



FUTURE
SKILL
NEEDS

IN EUROPE

FOCUS ON ITALY

TABLE OF CONTENT

1. INTRODUCTION	3
2. METHODOLOGY AND DATA ISSUES	4
3. ANALYSIS OF EMPLOYMENT TRENDS IN ITALY	5
3.1. CONTINUING SHIFT TOWARDS SERVICE-ORIENTED KNOWLEDGE ECONOMY	5
3.2. MORE THAN 1,6 MILLION NEW JOBS BY 2015	6
3.3. LOSSES OFFSET BY REPLACEMENT NEEDS	7
3.4. CONTINUING GROWTH IN DEMAND FOR HIGH AND MEDIUM SKILLED OCCUPATIONS	8
3.5. INCREASE IN QUALIFICATION LEVELS	9
4. CONCLUSIONS	11
ANNEX I: TABLES	12
ANNEX II: CLASSIFICATIONS AND AGGREGATIONS USED	14
BIBLIOGRAPHY AND OTHER REFERENCES.....	19

1. INTRODUCTION

The issue of future skill needs on European labour markets ranks high on the current policy agenda and is seen as one of the priorities for the next decade. The relaunched Lisbon agenda and other recent policy documents have stressed the need for Europe to place more emphasis on anticipating changing skill needs.

Cedefop has taken a pro-active approach and in 2007 carried out a first consistent and comprehensive medium-term forecast of employment and skill needs across the whole of Europe. Macroeconomic projections and alternative scenarios for each Member State ⁽¹⁾ and aggregate results at European level were developed. It provides data on future employment developments by economic sectors, occupations and qualifications covering the period until 2015 and uses comparative data for all Member States.

The results show that the trend of increasing skill requirements is unbroken, with high job gains for highly and medium skilled workers – including those with vocational qualifications, and substantial job losses for the lower skilled. However, the results differ by countries, sectors and occupations – thus requiring further research and analysis. Analysis should also indicate points of reference for pro-active education and training policies to prevent undesired developments, such as possible skill mismatches.

The present note focuses on results for Italy. However, there are particular problems with Italian data making the projections rather difficult (more details are provided in the second part of this note).

⁽¹⁾ EU-25 plus Norway and Switzerland.

2. METHODOLOGY AND DATA ISSUES

The results of the skill needs forecast have been developed by adopting a modular approach. It involves the following four main elements: a multisectoral macroeconomic model, occupational and qualifications expansion demand modules and a replacement demand module.

The forecast is based on data from Eurostat sources, adopting common methods and models. It involved the development of the basic database and tools required to produce a comprehensive and consistent set of skill projections for Europe. The modular framework allows for the refinement of the modelling approaches used for projecting occupational, qualification structures and replacement demands. It also allows for the improvement or replacement of data for particular countries or sectors where there are concerns about data quality and robustness. This framework provides an opportunity for this knowledge to be built in to future assessments in an efficient and transparent manner as it makes it easy to incorporate new data and alternative assumptions.

A key issue addressed in the forecast is the best data to be used to measure employment structures in Europe in a common framework. Historically, most countries have invested considerable resources in developing data for their national accounts (NA). In many respects estimates of employment on this basis are to be preferred as they are consistent with other key economic indicators such as output and productivity. More recently, greater emphasis has been placed on estimates of employment based on the European labour force survey (LFS). These have the considerable advantage of being broadly consistent across countries and providing a measure of employment structure by skills (e.g., occupation and qualification).

However, the LFS for Italy has many gaps and discontinuities, including a major change in classification in 2004. These poses many problems in estimating trends, especially for occupation "1.3 Managers of small enterprises". **The occupation and qualification shares for Italy are therefore very difficult to project with any confidence.** Even the corrections to the approach which were adopted following the discussion in the expert workshop in November 2007 (to apply longer-term trend changes to the latest base data even if this exhibited a discontinuity compared to the past) still caused problems in the Italian case (due mainly to the many missing observations). The results in this case should be regarded with particular caution. Efforts to resolve such problems are continuing.

The numbers presented by sector, as used in the multi-sectoral macroeconomic model, are based on Eurostat national accounts, rather than LFS based estimates and can be therefore interpreted with certain confidence. There are some significant discrepancies between these two sources which remain unresolved. These reflect sampling errors as well as other differences arising from the different methods used to collect the different data sets.

3. ANALYSIS OF EMPLOYMENT TRENDS IN ITALY

3.1. Continuing shift towards service-oriented knowledge economy

European labour market has experienced continuing shifts away from the primary sector (especially agriculture) and traditional manufacturing industries towards services and the knowledge intensive economy in general. The analysis suggests that these trends are likely to continue to be a key feature over the coming decade. This more or less applies also for Italian employment prospects (Figure 1).

