Title: ACTUAL CHANGES IN THE WORLD OF WORK.DEVELOPMENT OF THE DIVISION OF LABOR IN GERMANY SINCE 1979.

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I Introduction

There is a broad consensus among the social and economic sciences that there are changes happening in what is called "the world of work". This generally refers to changes in the way we organize production. There are two main levels for this organisation: occupation and firm-level. Of course work is aligned along both levels of organization, and it can even be so within one firm. For example, in a large firm with specialized sections within these sections there can be work-tasks performed by employees with specific occupations. It even used to be common for occupations being section-specific within one firm, thus leading to a generally high and rigid state of the division of labour (Lutz 1976). This also illustrates that neither way of organising work is exclusive. How work (and work processes) is organised at the firm level will always affect the organisation at the occupation level.

An interesting new development in this organisation can be seen in the task-based technological change (Autor 2013), where work processes are divided into tasks. Ideally this happens on the level of the employee or the workplace, but it can also be done on the level of occupations, branches, or goods. There are thoughts in how far this organisation along tasks will help explain the offshoreability of occupations (Kimeny/Rigby 2012). But here tasks are also not seen as the primal differentiator; they are assigned to occupations.

Within economies, the division of labour then can be seen as a division between firms (and branches) and occupations. Since firms can be part of different branches and produce (and change production of) several goods and services the actual change in the division of labour will be masked here by processes of assignment (of firms to branches) and markets (changes in products). Of course, changes in products will to a certain degree be due to changes in the division of labour, if new forms of industrial organisation of labour and new technologies (like for example 3-D-printing) bring about new possibilities for the production of goods.

On the other hand even the most recent machines and technologies need some human input to either program or run them. Although it is reasonable to assume that workers with different tasks and different qualifications will be differently affected by the implementation of new technologies, it is not foreseeable that human input will be completely superfluous in the near future. There will be workers performing specific tasks and these workers are first-hand experts on what is happening to the division of labour, because it is their tasks and qualifications that are required, their knowledge and competences that are being used. These characteristics are most commonly summed up in one concept: the individual's occupation.

Changes in occupational content can shed a very clear light on changes in the division of labour. Every change in the production process (e.g. from taylorist to team-organized), every change due to new technological requirements (the impact of CNC-machines, the still-growing impact of microchips and micro-computers) leads to a direct change in occupational contents, at least in those workplaces where new production processes are being implemented and new technologies are being used. This means that by looking at what workers can tell us about the changes in occupational content they help us assess two important aspects of changes in the division of labour: We get to know how many workers are affected by these changes, thus indicating the scope of changes and we also get to know what is changing, be it the implementation of new technologies or organisational changes. Obviously all these processes are happening simultaneously but with the right data it will be possible to also show their interactions.

II Germany as a special case

Being one of the central European states Germany poses a special case for this kind of analyses. Trading goods was, since the 1950s, unrestricted at least with western countries[1].It

[1]Here I mean Europe and northern America, but this actually can be read in the sense of Winkler (2014).

experienced prolonged economic growth but also major economic crises. It had a distinguishable phase of organisational change in the 1980s and 1990s and since the 1990s due to falling prices for microchips, computerisation has also taken place on a large scale.

There are close institutionalized connections between the educational system and the labour market where occupations form a link between the educational and the economic system (as e.g. Kurtz (2005) shows). In the educational system (including vocational education and training institutions, full-time vocational schools, occupational academies and the like) individuals can qualify in a specific vocation and have this certified. In the corresponding economic system vacancies are open for candidates with specific qualifications. While especially the close institutionalised link between the dual system of vocational education and training and the labour market is said to be the reason for Germany's comparably low level of youth-unemployment (for a discussion of this see Münk/Schmidt 2012), this is a peculiarity of the German system that makes the analysis in this paper somewhat geographically focused. There are not many states with similar connections and systems, so called like-minded countries. Among these are Austria, Switzerland, Luxembourg and to some degree Netherland or Denmark. For these countries there is no comparable data, so the analysis could not easily be adapted.

Still, the German economy presents an interesting example. Its size and level of industrialization, implying wide-spread computer-usage and different forms of organisation all indicate that in this example of an industrialised country developments in the division of labour would be sizeable, more likely to occur, and thus more easily detected. The aim of this paper is therefore to show which changes actually did take place and what their scope was. With this it will be possible to empirically underpin the often called-upon "change" that was seldomly proven.[2]

[2]Notable exceptions here can be found in the German „Arbeits- und Industriesoziologie" (work and industry sociology). Especially Kern and Schumann (1970, 1984) and Schumann (1994) did groundbreaking work here.

III Background

III.1 Theoretical background

The scarcity of direct empirical analyses is accompanied with only few theoretical works that were directly dedicated to occupational change. Starting with Durkheim (1992), a structuralistic or functionalistic perspective can be taken, which can be drawn up to Kurtz (2005); starting with relevant works of Weber (1976) and Smith (1991) a rationalistic perspective was derived; and in the 1980s in Germany Beck et al. (1980) tried to mend the ills they saw in those two strands with their subject-oriented perspective. A prerequisite for understanding occupational change in these perspectives is to understand the relation they see between the division of labour and their respective definitions of occupation.

Within structuralism Durkheim (1992) saw the division of labour being mirrored in different kinds or types of occupations. Occupations were generated through specialisation – hence specialisation is seen as a process with the division of labour being a snap-shot of this process at a given point in time. More recently, Kurtz (2005) described occupations as being forms mediating between two social subsystems, namely either the educational and the economic or the educational and the ethic subsystem. While Durkheim focussed on the connection to the ethic system, Kurtz focussed on the connection to the economic system. But his systems theory view only permits him to formulate a rather vague definition of occupation and its function. On a meta-level his analysis are correct, but one cannot easily operationalise it for and apply it to the micro-level of individual employees.

Weber (1976), as one of the representatives for the rationalistic perspective, actually gave a micro-level definition of occupation, which is also well known (Weber 1976: 80). For him,

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But they mostly looked at specific branches (in every analyses), focused on possible improvements for workers (1984) or possible new form of individual work-settings (1994) and thus did not arrive at a more complete picture. Besides conceding this themselves in every study, their theses were received as prove for huge overall changes.

tasks (or bundles of tasks) come to be occupations as they are used to secure the individuals' existence and with phylogeny proceeding these come to be capitalistic occupations. The division of labour for him is an expression of economic rationalisation. This reconstruction of what the division of labour is allows for individuals to choose whichever occupation (or new specialisation of occupations) fits their qualifications and their interests best. This was one of the points Beck et al. (1980) reconstructed differently. For them the division of labour was the distribution or apportionment of parts of the work that had to be done for securing the continuance of society. The instrument which set the rules for this distribution of work was occupations (in this reading they have interesting connections to Kurtz, 2005), in which abilities were traded like goods on the labour market.

