Josef Schmid and Rolf Frankenberger

On the Way to Welfare 4.0 – Digitalisation in Italy

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About the authors of the country studies

Prof. Dr. Daniel Buhr teaches Policy Analysis and Political Economy at the Institute for Political Science of the Eberhard Karls University, Tübingen. **Claudia Christ, MA,** is a scholarship holder in the doctoral programme "International comparative research on education and education policy in the welfare state" of the Hans-Böckler-Stiftung and the Eberhard Karls University, Tübingen. **Dr. Rolf Frankenberger** is Senior Lecturer at the Institute for Political Science of the Eberhard Karls University, Tübingen, teaching and researching in the area of comparative political science. **Marie-Christine Fregin, MA,** is a research assistant in political economy and policy analysis at Institute for Political Science of the Eberhard Karls University, Tübingen. **Prof. Dr. Josef Schmid** is Professor of Political Economy and Policy Analysis and at present is full-time Dean of the Faculty of Economic and Social Sciences at the Eberhard Karls University, Tübingen. **Markus Trämer, BA,** is a research assistant in Policy Analysis and Political Economy at the Institute for Political Science of the Eberhard Karls University, Tübingen.

Responsible for this publication at the FES

Michèle Auga is head of the Western Europe/North America department.
Beate Martin is an adviser at the Western Europe/North America department.

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ITALY

1. ABSTRACT

- Italy is among the stragglers with regard to digitalisation in Europe. The dimensions in which Italy does comparatively badly include the development of human capital, internet usage and the integration of digital technology in the economy. In the past year little progress has been made in relation to most indicators.
- The framework conditions for the digitalisation of the health care system have gradually been improved since 2008. The national e-health directives implement the forms of organisation and provision of medical services and are aimed at developing synergies in the health care system. However, the digitalisation of the health care system is limited mainly to the north of Italy.
- With regard to innovation Italy needs to make up ground with regard to both investment and policy governance and tackling regional inequalities. The national research programme "PNR 2014–2020" was announced two years ago, but as yet it has not been officially approved. Italy's government R&D intensity, at 1.29 per cent, is still substantially below the 2020 target of 1.53 per cent.
- The labour market has been deregulated by a number of "structural reforms", such as the Renzi government's Jobs Act. The first signs are positive and the number of labour contracts has increased significantly. At the same time, the policy changes have heightened labour market dualisation and disparity. Deregulation has been accompanied by weak productivity growth and falling R&D investment.

2. BRIEF OVERVIEW OF THE POLITICAL AND ECONOMIC SYSTEM

Italy, like Germany, is among the "belated" nations; Italy was reunified only in the course of the "Risorgimento". Vittorio Emmanuele II was proclaimed King of Italy on 17 March 1861. The country subsequently became a parliamentary democracy with two chambers that have almost identical legislative responsibilities. Until 2005, electoral law combined a system of majority voting and proportional representation, which resulted in a profusion of political parties and unstable political majorities.

"What distinguishes Italy from most other comparable democracies is the pronounced heterogeneity of its political culture" (Köppl 2007). This is linked to the three major divisions that characterise Italy's political system:

The dualism of Catholic and communist subculture; the strong regional fragmentation, manifested in broad terms by the opposition between north and south; and finally the far-reaching alienation of ordinary citizens from the political elites, often expressed in terms of piazza (where ordinary people go about their business) and palazzo (where the rulers go about theirs). (Köppl 2007: 31) (see Table 1)

According to Esping-Andersen's typology of the welfare state (Esping-Andersen 1990) Italy is to be categorised as "conservative" because of the dominant role of social insurance and the rather passive role of the state. This categorisation has been refined by Ferrara (1996; see also Lynch 2014), who prefers to categorise Italy as a Mediterranean welfare state. Such welfare states have four main characteristics:

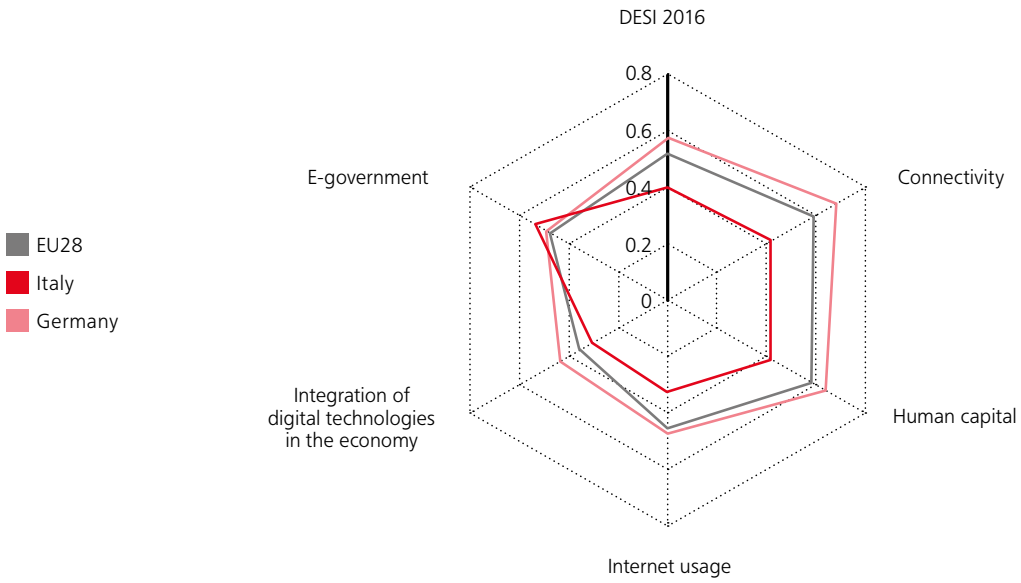
1. The considerable fragmentation of the social security systems, which are markedly selective and particularistic. Access to social insurance in Italy is almost exclusively limited to those in gainful employment. However, even within this group there are major inequalities. The proliferation of insurance funds and programmes that exist in parallel – for example, pensions and unemployment insurance – serve some employees (especially in the major industrial concerns) better than others. Another example is employment protection, which applies to standard employees, but gives much less protection to those in atypical employment and the large number of (sometimes bogus) self-employed (around 30 per cent of workers). This applies particularly to younger people. Furthermore, general basic insurance is lacking for people not covered by social insurance.
2. The existence of universal health care provision, in which private providers also play a major role. Italy's health care system, as solely a protection system, is not insurance-based; since 2000, it has been funded almost entirely from tax revenues and open to all citizens.

Table 1
Overview of Italy[1]

Indicator	Italy	EU28
Form of state	Parliamentary republic	
State organisation	Unitary	
Party system	Multi-party system	
Electoral system	Majority voting and proportional representation	
EU member since	1 January 1958	
Inhabitants/km²	201.2	116.7
Urbanisation (% of population)	69	74
Welfare state regime	Conservative	
Income inequality (distribution quintile)	5.8	5.2
Social expenditure (% of GDP)	29.8	28.6
GDP per capita (PPS, Index: EU=100)	95	100
Growth rate (real GDP in comparison with previous year)	0.7	2.2
Budget deficit/surplus (% of GDP)	–2.6	–2.4
Labour market productivity nominal per employee (Index: EU=100)	106.5	100
Harmonised unemployment rate	11.4	8.6
Trade union density (0–100)	37.29	
R&D total spending (% of GDP)	1.29	2.03
Proportion of people 20–24 years of age with at least upper secondary education (%)	80.1	82.7
Tertiary education in MINT subjects (per 1,000 graduates)	13.2	17.1
DESI (0–1; 1=digitalised society)	0.4	0.52
Proportion of regular internet users (16–74 years of age) in %	63	76
Internet penetration (% of households)	75	83
Proportion of households with broadband connection (%)	74	80
Proportion of companies with broadband connection (%)	94	95

1 Data sources, if not otherwise specified: Eurostat, http://www.ec.europa.eu/eurostat (3.10.2016), data from 2016 or next available year; data on type of welfare state: http://www.learneurope.eu/index.php?-cID=300 (3.10.2016); data on level of urbanisation: data.worldbank.org (3.10.2016); data on trade union density: OECD, https://stats.oecd.org/Index.aspx?DataSetCode=UN_DEN (3.10.2016); data on digitalisation: Digital Economy and Society Index (DESI) 2016, http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard (28.9.2016).

Figure 1
Development of a digital society in Italy by comparison with Germany and the EU28



Source: Digital Economy and Society Index 2016.

3. Bureaucratisation, clientelism and patronage in the distribution of benefits. This has led not only to generally strong growth in social spending in Italy, but also to disproportionate increases in some programmes, primarily provision for old age, at the expense of others (health care, the family).