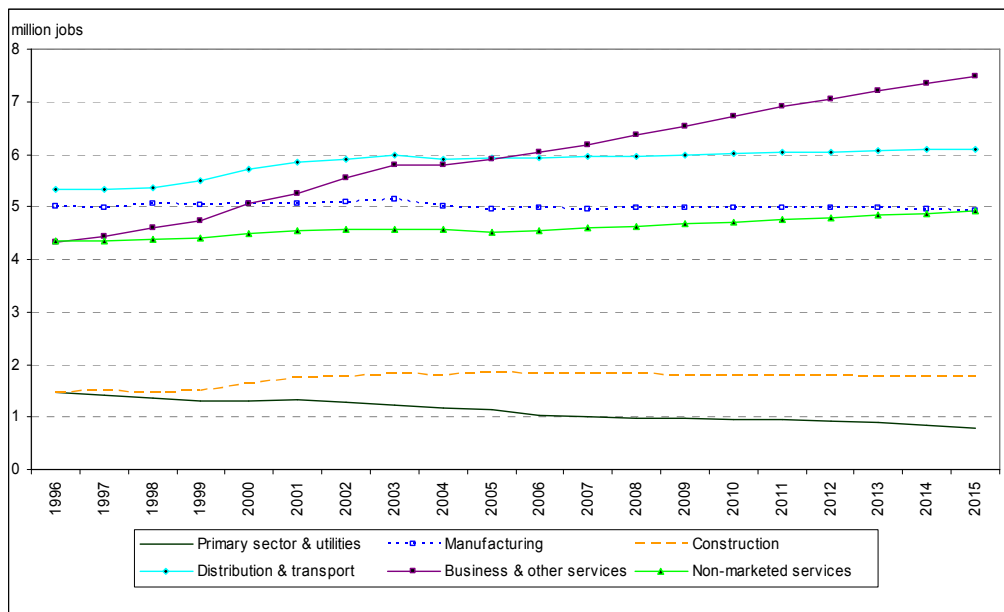
The primary sector and utilities ⁽²⁾ in Italy in 2006 only accounted for just above 1 million jobs, down from almost 1,5 million a decade earlier. This broad sector includes agriculture, which remains a significant area of employment in some Member States, although in all cases trends are downwards and further job losses are expected over the next decade. Employment is projected to further decrease to 800 thousand by 2015 implying net job losses of almost 200 thousand in Italy. The share of this broad sector will decrease from 6.6% in 1996 and 4.3% in 2006 to 3.1% in 2015.

Manufacturing tends to stagnate in Italy and still accounts for almost 5 million jobs. Generally, there are few industries within manufacturing (e.g. engineering) where demand for output is outstripping productivity gains thus leading to employment increases, but often employment levels are tending to decline. Construction sector in Italy has experienced positive employment trends in the past decade but tends to stagnate between 2006 and 2015. Across Europe as a whole, the projections suggest little change in total employment in the manufacturing and construction sector between 2006 and 2015 in the benchmark scenario.

Services now account for the vast bulk of employment and have generally seen positive trends, especially among business and miscellaneous services. Industries within the business and miscellaneous services category, which include many services aimed at consumers, has shown the most rapid growth in recent years for most countries, including Italy and this looks likely to continue. This broad sector is likely to become the largest category. In Italy it counted for around 6 million jobs in 2006 and is projected to create almost 1.5 million additional jobs there. Distribution, transport, etc., currently accounts for the largest share of employment in many countries, although trends have shown signs of flattening out as these sectors have matured. In Italy the employment in this sector was in 2006 at the same level as in business and miscellaneous services and will create only around 160 thousand additional jobs between 2006 and 2015. Non-marketed services, which include education and health as well as public administration is currently the second largest category in Europe, although trends here are also showing signs of reaching a plateau in many countries. In Italy the situation differs as non-marketed services accounted in 2006 for only 4.5 million jobs (even less than manufacturing) and will create less than 400 thousand additional jobs in the benchmark scenario between 2006 and 2015.

⁽²⁾ Utilities comprise producers and suppliers of gas, electricity and water.

