

**Low-Skilled Industrial Work in Advanced Economies**  
**- The Case of the German Manufacturing Industry**

Hartmut Hirsch-Kreinsen, Peter Ittermann and Jörg Abel

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**Abstract**

The paper discusses the situation and the development perspectives of low-skilled industrial work in advanced societies. In particular, the contribution will focus on low-skilled work in the German manufacturing sector. Germany is normally regarded as a country with a prevailing high-skilled work-force. Low-skilled industrial work describes activities that are of low complexity, make few demands on the employees and whose performance require only limited qualification efforts. It refers to activities that do not require occupational qualifications and that "everyone" can learn within a short period of time. According to the mainstream of research, this type of work is significantly losing ground in industrial societies. Here, employment perspectives for low-skilled workers are at best perceived in segments of the tertiary sector that are expanding further in the course of the structural change. The paper critically reconsiders this mainstream perspective. The argument is that in specific industrial sectors and areas low-skilled industrial work shows a remarkable stability. Methodological basis of the paper is an in-depth analysis of three German nationwide statistical surveys.

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Chair of Economic and Industrial Sociology  
TU Dortmund  
hartmut.hirsch-kreinsen@tu-dortmund.de

## 1. Introduction

In the scientific and public debate it is considered an undisputed fact that the future of employment in the developed industrialised societies will be characterised by continuously rising skill levels of the employees. The reasons cited are that the industrialised societies are on their way to becoming knowledge societies, whose central characteristic is the growing importance of knowledge- and qualification-intensive work processes with sophisticated products of advanced technology. 'Up-skilling' is often regarded as an ideal solution that meets the interests of employees, companies and society as a whole: For the employees, up-skilling implies attractive work situations, career opportunities and a growing income level. The companies benefit from higher qualifications as these lead to a higher innovativeness and flexibility. From a societal perspective, the upgrading of the labour force is considered as central prerequisites for low unemployment rates and for economic growth:

„Therefore, skills development is a cornerstone of active labour market policies and shifting from job security to employment security is the philosophy behind the European Commission's flexicurity strategy. The strategic importance of skills has been recognised both at European and national levels" (Lyly-Yrjänäinen, 2008: 1)

In Germany, policy-makers and the public focus on high-tech production and knowledge-intensive work processes that promise to enhance the innovation capability and the competitiveness of enterprises in global competition (cf. Federal Ministry of Education and Research, 2009). Therein they see the consistent further development of the specific German production model that is described as "diversified quality production" (Streeck, 1991). Its specialisation pattern is characterised by the production of durable industrial goods, relatively moderate, long-term oriented innovations and a well-developed focus on world market niches for sophisticated, specialised product and process technologies. This model constitutes the strength of the German industry on the world market. Typical "leading" industries of the German production model are the automotive industry, machine building as well as the electrical and the chemical industries. In future, these are supposed to be supplemented or superseded by the high-tech sectors biotechnology and genetic engineering, renewable energies, IT-industry and the aerospace industry.

From this perspective, there is little space for low-skilled industrial work. This term describes activities that are of low complexity, make few demands on the employees and whose performance require only limited qualification efforts. It refers to activities that do not require

occupational qualifications and that “everyone“ can learn within a short period of time. According to the mainstream of research, this type of work is significantly losing ground in industrial societies. Here, employment perspectives for low-skilled workers are at best perceived in segments of the tertiary sector that are expanding further in the course of the structural change.

The following paper critically reconsiders this mainstream perspective. Our argument is that in specific industrial sectors and areas non- resp. low-skilled industrial work shows a remarkable stability. This segment of work does not merely represent a “relict“ in advanced industrial societies. It persists in numerous core zones and it is largely immune to relocation and automation strategies. This development path of employment in advanced industrial societies is often overlooked in politics and research; or, in a more trade union-oriented perspective, is deemed undesirable. Consequently, there are only few recent systematic studies and empirical findings on this topic.

The paper comprises the following points: To begin with, important aspects of the socio-scientific debate on the concept and the development perspectives of low-skilled work are analysed (1). Thereafter, some basic data on the development of low-skilled labour in European Union countries will be presented in a comparative perspective (2). Subsequently, we focus on the German model of diversified quality production and on the significance of simple industrial labour in Germany. In the process, it will be shown that there are numerous industrial core zones of a ‘Made Simple in Germany’ (3). In conclusion, we look at the facets of and changes in low-skilled industrial work as well as at the contextual conditions that are decisive for the development trajectories (4).

