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On the Way to Welfare 4.0 – Digitalisation in Germany

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GERMANY

1. ABSTRACT

- The "German model was able to overcome the economic and financial crisis relatively well, not being afraid to resort to state aid or state coordination provided for economic and industrial policy. However, globalisation and digitalisation pose further challenges for the welfare state.
- Despite good development in the area of digitalisation, there is some way to go with regard to both rolling out broadband and expanding mobile networks. However, because of rapid positive progress in the areas of human capital, internet utilisation and digitalisation of the economy in recent years, Germany is at the forefront in the EU.
- With its high-tech strategy and Digital Agenda, the German government is trying to take advantage of the opportunities arising from digitalisation in Germany. In this context, besides technological development, the promotion of the population's digital competences and the development of Industry 4.0 are of key importance.
- Digitalisation of the health care system is still in its infancy in Germany. While individual actors are certainly implementing digital technologies, their networking – a key criterion for a "Health Care 4.0" – has yet to get off the ground.
- Coordination of innovation policy is one of the main challenges for the future. How the Digital Agenda and the digital strategy will be able to contribute to the modernisation of the welfare state and boost social and technological innovation remains to be seen.

2. BRIEF OVERVIEW OF THE POLITICAL AND ECONOMIC SYSTEM

Germany is a federal and parliamentary democracy, in which political parties play a key role as central political actors with constitutional status. As a result of its federal structure, Germany has a bicameral legislature. Currently, five parties are represented in the Bundestag by proportional representation. Coalition governments are thus the rule. The 16 governments of the federal states (Länder) are represented in the Bundesrat, the second chamber, and are involved in legislation in many instances. Institutionally, we can therefore describe it as a system with many veto players (see Table 1).

In the Basic Law (Germany's constitution) the welfare state is firmly anchored in the principles of the social federal state (Art. 1, para 1) and of the social state governed by the rule of law (Art. 28, para 1) and made concrete in terms of the concepts of social justice and social security. Germany's welfare state, which realises these principles, can be categorised, with Esping-Andersen, as a conservative welfare state (Esping-Andersen 1990). It is based on a comprehensive social insurance system in the areas of sickness, accident, old age and pensions, as well as unemployment, which emerged in broad outlines as early as the nineteenth century. Social security was and remains largely linked to gainful employment and the various forms of social insurance continue to form the institutional core of the welfare state. However, this has been modified through a series of reforms: nursing care insurance (1995) bolsters the social security principle and comprehensive labour market reforms (Employment Promotion Act 1997; Job-AQtIV Act 2001; and Hartz I–IV 2002 to 2005) have transformed unemployment insurance and social assistance, such that a movement towards a welfare state based on basic social protection (Sicherungsstaat) can be discerned, although this would best be described as a restructuring of the welfare state rather than as its dismantling (Schmid/Buhr 2015: 246).

The "German model" of a social market economy, with its neocorporatist embedding of economic activity in organisational negotiation systems, with enterprise codetermination and with its welfare state faces a series of challenges due to globalisation and the digital revolution, compounded by adaptation pressures heightened by the economic and financial crisis. But precisely because of its strong welfare state, made more flexible for example by the reforms of Agenda 2010, Germany has been able to get through the crisis relatively well compared with other European countries, such as Spain and France, "without being afraid of resorting to welfare state assistance or economic and industrial policy coordination" (cf. Schmid/Buhr 2015: 333f).