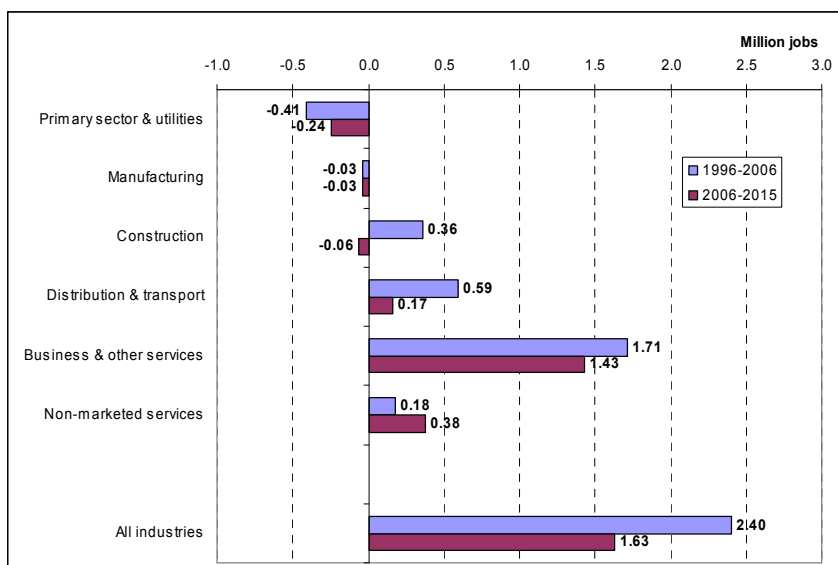
Figure 1: Past and likely future employment trends by broad sector, Italy



3.2. More than 1,6 million new jobs by 2015

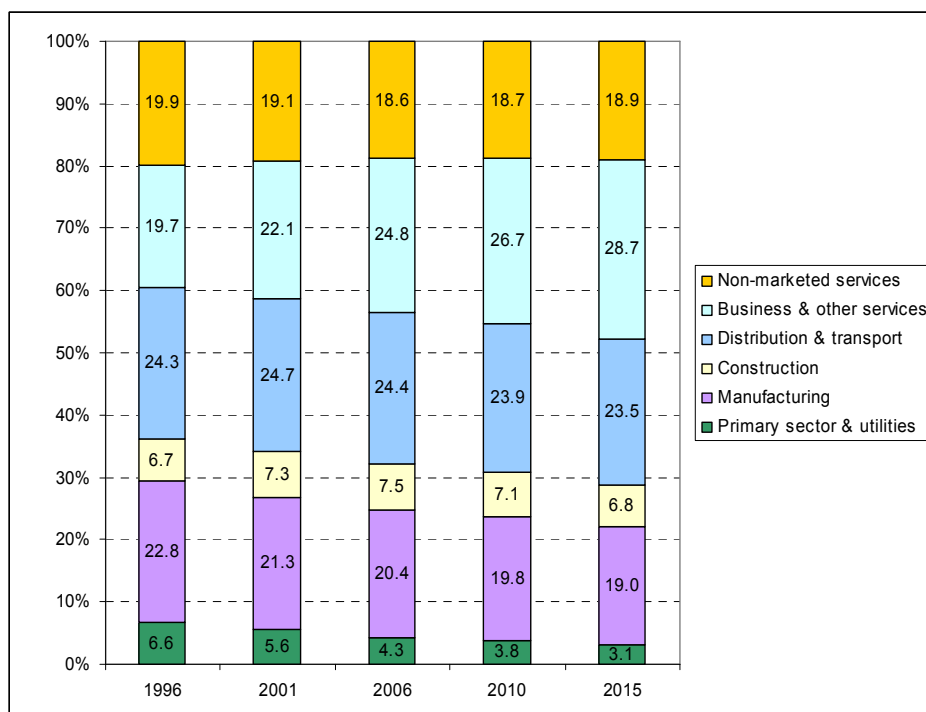
Italy is expected to see more than 1.6 million new jobs between 2006 and 2015. This is in the face of losing well over 200 thousand jobs in the primary sector, around 30 thousand jobs in manufacturing and more than 60 thousand jobs in construction. On the other hand, the distribution and transport sector, including hotels and catering, will create more than 160 thousand jobs in the coming decade and employment in non-marketed services (public administration, together with health and education) is projected to grow by more than 370 thousands. Business and miscellaneous services has the best prospects, with more than 1.5 million additional jobs being created between 2006 and 2015 (Figure 2).

Figure 2: Employment trends by broad sector, change in millions, Italy



As a consequence, services will account for more than 70 % of all jobs in Italy in 2015, whereas the primary sector will decline from almost 6.6 % in 1996 to 3,1 % in 2015 (Figure 3).

