secondary education and higher education. Level II is largely occupation-oriented.

The regulatory frameworks that preceded the legislative Decree 81/2015 were the following:

- Legislative Decree 276/2003 implementing the ‘Biagi Reform’ defined two types of apprenticeship: a) apprenticeship contract for the right and duty of education and training; b) professional or occupation-oriented apprenticeship (*apprendistato professionalizzante*) as a contract for the attainment of a professional qualification through on-the-job training and the acquisition of basic and technical skills.
- The Consolidated Act on Apprenticeship (*Testo Unico di Apprendistato*, Legislative Decree 167/2011) led to a comprehensive review of the regulatory framework. Apprenticeship, designed as a permanent contract for the employment of young people, had been divided into three types: a) apprenticeship for professional qualification and professional degree (*apprendistato per la qualifica e il diploma professionale*, Level I); b) professional or occupation-oriented apprenticeship (*apprendistato professionalizzante* or *contratto di mestiere*, Level II); c) higher education and research apprenticeship (*apprendistato di alta formazione e ricerca*, Level III).

The above-mentioned laws considered apprenticeship primarily as an employment contract, and only to a lesser extent as an instrument to pursue education and training goals. Notwithstanding this dominant design, the Biagi Reform marked a significant break with the past. With Legislative Decree 276/2003, an apprenticeship is no more an undifferentiated tool; it is instead split into two instruments - one more occupation-oriented and the other stressing the acquisition of skills. This process had been highlighted in the Consolidated Act on Apprenticeship and adjusted in the Jobs Act (namely the Legislative Decree 81/2015, currently in force<sup>11</sup>).

The review process initiated by the Legislative Decree 276/2003 explicitly aimed at revitalizing the instrument ‘*as a lever for a qualified entry of young people into the labour market*’ (Tiraboschi, 2008), addressing especially those who had a low educational qualification and were

<sup>10</sup> Training may be provided via the following methods: on-the-job, in classroom, action learning, e-learning, individual or group exercises, group company visit, other methods to be specified by the training provider).

<sup>11</sup> Further information on the ‘Jobs Act’ is available on the website of Eurofound EurWork Observatory: <https://www.eurofound.europa.eu/it/observatories/eurwork/articles/working-conditions-industrial-relations-law-and-regulation/italy-mixed-reaction-to-jobs-act>

stuck in low-skilled careers. Vis-a-vis the Consolidated Act, the Legislative Decree 81/2015 (implementing the Jobs Act) confirmed apprenticeship as an ‘*open-ended contract for the training and employment of young people*’, but it introduced some modifications on two of the three types of apprenticeships. In particular, the apprenticeship related to second-grade secondary education, which was introduced by the *Carrozza Decree* (104/2013) as experimentation at Level III of the former legislation (Legislative Decree 167/2011), was moved to Level I. This adjustment gave full legislative recognition to apprenticeship in second-grade secondary school and prepared the ground for the introduction of dual learning in second-grade educational pathways (*Alternanza Scuola-Lavoro*, Law 107/2015). Further, the Legislative Decree 81/2015 introduced apprenticeships for IFTS pathways (leading to higher technical specialisation certificate and not included in the Law 107/2015) at Level I.

Apart from establishing the threefold structure, the consolidated act contained another significant change, further confirmed by the Jobs Act. In the new regulations, the regions are mainly responsible for Level I and Level III apprenticeships. The state-regions agreement of 1 October, 2015 defined the training standards and the general criteria for the implementation of apprenticeship pathways at Level I and Level III.

Level II is instead largely based on collective bargaining and collective agreements with the social partners at sector level. The regions are only in charge of providing off-the-job training. De facto, regions encountered difficulties in establishing and providing adequate training for Level II apprentices. It is argued that the production of regulative mechanisms (resolutions and rules) to implement the national regulation of apprenticeship has been very patchy, and the high level of bureaucracy and the difficulties in the mechanisms of multi-level governance worsened the situation (Comandé, 2008; Tiraboschi, 2008).

Levels I and III apprenticeships are currently structured with the aim of integrating training and work organically in a dual system. A first pilot of the system for Level I is expected in the IeFP offer with the start of the project ‘Dual System Accompanying, Development, and Strengthening Actions in the context of Professional Training’ (*Azioni di accompagnamento, sviluppo e rafforzamento del sistema duale nell’ambito dell’Istruzione e Formazione Professionale*). The project – launched on a national scale – is addressed to the VET providers accredited by the regions (*Centri di Formazione Professionale*, CFP) in order to improve their capability of organising and managing dual learning instruments (Level I apprenticeship, *Alternanza Scuola-Lavoro* and *impresa formativa simulata*) in the IeFP pathways. The MLPS estimates that about 60,000 students are involved (ANPAL, 2016). The agreement signed by the government and the regions and autonomous provinces on 9/24/2015 specifies the project’s activities, organised around two ‘lines’ of funding.

- ‘Line 1’ aims at developing and strengthening the CFP job-placing system. The National Agency for Active Labour Market Policies, known as *ANPAL Servizi* (formerly *Italia Lavoro SpA*, an agency controlled by the MLPS) organises meetings and on-line training modules on the organisation of the placement office and service delivery (professional orientation, competence certification, demand/offer matching, school-work alternation paths), the training of CFP workers, the activation and management of apprenticeship contracts, and the scouting of companies interested in apprenticeship. Line 1 may also co-fund in-company mentorship.
- ‘Line 2’ supports IeFP paths in the dual-system and it offers financial support to off-the-job training in Level I apprenticeships, school-work alternation and *impresa formativa simulata* (simulated training-company).

The MLPS established the general operative criteria and the training standards for Level I and Level III apprenticeships (Ministerial Decree of 12 October 2015). The decree stated that the training/education institution and the employer must agree and sign a protocol which defines the content and duration of the training. Training has to occur both inside and outside the firm, according to the criteria specified in table 4 of this report. VET institutions accredited by the regions provide off-the-job training while the firm is responsible for the on-the-job training. The duration of the apprenticeship varies depending on the level (Table 5).

Table 5: Duration of Apprenticeship in Italy

Level	VET/educational pathway	Duration (months)		EQF Level
		Min	Max	
Level I	leFP	6	36	3
	IV Anno	6	12	4
	Second-grade secondary education	6	48	4
	IFTS	6	12	4
Level II	n.a.	Set by collective bargaining	36	n.a.
Level III	ITS	6	36	5
	Higher education	6	36	6

Source: Authors' own elaboration, based on Legislative Decree 81/2015 and state-regions conference agreement of 1 October 2015

## Financing the apprenticeship system

According to the current regulatory framework (Legislative Decree 81/2015), there are different direct and indirect forms to finance the apprenticeship system. The regions finance off-the-job training for the acquisition of basic and cross-cutting competences. The duration of this kind of training varies according to the type of apprenticeship. It is longer in Level I and Level III, more limited in Level II.

