

Field of Study and Flexible Work A Comparison between Germany and the UK

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Abstract

In this article, the relationship between study programs in higher education and the risk of holding a temporary contract is investigated in a comparative perspective. We find that the effects fields of study have on the type of contract can be better explained by their link to occupational positions than by field specificity differentials. Furthermore, fields of study are more important in explaining the individual risk of holding a temporary contract in the German rather than in the UK labor market. This may be attributable to the higher degree of standardization of the German educational system.

Key words: fields of study • flexibilization • higher education • institutional arrangements • labor market • temporary employment

INTRODUCTION

It has been argued that, in addition to educational levels fields of study constitute an important element for predicting individual labor market outcomes (van de Werfhorst and Kraaykamp, 2001). In this article, we argue that the value of fields of study as an additional determinant of graduates' labor market careers depends on the institutional arrangements that are relevant for shaping individual employment outcomes. We support this argument by presenting empirical evidence about fields effects on the incidence of temporary employment – a dimension of labor market outcomes, which has been widely discussed in recent years (e.g. Giesecke and Groß, 2003; Kalleberg, 2000; Polavieja, 2006) but has not been systematically related to fields of study yet (one exception being de Vries and Wolbers, 2005). We restrict our considerations to higher education graduates in order to hold vertical educational levels constant, that is, we focus on matters of the *tertiary graduate labor market* and the role of academic fields.

To examine how institutional factors influence the role fields of study play in determining individual labor market chances, we compare two countries that we think represent examples of opposite ends: the UK, where both the educational system and labor market regulations presumably lower the importance of fields of study, and Germany, where institutional settings can be expected to enforce the impact of subject studied.

The article starts with a theoretical discussion of the underlying mechanisms linking fields of study with temporary employment and their expected cross-national variation. This section is followed by the description of the data used in the empirical part and a discussion of the main results of the statistical analyses. The last section concludes the article.

THE NATURE OF TEMPORARY EMPLOYMENT

Temporary employment is frequently considered to be means of maintaining economic competitiveness and of counteracting high unemployment rates by increasing employers' flexibility (e.g. OECD, 2002). However, the reasons why employers offer temporary contracts are heterogeneous. Besides for tasks that are of a real fixed-term nature (project work, substitution for employees on maternity leave, etc.), employers make use of temporary contracts as a means of screening job applicants and/or of directly reducing labor costs. Prolonging the regular probationary periods (i.e. screening) might be necessary in case the productivity of an applicant is unclear and the correction of potential mismatches are costly (for example, due to high training costs or because of restrictions stemming from employment protection legislation). But temporary contracts can also be used to reduce labor costs by allowing employers to adjust the number of employees to the requirements of production, which is particularly important if there are high levels of demand volatility. Moreover, using temporary contracts as a sort of buffer can help to shelter permanent jobs from fluctuations in labor demand (a pattern that is typically found in internal labor markets), but might also increase the incentives of temporary workers to be productive if they want their fixed-term contracts to be transformed into permanent ones (Polavieja, 2003).

While for employers temporary jobs can be regarded as being advantageous, for employees they are likely to be associated with disadvantages such as job insecurity, fewer promotion prospects and lower wages and fringe benefits (e.g. Booth et al., 2002). The disadvantages might be less severe in the academic labor market (Mertens et al., 2007), but if evaluated against the standard employment relationship,¹ temporary employment still comprises a less valuable option that bears additional individual risks for employees (Giesecke and Groß, 2004).

The Link between Fields of Study and Flexible Work

Fields of study may be related to temporary employment for at least two reasons. First, fields provide graduates with certain skills, which in turn directly enhance

or lower their risk of holding a temporary contract. As outlined above, whenever an employer is facing uncertainty about the potential productivity of a job applicant, a temporary contract might be a way to screen the potential employee and thereby to reduce costs associated to possible mismatches. As different fields generate different degrees of specificity (in terms of skills and knowledge), the extent of an employer's uncertainty about the potential productivity of an applicant, as well as the amount of needed human capital investment, can be expected to vary with field of study. This means that *graduates from fields with a narrow occupational profile* (i.e. fields with a high degree of educational specialization) will face comparatively low risks of being exposed to fixed-term contracts. Simultaneously, graduates from fields with a rather general orientation signal more uncertainty about their productivity and higher investment costs, which in turn enhance their risk of being screened on a temporary contract.