Figure 3: Employment trends by broad sector, shares in %, Italy

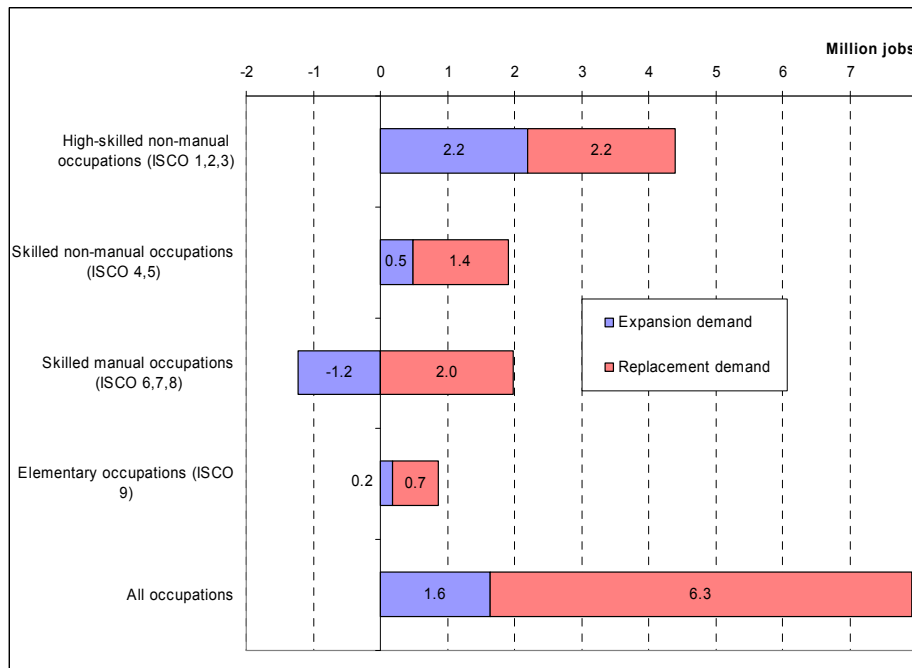


3.3. Losses offset by replacement needs

The forecast emphasises that even those areas where employment levels are expected to fall there will nevertheless be significant numbers of job opening and needs for education and training. This affects both sectors and occupations. Despite the structural changes projected it is important to emphasise that the primary and manufacturing sectors will remain viable sources of jobs and crucial components of the economy. Similarly there are significant replacement demands by occupation (to replace those leaving for retirement or other reasons) even for those occupations where employment levels are projected to fall sharply. It is important that policy-makers, education and training providers, guidance services and individual citizens are aware that many of those occupations that are likely to see job losses will remain viable sources of employment and make important contributions to the economy for many years to come.

Plus to 1,6 million new jobs another 6,3 million jobs (i.e. almost 4 times more) will be available due to replacement needs for workers leaving the labour market because of the retirement or other reasons. The total number of job openings therefore will be almost 8 million (Table 4 in Annex I) and the total number of jobs in the whole economy will be 26 million (Table 1 in Annex I).

Figure 4: Expansion and replacement demand by occupation, broad groups, projected change between 2006-2015 in millions, Italy

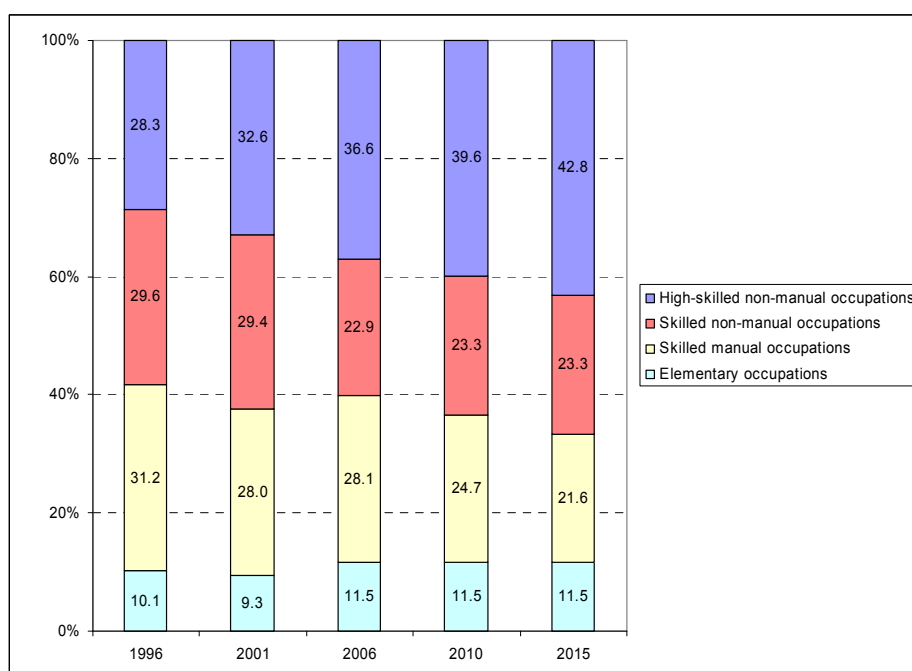


3.4. Continuing growth in demand for high and medium skilled occupations

The projected sectoral changes taking place will have significant implications for occupational skills needed in the future. These will be reinforced by changes in the way work is organised and jobs are performed within sectors. The main implications are a continuing growth in demand for many highly and medium skilled workers but also for some lower skilled occupations. In Italy more than 35% of people are currently employed in higher level jobs such as management, professional work of one kind or another or technical support of those activities. These areas are all expected to experience increased demand over the next decade to reach almost 43% in 2015 (Figure 5). In contrast, jobs requiring traditional agricultural skilled workers, craft and related trades workers and plant and machine operator and assemblers (skilled manual occupations) will decline in number (Figure 4).