'Line 2' of the above-mentioned 'Dual System Accompanying, Development, and Strengthening Actions in the context of Professional Training' experimentation is financed by the MLPS (in accordance with Law 144/1999 and Legislative Decree 150/2015), which – through the state agency *ANPAL Servizi* – distributes the resources among the regions (on the basis of the criteria specified in the Ministry Decree of 9/8/2101, art. 1). 'Line 1' is financed through the national operative plan, managed by the MLPS.

The state has also introduced tax breaks for employers to foster employability. As of 1 January 2013, companies that employ an apprentice can benefit from lower contributions for apprenticeship contract (reduced to 11.31% of the taxable salary for social security, the share paid by the apprentice is lowered to 5.84%). The incentive is also valid for the 12 months following the apprenticeship pathway. In addition, the 2017 Budget Act (Law n.232/2016) has introduced more tax breaks for Levels I and III. There is a three-year tax exemption period for social security contributions<sup>12</sup> (of up to €3,250 on a yearly basis) for persons recruited between 1 January 2017

<sup>12</sup> It does not apply to INAIL (National Institute for the Insurance against Accidents at Work) contribution.

and 31 December 2018 with an open-ended contract after a schoolwork period. Furthermore, the Budget Act states that on-the-job training costs are excluded from the basis-calculation of the IRAP (Regional Tax for the Economic Activities).

Furthermore, the ‘FiXO S&U Programme’<sup>13</sup> – managed by *ANPAL Servizi* – introduced economic incentives for the employers who recruit Level I or Level III apprentices. The public call (*avviso pubblico*) of 24 June 2014 (extended until 30 June 2017) stated that the employer can benefit of a contribution of €6,000 for each person recruited on an apprenticeship contract (€4,000 in case of part-time contract).

In-company training for level II apprentices may be financed by inter-professional funds (Law 388/2000, art. 118; Law 276/2003, art. 12). Apprentice wages are paid entirely by the company. Collective bargaining agreements set the professional level and the corresponding wage level. For instance, there are eight wage levels that correspond to different categories of workers in the current collective agreement of the metal-mechanic sector. The apprentice will start a 36-month pathway with a wage level that is two levels lower than the final wage. In practice, a category ‘4a’ worker receives a monthly wage of €1,657.28, so an apprentice in the same category will start the pathway with a wage that corresponds to category ‘2a’ (€1,432.58), that is, two levels below. The wage will go up to one level after the first 12 months of apprenticeship (13<sup>th</sup> month). The full category wage is reached in the 25<sup>th</sup> month.

### Key actors involved and their governance role

The key actors involved in the apprenticeship provision are the central government, the regions and the state-regions conference, social partners, companies, education and training providers and government agencies. Their roles and responsibilities vary according to the apprenticeship level.

Central government enacts the national regulation and finances the system by allocating the funds among the regions and by implementing programmes managed by the state agency *ANPAL Servizi*.

Regions are in charge of out-company training, which may be provided directly or by means of educational institutions (VET providers, second-grade secondary schools, universities). As detailed above and illustrated in Table 6, forms and relevance of out-company training differs according to the type of apprenticeship. Regional agencies<sup>14</sup>, CFP and other accredited training institutions provide off-the-job training (basic and transversal skills) at Level II.

Level I is committed to CFP, IFTS and second-grade secondary schools; universities and ITS are in charge of Level III.

Table 6: *Off-the-job apprenticeship training in Italy*

	Training Provider	Training relevance
Level I	CFP IFTS Networks vocational schools ( <i>istituti professionali</i> ) technical schools ( <i>istituti tecnici</i> )	High (VET pathways and second-grade secondary education)

<sup>13</sup> More information about the programme is available on the web site of ANPAL Servizi: <http://www.anpalservizi.it/wps/portal/fixo>

<sup>14</sup> Provinces were in charge of providing out-company training prior to Law 56/2014.

<b>Level II</b>	VET institution regions	Small (basic competences)
<b>Level III</b>	higher technical institutes ( <i>Istituti tecnici superiori</i> , ITS) universities	High (VET pathways and tertiary education)

Source: Authors' elaboration based on state-regions conference agreement of 1 October 2015

The state-regions conference defined the training standards in Level I and Level III (Agreement of 1 October 2015).

Social partners sign the collective bargaining agreements, which define apprentices' retribution and, with regard to Level II, the professional profiles and the time to be spent in on-the-job and off-the-job training (in accordance with the Legislative Decree 81/2015).

Companies are in charge of on-the-job training and have to identify an in-company mentor, in accordance with the standards defined by the state-regions Agreement of 1 October 2015 for Level I and Level III and by the collective bargaining for Level II. Training providers and companies have to agree and fill the individual training plan (*piano formativo individuale*, PFI) as detailed in the state-regions agreement of 1 October 2015 as a condition to start the apprenticeship contract. This is an important change introduced by the Legislative Decree 81/2015 to the former regulation (*Testo Unico* of 2011). The current regulation states that on- and off-the-job training has to be agreed between the provider and the company according to national training standards. In contrast, the former regulation did not require an integration of in- and out-company training and regions were not required to comply with standards for out-company training.

As regards the manufacturing sector, it is important to highlight that the regulatory framework for apprenticeship in Italy does not differentiate between manufacturing and non-manufacturing sectors. There are no specific policies regarding apprenticeship in manufacturing. The issue is only partly addressed in different collective agreements. However, there is no specific policy. Large companies play an important role in terms of company-specific initiatives only.

## Major statistical data and trends

The number of apprentices in 2015 totalled 410,213<sup>15</sup> (ISFOL, 2016). Level II apprenticeship is by far the most prevalent type (96%). The other two types of apprenticeship are marginal by comparison: 'Apprenticeship for the Professional Qualification and the Professional Degree' comes to just over 3%; 'Higher Education and Research Apprenticeship' less than 1%<sup>16</sup> (Table 7).

Table 7: Number of apprenticeship contracts by type, 2015

	Number (annual average)	%
<b>Apprenticeship for professional qualification and</b>	13,354	3.3%

<sup>15</sup> Measured as the average annual number of labour relations by taking into account only the apprentices with at least one workday paid a month.

<sup>16</sup> This report draws on the tri-partition adopted by the previous regulation (*Testo Unico*) because in 2015 the current law (Legislative Decree 81/2015) regulated a small fraction of apprenticeship contracts.

<b>professional degree (Level I)</b>		
<b>Occupation-oriented apprenticeship (Level II)</b>	390,110	96.4%
<b>Higher education and research apprenticeship (Level III)</b>	1,237	0.3%
<b>Total<sup>17</sup></b>	404,701	100.0%

Source: ISFOL's calculations, based on INPS-Uniemensdata, 2016

According to data published by ISTAT and the National Institute for Social Security (*Istituto Nazionale di Previdenza Sociale, INPS*), the ratio between the average number of apprentices aged 15-29 and the average number of workers in the same age cohort in 2015 comes to 13.6%. ISFOL data (2016) on apprenticeship pathways that started in 2010 report an average duration of less than 19 months. The distribution in terms of duration class shows that more than one third of contracts terminate before the 7<sup>th</sup> month (29.2% in the manufacturing sector) (Table 8).