Table 1
Overview of Germany[1]

Indicator	Germany	EU28
Form of state	federal democratic republic	
State organisation	federal	
Party system	multi-party system	
Electoral system	proportional representation	
EU member since	1 January 1958	
Inhabitants/km²	2,226.6	116.7
Urbanisation (% of population)	75	74
Welfare state regime	conservative	
Income inequality (distribution quintile)	5.1	5.2
Social expenditure (% of GDP)	29	28.6
GDP per capita (PPS, Index: EU=100)	125	100
Growth rate (real GDP in comparison with previous year)	1.7	2.2
Budget deficit/surplus (% of GDP)	0.7	–2.4
Labour market productivity nominal per employee (Index: EU=100)	106.6	100
Harmonised unemployment rate	4.2	8.6
Trade union density (0–100)	18.13	
R&D total spending (% of GDP)	2.87	2.03
Proportion of people 20–24 years of age with at least upper secondary education (%)	77.1	82.7
Tertiary education in MINT subjects (per 1,000 graduates)	16.2	17.1
DESI (0–1; 1=digitalised society)	0.57	0.52
Proportion of regular internet users (16–74 years of age) in %	84	76
Internet penetration (% of households)	90	83
Proportion of households with broadband connection (%)	88	80
Proportion of companies with broadband connection (%)	96	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).

The digitalisation of the welfare state thus represents as much of a challenge as an opportunity to further develop the "German model" in the twenty-first century.

3. STATE OF DIGITALISATION

If one considers the most popular indicators and indices of digitalisation, the Federal Republic of Germany occupies a prominent place. Germany, ranked 25 worldwide, belongs to the expanded leading group with regard to connectivity (Akamai 2016). With an average IPv4 connection speed of 13.9 Mpbs, an increase of 37 per cent on the previous year, however, Germany clearly lags behind the leading states South Korea (29), Norway (21.3) and Sweden (20.6). Worldwide the average is 6.3 Mbps. Broadband coverage over 4 Mbps stands at 91 per cent (placed 15 worldwide and 10 in Europe). Here Germany still has room for improvement. Also with regard to the speeds of mobile internet connections, it needs to catch up, finding itself somewhere in the European middle with an average of 15.7 Mpbs. For comparison only: the United Kingdom stands at 27.9. Thus mobile internet connections, interestingly, are on average faster than landline connections and the average loading speed for page displays is better than in the case of landline connections by a factor of 0.8. There is room for development with regard to both broadband roll-out and expansion of mobile networks (Akamai 2016).

If one turns to digitalisation development including social and economic factors, Germany is among the European leaders. In the European Commission's Digital Economy and Society Index (DESI 2016)[2] Germany lies somewhere in the middle in ninth place although due to its rapid positive development in recent years in the areas of connectivity, human capital, internet usage and digitalisation of the economy it is among the EU leaders and is classified as "running ahead".[3]

A total of 98 per cent of German households have broadband connections and 84 per cent of Germans between 16 and 74 years of age regularly use the internet. There has been an increase in all areas of internet usage. In particular online shopping (82 per cent) is enormously popular. Sixty six per cent of Germans have basic internet skills. In the area of integration of digital technologies in the economy, Germany is in seventh place, but exhibits positive development in all areas. For example, 56 per cent of companies use electronic information exchange. Germany's strengths include the wide diffusion of digital competences among the population, the high number of internet users and their broad spectrum of activities (especially in social networking and online shopping). Also in relation to coverage of landline, mobile communications and satellite Germany exhibits high values.

It is only in the areas of e-government and integration of digital technologies in companies – for example, with regard to the use of social media by SMEs – that Germany is still in need of substantial development.

With the High-tech Strategy and the Digital Agenda 2014–2017, described in detail below, the German government plans to take advantage of the opportunities of digitalisation. In this context, the Digital Agenda is particularly broad-based, ranging from promotion of digital competences in the population ("digital knowledge society") through digital infrastructure (bill on facilitating the expansion of high-speed networks) and digital working (Industry 4.0, IT summit), digital integration (citizen dialogue) to digital administration (Digital Administration 2020, National E-government Strategy 2014).