It is important to recognise that even in areas where employment is expected to fall there will still be significant numbers of job openings and needs for education and training. This is reflected in estimates of replacement demand by occupation. While the projections suggest job losses for a number of occupational categories as mentioned above, in all cases these losses are more than offset by the estimated need to replace most of those leaving because of retirement or other reasons. Of course the nature of these jobs and their skill requirements will change. There will, however, be significant expansion in the numbers of jobs for many service workers, especially in retail and distribution, and also for some elementary occupations requiring little or no formal skills.

Figure 5: Employment trends by occupation, broad groups, share in %, Italy

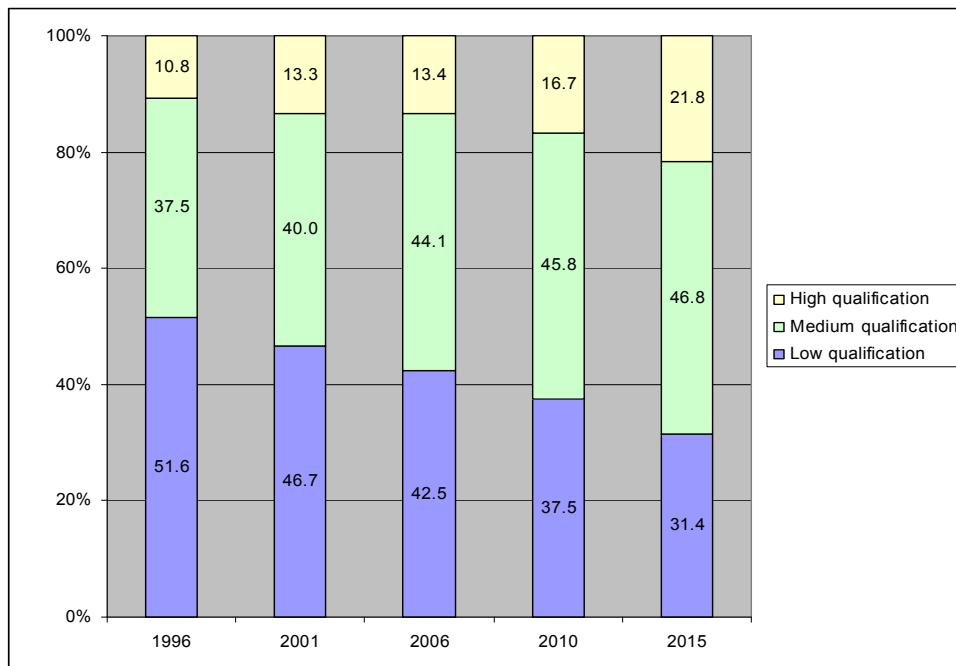


3.5. Increase in qualification levels

The nature and skill requirements of many jobs will not remain unchanged and it is important to understand the way in which they are evolving. This includes the formal qualifications that are typically required to undertake different jobs. While there is no simple one to one relationship between occupation and qualification it is possible to explore how these are changing over time. The analysis focuses on three levels (high, medium and low qualifications). The results highlight the general increase in qualification levels across most jobs. At the broadest level the projected changes are even more dramatic than for occupations. In total, the net employment increase in Italy of over 1.6 million jobs between 2006 and 2015 comprises increases of almost 2.4 million jobs at the highest qualification level (ISCED levels 5 and 6) and almost 1.5 million jobs at medium level (ISCED level 3 and 4), offset by a sharp decline of 2.2 million jobs for those with no or few formal qualifications (ISCED levels 0 to 2).

In part these changes reflect both recruitment behaviour of employers and the expected continued growth in supply of people who have acquired formal qualifications. In Italy in 2015, around 22% of all jobs will need high qualifications, and 47% medium qualifications. The demand for low qualifications will fall from more than a half in 1996 to around 31% (Figure 6). While some have argued that there is the possibility of oversupply in some areas, there is also considerable evidence of increasing needs for, and even shortages of, formal qualifications in many areas.

Figure 6: Past and likely future qualification structure of jobs, shares in %, Italy



It is crucial to take into account also the replacement demand when determining future job opportunities and this is even more legitimate when assessing implications for education and training. The forecast shows that the total of 8 million job openings (sum of expansion and replacement demand) in Italy between 2006 and 2015 might comprise more than 3.2 million jobs requiring high level of qualifications. Even more job openings – more than 4.2 millions - are expected for medium level qualifications, including vocational qualifications (Table 7 in Annex I). This reflects the current qualification structure of the ageing population which will have to be replaced over coming decade. There will be only half a million jobs opened for applicants with no or low level of qualifications.