Second, fields of study can be indirectly related to temporary employment by influencing the likelihood of entering positions that exhibit higher/lower risks of being temporary. Specifically, temporary contracts can be regarded as a consequence of certain characteristics of the occupational position itself. If there is a structural relation between fields of study and positions that exhibit either high or low levels of temporary employment, field-specific rates of temporary jobs appear to be mediated by positional characteristics. Such positional differences regarding temporary employment can be found at the level of industry sectors, as empirical results show (e.g. Boockmann and Hagen, 2001; Polavieja, 2006; Uzzi and Barsness, 1998). These industry differentials might be explained by differences in the degree of employment protection for permanent positions. We assume temporary jobs to be used more frequently for screening and buffering purposes in industry sectors with higher degrees of employment protection for the permanent staff. Thus, the public sector in particular, which exhibits above-average employment protection for permanent jobs, can be expected to use fixed-term contracts more often than other sectors (Giesecke, 2006). Moreover, the incidence of temporary jobs might differ between industries because some industry sectors are partly composed of firms that are exposed to high fluctuations in the demand for their goods or services. Those firms, which represent the major part of the secondary labor market segment, can be expected to make use of temporary contracts mainly to buffer demand fluctuations.

Besides effects of industry sector, positional characteristics influencing the incidence of temporary employment may also be expected for an occupation's degree of task specificity. As Polavieja (2003) points out, the degree of task-specificity is influenced by the amount of specific human capital that is necessary to exercise the task and the level of difficulty in monitoring employees. As both investments into firm specific capital and monitoring costs are highest among service class positions, it seems to be rational for employers to offer long-term employment relationships in order to retain employees (Goldthorpe, 2000). Thus, temporary employment within the service classes can be expected to be

mainly a matter of screening. However, given high conversion rates of temporary to permanent employment, the average level of fixed-term employment can be assumed to be fairly low for service class positions. Empirical results indeed show lower temporary employment rates for the service classes when the whole population of employees is considered (e.g. Polavieja, 2006).

Insofar as both industry sector and occupational class position (i.e. task specificity) are related to fields of study and temporary employment, these positional characteristics operate as mediating structures for the field-specific rates of temporary jobs. Thus, *high shares of temporary jobs in certain fields may be explained by a stronger association of those fields with industries or occupational positions exhibiting high rates of temporary employment and vice versa*. For example, as education and medical fields are very likely to lead to positions in the public or the service sectors, these fields can be expected to show considerably high rates of temporary employment. Likewise, graduates of humanities or the social sciences may be more likely to enter non-service class jobs (e.g. because of a lower demand for their specific skills), which in turn would increase their risk of holding a temporary contract.

CROSS-COUNTRY DIFFERENCES

Based on the empirical findings of the research on school-to-work transitions, which show that different systems utilize different mechanisms in the allocation to employment (e.g. Allmendinger, 1989; Müller and Gangl, 2003), we can expect an impact from institutional arrangements on the role fields of study play in the process of allocating graduates to temporary versus permanent jobs. To investigate this issue, we compare two countries that show marked differences in these institutional settings: Germany and the United Kingdom.

First, regarding the *tertiary educational system* of the two countries, the most striking differences are related to the degree of standardization (Allmendinger, 1989; Giesecke and Groß, 2004). In Germany, higher education degrees equip students of a certain field with a similar stock of knowledge – independently of the institution they have been awarded their degree. Therefore, the degrees are highly standardized and comparable across institutions. By contrast, in the UK, the specific contents are quite heterogeneous even within the same study program categories. Thus, comparability of degrees is rather limited in the British educational system – the degree of standardization is low. The differences in standardization are reflected in the degree of signaling that is argued to be more pronounced in Germany (Breen, 2005). German employers are assumed to be generally more aware of the kind of knowledge graduates from specific fields possess (which can be either specific or general), whereas uncertainty about the skills of applicants is comparatively high for British employers – even if they consider fields of study as additional information.