4. HEALTH CARE POLICY

Germany was able to obtain its first experiences with the digitalisation of the health care system with the introduction of the electronic health care card, adopted in 2003 within the framework of health care reform (Law on the modernisation of statutory health insurance). It is the "supporting pillar of the e-health concept" in Germany (Wemmel 2015: 6). Actual implementation, however, planned for 2006, foundered on technical delays, incompatible schedules and difficulties reaching agreement among the consortium partners of the operating company Gematik (Gesellschaft für Telematikanwendungen der Gesundheitskarte mbH), which had been entrusted with implementing the health card. As things developed, in particular the Council of German Doctors blocked the electronic health card based on doubts about its practicability and data protection. Only in 2011, after changes to provisions on test procedures and a reduction in the range of functions were the first health cards issued. To date, the range of functionality has encompassed only the storage of master data and the functionality of the European Health Insurance Card (on the reverse side). In the future, additional emergency data, patient medical records and medication regimes are to be stored and secure communication between service providers can be enabled.

In order to enable these new functions, a number of conditions still have to be created. For example, medical practices, hospitals and pharmacies have to be linked to the telematic infrastructure via so-called connectors and the different IT systems made compatible with one another so that health data can be retrieved across devices. The Law on secure digital communication and applications in the health care system (E-health act), which came into force on 1 January 2016, establishes a schedule for the creation of these conditions and lays down when the new functions are supposed to be enabled, step by step. The law also creates the regulatory

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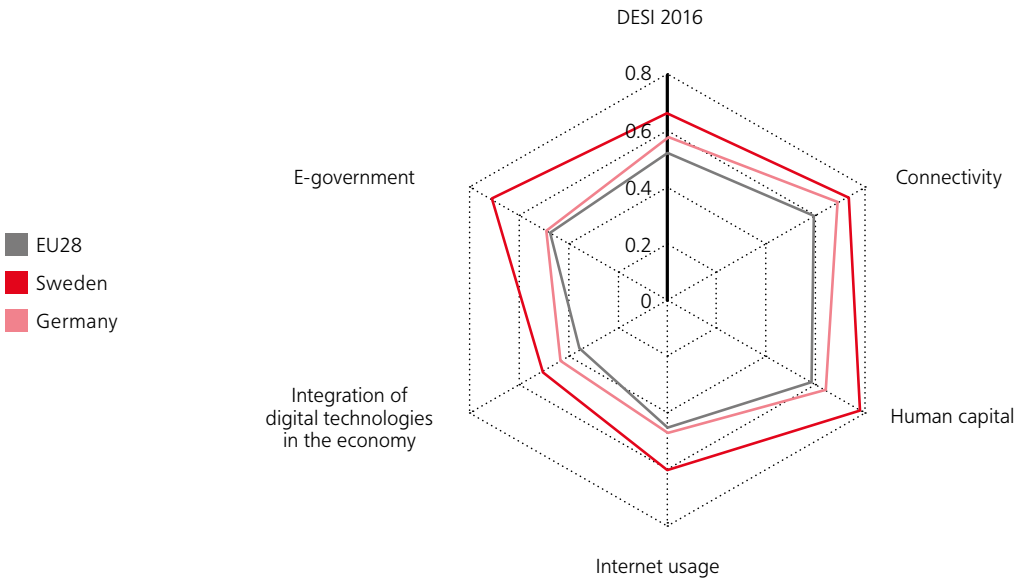
2 DESI is an index composed of five dimensions, which surveys the development of EU member states towards a digital society. Developed by the European Commission (DG CNECT) the index encompasses connectivity, human capital, internet usage, integration of digital technologies in the economy and digital 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 Auch der Networked Readiness Index sieht Deutschland auf einem eher (im europäischen Vergleich) mittleren Platz 16/139 im Jahr 2016 (vgl. Baller et al. 2016: 16). Im Standortindex DIGITAL 2015 liegt Deutschland ebenfalls mit Platz sechs von zehn im Mittelfeld (vgl. BMWi 2015: 8).

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



Source: Digital Economy and Society Index 2016.

framework for making it possible to introduce online video consultations and other new applications into ambulatory health care.

