

Chapter 11

Huawei in Europe: strategic integration of local capabilities in a global production network

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1. Introduction

Chinese outward foreign direct investment (outward FDI) started only in the late 1990s but has experienced very dynamic growth and diversification since then. Initially, Chinese firms focused on investments in emerging economies where they sought markets and natural resources, with the aim of providing a secure supply of the required raw materials as well as sales opportunities for the country's explosively growing industries. Within only a few years Chinese outward FDI started to diversify towards the developed economies of Europe and the United States as these regions offered not only mature markets for Chinese products but also capabilities that Chinese firms lack necessary to pursue an upgrading strategy. Advanced technologies, managerial knowledge and distribution networks became the focus of Chinese outward FDI. Chinese firms are also increasingly investing in semi-peripheral regions, such as central and eastern Europe (CEE), for example, to take advantage of relatively low labour costs, skilled workforce, developed manufacturing capabilities and market potential.

In this chapter we analyse the European operations of Huawei, a Chinese telecommunications equipment manufacturer. The case of Huawei demonstrates the complex ways in which Europe has so far been affected by Chinese high-tech outward FDI as the region has been integrated in the company's global production network (Henderson *et al.* 2002). Since its initial investment in Europe in 2000, Huawei has integrated 18 European countries, 16 of which are EU members, into its global production network through various investments and business ties. Using developed local capabilities in particular locations – ranging from R&D, university ties and standardisation initiatives to management knowledge and manufacturing and distribution networks – Huawei has built up a regional network that supports its entire global production network in research, manufacturing and distribution.

The goal of this analysis is to further develop an understanding of high-tech investments through Chinese outward FDI and enable a better assessment of their impact on Europe's economic and social development. The global production network approach (Hess and Coe 2006; Coe *et al.* 2008) shows that there is a dialectical relationship between global and local factors, and multinational companies have to take local conditions into account. However, the local impact of multinational companies' investments on the social level – especially in terms of labour conditions and employment relations – have significant ramifications. These analyses can thus provide a starting point to formulate suggestions for national and European regulations aimed at stabilising and further developing the 'European social model'.

A descriptive approach was used to identify the most important characteristics of Huawei's European operations, its cooperation with host country institutions, relations with competitors and employment relations in its European affiliates. These issues are examined here by relying on firm-level data available from the Amadeus Database, qualitative data from desk research and expert interviews with current and former Huawei employees, competitors and other experts dealing with the telecommunications sector in Europe.

The chapter reveals the complex and dynamic global production network that Huawei has established in Europe in recent years. The company has utilised local resources while optimising its pay structure. It locates functions in lower-cost markets when possible, while paying wages competitive on local labour markets as necessary. While Western European operations focus on R&D, Polish activities are focused on sales and marketing for CEE and Nordic countries, the Hungarian operations specialise in manufacturing and logistics (through EMS providers) and the Romanian affiliates specialise in technical support for European customers.

This allows the company to access engineering expertise in Romania and other central and eastern European countries at a fraction of the cost in France or Germany. Upgrading processes become visible in the analysis of Huawei's global production network strategy as several European locations have been developed in recent years. The company is also pursuing an active role in the development of local labour markets through various talent programmes. The company's culture includes pressure for hard work and a rather negative position towards unions.

Huawei's global production network strategy is linked to its business model. It is globalising certain company standards, such as a high customer orientation in its business model and labour-cost advantages of its global production network. Adding to its cost advantage, Huawei also benefits from financing through various Chinese sources, e.g. the Bank of China, at low interest rates. The ability to offer network operators competitive technological solutions at low cost underpins Huawei's growing market share in telecommunications equipment.

The chapter is organised as follows. The next section analyses Huawei's expansion in telecommunication equipment in Europe through greenfield investments, supplier networks and customer relations. Section 3 provides information on its business strategy in the mobile phone business. Section 4 focuses in more detail on activities in individual countries across the EU. Finally, Section 5 provides an overview of working conditions and employment relations in Huawei's European operations.

2. Huawei's European expansion: telecommunications equipment

Huawei is a privately owned company founded in 1987 in Shenzhen, China. While the company is not publicly traded it has become increasingly transparent in recent years. However, financial details are not verifiable and have not been available for long. Huawei designs and manufactures telecommunication carrier class equipment, smartphones

and data and storage solutions for business customers. Currently, Huawei is considered the largest telecommunications equipment supplier worldwide, with revenues of more than USD 60 billion in 2015.¹ It generates two-thirds of its revenues outside China and Europe is its largest overseas market (Osawa and Zekaria 2014). The company states that it provides equipment to 37 of the world's biggest 50 operators. Around 50 per cent of the equipment in the European market for 4G networks is provided by Huawei (Yoshida 2015). In contrast, the United States has effectively blocked Huawei from its network infrastructure market, citing concerns that its technology could be used to spy on Americans.