Table 8: Average duration of apprenticeship contracts in the same company (pathways started in 2010)

Up to 6 Months	7-12 Months	13-24 Months	25-36 Months	More than 36 Months	Total	Average Duration (Months)
34.3	15.2	17.9	13.7	18.9	100.0	18.9

Source: ISFOL's calculations, based on INPS-Uniemens data, 2016

As regards supply and demand, there is a lack of data that: i) refer to the supply of candidates and the effective capacity of the system to absorb them; and ii) refer to the effective demand of apprentices by firms. Clues about supply and demands can be gathered from the trends of apprenticeship labour relations: i) in absolute terms; ii) relative to employment in the 15-29 age range; iii) looking at the number of activations, terminations, and conversions of apprenticeship contracts into standard employment contracts.

The number apprenticeship contracts followed a negative trend between 2008 and 2015 (table 9), losing more than 1/3 of the contracts in 8 years (-36.4%).

Table 9: Number of apprenticeship contracts, 2008-2015

2008	2009	2010	2011	2012	2013	2014	2015	2015/2008 (%)
645,385	594,668	528,183	492,492	470,056	452,731	446,227	410,213	-36.4

Source: ISFOL's calculations, based on INPS-Uniemens data, (ISFOL 2011, 2012, 2013, 2016a)

<sup>17</sup> This figure includes 5,512 (1.3%) contracts of an unknown type.

According to ISFOL calculations (2016)<sup>18</sup>, there were 197,388 new contracts in 2015, a marked decrease (-17.7%) on 2014.

There were about 86,000 transitions from apprenticeship contracts to standard open-ended job contracts<sup>19</sup> in 2015, 23.5% more than in 2014 when 69,593 apprentices moved into standard open-ended contracts (almost the same number as in the previous year).

In contrast, 155,355 apprenticeship contracts were terminated in 2015 (share in manufacturing was 27.4%), which represents a slight decrease (4%) from the previous year. Terminations define apprenticeships contracts that: a) were interrupted before the conclusion of the pathway; or b) were not converted into standard contracts once the apprenticeship ended.

According to the last Excelsior report (2016a), new apprentices in 2017 are supposed to be (according to employers' forecasts) 5.1% of overall recruitments in 2016 (766,990). This percentage is lower for unskilled occupations (1.4%) and higher for intellectual, scientific and highly specialized professions (8.3%), technical professions (7.9%) and artisans, skilled workers and farmers (7.5%).

The estimated average number of persons employed on apprenticeship in 2015 was 215,486 (ISTAT microdata, Labour Force Survey)<sup>20</sup>. As regards characteristics of apprentices, table 10 shows that 59% of apprentices were male, almost half (49%) were aged between 20 and 24, more than one third (35%) were in the 25-29 age bracket, younger and more elderly apprentices are evenly distributed in the remaining 16%. Overall, the mean age is 25.4.

Most apprentices have only second-grade secondary education (65%). Lower and higher qualifications made up the remaining 35% of cases. The large majority (80%) have a full-time contract; almost 60% earn less than €1,000 per month (9% less than €500), while the remaining 40% receive a higher net monthly wage. The proportion of apprentices with a salary over €1,500 is marginal (3%).

Table 10: Apprentice characteristics (%), 2015

<b>Gender</b>	Male	59.4
	Female	40.6
<b>Age class</b>	15-19	7.5
	20-24	48.9
	25-29	34.6
	30-34	8.9
	35-39	0.1
<b>Education</b>	First-grade secondary education	17.5

<sup>18</sup> The National Institute for the Analysis of Public Policies (INAPP) replaced ISFOL in 2016.

<sup>19</sup> Apprenticeship is by definition an open-ended job contract. The term 'conversion' is appropriate only in the case of contracts regulated by pre-*Testo Unico* regulations; in any event – as stated by ISFOL (2016) – it is still a common practice. In case of contracts regulated by the *Testo Unico* or by the Legislative Decree 81/2015, 'transformation' means that once the three years pathway has concluded, the apprentice is converted into a 'standard' worker.

<sup>20</sup> Notice that in this case the number of persons is measured differently. The previous sections referred to the average number of apprenticeship contracts per person per year.

	Second-grade secondary education	64.6
	Tertiary education	17.9
<b>Working time</b>	Full time	80.2
	Part-time	19.8
<b>Monthly wage (€)</b>	Up to 500	8.8
	501-1,000	50.8
	1,001-1,200	23.9
	1,201-1,500	13.3
	More than 1,500	3.2

Source: Authors' own calculation, based on ISTAT microdata, Labour Force Survey, 2015

## Key challenges

With regard to key challenges related to the supply and demand of apprentices in Italy, a major aspect regards numbers. Numbers for the so-called training apprenticeships (Level I and Level III) are quite small, and need to be increased. Furthermore, the occupation-oriented apprenticeship (Level II) is suffering a 'dumping effect' by competing job placing measures, such as traineeship contracts (*tirocini*) largely promoted by the Youth Guarantee Programme (ISFOL, 2015) and a new typology of open-ended contract with increasing protections (*contratto a tempo indeterminato a tutele crescenti*) introduced by the Jobs Act.

According to the interviewed INAPP representative, the Level II apprenticeship is too embedded in collective bargaining, and technological changes occurring in the industrial production processes (digitalisation and advanced manufacturing) are not able to lead to the provision of a richer and proper training only by themselves. Further, the apprenticeship system, as it is currently structured, cannot deal with labour market challenges. The system fails in matching offer and demand because it is not able to differentiate between who is recruited as a 'standard' worker and who is recruited as an apprentice. The INAPP representative argues that any job that is minimally knowledge-based is an apprenticeship; therefore, apprenticeships should be reformed based on a skills assessment and qualification system.

According to the CGIL representative, the government should introduce a 'Labour 4.0 National Plan' to sustain the Industria 4.0 plan. As mentioned earlier in this report, the interviewed CGIL representative stressed the importance of a 'generational pact' to foster innovative skills in the labour market. The 'pact' should be accompanied by a comprehensive redesign of the Italian VET and dual learning offer, in line with the country's industrial identity (the so-called 'Made in Italy') in order to meet the needs of a fast changing labour market. In addition, it was also indicated that the collective bargaining system, on which Level II apprenticeship (that is, 96% of total apprenticeship) is largely based, works correctly in many cases and is a powerful instrument to match young workforce demand and supply. The interviewed CGIL representative further noted that there is a multitude of positive experiences where a constructive bargaining with employers' associations has led to successful training and job placing. Failures occur when there is opportunistic behaviour, that is, when apprenticeship is used just because of the tax breaks, with no planned investment on the apprentice.