Table 2
Cost of social security systems by comparison (% of GDP)

	EU15		Italy	
	1993	2012	1993	2012
Old-age provision	36 %	40 %	50 %	53 %
Health care	28 %	30 %	25 %	24 %
Family	8 %	8 %	4 %	5 %
Unemployment	10 %	6 %	3 %	3 %

Source: Authors' calculations.

4. Few active services on the part of the state. The Italian state plays a very passive role when it comes to the provision of social services. The dominant view is that families and thus primarily women are responsible for bringing up children and caring for old people. At the same time, there are major regional differences between north and south with regard to the provision of social services.

More recent reforms have been aimed at gradually retreating from the Mediterranean model, expressly unifying services and benefits, making the labour market more "flexible" and making administration more efficient.

3. STATE OF DIGITALISATION

Italy is among the stragglers of digitalisation, ranking twenty-fifth in the Digital Economy and Society Index rankings for 2016 (DESI 2016),[2] with a score of 0.4. Italy does comparatively badly[3] in particular with regard to the development of human capital (twenty-fourth place), internet usage (twenty-eighth) and the integration of digital technologies in the economy (twentieth). In the past year little progress has been achieved in relation to most indicators. One exception is a stronger role for e-commerce among SMEs. With regard to digital public services, Italy does a little better (seventeenth place). In relation to the human capital dimension, too (ICT competences), considerable progress has been made. Broadband use is low in fixed-line networks (only around 53 per cent of households), although the situation is much better with regard to mobile broadband connections. Similarly, the usage of internet services is low.

At the end of 2008, the government launched the "Digital Italy Plan", with the aim of completely digitalising the communications infrastructure. In 2010, the EU's ambitious Digital Agenda was integrated in the Plan. Investments in the amount of around 8 billion euros over 10 years for infrastructure and around 2 billion euros for electronics and software services

2 DESI is an index composed of five dimensions, which surveys the development of EU member states towards a digital society. Developed by the European Commission (DG CNECT) the index encompasses connectivity, human capital, internet usage, integration of digital technologies in the economy and digital public services (e-government). The Index varies between 1 and 0, with 1 representing the highest value, cf. http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard (28.9.2016).

3 DESI Country Report Italy 2016: http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=14128.

are envisaged. Twenty large national telecom operators – including Telecom Italia, Vodafone, Fastweb, Wind, BT, H3G, Tiscali and FOS – have also signed a memorandum of understanding for the development of next generation networks with speeds of more than 100 Mbps.

Among the highlights of development is the SPID (Sistema Pubblico Identità Digitale), the Italian digital identity, introduced in March 2016 and intended to make it possible to access all online public services – such as tax declarations – with a password. Private service providers – for example, banks – are also supposed to be able to use SPID (cf. DESI 2016). Also of interest is the project under the aegis of which, from this year, all 18 year-olds are to have 500 euros put at their disposal for culturally enriching activities, such as attending the theatre, concerts and museums or archaeological sites, as well as buying books. To get it they have to register online and use the money by means of a special app, 18app.it, which can be downloaded to a smartphone, tablet or PC.

Besides digitalisation in the narrow sense, the concept of the Smart City is also garnering attention in Italy. To date, around 3.7 billion euros have been invested in around 1,300 projects in areas such as energy efficiency, mobility, renewable energies, lighting and waste management. Northern Italian cities, such as Milan and Turin, are already well on the way to becoming Smart Cities (for more details on projects see www.italiansmartcity.it).

The policy areas cover a broad spectrum:

- sustainable mobility (820 million euros);
- energy and energy efficiency (640 million euros);
- the environment (waste management, monitoring of pollution levels – 290 million euros);
- improvement of living standards in urban areas, for ICT infrastructure and urban development (660 million euros);
- communications with the population, as well as modernisation and digitalisation of public administration (285 million euros).

The municipalities that have invested most in the development of the Smart City are Bari (755 million euros), Bergamo (532 million euros), Cagliari (345 million euros) and Turin (249 million euros). The main city of Lombardy, Milan, has made considerable progress, in particular within the framework of preparations for the world exhibition. Public and private actors, universities and citizens have been involved in the decision-making process (cf. Scheid 2016; for a more sceptical view, see Vitaud 2016).