Being a latecomer from an emerging market, Huawei's expansion in the European market seemed unlikely. The European market for telecommunications equipment is one of the most sophisticated worldwide. Investment decisions by network operators are not only based on the technical specifications of equipment but also entail long-term and trust-based relations with the supplier. To develop both capabilities Huawei took a route through emerging markets in Africa and Latin America, building up its technological prowess and developing a reputation as a trustworthy equipment supplier able to deliver on agreed contracts (Pawlicki 2015). Huawei prides itself on its strong orientation towards the needs of its customers, especially in providing quick technical support through a dense network of local offices, as well as by incorporating customer requirements in its development process (Ahrens 2013; Pawlicki 2017). In central and eastern Europe, Huawei has 25 offices, large and small, providing consumer support, which differentiates it from competitors such as Ericsson and Nokia.

Providing favourable credit lines for cash-strapped network operators is another pillar of the company's business model. The Chinese government's policy of supporting the internationalisation of Chinese companies provides them with huge credit lines that enables their foreign investment as well as support for their future customers, especially in emerging markets (in general see: Gill and Rilly 2007; for telecoms see: Low 2007). In Europe Huawei used the same strategy, entering the European market through relations with smaller network operators in small markets, providing favourable credit lines and establishing a dense customer support network.

Huawei won its first major contract in Europe with the Dutch mobile operator Telfort in 2004. In 2005 Huawei was selected as one of the strategic suppliers for British Telecom's twenty-first century network programme. While Huawei cooperated with BT and industry leaders on the development and setting of new standards² the company's contribution was very limited. However, this was the first time that Huawei supplied a first-tier network carrier, boosting the company's market reputation. By the end of 2007 Huawei was able to secure contracts with all major network operators in Europe and in 2014 Vodafone announced that it had awarded Huawei the contract to upgrade its networks in 15 countries in Europe and Africa.

1. However, the claim is sometimes disputed by experts who point out that Huawei's revenues are not only derived from network equipment operations but also from its terminal device business.
2. Standard setting is based on close cooperation between the particular vendors and as Huawei was one of the strategic partners in this process it enabled the company to build up capabilities in next-generation technologies, enabling Huawei to move away from its position as a technology follower and to become one of the global leaders in next-generation network technology.

In central and eastern Europe Huawei started by carrying out single projects and without officially establishing offices, which were set up only later when business in a given country became more mature and the company was able to secure more projects and clients (Huawei Warsaw office interview, 05.04.2016). In July 2005, Huawei won its first contract worth 9.5 million zlotys (2.37 million euros) for Telefonía Dialog, a small Polish operator. Its next big contract of 150 million euros was with P4, Play network operator, to provide complete UMTS solutions. Play was a start-up which experienced financial constraints. With the help of China Development Bank Huawei was able to secure funding for equipment purchase and agreed to staggered payments (interviews 13.09.16 and 3.10.16; Pivotl 2008). In 2016 Huawei signed a strategic partnership with P4 for 10 years that encompasses infrastructure projects, development of the 4.5G network, construction of a wireless network, a transmission network, an IP network and provision of mobile devices (Telepolis 2016). Currently, Huawei is cooperating with the key telecommunication operators (T-Mobile, Orange, Polkomtel, P4) active in Poland in the area of transmission networks and access devices.

The favourable credit conditions offered by Chinese banks played a major role in Huawei's Polish expansion – operator Play P4, for instance, paid only after several years.³ Favourable financing gives Huawei an edge over competitors.⁴ Initially, Huawei's business model in central and eastern Europe was firmly based on price competition, offering similar equipment for 30 per cent lower prices, but at least since 2009 the price difference between Huawei and incumbents has been smaller, at around only 3–5 per cent (Rabij 2009; interview with a Huawei employee 3 October 2016).

A 2011 investigation by the European Commission found evidence of 'significant Chinese government support' for Huawei and ZTE, including 'massive' lines of credit from state controlled banks.⁵ A threat of import tariffs was dropped in a 2014 deal with the Chinese government that included measures aimed at helping Ericsson and Nokia to secure market share in the Chinese market. That, however, failed as Ericsson saw its market share in China drop from 26.5 per cent in 2011 to only 6.9 per cent in 2016.⁶

3. Cracking the market for mobile phones

Huawei entered the market for mobile phones and smartphones relatively late. Although the company had been designing and manufacturing mobile phones for several years (Osawa and Kim 2014), it entered the market for smartphones as a brand name only in 2010. Since then Huawei has been able to grow in this market very dynamically and was the third biggest smartphone vendor worldwide in 2016.