## **2. Low-Skilled Work in Social Studies of Work**

Most studies dealing with low-skilled work adopt a labour market and education policy perspective: They focus on low-skilled workers as persons with low school qualifications and/or no vocational training and pay special attention to the workers‘ precarious employment outlooks and employment conditions as well as to labour market policy initiatives for the improvement of their employment prospects, e.g. by means of qualification measures or integration support. Many studies concentrate particularly on areas of low-skilled service work such as call centers, retailing, industrial cleaning, the hotel trade or geriatric care (cf. Dauser, 2003; Hieming et al., 2005; Grimshaw et al., 2007; Bosch/Weinkopf, 2008; Lloyd/Payne, 2008). In labour market research, these issues are closely connected with the discussion on low-wage labour (cf. Bernstein/Gittleman, 2003; Kalina/Weinkopf, 2008). Here, a low income (just

above the poverty line) is generated; this case is often put on a level with the areas of low-skilled or simple work.

In the German sociology of work the type of work referred to in this paper is mostly subsumed under headings such as “repetitive work“, “routine activities“, “mass workers; in particular assembly work and the remaining manual functions of highly mechanised or automated production were examined. (cf. Düll/Bechtle, 1991; Moldaschl, 1991 and 1993). A limited work autonomy, the tightly timed work patterns and the high physical strain on the employees are all regarded as characteristic of the repetitive and often meaningless activities. As opposed to skilled work, only unspecific basic qualifications and general skills in the sense of “minimum requirements of civilisation“ (Lutz, 2002: 19) are required for these work activities.

Of course, simple jobs, in contrast to qualified work, do not require a vocational training. They are based on short qualification and on-the-job training processes which are generally specific to the job or the field of work. Compared to qualified work, they are characterised by low knowledge requirements, lacking complexity and a great amount of routine and repetitive activities and direct control (cf. Bernstein/Gittleman, 2003: 4). However, this does not mean that there are no requirements for low-skilled work or that it is completely simple to carry out (cf. Weinkopf, 2006). With the labour market for low-skilled jobs in the US in mind, Maxwell (2006) ascertains the importance of new, specific basic skills of employees:

“Low-skilled jobs are not the same as no-skilled jobs (...). Most jobs require English, math, problemsolving, and communication skills, the so-called new basic skills. More than three-fourths of low-skilled jobs require oral and written comprehension of English, more than half require oral and written expression and deductive reasoning, and at least half require math, reading comprehension, active listening, writing, and speaking. Workers in low-skilled jobs are expected to act appropriately at work and to perceive cues from others correctly. Many low-skilled jobs also require physical abilities and mechanical skills. In fact, low-skilled jobs require physical and mechanical skills at higher levels than other jobs.” (ibid.: 3)

Moreover, there are evidences indicating a trend towards upgrading of job specifications regarding complexity, scope, etc. (cf. Zeller, 2005; Weinkopf, 2006). There is latitude in both the technical and functional complexity of the activities and in the autonomy of action of the low-skilled workers, so that different patterns of low-skilled work can be identified. Ultimately, the available new findings show that low-qualified persons and low-skilled work are by no means equivalent:

“As academics have pointed out low qualified or unskilled workers lacking formal education or vocational training degrees have to be distinguished from low-skilled work or low-skilled jobs which do not require job holders to have completed formal education or training.” (Vogel, 2009: 3)

Just as little as low-qualified workers are solely employed to do low-skilled work, low-skilled work is not only performed by low-qualified persons: One often and increasingly encounters formally qualified employees here (IAT, 2005: 89). The labour market situation in many countries permits many employers to attract formally qualified employees to simple work activities.

### **3. Low-Skilled Work in an International Comparison**

In an international comparative perspective different terms are used for low-skilled work. Moreover, the notions as to what constitutes low-skilled work differ greatly. This is also due to the fact that the respective (vocational) training systems at the national levels vary considerably. Because of the different definitions only very few (comparative) statistical findings on the occurrence and structure of low-skilled work in industrial nations exist. This impedes a reliable appraisal and an international comparison.