4. CONCLUSIONS

The results of the forecast reiterate the need to explore in more details working conditions, skill and competence requirements and profiles of both elementary and knowledge-intensive job segments. They equally emphasise the need for policy-making to initiate measures in time to prevent or at least alleviate risks of skills mismatches – shortages as well as surpluses. Consequently, the projected occupational change has policy implications for education and training, guidance and counselling, active and passive labour market measures, migration, mobility and social policy in the Member States. This calls for improved governance and the cooperation of all actors, including the social partners.

Last but not least, the forecast brought about many important insights and added value to the limited knowledge about the likely future development on European labour markets. The forecast however also raised a number of questions and uncertainties about specific developments in the demand by occupation and qualification. Is the demand changing in its nature? Do ‘elementary’ occupations still correspond to their initial definition³? How does the supply change the demand and what could be the economic consequences of this interaction? Which specific skills and competences will be needed in the future? These and other questions can only be answered, if Europe continues to invest in further research and analysis in the early identification of skill needs, including quantitative as well as qualitative methods of forecasting and research on the interactions between supply and demand seem to be crucial in the issue of job polarisation and skill mismatch.

³ According to the ISCO-88 definition, elementary occupations consist of simple and routine tasks and normally require skills at the first ISCO skill level (ILO).

ANNEX I: TABLES

Table 1 Employment by broad sector, Italy

Levels (000s)	1996	2001	2006	2010	2015
Primary sector & utilities	1,458	1,321	1,046	964	802
Manufacturing	5,005	5,056	4,971	4,989	4,937
Construction	1,469	1,732	1,831	1,802	1,766
Distribution & transport	5,346	5,859	5,937	6,013	6,102
Business & other services	4,329	5,251	6,042	6,726	7,474
Non-marketed services	4,361	4,534	4,543	4,709	4,921
All industries	21,968	23,752	24,369	25,203	26,002

Source: Cedefop (IER, ROA, EC estimates)

Table 2 Employment change by broad sector, Italy

Change (000s)	1996-2001	2001-2006	2006-2010	2010-2015	2006-2015
Primary sector & utilities	-137	-275	-82	-162	-244
Manufacturing	51	-84	18	-52	-34
Construction	263	99	-29	-36	-65
Distribution & transport	513	78	77	89	165
Business & other services	922	790	685	748	1,432
Non-marketed services	173	9	167	212	378
All industries	1784	616	834	799	1633

Source: Cedefop (IER, ROA, EC estimates)

Table 3 Employment by occupation, Italy

Levels (000s)	1996	2001	2006	2010	2015
Armed forces	164	169	237	243	232
Legislators, senior officials and managers	645	1,110	2,153	2,403	2,724
Professionals	2,296	2,626	1,925	2,097	2,288
Technicians and associate professionals	3,284	4,006	4,845	5,478	6,108
Clerks	2,938	3,172	2,549	2,712	2,788
Service workers and shop and market sales workers	3,561	3,818	3,027	3,157	3,277
Skilled agricultural and fishery workers	805	670	488	354	256
Craft and related trades workers	4,069	3,931	4,169	3,850	3,395
Plant and machine operators and assemblers	1,979	2,041	2,183	2,015	1,955
Elementary occupations	2,226	2,209	2,793	2,895	2,978
All occupations	21,968	23,752	24,369	25,203	26,002

Source: Cedefop (IER, ROA, EC estimates)

Table 4 Demand by occupation, 2006-2015, Italy

2006-2015	Expansion demand	Replacement demand	Total requirement
Armed forces	-5	63	58
Legislators, senior officials and managers	571	857	1,428
Professionals	363	378	740
Technicians and associate professionals	1,263	966	2,230

Clerks	240	620	860
Service workers and shop and market sales workers	250	802	1,052
Skilled agricultural and fishery workers	-232	117	-115
Craft and related trades workers	-773	1,304	531
Plant and machine operators and assemblers	-228	560	332
Elementary occupations	185	680	865
All occupations	1,633	6,347	7,980

Source: Cedefop (IER, ROA, EC estimates)

Table 5 Employment by qualification, Italy

Levels (000s)	1996	2001	2006	2010	2015
Low qualification	11,346	10,916	10,352	9,445	8,160
Medium qualification	8,246	9,361	10,741	11,535	12,178
High qualification	2,376	3,117	3,275	4,217	5,658
All qualifications	21,968	23,394	24,369	25,198	25,996

Source: Cedefop (IER, ROA, EC estimates)

Table 6 Demand by qualification, 2006-2015, Italy

2006-2015	Expansion demand	Replacement demand	Total requirement
Low qualification	-2,192	2,697	505
Medium qualification	1,437	2,798	4,235
High qualification	2,382	853	3,235
All qualifications	1,628	6,347	7,975

Source: Cedefop (IER, ROA, EC estimates)

Note: Without Armed forces.