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3. Play P4 received credit in the years 2006–2008 for building its infrastructure. The loan was paid off in 2014. <https://www.wprost.pl/134030/W-kieszeni-u-Chinczyka>, <http://www.gsmmaniak.pl/269042/play-splata-kredytu/>, <http://www.telko.in/wreszcie-sa-kto-chinczycy>
 4. Interview with a Huawei employee, 11 June 2016.
 5. <http://www.wsj.com/articles/SB10001424052748703960804576120012288591074>
 6. <http://www.wsj.com/articles/eu-bid-to-protect-telecom-companies-from-chinese-rivals-floundering-1470388349>

Huawei's growth on the Polish market illustrates the rapid expansion. Huawei started selling its phones, smartphones and tablets on the Polish market in 2011. As of April 2016, Huawei's share of the Polish market for smartphones amounted to 20 per cent.⁷ According to a report by GfK of September 2015 Huawei's Polish smartphone market share amounted to 7.7 per cent in terms of quantity and 7.3 per cent in terms of value, an impressive sevenfold increase over 2014 (Piechocki 2015). In 2015 Huawei sold 1 million smartphones on the Polish market, while in the central and eastern European and Nordic regions sales in the same period exceeded 3 million, which makes Poland a key market in the region for Huawei's smartphones (Piechocki 2015). Currently Huawei enjoys second position (17 per cent of the market in terms of value) on the smartphone market in Poland after Samsung, which has 33 per cent of the market, but ahead of Sony, LG and Apple (Media Marketing Polska 2016: 61; Wyborcza Biz 2016). The strong push for the consumer market is in line with the Huawei worldwide strategy to obtain a 25 per cent share of the global market by 2021 (Kosinski 2016).

At the end of 2016, Polish Orange introduced Huawei Nova, an exclusive offer resulting from cooperation between Huawei and Orange (Ormaniec 2016). Huawei's smartphones first are sold on the market and only later are sold by operators. For example, Orange was the exclusive seller of the P9 Plus till the end of June 2016, while the smartphone was on the market from the last day of May 2016 (Pura 2016).

4. Huawei's operations in Europe

Of Huawei's 150,000 employees worldwide about 45 per cent, or 67,500 people, work in R&D (Huawei 2015). The telecom equipment specialist was one of the first high-tech Chinese companies to look abroad for markets and started as early as the late 1990s to set up sales offices on the African continent and provide telecommunications equipment. By 2010 Huawei and ZTE, the second big Chinese telecom equipment supplier, were active in 50 African countries (Pawlicki 2015).

Huawei's first investment in the EU was the establishment in 2000 of an R&D centre in Kista, Sweden, *the* European region for mobile technology development. In central and eastern Europe, Huawei established its first operations in Romania (2003), Poland (2004) and Hungary, Czechia and Latvia (2005). Huawei developed a complex and extensive part of its global production network in Europe, comprising R&D, manufacturing, logistics and management operations. Besides its numerous R&D centres Huawei established two regional technical assistance centres, 10 training centres, five local network operation centres, 41 sales branches, two logistics centres and 46 country-level spare parts centres in Europe by 2014.⁸ Overall Huawei employed about 9,000 people in the EU in 2015 (see Table 1). It also operates in Ukraine (94 employees in 2015) and in Russia (331 employees in 2015, but falling in 2016 due to a disinvestment). These operations provide functions that are focused on Europe

7. Huawei Warsaw office interview, 5 April 2016.

8. Roland Huempfer, Huawei in Europe, November 2014, company presentation available at <http://www.profinrg.nl/wp-content/uploads/2014/04/Huawei-in-Europe-Roland.pdf>

alone, as well as globally and strategically important services, especially for Huawei's technology and mobile standard development projects.

The geography of Huawei's European activities suggests a specific division of labour along functional lines of research, sales and marketing, technical support, manufacturing and logistics. The last three functional areas are located in particular in CEE countries, while R&D related activities are spread around western Europe – the only research centre in central and eastern Europe is located outside the EU, in Russia. The company's sales and distribution activities for this region operate out of its regional headquarters, Warsaw and Düsseldorf. Poland specialises in sales and marketing for CEE and Nordic countries. Hungary focuses on manufacturing (through EMS providers) and logistics (European Supply Centre). Finally, Romania is a substantial hub that provides technical support for deployment services around Europe. It is designated as Huawei's Global Service Centre, financial centre and Global Network Operation Centre. The division of labour is reflected in the employment and turnover figures presented in Table 1.

Table 1 Huawei: 2015 employment and operating revenue (turnover)

	Employment	Turnover '000 €
Germany	1929	1,319,509
Romania	1101	201,331
UK	1007	951,558
Spain*	893	530,990
Italy	664	899,176
Netherlands	650	
France	643	507,206
Poland*	425	258,818
Sweden	396	307,588
Czechia	375	155,293
Denmark	253	139,353
Hungary	225	220,514
Norway	150	120,365
Belgium	113	263,093
Greece	100	109,063
Finland	88	99,798
Portugal	76	117,616
Slovakia	75	45,686
Austria**	74	43,260
Ireland*	53	40,525

Notes: * 2014; ** 2014 turnover, 2013 employment.