One of the few recent studies on low-skilled work in an international comparison is based on the ‘European Working Conditions Survey’ (EWCS) and analyses the situation of ‘low-qualified workers’ and ‘low-skilled workers’ in EU countries (cf. Lyly-Yrjänäinen, 2008). Workers with a low basic education are counted among the low-qualified workers.<sup>1</sup> In 2007, they accounted for approx. a quarter of the whole labour force in Europe (27% of men and 24% of women).<sup>2</sup> Low-skilled workers are workers in fishing, agriculture and forestry, service and sales workers, craft and related trade workers, machine and plant operators as well as in elementary occupations.<sup>3</sup> According to the data of the EWCS-study, half of all the employees in the EU countries fell into the group of the low-skilled workers in 2007.<sup>4</sup> Furthermore, their share in total employment was only slightly in decline between 2000 (53%) and 2007 (50%) (ibid: 11) and 58% of the male and 44% of the female gainfully employed persons can

<sup>1</sup> ISCED 0-2 - International Standard Classification of Education: 0 = pre-primary education; 1 = primary education or first stage primary education; 2 = lower secondary or secondary stage of basic education.

<sup>2</sup> Nonetheless, the share of the low-qualified in total employment declined in 2007 when compared to the year 2000 (Lyly-Yrjänäinen, 2008: 7).

<sup>3</sup> ISCO 5-9 - International Standard Classification of Occupations: 5 = service workers and shop and market sales workers;

6 = skilled agricultural and fishery workers; 7 = craft and related trades workers; 8 = plant and machine operators and assemblers; 9 = elementary occupations.

<sup>4</sup> Low-skilled workers are mostly put on the same level with low-paid workers (Lyly-Yrjänäinen, 2008: 2).

be assigned to this group. The male low-skilled workers are primarily employed in machine and system operation as well as in the crafts and in related trades while service and sales activities and elementary occupations tend to be dominated by female low-skilled workers (ibid.: 8).

Of course there are marked differences between the individual EU countries due to different development paths and economic structural characteristics: The highest shares of low-skilled workers can be found in the Eastern European countries (such as Rumania, Lithuania, Latvia, Poland and Hungary), in which up to 70% of the overall workforce belong to the group of the low-skilled (ibid.: 9). In the Southern European countries Spain and Portugal the share (especially among the female employees) is also higher than average. In the western industrial countries such as the Benelux States as well as Great Britain and Germany on the other hand, the proportion of low-skilled workers is much lower at 40% according to the EWCS-Survey (ibid.: 9).

The Eastern and Southern European countries still feature a comparatively large industrial population, their proportion of total employment amounts to more than 30% in these countries. In the Western countries such as the Netherlands, Great Britain or the US the proportion of employees in the industrial sector is less than 20 percent (cf. European Commission, 2009: 160). Because of the larger share of industrial sectors in the Eastern and Southern European countries, one must assume that many low-skilled workers are employed in manufacturing. A closer look at the economic sectors as deployment areas of low-qualified work confirm that a considerable proportion (approx. 25%) is employed in manufacturing (Lyly-Yrjänäinen, 2008: 8). Further core sectors of low-skilled work are the wholesale and the retail trades, agriculture, building as well as the health and welfare sectors. While the share of industrial activities and more particularly that low-skilled work has been declining in the past decades and low-skilled work has often been subject to relocations, unskilled labour has gained in importance in several trades of the tertiary sector in EU countries.

All in all, the data of the EWCS shows that low-skilled labour activities play an important role in the whole of the EU and that they have by no means been completely supplanted in the industrial sectors. However, on closer inspection the data also reveals the limits of the comparability of low-skilled work in the individual countries: Thus the broad concept of low-skilled work also comprises occupations that – at least in some countries – correspond to qualified work and call for a specific vocational training. For instance, in Germany many qualified employees (e.g. in the trades, machine and plant operators) are subsumed under the term low-

skilled workers. The following analyses present a differentiated picture of the structures and development courses of industrial low-skilled work in Germany. The focus is in particular on low-skilled work in industry and its core zones but developments in the tertiary sector are also included.

#### **4. Low-skilled Work in Germany**

The aforementioned German production model draws its strengths from the production of high-quality capital goods products which are distributed on the world market, from long-term innovations and the application-oriented development of new technologies by networking science and industry. Global supplier of factory equipment, world export champion and technology leadership are attributes that were in the past often associated with German industrial production. A central element of this model is skilled industrial labour which sets it apart from other work systems such as, e.g. those influenced by Anglo-Saxon traditions. The qualified work is in turn embedded in specific institutional mechanisms of the German “co-ordinated market economy” such as a labour market and training system structured by job descriptions and a social partnership model of industrial relations (cf. Hall/Soskice, 2001; Rubery/Grimshaw, 2003).