New occupations are generated through specialisation. The interesting question here is whether specialisation is a source for increasing division of labour or if increasing division of labour leads to more specialisation. In a holistic view (as in Beck et al., 1980) occupations are a way of organising this division of labour. Individual endowments are traded on a market which encompasses all the tasks necessary to be completed for the existing and continuance of a society. In an individualised perspective (as in Weber 1976, or Durkheim 1992) individuals compete with each other on a market without boundaries. The tasks to be performed can be chosen freely and only market rationals ensure that only those tasks are chosen that are actually needed.

Occupations can be seen as industrial operational, qualificational, or social forms of organising (the division of) labour. They are always an expression of the social division of labour. They comprise bundles of tasks that have to be done in order to produce goods. Occupational differentiation has reached a level where for most occupations a specific training has to be completed. Here, as well as generally, the connection of occupations and social inequalities becomes apparent: Not everybody can reach every occupational position –

not even in a quasi-meritocratic system like the German apprenticeship system. Individual social and human capital restricts the set of options from which they can choose.

III.2 Previous research

A structural change of the world of work implies consequences for structures of work, forms of organisation and qualificational change (cf. Schumann 2003: 105). There is the idea that instead of qualifications (i.e. vocational education and training certificates) highly complex, flexible and versatile qualificational patterns and potentials of individual workers will come into focus, with transversal and also multidisciplinary competences and general personality traits tending to be more important than specific disciplinary knowledge (cf. Voß 2006: 38f, Giddens 1997). Specific descriptors like dealing with specific raw materials and machines have moved out of focus of scientific analysis, while the view changed to looking at tasks. This is also a prerequisite for making research internationally comparable. And although Dostal (2002: 463) argued that occupations, as institutions, are flexible and will continue to play an important role in the labour market and its nexus to the educational systems in Germany, he also concluded that for some occupations (namely: the most innovative) formal certifications and vocational trainings will become less important than a description of the set of tasks a worker is able to perform. In this respect he is arguing in the same way as Giddens (1997) with his "portfolio worker".

Before these changes on the level of individual workers were described, the literature was concerned with analysing the effects of industrial reorganisation. Lean production, team work and relocation of (managerial) responsibility (Kalkowski 1997, Kern/Schumann 1984, Schumann 1994) as new types of organising work on the firm level were thought to bring about changes in the world of work. The effects on the individual worker were seen as deliberating (more autonomy, more interesting work, less monotony) on the one hand but also

restrictive on the other hand (higher responsibilities, blurred distinctions of free- and work-time). Their impact on occupations as such was neither broadly nor easily agreed upon, but a minimal consensus was that „[t]he resulting effects of the organizational and data-based integration of different production (and distribution) stages, which cause an increasing abstraction of labour, [would] make their mark on the structure of working conditions and the skill profile“ (Sauer 1992: 54).

IV Definitions

Assessing existing definitions of occupation (Weber (1976), Beck et al. (1980), BA (1988), Kurtz (2005), Arendt (2007)) the following definitions were derived:

The function of the division of labour is to secure social cohesion and continuity. Occupational division of labour, or occupational differentiation, leads to a vertical segmentation of the social division of labour (with social disparities as expressions of the horizontal segmentation, which is based on structural occupational differentiation). Being part of the division of labour the function of occupations is to secure a matching of individual capabilities and social and economic needs and requirements. Occupations differentiate (allocate) individuals on positions that are relevant for the society's continuity.

A vocational training occupation is defined as a bundle of qualifications that are learned, assessed and certified in an institutionalised training which enables the graduate to work in a number of similar occupations. It gives a signal on potentials. A held occupation on the other hand entails a number of tasks, skills, qualifications and requirements the incumbent has to perform, utilize, and fulfil. The majority of held occupations are also institutionalised. They show realised potentials. Most held and all vocational training occupations fulfil the relational, regulative and cultural aspect of institutions as they organise social roles, the allocation to positions and represent social context.

Tasks are here defined as actions performed in occupational workaday life which are basic for the individual worker's occupation in order to produce the goods or services the specific workplace requires to produce. Requirements are defined as occupational requirements for competences workers have to have in order to be able to do their job. Skills and qualifications are defined as specific knowledge in domains that workers see as basal for the occupation. Inter-occupational homogeneity or homogeneity between occupations is defined as the similarity between all occupations at one point in time. Intra-occupational homogeneity or homogeneity within occupations is defined as the similarity of one occupation's contents between different points in time.

V Hypotheses

From the above following hypotheses can be derived:

H1: Inter-occupational homogeneity increases over time. Occupations become more alike to each other.

H2: Intra-occupational homogeneity decreases over time. Singular occupations change over time.

Over time, the changes take different effects within and between occupations. Possibly due to computer usage, firms trying to cut costs with standardised solutions (that themselves can be traded) there will be growing fractions of occupational contents being comparable between them. Also, the usage of adapted machines in production can be a source of homogenisation (if, for example, a baker today works in a firm controlling a production line for baking breads instead of doing every step of the production by himself). While this certainly makes occupations alike, they all at the same time have less in common with the contents that defined the occupations in the past.

There are more hypotheses that can be derived here (cf. Tiemann 2014). These will only be touched here. For one, monotonous and routine occupational contents will decrease over time due to machine and computer usage as supplements for less or non-routine tasks. This will lead to technical and analytical occupational contents increasing over time. Occupational complexity will thus increase over time. Lastly, autonomy in occupations will also increase over time.

VI Data and empirical strategy

The data needed to assess, operationalise and understand the phenomena discussed in the hypotheses above has to fulfil a number of requirements. It has to be micro-level data, with information on individual worker's workplace characteristics, qualifications and socio-demographic background variables. The workplace characteristics at least have to comprise information on the tasks performed, the knowledge used, and the competences required to perform that specific job in the specific workplace. Also, the occupation has to be recorded and preferably coded to a classification. Above all, the data has to be available over at least two points in time.