Also the creation of a national system for the certification of competences in formal and non-formal learning – as stated by the Legislative Decree 13/2013 – is one of the most significant challenges the Italian apprenticeship system is facing. As stated by the INAPP stakeholder,

**Disclaimer:** This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.

collective bargaining generated more than 2,500 professional profiles for Level II apprenticeship, about half of which belong to the ‘Common Area’, that is, they concern all activity areas (‘repairer’ or ‘office worker’ are examples of ‘Common Area’ profiles). In addition, several profiles, although differently labelled, largely or completely overlap. There is no ‘common toolbox’ to certify the competences by following shared procedures and identify professional qualifications recognised at national level. In this situation, it is not possible to assess the skills needed to match apprenticeship supply and demand, and to face the challenges raised by a changing labour market.

The Legislative Decree 13/2013 introduced three prerequisites for a qualification to be included in the national repository. The qualification has to be: a) defined by learning outcomes; b) linked to the ISTAT classifications of professions and sectors of economic activities; c) linked to an EQF level. Currently, a technical body (*organismo tecnico*) established by the National Technical Committee in charge of the application of the Legislative Decree 13/2013 is working on this. As stated by INAPP – which is part of the technical body – none of the 2,500 profiles met the criteria stated by the Legislative Decree 13/2013.

The work being conducted by the technical body will lead to the completion of the National Atlas of Labour and Qualifications (*Atlante Nazionale del Lavoro e delle Qualificazioni*), which is a comprehensive description of occupational outcomes in terms of processes and activities.

In the case of training apprenticeships (Levels I and III), a common framework has been reached; Level I is linked to nationally recognised VET pathways and to some second-grade secondary school pathways, Level III to tertiary education pathways.

## Apprenticeship policy and practice in the manufacturing sector

### Apprenticeship in the manufacturing sector

The overwhelming majority of apprentices in Italy (96.4%) are enrolled in Level II programmes. Level I and Level III are instruments that can be adopted by all the VET pathways (namely, *leFP*, *IV Anno*, ITS, IFTS) addressed to people younger than 29; and by second-grade secondary schools (*istituti tecnici* and *istituti professionali*) and university courses. A quantitative comparison in the manufacturing sector is not possible because VET pathways other than Level II apprenticeship are classified only by qualifications that are not univocally linkable to manufacturing.

ISFOL data (2016) on apprenticeship pathways that started in 2010, report an average 21.2 months for the manufacturing sector. The distribution in classes of duration shows that less than one third of the contracts (29.2%) terminate before the 7<sup>th</sup> month (Table 11).

*Table 11: Average duration of apprenticeship contracts in the same company – Pathways started in 2010*

Up to 6 Months	7-12 Months	13-24 Months	25-36 Months	More than 36 Months	Total	Average Duration (Months)
29.2	13.8	18.2	16.4	22.4	100.0	21.2

*Source: ISFOL's calculations, based on INPS-Uniemens data, 2016*

The number of apprenticeship contracts in the manufacturing sector followed a negative trend between 2008 and 2015 (Table 12), losing more than 1/3 of the contracts (-38%) in 8 years.

*Table 12: Number of contracts in apprenticeship 2008-2015*

2008	2009	2010	2011	2012	2013	2014	2015	2015/2008 (%)
170,887	146,721	122,818	115,261	111,109	107,800	109,365	105,130	-38.4

*Source: ISFOL's calculations, based on INPS-Uniemens data (ISFOL 2011, 2012, 2013, 2016a)*

According to ISFOL calculations (2016), one fifth of new apprenticeship contracts in 2015 (42,388; 21.5%) were signed in the manufacturing sector. Transitions from apprenticeship contracts into standard open-ended job contracts in 2015 numbered 22,486 (26.1% of all apprentices that transitioned into open-ended contracts). In contrast, 42,567 apprenticeship contracts were terminated in 2015 (27.4% of total terminations).

As to the occupational profiles, there is still no national framework for qualifications related to Level II apprenticeships. The occupational profiles related to Level II apprenticeships are defined in collective bargaining by social partners. Each collective bargaining agreement defines i) a set of cross-cutting profiles, ii) a set of profiles related to the specific economic sector, and iii) a set of IT/ICT related profiles. The large number of profiles – the majority of which overlap – must be

reduced and linked to nationally recognised qualifications, as stated by the Legislative Decree 13/2013. This is work in progress, and it will lead to the implementation of the ‘Labour Atlas’.

In general, and regardless of some sector peculiarities, longer Level II apprenticeship pathways are required to gain higher-level profiles. For instance, 36 months training leads to the qualification of technician, while only 24 months are required to become an ‘operator’. Further, higher-level profiles usually require a previous qualification of EQF level 5 or higher.

The occupational profiles related to Level I apprenticeship are listed in the national qualifications repository, which was established in Legislative Decree 13/2013, none of them can be directly related to advanced manufacturing. In the review that follows, the profiles generally relevant to industrial manufacturing are highlighted.

As regards IeFP pathways (EQF level 3), the national repository contains the qualifications defined by the state-regions conference agreement of 27 July 2011, updated by the agreement of 19 January 2012. Out of 22 qualifications, 11 are directly or indirectly related to manufacturing (listed in Table 13).

*Table 13: Number of registered persons doing IeFP pathways related to manufacturing (2014/2015)*

<b>Qualifications (National Repository)</b>	<b>Number of registered persons</b>
<b>Wearing apparel operator</b>	10,247
<b>Footwear operator</b>	263
<b>Chemical production operator</b>	1,355
<b>Electric operator</b>	24,709
<b>Electronic operator</b>	10,977
<b>Thermo-hydraulic systems operator</b>	7,540
<b>Artistic handicraft operator</b>	1,522
<b>Wood manufacturing operator</b>	2,467
<b>Pleasure craft manufacturing and maintenance operator</b>	248
<b>Mechanical operator</b>	21,584
<b>Food processing operator</b>	8,267
<b>Total</b>	89,179

*Source: Author’s own calculation, based on ISFOL (2016b)*

Some of the profiles are not univocally linked to the manufacturing sector. For instance, an electric operator or a thermo-hydraulic systems operator may work in the construction sector or in a manufacturing plant.

The state-regions agreement of 27 July 2011 also defined the profiles of the *IV Anno* (EQF level 4). Nine out of twenty-one qualifications directly or indirectly relate to the manufacturing sector. These are the electric and electronic technician, artistic handicraft technician, wood manufacturing technician, automated industrial machinery technician, industrial automation

technician, apparel technician, thermic systems technician and food processing technician; together they account for 3,791 registered persons in 2014-2015 (ISFOL, 2016b).

Regarding IFTS (EQF Level 4), the 19 pathways defined in the Inter-Ministry Decree of 6 February 2013 are largely services-oriented. Just three of them are related to industrial or craft manufacturing (the industrial design and planning technician, product and process industrialisation technician and technician for 'Made in Italy' craft products).