Source: Amadeus Database; information on Huawei's website was used for the Netherlands.⁹

This division of labour seems to be linked, at least partially, to existent local capabilities, where Huawei plays the role of a follower by integrating already existing local capabilities into its global production network. This strategy can be linked to

9. <http://www.huawei.com/en/news/2015/12/Huawei%20Netherlands%20celebrates%2010th%20anniversary%20and%20brings%20100%20Dutch%20students%20to%20China%20until%202020>

Huawei's position as latecomer looking for opportunities to both further upgrade its technological capabilities and take advantage of existing industrial and managerial capabilities developed in previous development cycles.

4.1 Research focus: Western Europe

The research-oriented part of Huawei's global production network comprises 18 R&D centres in Europe, making it the region with the most Huawei R&D centres worldwide. Although these European R&D centres are quite small compared to the company's huge centres in China, they are quite important for Huawei's R&D capabilities as they often focus on fundamental research and highly innovative projects. Huawei is also very well integrated into the European institutions and organisations working on the development of future standards for mobile communications.

Already in 2000 Huawei opened its first European R&D centre in Kista, Sweden, the location of Ericsson's headquarters and a region that has become a global centre for telecommunications technology research and development. In the following 16 years Huawei has expanded its research activities in Europe considerably, establishing 18 R&D centres in 11 western European countries and Russia, employing around 1,570 researchers¹⁰ (for detailed information on Huawei's European R&D strategy see Chapter 1 in this volume). In addition and in line with Huawei's strategy of customer orientation the company operates 19 joint innovation centres in Europe to sustain cooperation with its main customers, such as Vodafone or British Telecom, focusing in particular on joint application development.

For comparison, Huawei employs the largest numbers of engineers in China and India, at huge R&D campuses. The company's main R&D campus in Shenzhen, where its headquarters are also located, houses 40,000 people. Huawei's only Indian R&D centre in Bangalore employs around 5,000 engineers. With overall around 1,570 employees the 18 European R&D centres are very small – ranging from 10 employees in Paris, to 350 in Kista and 500 in Moscow. The size of Huawei's European R&D centres suggests that they are research oriented, developing and acquiring new knowledge, with the help of a small number of highly trained specialists working on leading-edge technologies and often focusing on fundamental research. Product development arising from such research results requires various functions and departments and a massive number of employees.

Huawei developed the research-oriented part of its global production network in Europe in three movements. Its first movement into Europe, the Kista R&D centre, originally employed 70 people but has been developed over the years and now employs more than 350 engineers and 100 people working in the marketing department. Between 2008 and 2009 R&D centres in Brussels, Copenhagen, Bonn, Munich, Milan and Gothenburg were opened. Since 2011 Huawei has opened almost two R&D centres per year in Europe, in Nürnberg, Ipswich, Helsinki, Banbury, Dublin, Sophia-Antipolis

10. <https://www.huawei.eu/research-and-innovation>, checked 17 December 2016.

and Bristol. Huawei's biggest European operations are in Moscow, Russia, where the company expanded employment to around 500 software engineers in 2013. All but one of its European R&D centres are greenfield investments. With researchers and engineers working on wireless, wireline and optical projects for network equipment and mobile phones the 18 European R&D units take part in all major technology fields and products of the company.

Not only has Huawei established important research-focused operations in Europe but it has also upgraded some of them substantially, developing their responsibilities and role in its global production network. Huawei developed its Munich location to become the European Research Centre and Central Research Institute by expanding the centre's research focus, especially towards 5G mobile telecommunication technologies, with fundamental and applied research projects. Additionally, Munich has become the regional management centre for Huawei's European research operations. Only three years after establishing its Milan operations global R&D activities in microwave and optoelectronics have been located here, as well as service, marketing and sales support, making the centre a Microwave Competence Centre and the first competence centre of the company outside China.

Through its research activities in Europe, Huawei has built up a strong presence in the development of future mobile telecommunications standards that are heavily based in and driven by European institutions and networks. The company was able to become a central actor in these processes, which will allow it to develop first-mover advantages on future markets for mobile technologies (see Chapter 1).

With each of its research-oriented activities Huawei has been able to successfully embed itself in an already developed specialised local innovation system comprising education and research institutions, labour markets, competing companies and supplier networks, as well as policy-based support structures. This has allowed Huawei relatively easy access to already existing capabilities in the form of the skilled manpower, institutions and support necessary for the company in its dynamic development.

4.2 Technical support focus: Romania

Cost advantage played a major role in Huawei's rise to become a major telecom equipment vendor in Europe. Huawei obtains such advantage by serving its European clients from its regional hub in Romania, where in 2007 it created a centre specialising in technical support for deployment services and network monitoring and maintenance. The company established a Global Service Centre and a Global Network Operation Centre in Bucharest and it plans to open a second global support centre in Timisoara, Romania's ITC hub. More specifically, the Romanian centres solve opened technical-support cases, offer parameter setups, software upgrades and troubleshooting. They cover a range of activities from mobile to IP and fixed access.