Table 7 Employment shares by qualification, Italy

Shares (%)	1996	2001	2006	2010	2015
Low qualification	51.6	46.7	42.5	37.5	31.4
Medium qualification	37.5	40.0	44.1	45.8	46.8
High qualification	10.8	13.3	13.4	16.7	21.8
All qualifications	100.0	100.0	100.0	100.0	100.0

Source: Cedefop (IER, ROA, EC estimates)

Table 8 Employment change by qualification, Italy

Change (000s)	1996-2001	2001-2006	2006-2010	2010-2015	2006-2015
Low qualification	-430	-564	-907	-1,284	-2,192
Medium qualification	1,115	1,380	794	643	1,437
High qualification	741	158	942	1,440	2,382
All qualifications	1426	975	829	799	1628

Source: Cedefop (IER, ROA, EC estimates)

ANNEX II: CLASSIFICATIONS AND AGGREGATIONS USED

Sectors

Aggregation of 41-industry to 6-industry

6-INDUSTRY [NACE]		41-INDUSTRY [NACE]	
1	Primary sector and utilities [01-14, 40, 41]	1	Agriculture, etc.[01-05]
		2	Coal [10]
		3	Oil and gas, etc.[11, 12]
		4	Other mining [13, 14]
		22	Electricity [40.1, 40.3]
		23	Gas supply [40.2]
		24	Water supply [41]
2	Manufacturing [15-37]	5	Food, drink and tobacco [15, 16]
		6	Textiles, clothing and leather [17-19]
		7	Wood and paper [20, 21]
		8	Printing and publishing [22]
		9	Manufactured fuels [23]
		10	Pharmaceuticals [24.4]
		11	Chemicals nes [24(ex24.4)]
		12	Rubber and plastics [25]
		13	Non-metallic mineral products [26]
		14	Basic metals [27]
		15	Metal goods [28]
		16	Mechanical engineering [29]
		17	Electronics [30, 32]
		18	Electrical engineering and instruments [31, 33]
		19	Motor vehicles [34]
		20	Other transport equipment [35]
		21	Manufacturing nes [36, 37]
3	Construction [45]	25	Construction [45]
4	Distribution and transport [50-64]	26	Distribution [50, 51]
		27	Retailing [52]
		28	Hotels and catering [55]
		29	Land transport, etc.[60, 63]
		30	Water transport [61]
		31	Air transport [62]
		32	Communications [64]
5	Business and other services [65-74, 90-99]	33	Banking and finance [65, 67]

6	Non-marketed services [75, 80, 85]	34	Insurance [66]
		35	Computing services [72]
		36	Professional services [70, 71, 73, 74.1-74.4]
		37	Other Business services [74.5-74.8]
		41	Miscellaneous services [90-93,95,99]
		38	Public administration and defence [75]
		39	Education [80]
		40	Health and social work [85]

Qualifications

LEVEL OF QUALIFICATION	
Low	At most lower secondary (ISCED 0-2)
Medium	Upper secondary (ISCED 3-4)
High	Tertiary (ISCED 5-6)

ISCED 0: pre-primary education

Programs at level 0, (pre-primary) defined as the initial stages of organised instruction are designed primarily to introduce young children to a school-type environment, i.e. to provide a bridge between the home and a school based atmosphere. Upon completion of these programs, children continue their education at level 1 (primary education).

ISCED 1: primary education or first stage of basic education

Programmes at level 1 are normally designed on a unit or project basis to give students a sound basic education in reading, writing and mathematics along with an elementary understanding of other subjects such as history, geography, natural science, social science, art and music. In some cases religious instruction is featured. The core at this level consists of education provided for children, the customary or legal age of entrance being not younger than five years or older than seven years. This level covers, in principle, six years of full-time schooling.

ISCED 2: lower secondary education or second stage of basic education

The contents of education at this stage are typically designed to complete the provision of basic education which began at ISCED level 1. In many, if not most countries, the educational aim is to lay the foundation for lifelong learning and human development. The programmes at this level are usually on a more subject oriented pattern using more specialised teachers and more

often several teachers conducting classes in their field of specialisation. The full implementation of basic skills occurs at this level. The end of this level often coincides with the end of compulsory schooling where it exists.