However, beyond the core zones of this model, many areas persist in the German industry in which (mass) products are predominantly manufactured with low-skilled labour. Only little attention is usually paid to these areas and in scientific research there are only very few recent studies on this subject matter. Low-skilled labour and the enterprises in which it is performed at best are regarded as suppliers for the leading industries and as subordinate, often fungible elements in the production chains. Or they are examples for those industrial sectors that – in the context of increasing globalisation and the pressure of international competition – relocate unskilled work in particular to newly industrialising and developing countries.

For Germany, very little reliable data on the prevalence of low-skilled work in industry is available. Therefore an in-depth analysis of three nationwide statistical surveys was conducted within the scope of an ongoing project at the TU Dortmund funded by the German Research Foundation (DFG).<sup>5</sup> Firstly, data from the microcensus of the Federal Statistical Office of Germany and secondly information from the IAB-Betriebspanel (Establishment Panel of the Institute of Employment Research of the Federal Employment Agency) were examined. The microcensus is an annual household survey that is based on a 1% random sample of the total population. The “IAB-Betriebspanel“ is a survey of companies and of employers that has

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<sup>5</sup> The research project „Bedingungen und Entwicklungsperspektiven ‚einfacher‘ Industriearbeit“ is funded by the German Research Foundation (2008-2011). Further details: <http://www.einfacharbeit.de>

been conducted since 1993 and that covered around 16,000 enterprises in 2007. In both surveys data on the number of “unskilled and semi-skilled“ workers or of “employees performing simple activities“ in the economy are collected. Both surveys cover different aspects and thus offer numerous starting points from which to statistically analyse the extent and the structures of industrial low-skilled work.<sup>6</sup> Thirdly, data from of the survey ‘BIBB/BAuA-Erwerbstätigenbefragung 2006’ have been partly evaluated.

#### 4.1 Structures

According to these data around 38 million people were gainfully employed in Germany in 2007 (table 1). Of these, about 8.4 million persons were employed in manufacturing<sup>7</sup> and approx. 26 million people were employed in the tertiary sector. The proportion of industrial employment thus lies around 22% and is markedly higher than in the Netherlands or the US. The remaining 3.8 million employees worked in other economic sectors (agriculture and forestry, energy supply and construction).

Table 1: Employees and low-skilled work in Germany 2007 (in thousands)

	Total		Manufacturing		Tertiary Sector		Other	
	1.000	in %	1.000	in %	1.000	in %	1.000	in %
Employees	38,16	100	8,39	100	25,94	100	3,82	100
Low-skilled workers	8,24	21.6	2,18	26.0	5,51	21.3	550	15.7

Source: own calculations according to the microcensus 2007; weighted data

##### a) Prevalence and Development

In 2007, approx. 8.2 million employees in Germany performed low-skill work tasks. This corresponds to a share of about 22% of all employees. Unskilled and semi-skilled employees as well as simple white collar workers and civil servants are ranked among the low-skilled workers.<sup>8</sup> The great majority of low-skilled workers (approx. 5.5 million) is employed in businesses of the service sector. Around 2.2 million low-skilled workers do industrial work, low-skilled work accounts for 26.0% of total employment in manufacturing and is thus higher than the percentage of low-skilled workers in the service area (21.3%). The remaining approx.

<sup>6</sup> To ensure comparability, the years 1993, 1995, 2000, 2004 and 2007 were in each case chosen for the longitudinal analysis.

<sup>7</sup> Manufacturing (without construction, mining, energy).

<sup>8</sup> In this narrower definition, the extent of low-skilled work activities is considerably lower than according to the data of the EWCS-Survey (cf. Lyly-Yrjänäinen, 2008).

550.000 low-skilled workers are employed in the areas agriculture and forestry, energy supply and construction.

Concerning the development of low-skilled work the number of low-skilled workers in industry has declined markedly since the beginning of the 1990s (table 2). Thus, in 1993, more than 3 million people were employed in low-skilled industrial labour. The proportion of low-skilled labour sank from almost 30% (1993) to 26% (2007). The decline in industrial low-skilled work in Germany must be seen within the context of the economic structural change and the generally decreasing role industrial work plays for overall employment. Thus around 2 million industrial jobs were lost in the 1990s while employment continued to grow in the tertiary sector. However, a surprising stabilisation has been observable in the past few years: Between 2000 and 2007, the number of low-skilled industrial workers remained almost constant. In the course of the economic upturn in Germany until the financial crisis 2008, total employment and the number of low-skilled workers were actually on the rise: Altogether, the number of low-skilled workers rose by 1.1 million between 2004 and 2007, in industry by approx. 170,000. All in all, around a quarter of all industrial workers do low-skilled work.