Data from the German Employment Survey (for the latest cross-section: Hall et al. 2014, Rohrbach-Schmidt/Hall 2013) fulfil these conditions. They have been surveyed in a comparable manner roughly every six to seven years since 1979, the contain information on individual respondents, their qualifications, workplaces, tasks, knowledge and much more.

Information from over 118.000 respondents on their skill requirements, performed tasks and competences are used here to define a three dimensional space of occupational contents. Within this space changes in occupational contents over time and thus in the division of labour can be assessed.

The data had to be homogenised and include cases of West German workers aged between 15 and 65 years, who have paid work for a minimum of 10 hours per week. The synopsis that was analysed here contains data from the cross-sections 1979, 1985/86, 1991/92, 1998/99, and 2005/06. For the study of change in occupational contents the data were aggregated at the level of occupations, namely 92 3-digit codes of the German classification of occupations of 1988 (KldB 88). This was done in order to keep occupations constant and not having to define them with the same measures and variables that would indicate (possible) changes of their content. In this way, every 3-digit code was assigned metric scaled information on ten tasks performed (e.g. teaching, consulting, developing, taking care), eight skills or knowledge domains (e.g. foreign languages, knowledge in mathematics, sales and distribution, or technical knowledge), and also five general competences or requirements (including pressure to perform, having to meet precise instructions, the need to improve existing or invent new procedures and techniques).

Said 92 3-digit codes contain information on, grossed up, more than 82 percent of employees of each cross-section. So the quasi-panel on the level of occupations enables us to understand what kind of changes happened to and affected the majority of workers in Germany between the 1980s and the beginning 2000s. The empirical strategy foresaw for this data to be analysed in a principal components analyses (PCA). The first set of PCAs was done on the cross-sections. It could be shown that the dimensions derived were comparable over the cross-sections, as they were defined by the same variables (Tiemann 2012, 2013). Only clerical or mercantile contents were found to define a higher number dimension by themselves in the last cross-section, while before they defined the third dimension.

The first of the three dimensions can be described as depicting monotonous versus complex occupational contents. This can also be seen as showing how work is done: autonomous workers with more complex tasks are on one side of this dimension, while those workers with

highly monotonous work settings and workplaces where everything is stipulated in the minutest detail are on the other side. The second dimension distinguishes what or who is worked with. Tasks like buying and selling, taking care and serving, informing, or training define one end of this dimension, while having technical knowledge and handling machines, or repairing define the other end. The third dimension informs us about whether the occupation is more about interacting with other people (as in training / teaching situations) or communicating ideas (as in advertising or selling).[3]

Inside this space of occupational content every (in this case: 3-digit) occupation is assigned a position for every cross-section. Homogeneity between occupations can then be seen by comparing distances between occupations' positions and their changes over time. Homogeneity within occupations can be seen by comparing positions of one and the same occupation over time.

VII Results

Testing H1 of increasing inter-occupational homogeneity can be achieved by comparing mean distances of all occupations at different points in time. Table 1 shows the results. One can see that nothing much happened in the two decades since 1986[4]. There is a very small increase in the mean distance from 1986 to 2006, but in 1992 this was contradicted by a rather high mean distance. Possibly this can be explained by a higher awareness of occupational contents and the need to clearly identify and confine one's own occupation as this was the time when the former German Democratic Republic's labour force with their own definitions of occupations were integrated into the all-german labour market.

Table 1 about here

[3]These dimensions are derived empirically. Recently, Helmrich et al. (2014) have constructed a theory-based three-dimensional space of occupational contents.

[4]For reasons of data management and comparability, for some analyses the first cross-section of 1979 has been left out.

But not only events like this and their impacts on how individuals respond when asked about what defines their workdays hinder the identification of changes in inter-occupational homogeneity.

Figure 1 gives an impressive example for the effects of using different classificational systems. The figure shows Herfindahl measures for different national German classifications of occupations and different datasets. If something like occupational diversification happens on a large scale, then the measures printed here should decline over time. Yet, the evidence is inconclusive and it cannot be decided whether actually there are less occupations holding a majority of workers.

Figure 1 about here

Regarding H2 of decreasing intra-occupational homogeneity it can be shown that there are distinctive developments on the dimension of complexity and on the dimension of technical knowledge. Since 1986 occupational content has become increasingly complex, but only marginally so between 1992 and 1999. Between these two cross-sections we also find a decrease in technical contents, which corresponds to services being an ever-present subject in that time, where even transfers of knowledge or providing advice would be seen as a service. Then, from 1999 to 2006 there was a sharp increase in technical contents. This can be attributed to a truly widespread use of computers and microprocessors in work. Figure 2 illustrates this by depicting the central occupational positions for every cross-section between 1986 and 2006.

Figure 2 about here

Grouping the occupations it becomes clear that occupations in production have moved farthest between 1999 and 2006, when technical content became more important. Service occupations and technical occupations showed the highest distances between 1986 and 1992, when complexity and autonomy got more important. This development of technical

occupations can be explained by reorganisations of processes (implementing team-work, process orientation, lean production) where responsibilities were relocated at the level of lower management and production, which is where most of the technical occupations are situated. Thus, the data shows that changes in industrial organisation of work had the highest impact between 1986 and 1992, while technological change had the highest impact between 1999 and 2006.

VIII Occupational Change and it's links

Now that the scope and directions of occupational change between the 1980s and 2006 could be established, one can go one step further and examine the links of occupational change and other trends.

VIII.1 Task-biased technological change:

First, it is shown how the changes were driven by technological change (the impact of computers and automated machines, raising productivity by altering the labour/capital relation and changing requirements on workers, following the "task-biased technological change", Autor et al. 2003, Autor/Handel 2009, Autor/Dorn 2009).This task-approach sees the increasingly widespread use of computer technology driven by falling prices for processors on the one hand but, more importantly, as caused by the share of routine contents of occupations. Since routine here means programmable, the link is self-explaining: the higher the share of programmable tasks in an occupation, the higher the probability for these tasks being performed by programmable machines (given the marginal costs are lower than with human labour, otherwise tasks could also be 'offshored'). Nonroutine tasks can then be supplemented by the use of these machines and computers, leading to a falling demand in middle-skilled

labour (where most tasks are programmable, i.e. routine) and a rising demand in both, low- and high-skilled labour.

The share of routine contents of an occupation was defined with a PCA on only the 10 tasks of the aggregated data, where the first dimension depicts an occupation's share of routine contents. The individual data allowed for building an index depicting the share of computerisation of occupations by assessing how many workers used different kinds of robotised machinery (ranging from CNC-machines to personal computers).