Huawei employs (as of 2016) 1,100 workers in Romania, mostly engineers. They are paid wages that are competitive on the Romanian labour market.¹¹ These employees are often posted to other European countries to serve clients there directly. The posting periods last 1–6 months during which the employees are paid the Romanian wage and a daily allowance (35 euros in 2016). This makes them substantively cheaper than engineers employed directly in Western Europe. In this way, Huawei is able to hire fewer people in higher-cost locations and do as much technical support as possible by using the Romanian workforce. Romania is particularly well suited as a location to be exploited through this strategy as its education system has a good record of producing software engineering expertise (cf. Pawlicki 2012).

4.3 Sales and marketing focus: Poland

Huawei Poland was originally established to serve the local telecom equipment market. However, from 2008 the company started to concentrate its sales and marketing activities in Warsaw. In 2008 Huawei CEE & Nordic was established, making it the regional centre for central and eastern Europe and Scandinavia. Since 2004 Huawei's Polish office has grown from a small team to over 500 employees (as of 2016). Huawei's CEE & Nordic subsidiary is one of its regional centres, employing approximately 285 workers. According to one interviewee currently employed by Huawei CEE & Nordic the region is growing in terms of sales/revenue but not necessarily in terms of importance within Huawei's global structure. Huawei's operations in Warsaw have been upgraded in recent years, as the focus on sales-related functions – such as technical support engineers, sales and logistics – was increasingly broadened towards finance, administration and HR as the location was assigned control and management of the CEE & Nordic region; marketing and purchase functions were also transferred there by 2016.

Huawei provides research-dedicated IT solutions and offers programmes for students at Polish universities. Huawei was a supplier and consultant for the Poznań Supercomputer-Network centre and maintains the cooperation in the form of a joint research innovation centre that was inaugurated at the beginning of 2016.¹² Huawei has also carried out similar projects in Scandinavia and in the Balkans (Huawei website, 26.05.2015). Warsaw University of Technology and Poznań University of Technology are partners in Huawei's Authorized Information and Network Academy, a training programme aimed at improving students' skills in the latest information and telecommunication technologies. Huawei Poland also supports technical universities and students through its global 'Telecom Seeds for the Future' programme, which aims to provide top students with practical knowledge on ICT.

11. In 2016, the starting salary for an engineer was in the range of 500–600 euros, rising to 800–1000 euros for those with five or more years of experience and 1500–2000 euros after eight years of experience.

12. http://www.man.poznan.pl/online/en/articles/2786/Inauguracja_Centrum_Innowacji_PCSS-Huawei.html, accessed 27.12.2016.

4.4 Manufacturing and logistics focus: Hungary

Huawei serves all the top operators (including Telenor, Vodafone, Deutsche Telekom) in the country, as well as 70 per cent of Hungarians through their products and services. In 2009, it launched its European Supply Centre in Hungary. With enlarged warehouse capacity of 30,000 square meters, serving three thousand trucks each month, Huawei's Hungary-based supply centre is the second biggest operation of its kind in its global production network and serves as a production and logistics centre for 55 countries in Europe, North and West Africa, Russia, Central Asia and the Middle East. Huawei expanded the Supply Centre in 2011. According to Chinese diplomats, the creation of the logistics centre in Hungary shows that Chinese-funded enterprises were confident about Hungary and its investment environment, even after the global financial crisis and its impact on the country (Xinhua 2013).

The company has built up manufacturing and logistics capabilities throughout Hungary by relying on outsourcing to other companies. Electronics manufacturing service (EMS) companies Flextronics and Foxconn engage in manufacturing. DHL and Westlog take care of logistics. At Foxconn's Komárom and Flextronics's Pécs operations Huawei's telecom equipment is assembled, with almost all devices in the company's portfolio destined for markets in Europe, North and West Africa, Russia, Central Asia and the Middle East, including optical transmission units and wireless communication server products. DHL and Westlog operate Huawei's logistics centre in Biatorbágy, providing a complete service package including transportation and storage activities, packaging, customs services, road transportation and ocean freight forwarding of the products. Overall between 2500 and 2700 employees work at Huawei's suppliers in Hungary. In line with the EMS business model both permanent and temporary workers are employed.

Huawei's location choice can be related to Hungary's well developed supplier capabilities. Since the late 1990s Hungary has become an important manufacturing location for the electronics industry as EMS companies started to offshore their activities increasingly towards so-called low cost locations. EMS companies manufacture electronic products for brand name companies, such as Apple, HP, Huawei or Dell, providing manufacturing with many activities directly linked to manufacturing, such as engineering, parts purchasing and logistics as a service. In the past 20 years Hungary has experienced a dynamic upsurge in EMS activities followed by a stagnation, as China became the biggest manufacturing location for electronics, relegating Hungary and other locations – such as Mexico – to merely regional status (Lüthje *et al.* 2013).