4. HEALTH CARE POLICY

Digitalisation of the health care system is taking place primarily in the north of Italy. The country has gradually improved the framework conditions since 2008. The Ministry of Health is trying to implement new forms of organisation and provision of medical services by means of national directives on e-health, to rationalise investments in the health care system and to achieve synergies by means of a consistent strategy. The background here comprises, on one hand, the high public spending on health care and, on the other hand, increasing demand for health care services from an ageing population. Another key concern is to achieve more social justice, in other words, to facilitate access to services and therapy options (especially in the south of the country), as well as to tackle the increasing mobility of patients and specialist staff (cf. Di Carlo/Santarelli 2012; Donatini 2015).

Already Italians are able to see test results on the internet and, for example, can discuss matters with their GP via smartphone. The digitalisation of medical records is also making progress. The public health care system ASL is administered by the regions. Five regions – Trento, Lombardy, Tuscany, Emilia-Romagna and Aosta Valley – are leading the way with digitalisation. Data protection is a key issue in this context.

Some regions have developed IT networks to facilitate communications between doctors, paediatricians, hospitals and territorial services. These networks enable the automatic transfer of patient registries and services that have been provided (prescriptions, outcomes of special diagnostic tests, such as lab and radiology results). Furthermore, a slow transition is going on from paper to electronic prescriptions. By the end of 2014, 80 per cent of all prescriptions were supposed to be electronic, although this target was not achieved.

Because funding of the public system has been considerably curtailed by the government's "austerity" policy, it is mostly private medical practices that have invested in digital solutions. Many practices have introduced online appointment systems (Scheid 2016).

5. LABOUR MARKET POLICY

The Italian economy is currently exhibiting the first signs of recovery after years of recession in the wake of the 2008 financial and economic crisis. GDP is on the rise again: by 0.8 per cent in 2015 and by 1.4 per cent in 2016. Nevertheless, Italy is still far below the pre-2008 level and industrial production in 2014 was 25 per cent below the level of 2007. The government debt ratio is one of the highest in the euro area (132.3 per cent in 2014). The unemployment rate is also high, at 12.7 per cent, with a shocking 42.7 per cent unemployment rate among young people (below 25 years of age). Workforce utilisation and labour productivity are low (European Commission 2016).

In structural terms the Italian economy has two peculiarities:

- the country is competitive primarily in labour-intensive, low-wage industries with low or medium level technology;
- 99.9 per cent of companies are SMEs, accounting for 81 per cent of employment; 47.4 per cent of workers work in companies with fewer than 10 employees (EU average: 29.8 per cent; cf. Dauderstädt 2016).

So-called structural reforms have been implemented primarily in the labour market. In labour legislation – the Renzi government's Jobs Act – the concluding of fixed-term contracts has been made easier and employment protection has been weakened. The first signs since the passing of the Jobs Act appear positive. In the second quarter of 2016 by annual com-

parison there were 439,000 more employment contracts; according to Labour Minister Giuliano Poletti, their quality had also improved (cf. derstandard.at/2000044317498/Italiens-Arbeitsmarktreform-zeigt-erste-Erfolge).

At the same time, labour market dualisation and disparity has also intensified. Furthermore, there is a flow of (often illegal) immigrants, as well as strong internal migration from the south of Italy. It is estimated that they will number over 4 million in the coming four to five decades (Vitaud 2016). Deregulation ("liberalisation") will be accompanied by weak productivity growth and falling investment in R&D. Nevertheless, nominal wages are growing more strongly than productivity (cf, Dauderstädt 2016).

Vitaud (2016) notes a conservative mentality and attitude towards the labour market in response to its increasing dynamism. Workforce foreign language skills are also inadequate.

For Dauderstädt (2016: 21), Italy's structural competitiveness could be improved in a number of ways:

- Labour market reforms could help to reconcile wage and productivity growth. Collective agreements usually last too long and cover branches and regions with widely varying performance.
- The training system must be improved. The transition from school to employment is too rapid because school leaving takes place too early and participation in higher education is low (22.5 per cent in contrast to 37.1 per cent in the EU as a whole in 2013). Participation in lifelong learning, at 8 per cent, is also below the EU average of 10 per cent (2014).
- Italy must not only invest more in R&D, but train and employ more researchers. The number of full-time researchers in industry rose by only 14 per cent between 1990 and 2008 (40 per cent in Germany).