Figure 3 about here

Figure 3 shows the results of ordinal least square regression of share of routine contents on computerisation. The lower regression line estimates computerisation in 1992 on routineness in 1986. There is a clear positive correlation, with $\beta=0.0225$ and $\rho=2.81 * 10^{-7}$. For the estimation of computerisation in 1999 the slope is even steeper with $\beta=0.0304$ and $\rho=6.82 * 10^{-6}$. This is consistent with the ideas of the task-approaches' theoretical framework. And although the changes in occupational content between 1986 and 1992 were shown to be caused mostly by organisational changes, there is a clear correlation between routineness in 1986 and the distances occupations travelled between 1986 and 1992, with lower share of routine contents leading to smaller distances.

Thus, the data supports the notion that occupational changes were driven by technological change with the impact of computers and automated machines raising productivity by altering the labour/capital relation, thus changing requirements on workers.

VIII.2 Flexibilisation:

Flexibilisation here is seen as in modernisation theories. Most prominently Beck (1986) saw an increasing flexibilisation of work in changes in working conditions and the ways people

work, on the level of the workforce resulting in higher shares of female workers, higher shares of part-time workers and more (Beck 1986, Beck/Bonß 2001, Beck/Lau 2004, Bonß et al. 2001). These changes are structural changes, in opposition to the changes regarding occupational content that were described above. So in flexibilisation the question is whether changes in content are linked to structural changes.

Figure 4 about here

There is a distinct increase in part-time work between 1979 and 2006, which can be seen in Figure 4. The data also allow for detecting changes in the shares of female workers, self-employed, and the perceived risk of losing one's job. Together, these trends should indicate structural flexibilisation. Albeit we will not be able to construct a valid causality, it is worthwhile looking at the connections of occupational change and structural flexibilisation.

Figure 5 about here

Figure 6 about here

Figure 5 and Figure 6 illustrate these connections with locally weighted scatterplot smoothing regressions. Between 1986 and 1992 changes in occupational content were more likely to happen in occupations where no structural flexibilisation took place, if flexibilisation was present, changes in content were even less likely to happen (Figure 5). For a negative flexibilisation (which could be interpreted as a structural rigidisation due to decreasing flexibility) changes in occupational content were also less likely to occur. Between 1999 and 2006 flexibilisation (or rigidisation) was connected to changes in occupational contents being more likely to happen than with no flexibilisation (Figure 6). This can be interpreted as structural changes compensating changes in occupational content between 1986 and 1992, with an increase in complexity in some occupations and structural changes in other occupations. Between 1999 and 2006 changes in content and structure do seem to occur at the same time.

VIII.3 Knowledge intensive work

As we have seen there are developments of occupational content towards higher complexity and also higher flexibilisation. It could also be seen that there were no surprising fits in the developments, but rather moderate changes over time. But, if occupations become more complex and offer more freedom of decision, while there is an increase in the overall general educational endowment of the workforce (cf. Figure 7) – did work also become more knowledge demanding? Tiemann (2013) uses the data of the Employment Surveys to construct a measure of knowledge-intensity of occupations. This measure is based on information of the learning and creativity requirements workers meet in their jobs. The more frequent these are, the higher the share of innovative and task-flexible workers in an occupation and the more knowledge-intensive the occupation. Tiemann (2013: 74) also shows the development of shares of workers in knowledge intensive occupations in Germany, which increased about 7 percentage points from 1980 to 2009, i.e. in 29 years, to reach a level of about 26 percent of all workers. This is hardly a sudden increase.

High knowledge requirements were shown to be caused by interactive and communicative contents (like consulting or training), research tasks, but, from 1998 on also by producing tasks (Tiemann 2013: 77).

IX Conclusion and prospect

Results show that since the 1980s in Germany the occupational division of labour has slowly changed towards growing complexity, higher technical skill requirements and a growing importance of service tasks. In the same time the share of workers in knowledge-intensive occupations has risen.

At least for the case of Germany with its highly institutionalised occupations there are no signs of occupations losing significance. They adapt throughout the changes of the labour market and neither organisational changes of work processes nor changes in the human capital endowment of the workforce did bring about vast changes in occupations. Still, the developments that could be found might in the future lead to changes in the definitions of occupations, when formal certificates might become less important than the (however proven) ability to carry out certain tasks.

For now we can assess that a country going through the steps of post-industrial development like Germany since the 1980s occupational contents are interestingly stable. They do change towards growing complexity, higher technical requirements and also a higher importance of service and mercantile contents. But these changes occur slowly. They are possibly driven by structural changes (like higher shares of part-time workers or higher shares of female workers), but these interdependencies cannot (yet) be established as causal relations. But it could be proven that technological change, in the form of computerisation, is a driving force behind these changes. It is also apparent that these changes lead to more workers being employed in knowledge intensive occupations.

The effects the changes have on the workforce, on working conditions, wages and satisfaction with work can now also be analysed. With the clear definitions given here for the concepts involved (starting from “occupation”, “tasks” and “skills” up to “knowledge-intensive occupation”) these concepts can be operationalised empirically. This is the first time the nature of the changes in work were analysed in this depth and it could hold as an example for similar analyses in other economies.

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Table 1: Distances between occupations

Year	Mean Distance	Smallest Distance	Highest Distance
1986	4.07	0.08	8.75
1992	5.11	0.20	11.74
1999	4.52	0.04	10.58
2006	4.58	0.22	10.40