Finally, similar to Poland, Huawei established a Laboratory and Academy at István Széchenyi University in Győr, which opened in 2016. The investment is of approximately 300,000 USD, Huawei provides education materials, makes presentations and has donated a supercomputer to the university. Since 2011 Huawei has invested 200 million HUF (around 730,000 USD) in Hungarian education. Students from Hungary are also participating in Huawei's 'Seeds for the Future' programme; some have also been hired by Huawei.

5. Management methods and employment relations

Huawei's management methods and control strategies at its Chinese R&D centres do not differ from those familiar in its Western competitors. Work organisation and employment relations seem to be in line with the 'global standard' set by companies from Silicon Valley: overtime, project-based work, formal and informal control and individualised labour relations that prevent the development of structures that would enable forms of collective representation, bargaining or action (Yu 2014).

Labour relations in the electronics industry are frequently characterised by problematic work organisation, as well as strained relations between management and workers. This holds true for both blue- and white-collar workers. Electronics manufacturing is characterised by inhumane working conditions and highly fragmented work organisation (for example, Chan and Pun 2010; SACOM 2010; Drahokoupil *et al.* 2016; for EMS in central and eastern Europe see also Maciejewska 2012; Lüthje *et al.* 2013). However, white-collar workers face a quite different reality in the sector, given their high level of education and expertise and associated bargaining power. At the same time, the increasingly internationalised character of innovation work also has detrimental effects on the work and labour relations of both engineers and technicians. Standardisation and automation of work, international teams, international competition and cross-cultural frictions are the main problems they have to face (Boes and Kämpf 2011; Feuerstein 2013; Kämpf 2008; Mayer-Ahuja 2011; Pawlicki 2014). In general, the labour conditions of white-collar workers in the electronics industry seem to be driven heavily by the situation in Silicon Valley, where highly individualised relations between management and engineers has developed, further amplified by the very competitive relations within the engineering workforce.

Huawei seems to have developed a locally specific company culture in China that is distinct from other global electronics companies. It has established a culture based on 'plain living and hard work' that requires employees to endure high workloads and continuous overtime and underlines their important role in China's economic development. Yu (2014) is able to document this by referencing the so-called 'fighter's contract' through which employees pledge to work overtime voluntarily, give up all paid annual leave and renounce maternity/paternity leave or marital leave.

Huawei's labour relations in China share many similarities with the worldwide situation of engineers in the electronics industry. Very individualised, fragmented and competitive groups of highly skilled engineers that do not develop an understanding of their collective interest. This is coupled with possible considerable financial gains through stock options. Such a model has been the quasi-standard that Silicon Valley companies have exported throughout the world. Huawei's model is different in two very important aspects. First, the lack of transparency that has been a central feature of the company extends towards the relations between management and engineers. The lack of transparency in Huawei's stock option programme is very different from those of US-based high-tech companies, where open communication about stock option programmes is the basis of market-oriented incentive schemes for engineers. Huawei not only fosters a competitive culture between its employees, but also encourages direct

dependence and control. Second, the nationalistic undertones of Huawei's company culture are generally not found, at least openly, in other global electronics companies.

Information is scarce on labour relations at Huawei's European R&D operations. Müller (2014) reports that there are no works councils and no collective agreements at Huawei's R&D centres in Germany (see also Fehr 2014). As all but one of Huawei's and ZTE's European R&D centres are greenfield investments, they do not have to take into account already established labour relations, but only have to abide by the local legal framework. Interview data support this, while sketching an even more problematic situation at the suppliers. There are strong indications that employees who tried to organise works councils at Huawei's German operations were laid off on various grounds.

Research and engineering staff at Huawei's West European R&D operations report a complex picture with regard to working conditions.¹³ Technical professionals at Huawei's European R&D centres are relatively well paid and are offered the chance to work in a highly dynamic environment with leading-edge technologies. However, working hours and work pressure are high, while there seems to be little ability to influence decisions regarding technical aspects of projects. There are also indications of a division between local staff and Chinese employees at Huawei's R&D centres.

In central and eastern Europe, Huawei has implemented a centralised management structure, with varying reliance on Chinese workers. A trade union (OS ZPTNS) operates in Huawei Technologies Czech, where they organize about a third of Czech white-collar employees (technical support for network equipment) and negotiate a collective agreement, but the Czech affiliate represents an exception. In general, working conditions for Huawei's white-collar workers seem to correspond to the standards in the industry. It is the hierarchical management style that makes the company different from its competitors.