6. INNOVATION POLICY

The Ministry for Education, Research and Universities (MIUR) is the main player in research and innovation (R&D). It is responsible for national and international scientific activities, the funding of universities and research institutions and the support of public and private research and technological development. The Ministry for Economic Development (MISE) is responsible for industrial innovation (Modena 2001). The National Research Programme (PNR 2014–2020) was announced two years ago, but has still not been officially approved. Italy's government R&D intensity, at 1.29 per cent, is still substantially below the target for 2020 of 1.53 per cent. Furthermore, R&D spending as a proportion of GDP is also low for an industrialised country. According to data from the Italian Association for Industrial Research, AIRI, in 2015, companies invested around 8 billion euros in R&D, 1.1 billion in ICT. A third of this sum was spent on software development, another third on telecommunications projects.

The governance and organisational shortcomings of the R&D system, as well as the massive territorial inequalities, are also regarded critically. Around two-thirds of projects are concentrated in northern Italy (Modena 2001). Another problem is the inadequate networking of industry and the low level of risk capital. This also explains why Italy ranks a lowly twenty-fifth (out of 35 countries) on the innovation indicator.

One particularly positive feature is the science and research system. Just under 2 million students are enrolled at the 95 universities (66 state and 29 private). On top of that, there are the major state research agencies, such as the CNR (National Research Council), ENEA, INFN, INFM, ASI (Italian Space Agency) and the National Health Institute, the INS.

The telecommunications sector is a special case. It has been changing rapidly and has adapted to switch from the traditional voice telephony to landline and mobile broadband and the plethora of new services. Telecom Italia has come to regard itself – according to a company report – as an important provider of services and platforms, not only of connectivity. Technological and business innovation are increasingly a key element of Telecom Italia's strategy. Digital innovation is based on a paradigm of "open innovation". In this sense, the company has intensified its relations with universities and has funded around 25 so-called triennial PhDs and Open Labs. In addition, the company is committed to digital start-ups. From 2009 to 2015 around 260 projects were supported (Telecom Italia 2015).

A total of 75,400 companies are active in the IT sector, although most of them have fewer than 10 employees. On the other hand, there are around 150 large IT companies that employ more than 250 people, around 70 per cent of them in the service sector and 25 per cent software houses. At 57 per cent more than half of the sector's companies are based in the north of the country. A further 23 per cent are located in the centre, especially around Rome, while only 19 per cent are in the south.

The shortage of skilled labour in the IT sector is as much of an issue in Italy as in the rest of the Europe. Particularly in demand are flexible specialists who have not only technological skills, but also business or managerial knowledge (cf. Scheid 2016a and Vitaud 2016).

With regard to Industry 4.0, however, there are a number of interesting developments and projects. In particular large companies in the automotive and aerospace industries – including many suppliers of German industry – are at the cutting edge of technology. The strong links with Germany are thus driving development. Piedmont was the first region to make money available – 40 million euros – for smart factory projects, within the framework of a tender. Furthermore, there are numerous individual initiatives: Intellimech is an innovation cluster that implements self-financed research projects on the integration of new technologies in industrial processes. In addition, in 2014, the cluster network Fabbrica Intelligente was established, which is currently involved in four applied research projects, with the participation of Siemens Italia. Other examples include a 3D printing project at the University of Pavia and a partnership of the Marche Polytechnic University with the company Arburg, within the framework of which innovative injection printing solutions are being developed (Scheid 2016b).

7. SUMMARY

On the occasion of a German–Italian summit on 31 August 2016, Italian Prime Minister Renzi emphasised at the closing press conference that "the whole north-east and also the Veneto have excellent relations with Germany. A lot has been invested there and there is a lot of innovative production. There are many good relations with the Germans, in particular regarding the implementation of Industry 4.0 and related efforts in our education system" (Renzi 2016). Thus the notion of Industry 4.0 is coming to prominence and increasingly has strong resonance in Italy.

The current state and prospects of Industry 4.0 in Italy and the effects of digitalisation of the economy and society are difficult to predict and becoming more difficult. On one hand, the structural conditions are merely adequate (Vitaud 2016: "few cards to play"), ranging from low R&D spending through the difficult economic situation to the special nature of a family-oriented welfare state in an SME-dominated economy. Furthermore, although there are some interesting individual projects, their overall effects are uncertain and regional disparities, with the south of Italy hung out to dry, remain serious.

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