The Inter-Ministerial Decree of 7 September 2011 defined the 29 qualifications of the ITS program (EQF Level 5). ITS profiles are grouped into six occupational families:

- 1) energy efficiency
- 2) sustainable mobility
- 3) new life technologies
- 4) new technologies for the 'made-in-Italy' (mechanical systems, fashion, food, housing, business services)
- 5) new innovative technologies for cultural heritage and activities
- 6) information and communication technologies.

Some of the profiles included in family 4 may satisfy some of the skill needs of advanced manufacturing<sup>21</sup>.

In Level III apprenticeships, the occupational profile is defined in agreements signed by the tertiary education provider and the company.

Regarding the connection with the European framework, Level II apprenticeship has no links to EQF, ECVET and EQAVET policies. Level I related to initial VET pathways (namely IeFP), is linked to EQF qualifications; the linking with ECVET has been initiated, although as yet there are no specific national initiatives relating to apprenticeships in manufacturing (Memorandum of Understanding of 27 March 2013 for the stabilization of the network of competent authorities and the continuation of ECVET testing in relation to EQF and other European tools). INVALSI, INDIRE and a team of inspectors nominated by the MIUR are in charge of EQAVET for IVET pathways. Vocational training provisions in each region are usually determined by an annual plan, agreed with all the stakeholders and approved by the region. The plan is based on the results of needs analyses, with reference to the Excelsior survey (EQAVET, 2016).

## **Strengths and weaknesses of the system**

As regards the strengths and weaknesses of the Italian apprenticeship system that are specific to the manufacturing sector, all stakeholders interviewed in the frame of this study did not point to any sector-specific strengths and weaknesses. Instead they pointed to the following general strengths and weaknesses of the system that also impact the manufacturing sector.

As reported earlier, apprentices in 2015 made up 13.6% of the workforce in the 15-29 age bracket. According to interviewed representatives from MLPS, INAPP and Adapt, this figure is unsatisfactory. The main reason for the limited attractiveness of apprenticeships is due to the continuous process of reformation of the system and the bureaucracy associated with the regulation of apprenticeship. The sequence of reforms in recent years (four in less than ten years) generated misinterpretations of the rules, making apprenticeships less appealing. In fact, continuous reviews and high level of bureaucracy are causes of some mistrust among both

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<sup>21</sup> Some examples are 'higher technician in research and development of biotechnology-based products and processes', 'higher technician in automation and mechatronic systems' and 'higher technician in innovation of mechanical products and processes'. An exhaustive review of the profiles is provided in the 'Work Atlas' (*Atlante del Lavoro*: [http://nrpitalia.isfol.it/sito\\_standard/sito\\_demo/atlane\\_repertori.php](http://nrpitalia.isfol.it/sito_standard/sito_demo/atlane_repertori.php)).

employers and potential apprentices. According to interviewed experts and stakeholders, although the last two reforms (*Testo Unico* and Legislative Decree 81/2015) introduced significant improvements and simplifications, employers and labour consultants are still cautious towards the instrument because of the bureaucratic burdens associated with the reorganisation of on- and off-the-job training.

Moreover, the most recent institutional monitoring of apprenticeship (ISFOL, 2016a) shows a decrease – in quantitative terms – of apprenticeship attractiveness. While between 2013 and 2014 the decrease of contracts in apprenticeship was limited (-1.4%), the phenomenon widened between 2014 and 2015 (-8.1%). This loss is mainly due to the introduction of concurrent instruments designed to foster job placement for young people<sup>22</sup> (Teselli, 2016). However, manufacturing proved to be more resilient; contracts increased between 2013 and 2014 (+1.5%) and fell less drastically (-3.9%) between 2014 and 2015.

Besides the limits of the global attractiveness of the system, there is a marked imbalance in apprenticeship instruments. The training apprenticeship (*apprendistato formativo* – Level I and Level III) are marginal, while the system is dominated by the occupation-oriented apprenticeships (Level II). The marginality of Level I apprenticeship is attributed by the interviewed MLPS and INAPP representatives to the fact that – prior to Legislative Decree 81/2015 – it was linked to VET pathways of regional competence only. The new regulation should change this and make Level I more central, by committing it also to second-grade secondary education institutes (*Istituti Tecnici*).

The large number of apprenticeship contract terminations illustrates a certain mismatch between the supply of apprentices and the capacity of the labour market to absorb them. Anyway, the information on the number of terminations could be misleading because various factors can determine the interruption of a contract (for example, resignation, dismissal, consensual resolution, non-conversion into standard open ended contract).

Beyond this review, there are no exhaustive data that refer to either the supply of candidates or the effective capacity of the system to absorb them or the effective demand of the firms.

Concerning the large number of interruptions of apprenticeships, according to the interviewed CGIL representative, a careful monitoring of apprentice entry conditions, training and labour pathways should strengthen the role of collective bargaining.

As to the quality of apprenticeship programmes, according to the MLPS representative, apprenticeship in Italy had been seen as an instrument for ‘integrated training’, which offers formal and informal learning pathways where theoretical knowledge and practical skills are linked and integrated.

Nevertheless, it is underlined that these founding principles partly contrast with a regulation that is primarily set in the job-contract dimension. In fact, apprenticeship had always been regulated as pathways that can only lead to an open-ended contract with the employer. This kind of enforcement is felt as too challenging because employers are cautious under uncertain market conditions. Consequently, the use of apprenticeship is largely dependent on economic trends, limiting its actual scope, which, instead, should be systemic and universally accessible. In order to reach this aim, it is suggested that the training apprenticeships (Levels I and III) should have the status of a national training programme separated from Level II, which – instead – simply works as a job-placement instrument.

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<sup>22</sup> Namely the *tirocinio formativo* and *contratto a tutele crescenti*. These instruments will be discussed in the section dedicated to the ‘cooperation and involvement of relevant stakeholders’ because they are the result of a lack of coordination, leading to fragmentation and duplication in efforts.

The apprenticeship system should evolve with a view to addressing the challenges stemming from new labour market and skills needs. Currently, the Italian workforce in manufacturing is largely anchored to traditional manufacturing technologies. Data provided by the KET-Observatory show that Italian employment in Key Enabling Technologies accounts for 7.8% (4.9% if we consider only advanced manufacturing technologies). The EU28 average amounts to 14% (9.1% in advanced manufacturing technologies). The Excelsior survey (2016b) reports that a relatively large share (30.3%) of Italian manufacturing enterprises intend to hire new personnel without any specific education or training. In addition, ‘new professional profiles’ represent only 16.1% of the forecast recruitments. On the other hand, there is a marked need for personnel with previous experience (58.5% of forecast recruitments).

As regards the capacity of the apprenticeship system to adjust and modernise, the MLPS stated that apprenticeship is the only viable training instrument to carry out the generational transition in the Italian production system. This is even more evident for the manufacturing sectors of the so-called ‘made in Italy’, where the hybridization between traditional tacit knowledge and advanced technologies is crucial and strategic to gain a competitive advantage. Apprenticeship can trigger ‘reverse mentoring’ mechanisms, by creating virtuous knowledge transfer and exchange between senior and junior workers. The other on-the-job training instruments – namely, traineeship and school-work alternation – are not suitable to reach this aim.