Table 2: Low-skilled work in Germany 1993-2007

	Low-skilled work/total		Low-skilled work/manufacturing	
	absolute (in 1.000)	in %	absolute (in 1.000)	in %
1993	8,616	23.7	3,027	29.2
1995	8,624	24.0	2,686	30.1
2000	7,121	19.5	2,147	25.1
2004	6,932	19.5	2,012	24.7
2007	8,243	21.6	2,184	26.0

Source: own calculations according to the microcensus 2007; weighted data

The stabilisation of low-skilled work can be put down to the following reasons: Firstly, it may be safely assumed that the corporate strategies of downsizing enterprises and outsourcing activities, that were quite prevalent in the 1990s, are increasingly reaching their limits. Very often, the sectors in which simple activities predominate – for instance in standard production or in services such as logistics and guard services – were the object of such strategies. New data on restructuring processes of companies suggest that the outsourcing processes have recently reached certain limits (Kinkel et al., 2008). Secondly, the automation of production processes

has proceeded rather slowly in the past few years due to cost and flexibility considerations, this has probably led to the preservation of jobs for low-skilled workers. Moreover, the financial resources of many small and medium-sized enterprises as well as their capability to undergo process automation are limited. Quite obviously, this particularly affects assembly processes where low-skilled labour is often encountered (Lay/Schirrmeister, 2001). Finally, it can be surmised that though

despite low-skilled jobs fall away in the course of the progressive automation of production, new jobs for the low-qualified also come into being; typical examples of this are not only newly emerging “mechanisation gaps“ but also simple control and monitoring work activities.

### **b) Low-skilled work in manufacturing**

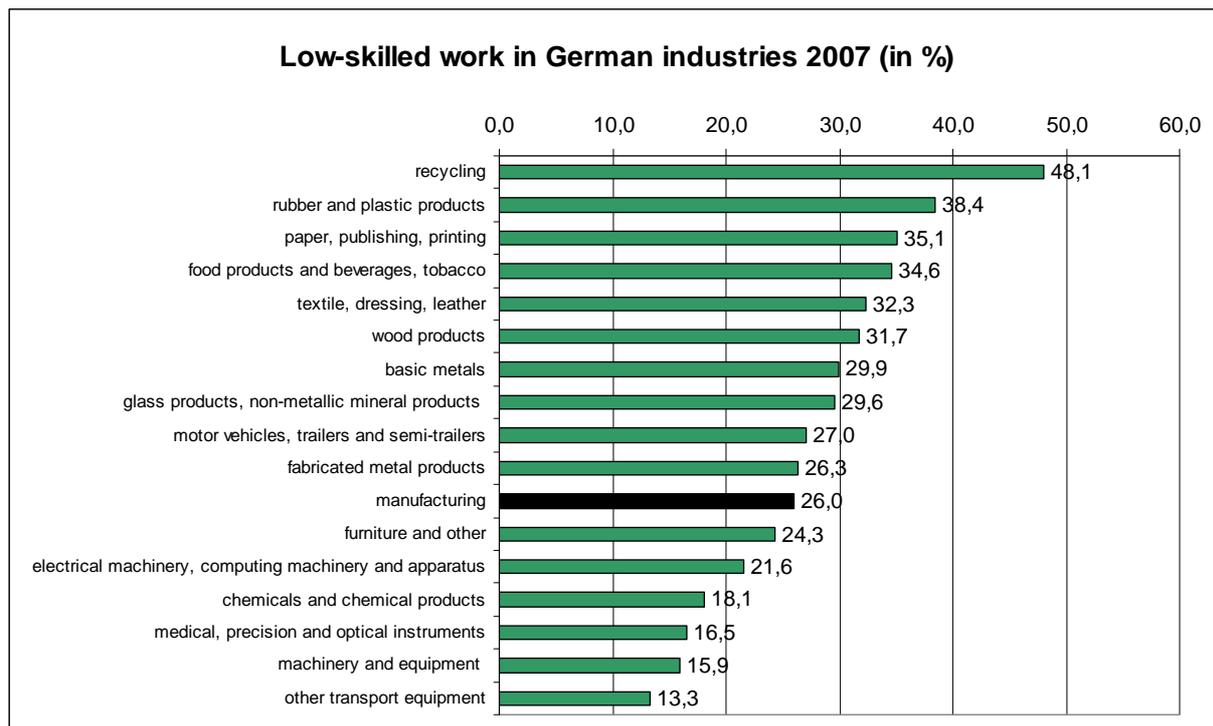
As outlined above, most of the low-skilled workers are employed in the service sector. The health and social work, commercial cleaning, the retail trade, the public service and gastronomy in particular are central fields of low-skilled labour. More than two million persons perform low-skilled work in these five services segments. In Germany, the strongholds of low-skilled work, i.e. the service sectors with the highest shares of low-qualified workers, are commercial cleaning (73%) and private households (64%). The high-tech-areas hardware and software services, media as well as research and development, on the other hand, feature the lowest shares of low-skilled labour.