The local and Chinese staff seem to work in separate worlds. In Romania, where 22 per cent of employees were Chinese in 2014, key management positions in local operations were held by Chinese employees. A Romanian programme manager worked with a Chinese 'ghost' who reported periodically to headquarters in Shenzhen. Romanian employees found it difficult to engage with their Chinese colleagues, who worked as a separate group. In Hungary, 60 per cent of employees are Hungarian and the rest are Chinese nationals (working there with work permits). In Poland, 60–65 per cent of employees in Huawei's CEE & Nordic subsidiary are Polish and the rest are Chinese nationals. Following the centralised model, Huawei CEE & Nordic controls and manages all country offices in the two regions, with all projects having to be approved by the Warsaw centre. Serving the local market, the Huawei Poland subsidiary employs predominantly Polish workers (84 per cent) (Huawei Warsaw office interview, 05.04.2016). The general feeling among employees within Huawei Poland is

13. The data used in this section were compiled from extensive searches on employer rating websites. While such data has to be used very cautiously – comments and ratings in the internet tend to produce a highly polarised picture – currently there is no possibility to generate data on this topic in another way, as both employees as well as Huawei are not very supportive of academic research on the topics of working conditions and employment relations.

that there are in fact two companies, one comprising Polish employees and the other Chinese ones. An example is that Chinese staff have meetings after 6 pm, when the Polish employees have left the office.

Decisions are typically made by Chinese managers, who may seek the opinions of local staff. As suggested by employees interviewed in central and eastern Europe, management style, rather than working conditions, make Huawei distinct from other IT multinationals. The high share of Chinese workers in the Hungarian subsidiary reinforces the importation of practices from headquarters in China. Managers are mostly Chinese and meetings sometimes take place in the Chinese language, which is not favourable for local workers. Hierarchy in the decision-making process, communication and manners are the aspects with regard to which employees can feel the difference between Western and Chinese business cultures the most. The company organises training to introduce Chinese culture to non-Chinese employees, Chinese language courses are offered for local workers and Chinese colleagues get some coaching, too, before leaving for a European destination. However, there is no cross-cultural training although – according to interviews – it would be necessary for new entrants.

Decisions about working conditions and pay are also highly centralised, but they are likely to involve also local managers. In Hungary, they are made by a team of five managers, including the managing director and HR manager; in other words, by both Chinese and Hungarian managers. They evaluate all employees every six months and decide on bonuses, wage increases and promotions. Their decision is then submitted to the regional headquarters for approval. In Romania, the HR department in the Chinese headquarters has a final decision on all job candidates.

Local employees in central and eastern Europe are normally hired directly on standard contracts. Agency workers are used in Czechia where it is a common practice in the industry. According to a Czech trade union leader, working conditions for agency workers, which represent about 50 per cent of Huawei's workforce in the country, are identical to workers employed directly. Trade unions organize also the agency workers, who are also covered by the collective agreement. Some Chinese employees rely on a combination of a local employment contracts (typically 1,000 euros in Hungary and Poland) and separate work contracts in China. Chinese employees who come to work for a short time (for example, engineers working on specific projects) enter on business or tourist visas (depending on their length of stay). Chinese workers are replaced regularly, after two or three years. In Hungary, which hosts a significant Chinese minority of about 20,000, there are some local Chinese workers.

Working conditions and pay for Huawei (white-collar) workers in central and eastern Europe broadly correspond to the standard in the industry and that of competitors, such as Ericsson. The main issue reported by Romanian employees was the unpaid overtime, a practice apparently common, especially during the first six months of employment, and extensive work time and travel.¹⁴ In Poland, the salaries of administrative staff are relatively lower than those at local competitors, while engineers and staff generating

14. Reported on an internet forum for Huawei employees (data collected by Aurelian Muntean and Elena Radu, December 2015). <http://www.undelucram.ro/forumhuaweitotuldespremediuldelucruinterviusalarium113>

income are remunerated relatively higher. There might be differences in conditions between Chinese and local staff. Local staff in Hungary, for instance, reported that Chinese colleagues often work overtime on weekdays and sometimes also work during the weekend, so they deserve higher salary grades.

Finally, there are some indications that Huawei's management is particularly hostile to unions, but the lack of unionisation is by no means exceptional in the sector in central and eastern Europe. In Czechia, where trade unions are active in some of the major telecommunication providers, employees started to organize as a reaction to excessive work time and violation of respective regulations. At the time, employees were also asked to sign a statement that they will not get involved in any civil activities. The first collective agreement was signed in December 2013. In 2017, trade union leadership perceived employment relations in Huawei positively and interpreted the initial dispute as a learning process on the side of the Chinese management. In contrast, establishing a trade union in Huawei seemed unthinkable to the interviewed Romanian engineers, who thought that there would be interest among the employees but management would resist.¹⁵ There are no trade unions or collective bargaining processes in Poland and Hungary. If disputes between Chinese and Polish/Hungarian staff occur the management appoints local employees, often graduates of Chinese Studies.