Consulted experts from MLPS, INAPP and Adapt agreed on the importance of the so-called *Carrozza* experimentation (Legislative Degree 104/2013, art. 8-bis), whereby fifth year students from higher technical institutes could obtain a diploma by following a Level III apprenticeship pathways. This experimentation was initiated under the regulative framework set out in the consolidated act, and inspired the adjustment made by the Jobs Act, which introduced the apprenticeship in second-grade secondary education as part of Level I, leaving level III with only tertiary training and ITS.

The interviewed MLPS representative underlined that the latest regulation (Legislative Decree 81/2015) achieved an important turning point by committing the implementation of the training programmes of level I and level III also to second-grade secondary schools run by the state. This new operative framework may be able to overcome regional fragmentation and stakeholder reluctance, and make Level I and III more central in the apprenticeship system.

A poor major flaw in the capacity to adjust and modernise is due to the delay in the creation of a nationally recognised list of qualifications and occupational profiles for Level II apprenticeships. The interviewed INAPP representative attributes the delay to difficulties in reaching an agreement with the social partners. The modernisation also involves the creation of a shared and universal system of certification linkable to national and EU training policies.

The systemic, cooperative approach and the involvement of relevant stakeholders represent an important strength of the Italian apprenticeship system. The central state, regions and autonomous provinces, VET providers, trade unions and employers’ associations are all required to play their role to make the instrument work. Cooperation is however hindered by duplication in efforts, fragmentation in policy actions and idiosyncratic failures.

A relevant weakness is due to the dumping effect played by overlapping job-placing instruments, like traineeship contracts (*tirocinio*) (ISFOL, 2015) and the open-ended contract with increasing protections (*contratto a tempo indeterminato a tutele crescenti*), which employers find easier to use due to less bureaucracy (Teselli, 2016).

The 2016 INPS report confirms ‘the dumping-effect hypotheses’ after analysing the share of the different type of incentives that favoured open-ended recruitments in recent years. In the period 2009-2014, apprenticeship incentives were the major determinant for new permanent

employment (stable at 15-16% per year). In 2015, the share fell to 8%, while new open-ended contracts benefiting from the incentives associated with the Jobs Act rose by 53%.

Another weakness of Level II apprenticeships, which are under the responsibility of regions, concerns delays and inefficiencies in programming the provision (direct or committed to accredited institutions) of out-company training (Comandé, 2008; Tiraboschi, 2008).

The CGIL representative distinguished two patterns of behaviour. There are regions that implicitly endorse a flexible and vaguely new-liberal application of apprenticeship, a sort of *menu a la carte* for enterprises. Instead, other regions are committed to ensure an effective use of apprenticeship in line with training standards and the goal of worker stabilization. In this regard, leading advanced manufacturing regions – namely, Piedmont, Lombardy and Emilia-Romagna regions – demonstrated a strong commitment to provide high-standard training.

Moreover, the fact that apprenticeship is primarily a job contract confined its regulation to the MLPS, inhibiting the creation of a systemic cooperation with the ministers in charge of training policies (MIUR) and economic development policies (MISE).

Also the INAPP representative emphasised difficulties in coordinating with the social partners (trade unions and employers' associations) in the definition of a common national framework of qualifications for the occupation-oriented apprenticeship (required by Legislative Decree 13/2013). These difficulties stem from the conflictual relations of collective bargaining and the sensitivities of the social partners with regard to contractual issues, which have led to a deadlock situation.

## **Key requirements arising from technological and other changes in manufacturing**

### *Adjusting training contents and curricula*

Interviewed experts and stakeholders representing INAPP, MLPS and Adapt underlined that the historical rigidity of the Italian education system hold back the adaptation of education and training programs and contents to new requirements arising from the transformation of the value chains. For these reasons, the suggestion is to adopt a different approach which promotes the use of tools for the recognition of both formal and non-formal learning. This approach is crucial in the dual learning framework that characterises training apprenticeships (Levels I and III) and occupation-oriented apprenticeships (Level II). A full assessment of formal and non-formal learning is a prerequisite for the creation of integrated training curricula.

The interviewed CGIL representative affirmed that industrial vocational technical education and training curricula should be redeemed, strengthened and further improved. ITS pathways – which offer a technical training cooperatively planned by second-grade secondary schools, VET providers, universities and companies – may constitute a relevant opportunity to adjust the curricula to meet the new requirements arising from technological change. Nevertheless, their implementation at national level and their integration with apprenticeship (Level III) is still in progress.

As regards Level II apprenticeships, the results of an experimentation that involved companies and training providers in the Piedmont region (provinces of Cuneo and Turin) showed the need of a tight cooperation for the definition and integration of contents of in and out-company training. Most of all, the stakeholders stressed the importance of cooperation between companies and training providers in order to ensure a flexible and customised training offer that meet apprentices' and companies' needs and expectations.

### *New occupations*

The structuring of the ‘Labour Atlas’ (implementing instrument of Legislative Decree 13/3013 for the creation of a national system of certification) mentioned earlier in this report, is a precondition for an effective matching of the skills required by new occupations and the skills acquired in formal and non-formal apprenticeships.

### *Developing higher apprenticeships*

The interviewed CGIL representative suggested introducing Level III into a broader planning of local value chains, involving employers’ associations, policy makers and trade unions. This is one effective way to boost higher apprenticeships in a productive system made of many SMEs, often embedded in geographical clusters or industrial districts. This may contribute to transforming Level III from a niche tool to an effective instrument available to all firms willing to innovate also by investing in a highly qualified workforce.

### *Establishing links to continuous learning*

Links between apprenticeship and continuous learning can be established once the national system for the certification of competences in formal and non-formal learning is operational. Legislative Decree 13/2013, which established the national system, is an implementing decree of Law 92/2012 (also known as *Legge Fornero*), which aims at promoting an integrated system for life-long learning. This is a fundamental transformation of the paradigm because it focuses on the individual and gives value to the right to training opportunities in each phase and in every context of life. Until now, continuous training has been offered in a way that is fragmented, infrequent, and often self-referential (ISFOL, 2016c).

According to the interviewed CGIL representative considerable efforts in worker re-qualification and re-training are needed in the light of rapid technological change in the manufacturing sector. Apprenticeships, if combined with continuous VET, could be a smart and suitable instrument to address those issues.

### *Other requirements*

The interviewed CGIL representative stressed another key requirement, that is, a successful transition to new forms of manufacturing and new technological regimes. This can occur only if the north-south development divide is reduced. In this sense, technological development would be a great opportunity and a unifying force for the country.