In manufacturing, the prevalence of low-skilled work varies considerably in the different lines of industry. A closer look at its distribution in the different industrial segments reveals that there are some “strongholds“ as well as some branches with very low shares. Of significance are the low shares of low-skilled work in total employment, in the leading industrial sectors with predominantly skilled work and knowledge work such as manufacture of transport equipment, machine building, electrical engineering or the chemical industry (figure 1). The segments recycling<sup>9</sup> (48.1 %) as well as rubber and plastic products (38.4 %) prove to be domains of low-skilled work. The segments manufacture of paper and printing (35.1%), food products (34.6%), textiles (32%) as well as metal production (30%) feature markedly higher shares in comparison to the industry as a whole.

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<sup>9</sup> The segment recycling with approx. 20,000 employees is admittedly a very small industrial segment.

Figure 1: Low-skilled work in German manufacturing industries 2007



Source: own calculations according to the microcensus 2007, weighted data

In addition, the shares of low-skilled work vary markedly within the industrial sectors themselves. For instance in the automotive sector:

Thus, in the sector of final-producers of the automotive industry low-skilled workers count for less than 20% of the employees of the, whereas in the sector of automotive suppliers low-skilled workers have a share of approx. 33% of all employees. In the chemical and the electrical industries there are segments with comparatively high shares of low-skilled work. In all subsectors of machine building, however, the percentage of low-skilled workers is relatively low. All in all, the data indicates that the percentage of low-skill industrial work is above-average in sectors with low-tech products. On the one hand, these sectors have undergone a process of decline since the 1990s, which has also entailed a reduction in the number of low-skilled jobs, on the other hand they account for a large share of total industrial employment to this day (cf. Hirsch-Kreinsen, 2008).

Furthermore, low-skill work is concentrated especially in small and medium-sized enterprises. In 2007, most of the low-skilled workers (approx. 328,000) worked in manufacturing companies with 200 to 499 employees, the proportion here was just under 26%. In large enterprises with more than 1,000 employees (approx. 18% low-skill work) the shares were markedly lower than the mean value of all manufacturing companies. In larger enterprises

with more than 5,000 employees, the share of low-skilled workers amounted to a mere 5% of the total workforce (cf. Bellmann/Stegmaier, 2007). This share has dropped sharply in the past few years. This indicates that many large enterprises transferred parts of their simple production to suppliers, relocated it abroad to lower-cost countries or subcontracted it. Small and medium-sized companies normally do not have the option of outsourcing or relocating. Instead, they often act as suppliers which take over standard functions of large enterprises in the course of outsourcing processes, so that the share of low-skill work is relatively high here.

### c) Activities and occupations

The industrial activities performed by low-skill workers primarily pertain to directly productive (machine operation, manufacturing, assembly, etc.) operations while production-related activities are secondary. According to the data (table 3), most of the industrial low-skilled workers fall into the directly productive operations such as machine operation (26.0 %) and manufacturing (30.6 %); while repairing (2.0%) is of secondary importance in this respect. At 31%, another core area of low-skill labour activities in industry are simple services such as packing, loading, sorting, cleaning and securing (table 3). Regarding office work, low-skill workers are significantly underrepresented. In the past few years, there have been shifts in the activity structures as the panel data for the activity fields of low-skill industrial work show. While there has been an upward trend in the share of the low-skill industrial activity ‘machine operation’ since the 1990s, the importance of the activities ‘manufacturing’ and ‘repairing’ has declined. A growing number of low-skilled workers work in the field of simple ‘services’, the share has risen from approx. 20% (1993) to approx. 31% (2004).