ISCED 3: (upper) secondary education

This level of education typically begins at the end of full time compulsory education for those countries that have a system of compulsory education. More specialisation may be observed at this level than at ISCED level 2 and often teachers need to be more qualified or specialised than for ISCED level 2. The entrance age to this level is typically 15 to 16 years. The educational programmes included at this level typically require the completion of some nine years of full-time education (since the beginning of level 1) for admission or a combination of education and vocational or technical experience.

ISCED 3A: programmes designed to provide direct access to ISCED 5A;

ISCED 3B: programmes designed to provide direct access to ISCED 5B;

ISCED 3C: programmes not designed to lead to ISCED 5A or 5B.

ISCED 4: post-secondary non tertiary education

ISCED 4 captures programmes that straddle the boundary between upper secondary and post-secondary education from an international point of view, even though they might clearly be considered as upper secondary or post-secondary programmes in a national context. These programmes can, considering their content, not be regarded as tertiary programmes. They are often not significantly more advanced than programmes at ISCED 3 but they serve to broaden the knowledge of participants who have already completed a programme at level 3.

Typical examples are programmes designed to prepare students for studies at level 5 who, although having completed ISCED level 3, did not follow a curriculum which would allow entry to level 5, i.e. pre-degree foundation courses or short vocational programmes. Second cycle programmes can be included as well.

ISCED 4A: see text for ISCED 3

ISCED 4B: see text for ISCED 3

ISCED 4C: see text for ISCED 3

ISCED 5: first stage of tertiary education (not leading directly to an advanced research qualification)

This level consists of tertiary programmes having an educational content more advanced than those offered at levels 3 and 4. Entry to these programmes normally requires the successful completion of ISCED level 3A

or 3B or a similar qualification at ISCED level 4A. They do not lead to the award of an advanced research qualification (ISCED 6). These programmes must have a cumulative duration of at least two years.

ISCED 5A: programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements.

ISCED 5B: programmes that are practically oriented/ occupationally specific and are mainly designed for participants to acquire the practical skills and know-how needed for employment in a particular occupation or trade or class of occupations or trades, the successful completion of which usually provides the participants with a labour market relevant qualification

ISCED 6: second stage of tertiary education (leading to an advanced research qualification)

This level is reserved for tertiary programmes which lead to the award of an advanced research qualification. The programmes are, therefore, devoted to advanced study and original research and not based on course-work only. They typically require the submission of a thesis or dissertation of publishable quality which is the product of original research and represents a significant contribution to knowledge. They prepare graduates for faculty posts in institutions offering ISCED 5A programmes, as well as research posts in government, industry, etc.

Documentation by EULFS: Levels of education and training ISCED 1997 (http://circa.europa.eu/irc/dsis/employment/info/data/eu_lfs/Related_documents/ISCED_EN.htm)

Occupations

ISCO	
MAJOR GROUP 1: LEGISLATORS, SENIOR OFFICIALS AND MANAGERS	
11	Legislators and senior officials
12	Corporate managers
13	Managers of small enterprises
MAJOR GROUP 2: PROFESSIONALS	
21	Physical, mathematical and engineering science professionals
22	Life science and health professionals
23	Teaching professionals
24	Other professionals
MAJOR GROUP 3: TECHNICIANS AND ASSOCIATE PROFESSIONALS	
31	Physical and engineering science associate professionals
32	Life science and health associate professionals
33	Teaching associate professionals
34	Other associate professionals
MAJOR GROUP 3: CLERKS	
41	Office clerks
42	Customer services clerks
MAJOR GROUP 4: SERVICE WORKERS AND SHOP AND MARKET SALES WORKERS	
51	Personal and protective services workers
52	Models, salespersons and demonstrators
MAJOR GROUP 6: SKILLED AGRICULTURAL AND FISHERY WORKERS	
61	Skilled agricultural and fishery workers
MAJOR GROUP 7: CRAFT AND RELATED TRADES WORKERS	
71	Extraction and building trades workers
72	Metal, machinery and related trades workers
73	Precision, handicraft, craft printing and related trades workers
74	Other craft and related trades workers
MAJOR GROUP 8: PLANT AND MACHINE OPERATORS AND ASSEMBLERS	
81	Stationary plant and related operators
82	Machine operators and assemblers
83	Drivers and mobile plant operators
MAJOR GROUP 9: ELEMENTARY OCCUPATIONS	
91	Sales and services elementary occupations
92	Agricultural, fishery and related labourers
93	Labourers in mining, construction, manufacturing and transport
MAJOR GROUP 0: ARMED FORCES	

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Country workbooks developed within the project “Medium-term forecast of occupational skill needs in Europe” by the Institute for Employment Research (IER) at the University of Warwick, Research Centre for Education and the Labour Market (ROA) at the University of Maastricht and Cambridge Econometrics (CE) - available upon request from Skillsnet team (skillsnet-team@cedefop.europa.eu).