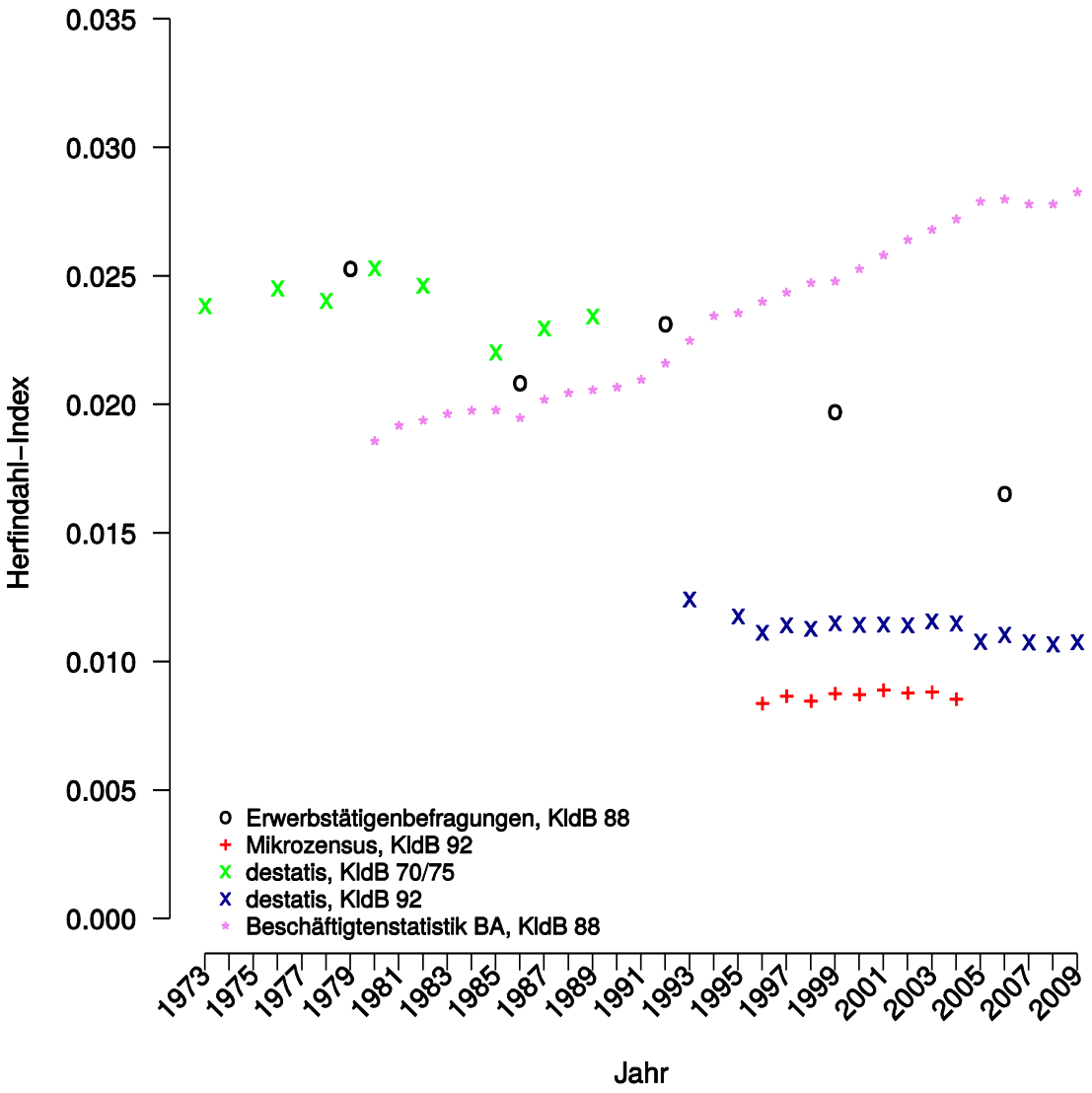

Figure 1: Concentration of workers in occupations over time

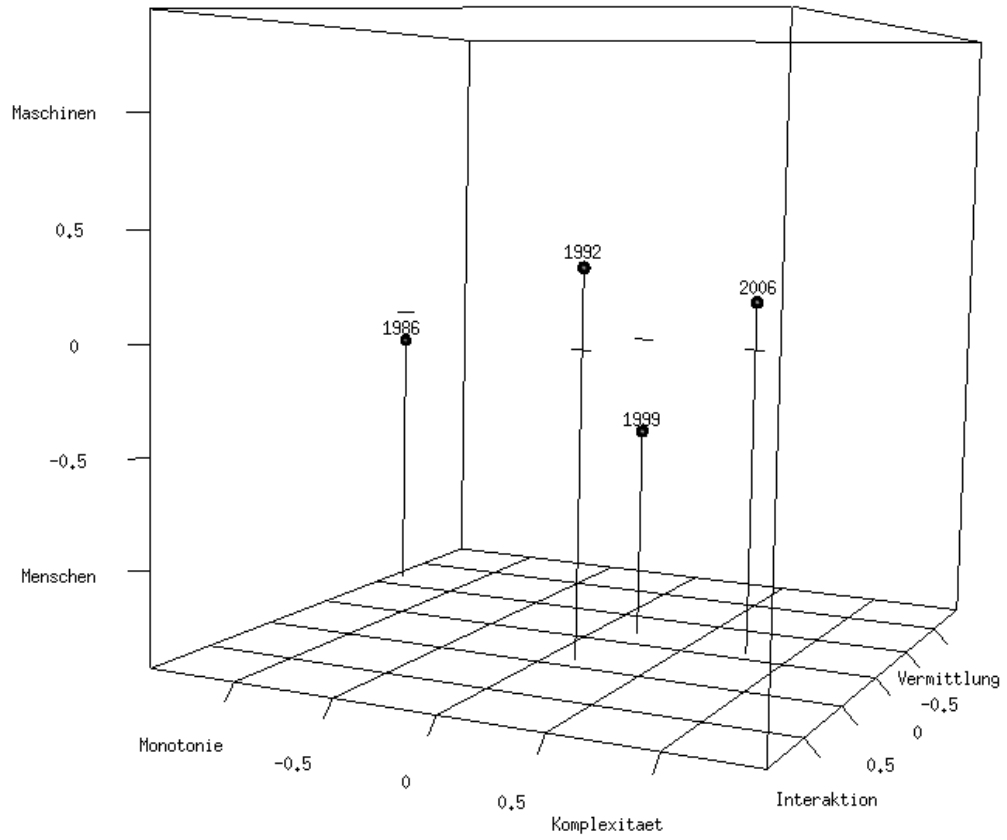

Figure 2: Mean occupational positions over time

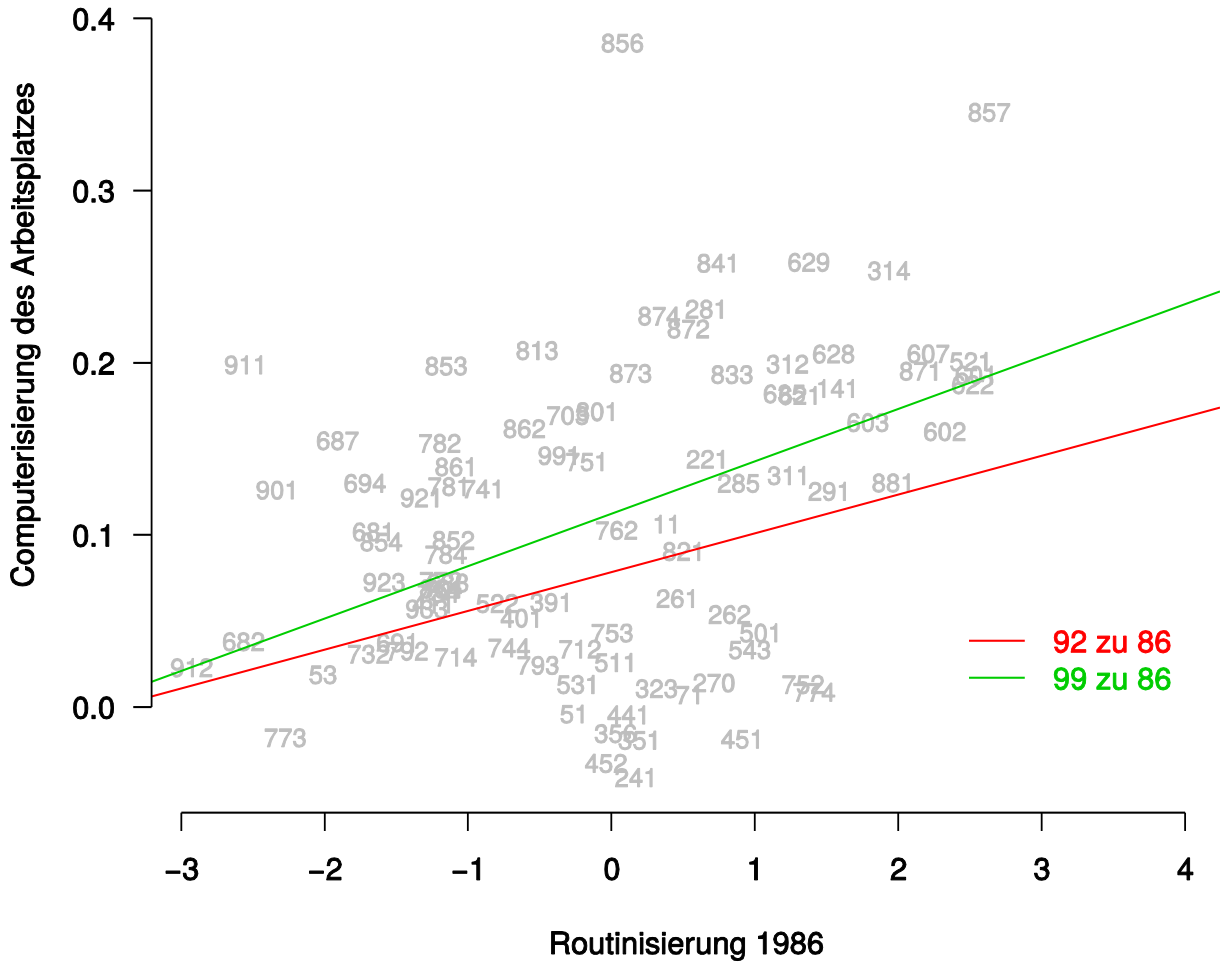

Figure 3: Share of routine contents and computerisation of occupations