Table 3: Low-skilled industrial work activities 1993 to 2007 (in %)

	1993	1995	2000	2004	2007
machine operation	22,4	23,3	26,7	27,9	26,0
manufacturing	39,3	37,8	33,3	30,3	30,6
repairing	5,1	5,1	1,9	1,8	2,0
office work	12,7	12,9	8,8	8,9	9,9
services	19,5	20,8	28,3	29,8	31,1

Source: own calculations according to the microcensus 2007; weighted data

#### ***4.2 Characteristics of low-skilled workers***

In the following, the persons who perform low-skilled work will be characterised in more detail. As in many countries, low-skilled workers in Germany are characterised by three features in particular:

Firstly, the majority of low-skill workers in Germany are women. In 2007, there were 4.4 million female low-skilled workers versus 3.8 million low-skilled male workers, the proportion of women thus being around 54%. In industrial low-skilled jobs, the proportion of women is around 41%, this figure is markedly higher than the share of women employed in manufacturing (approx. 28%). The proportion of women doing low-skilled work is particularly high in the service sector and in simple white-collar jobs.

Secondly, regarding the nationality, the proportion of foreign workers in low-skilled jobs amounts to about 18% and is markedly higher than their share of total employment (around 8%). In manufacturing too, foreign workers are disproportionately often employed in low-skill jobs (around 20%).

Thirdly, as to the school qualifications of low-skilled workers, it can be pointed out that around 12% of these persons do not have a school leaving certificate. This figure is double the figure for the share of persons without a school leaving certificate in total employment. More than half (51%) have a qualified school-leaving certificate ('Hauptschulabschluss') and a further 25% have a General Certificate of Secondary Education ('Realschulabschluss'). In industrial low-skilled work too, the proportions of employees without any school-leaving certificates are above average.

The data on vocational education reveal interesting findings on the spread in the qualification structure of low-skilled work. On the one hand, it is discernable that more than 38% (2007) of low-skilled workers in industry have not completed vocational training. This share is more than double the share of employees in industry (19%); according to these figures, the qualification level of low-skilled industrial workers is below average.

On the other hand, the data paints a remarkable picture: more than half of the employees in low-skill jobs (approx. 61%) have completed a vocational education. In their case, it appears that qualified employees are often deployed in jobs with low skill requirements despite their special occupational skills. Evidently, companies fall back on qualified employees to fill low-skill jobs if there are enough qualified job applicants. As studies on low-skilled labour in the service sector show (cf. Hieming et al., 2005), the motives for this range from the intention of

keeping qualifications “in stock” to the intention of being “on the safe side“ by deploying skilled employees for tasks that actually require far fewer skills. Furthermore, quite obviously cost arguments also play a role here (Bellmann/Stegmaier, 2007): But if employees work in jobs others than the ones they were trained for, this can lead to a lower remuneration for them and to lower labour costs for the company.

But also on the part of many employees in low-skilled jobs, the fundamental importance of a vocational training for their tasks, albeit in a different occupation, are emphasised. According to available data, as many as 34% of the respondents indicated that they consider vocational education necessary for their simple labour activities. Almost 59% of the respondents underwent a ‘longer’ period of vocational adjustment. At least in the self-perception of the surveyed employees, the qualification requirements of low-skilled work are thus by no means restricted to general work ethics and “minimum requirements of civilisation“ but also centre on more advanced competencies, not least to allow for flexibility requirements.

### ***4.3 Work and employment conditions***

The current debate on the development of work seems to suggest that industrial low-skilled work is particularly exposed to labour market risks. However, the majority of low-skilled jobs do not fall into the category ‘contingent work’: Thus almost 92% of industrial low-skilled workers indicate that they have permanent employment contracts, while this share only amounts to 77% for the employees in the overall economy. Furthermore, more than 80% of the low-skilled workers consider the risk of being laid off as rather slim.

What is striking though is the higher proportion of low-skilled workers in part-time employment. Around 40% of the low-skilled employees work part-time, this value is twice as high as that of other employees. Although the share of part-time workers in industry is much lower (21%), it is still markedly higher than in total industrial employment (11%). The share of part-time work is particularly pronounced among women in low-skilled jobs. What is more, the proportion of part-time work in industrial low-skilled employment has risen markedly since the beginning of the 1990s. Here one can find indications of the structural change, as a result of which services and part-time work are gaining in importance in the industry too.