## **Advanced manufacturing: mapping reform processes and adjustments**

Though apprenticeship has not always been the target of VET reform policies, it has been repeatedly modified over the last 15 years. This process led to the current threefold system of apprenticeship, where Level I and Level III are integrated with the VET provision, while Level II is largely ‘occupation-oriented’. In this situation, the link between apprenticeships, VET, and advanced manufacturing is left to company-specific initiatives.

None of the recent reforms have linked apprenticeship to advanced manufacturing. Currently, some connections between apprenticeship and advanced manufacturing can be found in the training provided under the current VET system and in some of the innovative practices presented below.

Interesting policy initiatives are expected to come from the future implementation of the national plan Industria 4.0, where policy makers underlined the need for a tighter integration between

industrial development and the training of innovative skills and competences. On 25 July 2016 the MISE and MIUR signed a Memorandum of Understanding to address common efforts in the governance of the digitalisation process in the manufacturing sector. One of the areas of activity identified by the signatories refers to ‘persons and skills’ (Area 3). It is specified that the transition to Industry 4.0 must be accompanied by: i) the reduction of the skill mismatch towards an active involvement of the VET and the tertiary education systems; and ii) the strengthening of professional training and school-work alternation. The document generically refers to the VET system, and specifically mentions school-work alternation (*Alternanza Scuola-Lavoro*), which is an instrument that partially overlaps with apprenticeships. In addition, the MLPS – which is, and always has been, in charge of legislation on apprenticeship – is not among the signatories of the document. In the light of these considerations, it could be argued that the creation of a stronger connection between the apprenticeship system and advanced manufacturing is not a priority on the policy agenda.

In a situation often characterised by regional fragmentation, stagnations in the implementation of regulations and conflicts among the social partners, interesting initiatives are rather bottom-up, in the sense that they originate at company-level with the active involvement of local education and training providers.

Thanks to the *Carrozza* Decree (Legislative Decree 114/2013), in the 2014-2015 school year, *Enel Group SpA* initiated the ‘Enel Programme’<sup>23</sup> in agreement with the MIUR, MLPS and some regions (Memorandum of Understanding of July 2014). The programme involved 150 students admitted to the fourth year in seven technical institutes in Level III apprenticeship programmes (consolidated act framework, Legislative Decree 167/2011). *Enel Group SpA* is one of the largest public utilities providers in Italy, whose core business is the production and distribution of gas and electricity. This includes the production of electric and electronic systems, also through the adoption of advanced manufacturing technologies. The programme is still ongoing; the stakeholders are currently working to extend the entire value chain, involving smaller enterprises and different production sectors.

Another interesting company initiative was launched in January 2017 by the Italian subsidiary of Bosch GmbH. ‘Bosch Industry 4.0 Talent Programme’<sup>24</sup> provides Level III apprenticeships for graduates in engineering, physics or mathematics. The programme has a two-year duration and will select 15 candidates which, beside theoretical and practical on-the-job training on machine digitalisation, data mining and IoT, will attend a Master Degree course at the *Cefirel – Politecnico di Milano*. A six-month visit to the Blaichach Bosch plant in Germany is also scheduled.

The interviewed CGIL representative also pointed to good practices in social partners’ cooperation and successful pathways in Level II apprenticeship. An example concerns automatic packaging machines manufacturer IMA Group in the Emilia-Romagna region, which is judged as successful in terms of continuity of the apprentices’ careers and skills development within the company.

Another example of good practice in the use of training apprenticeships (Levels I and III) is that of IT solutions provider Luccioni Group, which established relations with both local education providers and international universities to integrate education, training and work. According to the interviewed Confindustria representative the initiative was successful in establishing a

<sup>23</sup> More information about the programme is available at <https://www.enel.it/it/media/press/d201609-enel-miur-e-mlps-presentato-il-progetto-di-apprendistato-scuola--lavoro-20162017.html>

<sup>24</sup> More information about the programme is available at <http://www.bosch.it/stampa/comunicato.asp?idCom=2602>

network of practices involving the local education and training providers at both secondary and tertiary level of education, hence ensuring continuity of dual learning experiences.

As discussed above, the implementation of the most recent regulation is very fragmented. Hence, while in some regions what is on offer is still poor, there are some contexts where innovative practices occur. It is difficult to give a complete overview, as these practices are left to spot initiatives. Nonetheless, some interesting initiatives – mainly in the north of Italy – can be highlighted:

- The *Politecnico di Torino* has activated specialised master programmes in Level III apprenticeships. The initiative is funded by the Piedmont region in the frame of the POR FSE and FESR 2014-2020 (Regional Operational Programmes of the European Social Fund and the European Regional Development Plan) and it is linked with the ‘Smart Factory’ cluster. The Masters in ‘Additive Manufacturing’ and ‘Industrial Automation’ are the most relevant to advanced manufacturing.
- The public technical school ‘Gadda’ (Fornovo di Taro, in the Emilia-Romagna region) formed a class of apprentices in the field of mechanics who had completed their apprenticeship pathway in seven different firms, including leading motor-racing manufacturer [Dallara Automobili SpA](#). This is a Level I apprenticeship (Legislative Decree 81/2015), associated with second-grade secondary education.
- ADAPT has activated many innovative high-level training and research apprenticeship programme at level III (Legislative Decree 81/2015 and consolidated act) in cooperation with leading Italian manufacturing firms (*Finmeccanica* and *Fincantieri*, among others).
- The promotion of Level III apprenticeships in the firms in the Emilia-Romagna region is a specific aim of the high skills plan of the region ([Piano Alte Competenze](#)). This is a three-year strategy designed to move the regional innovation system towards cutting-edge advanced manufacturing technologies.
- The experimentation of the [digital manufacturing designer’ apprenticeship programme](#) (Level III, associated with the training pathway offered by ITS) is explicitly designed to train a profile (higher technician for digital manufacturing design) that fit the transformation introduced by the Industry 4.0 process. This experimentation is promoted by *CFP Giuseppe Veronesi, Istituto Fontana* and *Don Milani di Rovereto* (VET providers) in partnership with *Fondazione Bruno Kessler, Fondazione Nord Est, Unindustria Bologna, Confindustria Trento* and some universities in northern Italy (*Politecnico di Milano, Iuav di Venezia, Università Ca’ Foscari, Università degli Studi di Trento*). The programme started in January 2017 at the *Polo della Meccatronica* of Rovereto (Autonomous Province of Trento).

## Commentary and conclusion

The review of issues related to the apprenticeship provision and manufacturing in Italy allows for the identification of the following needs:

- creation of the National System for the Certification of Competences that will fully implement the National Repository of Qualifications (Legislative Decree 13/2013). As underlined by the interviewed INAPP representative, this is the only instrument which will link Level II apprenticeships with qualifications recognised for NQF/EQF purposes
- reduce the high number of ‘drop-outs’ and apprenticeship contracts that are not converted into standard open-ended contracts at the end of the apprenticeship.
- make apprenticeship a valuable dual-learning instrument in second grade-secondary education. The Jobs Act (Legislative Decree 81/2015) – building on the *Carrozza Decree* (Legislative Decree 114/2013) – extended Level I apprenticeships to second-grade secondary education. Beforehand, apprenticeships were linked to professional training only. The success of this new provision is crucial for the relaunch of apprenticeships in Italy
- reverse the decline of the manufacturing sector and rediscover the industrial vocation of the country, also by promoting the transition to new forms of manufacturing
- create a ‘generational pact’ to reduce youth unemployment and the share of NEETs
- reduce the north-south divide in terms of productivity, unemployment, and share of NEETs.