Conclusions

Huawei's global production network in Europe – that is, its own operations and its customer relations with network operators and suppliers in this region – are impressive. Huawei was able to integrate Europe in its global production network by establishing a complex division of labour between its various ever-expanding operations that show distinct signs of specialisation. Europe is the most important region for Huawei as it is not only an important market for its network, business and consumer products, but provides the company with highly trained workers for its R&D activities; stable and distinguished institutions for mobile technology standard development; as well as mature manufacturing infrastructure.

Huawei uses its global production network and business model to internationalise its own standards with only limited regard for local standards, especially when it comes to employment relations. The company has established a highly complex and dynamic global production network in Europe, drawing on existing local resources. Currently, there is a distinct division of labour along functional lines: R&D, engineering, marketing and sales, manufacturing and logistics. However, as upgrading occurs, these specialisations will possibly shift in the future. With its talent development programmes Huawei is not only developing technical personnel for its future customers but also specialists for its own strategic plans. While these initiatives are small and limited they can provide a further dynamic boost for the company's global production network development.

¹⁵ Trade unions are not common in the IT sector in Romania. However, the Timisoara IT Trade Union (SITT) represents more than 3,000 employees in Alcatel Lucent Romania, Accenture Managed Services Romania and Wipro Technologies.

With its global production network Huawei is facilitating the spread of the ‘Silicon Valley model’ of industrial organisation and employment relations, where polarised workforces are organised in fragmented value chains (Lüthje *et al.* 2013). One of the mainstays of this model is a rejection of positive and developed employment relations, based on employee representation and collective bargaining. As Huawei is mostly developing through greenfield investments, the company does not have to cope with existing company unions and/or works councils. However, as shown in the Czech case, the management is likely to accept local institutions, including collective bargaining, if enforced through collective action and underpinned by good regulation of employment relations.

Against the background of Huawei’s exploitation of high-quality local assets that are spatially ‘sticky’ (Pavitt 1999) and hence cannot be easily offshored and replicated in other localities, it needs to be questioned whether the respective regions are able to extract sufficient value from these activities. This question of value retention is not only relevant regarding Huawei’s or Chinese investments in Europe, but also more generally regarding companies in this region. However, with the influx of Chinese investors there seems to be a chance to put this question forward again and reformulate it for this new phase of globalisation, in which multinational companies from emerging markets are increasingly becoming investors in mature markets, such as Europe.

The value needs to be captured by raising social standards in depth and breadth, as well as their upward harmonisation across the EU. Value retention in the form of good work is supported by fully developed employment relations, which are supported by clear and firm regulation. A regulatory model based on this idea can not only provide a foundation for sustainable growth in Europe, but can also develop Europe into the leading export region for social standards, through the global production network.

To sustain its already crumbling social model and to try to develop it further Europe has to get a grip on how it wants to use its existing local resources as a lever to convince especially multinational companies that fully developed employment relations are one of the pillars of sustained economic development based on a high rate of innovation. Employees, both blue- and white-collar, that work in a stable environment with a high level of participation – both financially as well as organisationally – have a long-term motivation to develop ideas and suggestions that form the basis of innovation processes.

Finally, Huawei’s expansion underlines the EU’s failures with regard to increased technological competition. The goal of China’s integrated industry policy strategy is the upgrading of substantial parts of its industry, driving the current wave of outward FDI geared towards technology acquisition. While these investments are currently positive for locations in developed economies, they may lead to growing competitive pressures in the mid to long term as Chinese companies succeed in becoming technology leaders or at least fierce competitors beyond price competition. China’s integrated and complex industrial policy measures, the ‘Made in China 2025’ strategy in particular, thus puts substantial pressure on developed industrial countries (see Wübbecke *et al.* 2016). As a result it is becoming essential for Europe to quickly develop and put in place industrial

policies that help counter these challenges, while further developing employment relations.

Together with Chapter 1, this chapter shows how important Chinese telecommunication suppliers have become both in European markets as well as within the region's industrial structure. One of the main drivers of this development has been Europe's central role as a location for setting telecommunication standards. Standard-setting is also a focal strategy of China's industrial policies (see Wübbecke *et al.* 2016). Europe is equipped with the required market size, industrial base, institutions and experience for technology standard-setting processes. However, to ensure that new technology standards translate into sustainable industrial and economic development, an integrated approach is necessary to establish value retention institutions. Public investment projects that help to create local and regional markets – for example, for technology fields around smart cities, resource efficiency/green tech, digital government, infrastructure for new concepts for mobility, aeronautics – local sourcing guidelines, public private technology investments and social standards for products and services based on the newly set standards would be necessary to accompany such developments. As surprising as it may sound Europe can learn a lot from China with regard to sustainable industry development, while developing its strategy further by extending it with a social model based on participation.

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