The E-health law is, for its part, embedded in a larger Health Ministry initiative proclaimed in 2010 in connection with the Ministry's IT summit process. The aim of the initiative is to identify barriers to the diffusion of telemedicine applications and measures to eliminate them. "The main results so far are the National Telemedicine Portal, a list of criteria for future projects and the planning study on interoperability, whose main elements have been included in the E-health law" (BMG 2016). In parallel with this the Ministry for Education and Research, within the framework of the Digital Agenda on promoting innovation, is supporting health care projects, such as big-data centres and a programme to promote medical IT.

In Germany, the digitalisation of the health care system is still in its infancy. While individual actors are certainly implementing digital technologies, their networking, which is a key criterion of a "Health Care 4.0", has made little headway to date. Furthermore, perceptions and expectations concerning how digitalisation is to be approached are still relatively at odds. The Health Ministry regards digitalisation in the health care system first and foremost as an instrument of efficiency gains and cost savings, as well as for preventing overtreatment and ensuring more patient safety. By contrast, a new perspective is gaining ground: for example, a study by consultancy firm Deloitte goes one step further and describes the German health care system as a "billion euro market on hold" (Gentner et al. 2014: 4).

5. LABOUR MARKET POLICY

The number of workers in Germany categorised as ICT specialists, at 3.7 per cent of the workforce, is in line with the EU average (EC EDPR 2016). However, in recent years in Germany the number of jobs for computer specialists has increased substantially. Employment subject to social security contributions ("proper jobs") has enjoyed particular growth (BA 2015). Demand is enormous and the Federal Employment Agency has announced a labour shortage among graduate ICT specialists and software developers. Statistically speaking, IT specialists in Germany are a young occupational group with a low proportion of women and excellent prospects in all branches of the economy.

According to a study by the Federal Ministry for Labour and Social Affairs (BMAS) 12 per cent of jobs in Germany have a high probability of falling prey to automisation (BMAS 2015). However, the authors of the study do not believe that total employment is necessarily under threat because change will bring new activities and occupations in its wake, although, generally speaking, they will call for higher qualifications than those they will replace. Jobs for the low qualified and low earners are thus more likely to be hit (BMAS 2015). Hitherto, workforce shifts between sectors and occupations have been greater than changes in total employment: Industry 4.0 has so far had only moderate effects on labour demand in Germany (BA 2015).

The already-mentioned Digital Agenda 2015–2017 takes a broader view of Industry 4.0 and its consequences. It also explicitly addresses digitalisation and its possibilities as an engine of employment. The German debate on Industry 4.0 thus encompasses much more than technological possibilities: the Federal Ministry of Labour and Social Affairs (BMAS) has turned its attention to employment and employees and

is focussing on people. To this end a broader – part public, part specialised – dialogue has been launched, centred primarily on coming up with new guidelines on "decent jobs" and proactively shaping the rules of the game for the future world of work. The basis for this is the green paper "Work 4.0", presented in April 2015 by federal minister Andrea Nahles (SPD). In it concrete guidelines are formulated that are being discussed with the involvement of experts from business, associations, trade unions, companies, the social partners and, last but not least, civil society. The dialogue is slated to reach a conclusion at the end of 2016 with a white paper "Work 4.0", formulating answers to the key questions of the green paper and making clear government actions and intentions. Alongside the government initiative there are a number of trade union initiatives. For example, IG Metall has established an advisory board "The Future of Work" with 27 experts from the metal and electrical sector, politics and academia. As a practical accompaniment to political initiatives, the advisory board is to identify ways in which employers and employees can benefit from Industry 4.0 and digitalisation (cf. IG Metall 2015). IG Metall has also set up a website "FairCrowdWork Watch" (http://www.faircrowdwork.org), on which so-called "crowdworkers" can assess their working conditions, exchange views and make use of the trade union's legal advice. This represents a trade union attempt to organise otherwise atomised "freelance" workers (cf. Degryse 2016). The United Services Union ver.di has also taken up the issue and has organised an advice platform for cloudworkers (http://www.ich-bin-mehr-wert.de/support/cloudworking), besides a number of conferences. The German Trade Union Confederation, the DGB, has made a number of demands with regard to the white paper, pointing among other things to the need to expand occupational further training. It also calls for measures to reform enterprise codetermination and on the integration of older workers and immigrants, as well as commitments in relation to labour market research, monitoring of "rationalisation" processes and technology impact assessment (DGB 2016). At the same time, the employers' organisations the BDA and the BDI emphasise what they see as the benefits of "flexibilisation" and subcontracting for employers and employees alike and warn of the alleged constricting influence of the trade unions (cf. Degryse 2016).