All the involved stakeholders (labour, education and training policy makers, VET providers, and social partners at national and local level) will have to work together to tear down the barriers that have been – and still are – limiting the chances of making apprenticeship an effective instrument in the transition to advanced forms of manufacturing. Some of the outstanding barriers are the following:

- the large amount of bureaucracy for companies (particularly SMEs) willing to take on apprentices, which limits a more widespread use of apprenticeships
- the small number of ‘national champions’ that can drive the production system toward the spread of advanced manufacturing technologies
- the strong need for a reform that would reorganise VET pathways and organically promote learning in a dual system
- the conflictual relations that often characterise collective bargaining and prevent from limiting the number of Level II professional profiles and their adjustment to national standards (linked to the EQF)
- the marginal incidence of Level I and Level III, as compared to Level II.

In terms of strengths, apprenticeship is an instrument that focuses on ‘integral training’, by linking theoretical and practical knowledge to formal learning and non-formal learning. In addition, it is the only viable training instrument that allows for a generational transition in the Italian production system. This is even more significant in the ‘Made in Italy’ manufacturing, where apprenticeship could ensure a continuous transfer between traditional tacit knowledge and knowledge in advanced technologies; a mechanism that is crucial to the survival of Italian manufacturing.

The main weaknesses of the apprenticeship system concern the design of the available instruments and insufficient coordination among stakeholders, which limit its adaptability. These are due in particular to:

- a lack of nationally recognised certification procedures for the profiles of *apprendistato professionalizzante* (Level II)
- the embryonal state of multilevel governance for the definition of the basic levels of services (*Livelli Essenziali delle Prestazioni*, established in Law 92/2012) for the identification and the validation of formal and non-formal learning
- fragmentation in the implementation of VET pathways at regional level: some of the IeFP, ITS and IFTS training offer is still missing in some regions.

None of the reforms targeting apprenticeship in recent years have established any link with manufacturing. Further, the main industrial policy initiative for the development of advanced manufacturing (Industria 4.0 national plan) does not make any explicit reference to apprenticeships as an implementation instrument.

The latest labour reform (Legislative Decree 81/2015) introduced a major novelty by linking apprenticeships to second-grade secondary education. This is an important step, because Italy has been negatively affected by the lack of VET reform. Moreover, it would benefit from the promotion of a dual system that can integrate second-grade secondary education, tertiary education, professional training and other pathways and instruments of formal and non-formal learning.

Yet, apprenticeships have limited attractiveness. Training programmes (Levels I and III) are of marginal importance, and the demand for *apprendistato professionalizzante* (Level II) is decreasing because of the dumping effect caused by competing job placing instruments. Different factors, both internal and external to apprenticeship, contribute to this situation. First, difficult relations among the various levels (central and local governments) have hindered the development of shared governance. Also, many companies are being put off from taking on apprentices because of the bureaucracy involved.

Training apprenticeships (Levels I and III) and *apprendistato professionalizzante* (Level II) are facing different challenges. The next few years will see whether the connection between VET and second-grade secondary education will contribute to a wider and more effective use of training apprenticeship.

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## Annex 1: Glossary

Abbreviation	Original term	English translation/explication
<b>ANPAL</b>	Agenzia Nazionale Politiche Attive del Lavoro	National Agency for Active Labour Market Policies
<b>ADAPT</b>	Associazione per gli studi internazionali e comparativi nel campo del diritto del lavoro e delle relazioni industriali	Association for International and Comparative Studies in the field of Labour Law and Industrial Relations
<b>CFP</b>	Centro di Formazione Professionale	Centre for Professional Training
<b>CGIL</b>	Confederazione Generale Italiana del Lavoro	Italian General Confederation of Labour
<b>CISL</b>	Confederazione Italiana dei Sindacati dei Lavoratori	Italian Confederation of Trade Unions
<b>ECVET</b>	European credit system for vocational education and training	
<b>EQAVET</b>	European quality assurance in vocational education and training	
<b>EQF</b>	European Qualifications Framework	
<b>leFP</b>	Istruzione e Formazione Professionale	Education and Professional Training
<b>IFTS</b>	Istruzione e Formazione Tecnica Superiore	Higher Technical Education and Training
<b>INAPP</b>	Istituto Nazionale per l'Analisi delle Politiche Pubbliche	National Institute for the Analysis of Public Policies
<b>INDIRE</b>	Istituto Nazionale Documentazione, Innovazione, Ricerca Innovativa	National Institute for Documentation, Innovation and Educational Research
<b>INPS</b>	Istituto Nazionale per la Previdenza Sociale	National Institute for Social Security
<b>INVALSI</b>	Istituto nazionale per la valutazione del sistema di istruzione e formazione	National Institute for the Educational Evaluation of Instruction and Training
<b>IoT</b>		Internet of Things
<b>ISFOL</b>	Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori	Institute for the Development of Vocational Training for Workers
<b>ISTAT</b>	Istituto nazionale di Statistica	National Institute of Statistics
<b>ITS</b>	Istruzione Tecnica Superiore	Higher Technical Education
<b>MISE</b>	Ministero dello Sviluppo Economico	Ministry of Economic Development
<b>MIUR</b>	Ministero dell'Istruzione, dell'Università e della Ricerca	Ministry of Education, Universities and Research

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<b>MLPS</b>	Ministero del Lavoro e delle Politiche Sociali	Ministry of Labour and Social Policy
<b>NACE</b>	Nomenclature statistique des activités économiques dans la Communauté européenne	Statistical Classification of Economic Activities in the European Community
<b>NEET</b>		Not in Education, Employment, or Training
<b>NQF</b>		National Qualifications Framework
<b>SME</b>		Small and Medium Enterprise
<b>UGL</b>	Unione Generale dei Lavoratori	Workers' General Union
<b>UIL</b>	Unione Italiana del Lavoro	Italian Union of Labour
<b>VET</b>	Vocational Education and Training	

## Annex 2: List of consulted national stakeholders and experts

Type of organisation	Name of organisation	Position
Ministry responsible for VET	Ministero del lavoro e delle politiche sociali	Executive – ANPAL
Public agency / VET provider	INAPP (ISFOL)	Head of the Research Group on Skills and Qualifications
Employer organisation	Confindustria	Executive - Labour, Welfare, and Human Capital
Trade union organisation	CGIL	Member of the National Secretariat
VET expert /research institute	ADAPT	President of Adapt; Professor of Pedagogy of Labour; VET and Apprenticeship Expert

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