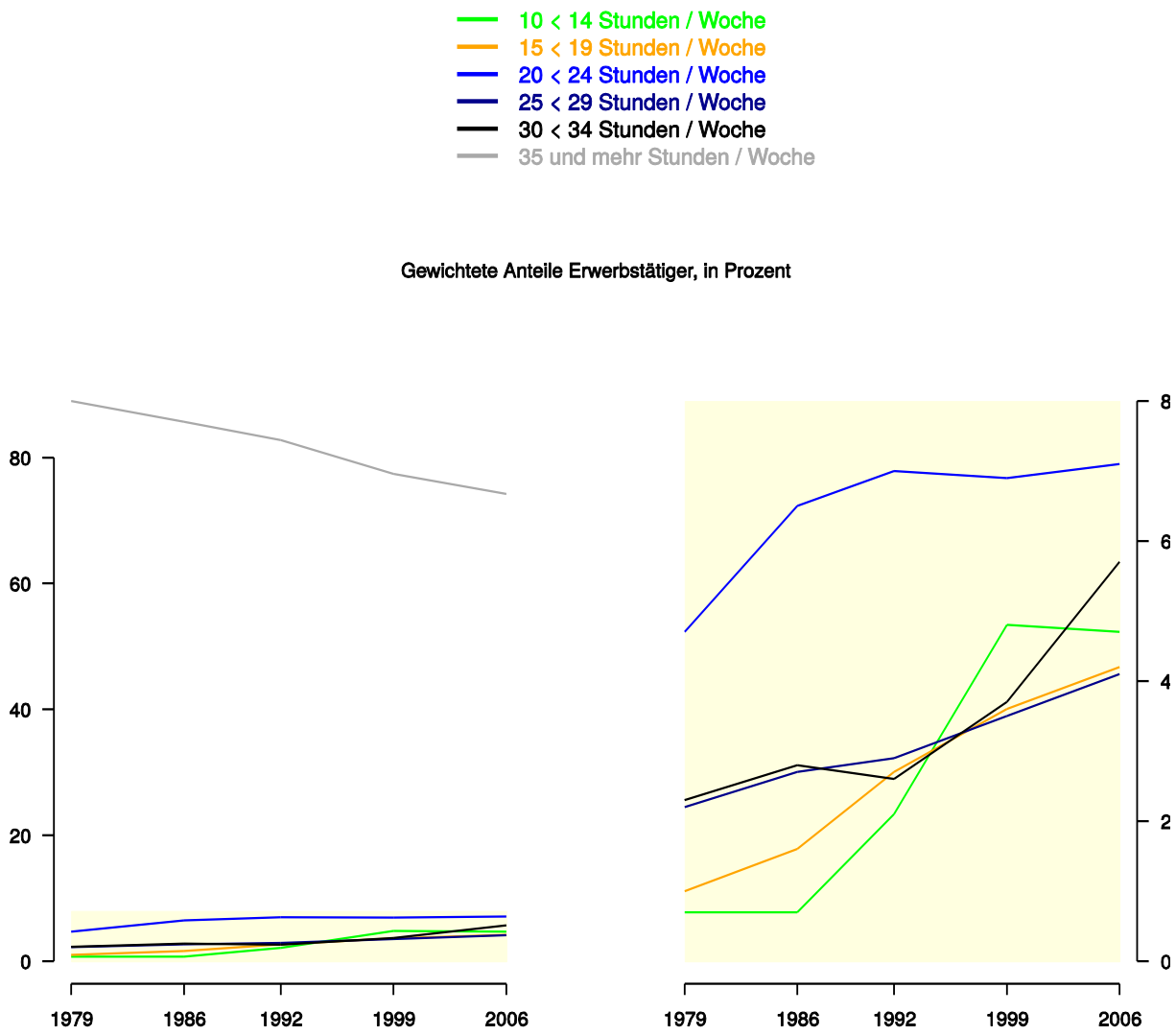

Figure 4: Shares of part-time work over time

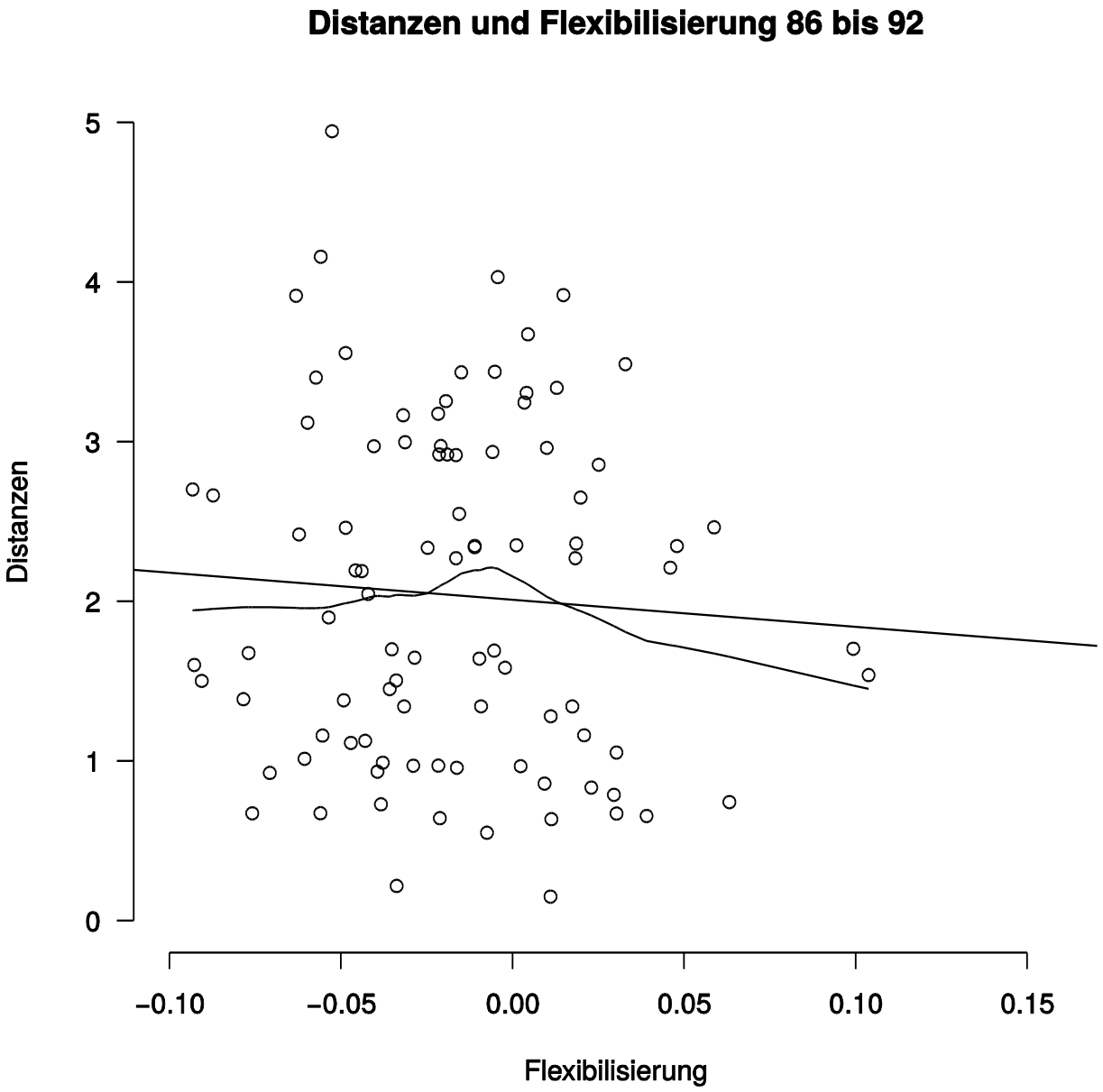

Figure 5: Occupational change and flexibilisation 1986 to 1992

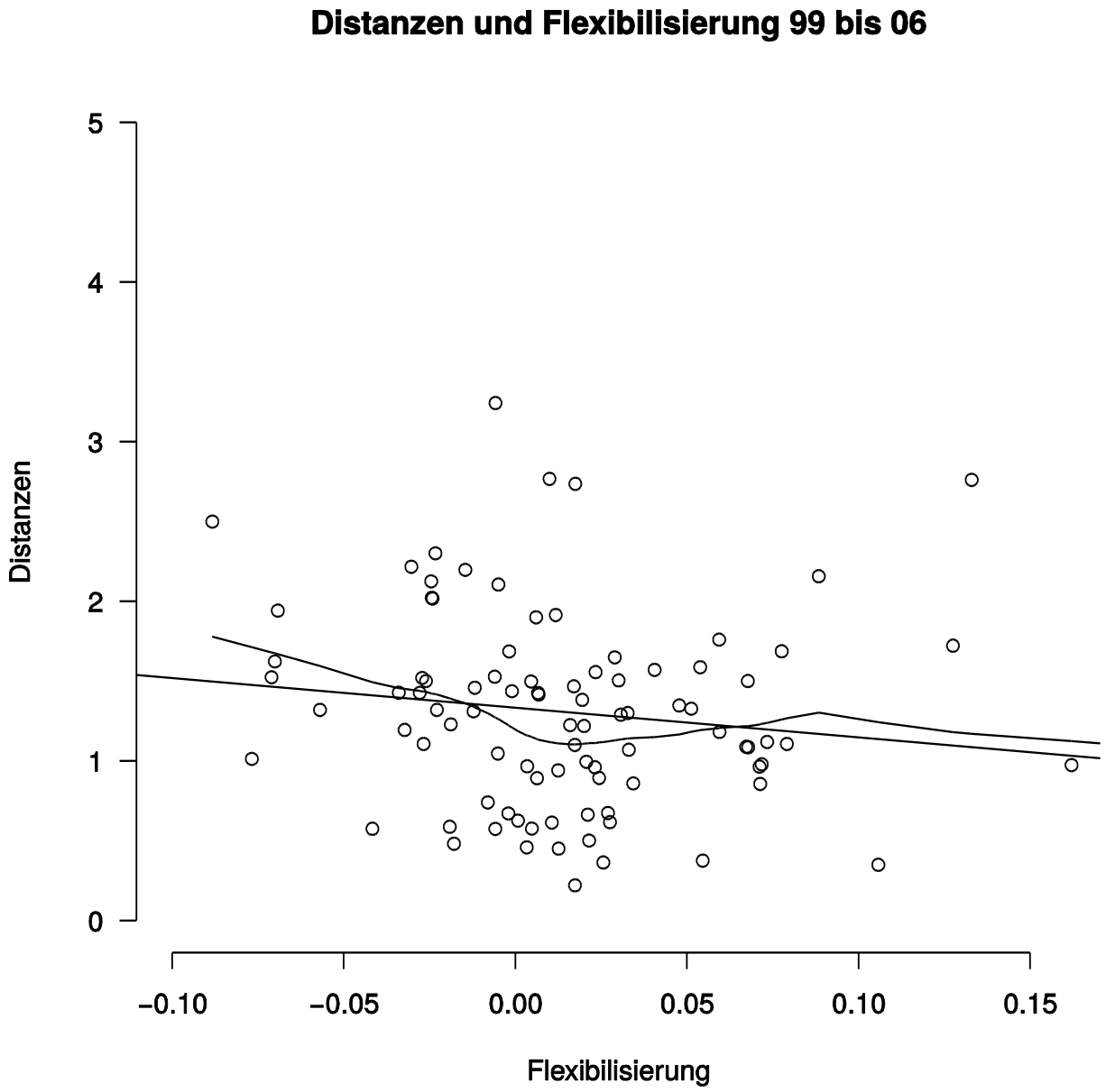