6. INNOVATION POLICY

The tasks of innovation policy are distributed over a number of levels (vertically) and various ministries (horizontally). At the national level, competences lie above all with the Ministries of Education and Research (BMBF) and of Economic Affairs and Energy (BMWi). Other ministries with their respective research institutes and agencies (for example, the Ministry of Food, Agriculture and Consumer Protection, the Ministry of the Environment, Nature Conservation and Nuclear Safety, the Ministry of Health and the Defence Ministry) are also involved. In 2015, a total of 14.9 billion euros in government spending were set aide for innovation measures, rising to 17.6 billion in 2017. The focus of activities here is the digital transformation. The skills needed to cope with and shape digital technologies are in future to be passed on at all stages of education and training, which is also intended to boost occupational training.

In contrast to other countries, Germany has no central institution – for example, an innovation agency – for the coordination of innovation policy. In order at least to better coordinate the abovementioned ministries, in 2006 the federal government introduced the High-tech Strategy (HTS), which was revised in 2010 and 2014. In contrast to previous innovation policies, the HTS is not intended to promote only individual technologies, but also to address social needs for cleaner energy, good and efficient health care provision, sustainable mobility, secure communications and Germany's future competitiveness (for example, Industry 4.0). The HTS will thus pursue a more mission- and demand-oriented approach than the previous policy and expand into a comprehensive, inter-ministerial innovation strategy dealing with both technological and social innovations (Buhr 2016).

With its Digital Agenda 2014–2017 the federal government, as already mentioned, now attaches greater importance to the opportunities and challenges accompanying the digital transformation (EFI 2016). The background to the Digital Agenda at national level was above all the commission of inquiry on the internet and the digital society (2010–2013), which made recommendations on further policy development in its closing report. The Digital Agenda formulates "principles" of "digital policy" from which development opportunities in individual policy areas are derived (digital infrastructure, digital world, the economy, public administration, digital participation, education, European and international development). The Agenda is being steered under the joint auspices of the Ministry of the Interior, the Ministry of Transport and Digital Infrastructure and the Ministry of Economic Affairs and Energy. The very involvement of three lead ministries hampers coordination and so the federal government has established a Digital Agenda steering committee to identify new developments at an early stage on a cross-departmental basis and to bring them into discussions. It comprises the relevant state secretaries of the three ministries concerned. The steering committee is to integrate the other federal authorities responsible for implementation in the management and further development of the Digital Agenda. In spring 2016, the Ministry of Economic Affairs presented the "Digital Strategy 2025", which is linked to the Digital Agenda. The "Digital Strategy 2025" is further specified in the Digitalisation Action

Programme, which lays out and prioritises tasks. Consistent use of digitalisation as an opportunity to modernise the welfare state is as yet not evident in the Digital Agenda and in the composition of the steering committee.

7. SUMMARY

Germany is developing into a digital society. Both at the technological and the social and economic levels further efforts in this direction are necessary, however. With the High-tech Strategy and the Digital Agenda Germany has established two programmes aimed at taking advantage of the opportunities of digitalisation and minimising the risks. In particular the Digital Agenda has set its sights on a broad promotion of human capital in the digital knowledge society, the expansion of digital infrastructure, the promotion of digital work and the enhanced deployment of e-government and digital administration. Above all the non-supply-side-oriented measures to promote broad-based social innovation are highly promising.

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