Of course, one has to assume that low-skilled industrial work is predominantly characterised by below average income opportunities and that low-qualified employees are often assigned to lower wage and salary brackets (Kalina/Weinkopf, 2008; Statistisches Bundesamt, 2007). However, low-skill industrial work does not prove to be a pronounced domain of low-wage employment (less than two thirds of the average pay of the gainfully employed). The German

industry is characterised by a comparatively high tariff commitment or an orientation of the companies to collective agreements so that the lower wage brackets have an above average level. In addition, manufacturing companies are not to the same extent exposed to market-driven flexibility requirements as many service enterprises with predominantly contingent working conditions.

The labour policy debate on trends and problems of the “precarization” of labour in modern societies (cf. Nienhüser, 2005; Dörre et al., 2006), that has been influential and prominent for quite a while, needs to be differentiated and specified in view of the different deployment areas of low-skilled work. In doing so, the fact that the contingency of low-skilled activities is increasingly being transferred to other employment forms (e.g. temporary work) should, however, not be left unconsidered.

## **5. Conclusion**

To sum up, it is worth noting that low-skilled industrial work is characterised by a large range of variation regarding its activities and requirements. This still needs to be examined more closely. The general trends of flexibilisation and subjectivisation of work highlighted by sociology of work research will probably also affect low-skilled work and lead to a change to more advanced and higher requirements. Taking up the basic dimensions of work analysis ‘decentrality’ or ‘autonomy of action’ as well as ‘functional flexibility’ or ‘complexity’ (Adler, 2007: 1313), one has to assume that there is a broad spectrum of different patterns of low-skilled work:

- On the one hand, there are low-skilled jobs that are subject to similarly low requirements regarding complexity and autonomy of action as the repetitive sub-operations in the assembly work of the German automotive and electrical industries that are empirically traceable up to the 1990s (Moldaschl, 1991; Kurz, 1999); this form can be referred to as classic Taylorist.
- On the other hand, there are manifest empirical examples that point to an expansion of the range of tasks in a functional and extra-functional respect; i.e. the low-skilled work is characterised by a certain degree of technical-functional complexity and autonomy of action (Zeller, 2005). In these functionally and extra-functionally extended forms of low-skilled work, job and process-specific qualifications and furthermore especially general skills such as communication and method competencies gain in importance.

Of course neither the complexity nor the degree of action autonomy of low-skilled work will ever achieve the same level as that of professional work but different patterns of industrial low-skilled work become apparent that still have to be classified and examined empirically.

Above all, it is important to look into the development trends of low-skilled labour. In the light of the growing heterogeneity of the available work potential this question is highly significant from a labour market and social policy point of view. For it can by no means be assumed that all employees will in equal measure be able to come to terms with the rising knowledge and qualification-intensity of work and the requirements of lifelong learning that go along with it. Here, sectors with low-skilled jobs may be able to offer hitherto underappreciated employment opportunities.

These considerations can further our understanding of the restructuring of the landscape of industrial labour in the first years of the 21<sup>st</sup> century. The economy does not appear – as postulated in the concept of the emerging knowledge society – to be undergoing a wholesale structural replacement of ‘old’ sectors with ‘new’ ones, or a substitution of ‘low-skilled’ with ‘high-skilled’ labour. In fact this process of change is evolving as a restructuring – a transformation more from within than from without – of sectoral systems. This change process is not dominated by industrial activities in which competitive advantage, capability formation and economic change are generated by totally new economic sectors and scientific knowledge. Rather, it is dominated by what are known as mature industries based on more or less existing skills and qualifications and even labour on a low skill-level. As has been shown, low-skilled industrial work is not restricted to technologically mature small and medium-sized enterprises. This work form can also be found in industrial sectors such as mechanical engineering or the automotive industry, which produce highly innovative products. Moreover, one comes across low-skilled labour in certain areas in high-tech industrial sectors too. A typical example are the production processes in communication technology companies which manufacture mobile phones, the same goes for the assembly of IT-systems or of complex motor vehicles. From this it follows that, all in all, the industrial work form discussed here continues to be widely-used in advanced societies to this day and evinces a high degree of stability.

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