Figure 6: Occupational change and flexibilisation 1999 to 2006

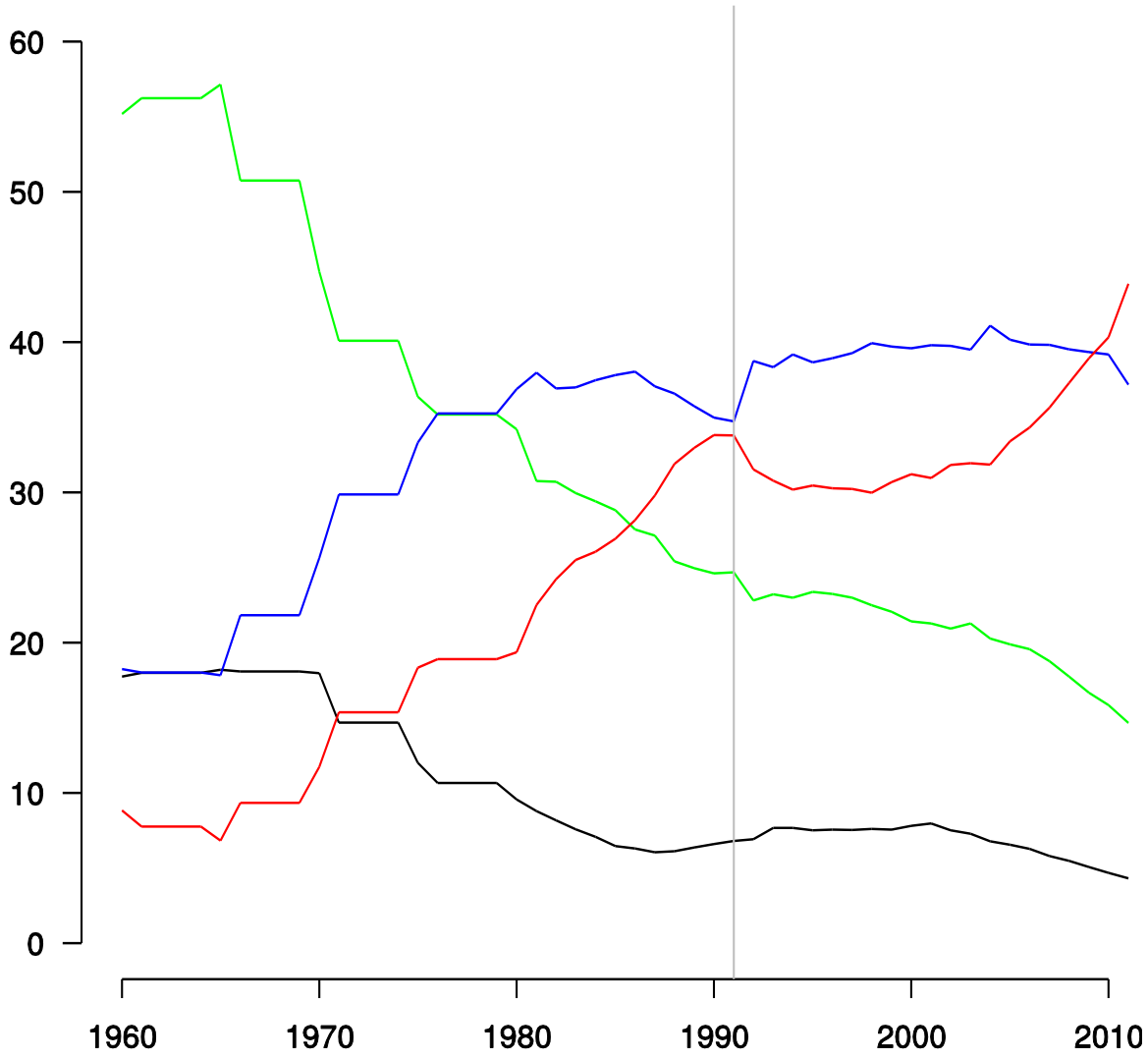

Figure 7: Shares of general education certificates

Black line: no formal education; green line: lower secondary education ("Hauptschulabschluss"); blue line: medium secondary education ("Realschulabschluss"); red line: higher secondary education ("Fach-/Hochschulreife"). Data for 61 to 64, 66 to 69, 71 to 74 and 76 to 79 estimations; up to 91: only Federal Republic of Germany, source: Statistisches Bundesamt, Fachserie 11, Reihen 1 and 2