Moreover, in addition to the higher degree of standardization, the German higher education system comprises many study programs with a clear occupation-related profile (see Müller et al., 1998), while the British system is geared to

providing more general skills across the board. Thus, the linkage of the educational system with the labor market is much stronger in Germany.

In summation, the German system features many more educational signals for the labor market, with a strong emphasis on subject studied, whereas in the UK fields of study are no adequate indicator for reducing employer's uncertainty about the productivity of a job applicant. Therefore, *fields of study are expected to be more important for the process of allocating graduates to temporary jobs in Germany than in the UK*. Furthermore, the link between fields and labor market positions is much looser within the British context. Thus, it seems reasonable to expect *positional characteristics to be less capable of explaining variation in the shares of temporary jobs between fields of study in the UK compared to Germany*.

Second, Germany and the UK differ not only in their institutional settings of their respective educational systems, but also with respect to *labor market institutions*: the UK labor market is usually regarded as a rather open one with low levels of employment protection, whereas the German labor market is characterized by a high degree of employment protection (OECD, 2004). These differences suggest that temporary employment as a means of increasing flexibility is of less importance in the UK labor market, as restrictions against dismissal of employees holding permanent contracts are rather low. Indeed, overall rates of temporary employment are higher for Germany than for the UK, though the difference is less than expected if only differences in employment protection are considered (Giesecke, 2006; OECD, 2004). However, we believe that the overall degree of employment protection is of only minor relevance for explaining cross-country differences in the *relative* effects fields of study have on the individual risk of holding a temporary contract.

DATA AND VARIABLES

Our analyses are based on the German and the UK Labor Force Surveys for the year 2004. We restricted the samples to employees with higher education degrees, aged 20–39, who were not enrolled in education at the time of the interview. Taking into account missing values on the variables used, information of 2107 German men and 1594 women as well as 2108 British men and 2396 women could be analyzed.

The variables used attempt to capture important individual as well as job characteristics. The dependent variable *type of contract* is coded 0 for permanent employment and 1 for temporary employment. *Fields of study* are coded into ten categories: engineering/applications, science/mathematics, social sciences,² education, business/finance, medicine, media, humanities, arts, and law/administration. Although our sample is restricted to higher education degree-holders, we distinguish higher and lower degrees to capture some within group variation.³

As indicator of field of study specificity, we constructed a *dispersion index* (de Vries and Wolbers, 2005; Dekker et al., 2002). This index is a measure of concentration, focusing on the distribution of occupations within a certain field (field-based

dispersion). It ranges between 0 and 1, higher values indicating fields with a heterogeneous distribution across occupations.⁴ We additionally constructed an index indicating for each occupation the degree of heterogeneity of its employees' educational background (occupation-based dispersion).⁵

Other individual characteristics are measured by age, nationality, and marital status. We use *age* in years and *age squared* to control for (non-linear) lifecycle effects. *Nationality* is measured as a dichotomous variable, distinguishing between citizens and non-citizens of the respective country. *Marital status* distinguishes married from non-married respondents.

Apart from individual characteristics, we constructed indicators for positional features. In order to capture characteristics that are related to task-specificity, we use a variable for the *class position* proposed by Erikson and Goldthorpe (1992). We distinguish between positions of service class I, service class II, and below service class. *Industry sector* distinguishes ten categories: agriculture, energy, manufacturing, construction, trade/hospitality, transportation/communication, banking/insurance, education/health, other services, and public sector. In order to provide a more substantial explanation of industry sector effects, we additionally constructed indicators for industry properties: *the share of service class positions* as well as *the share of women* measured at the industry level. We further use the *industry sector expansion* between 1999 and 2004, measured as relative growth in the industry specific (highly educated) workforce, in order to capture differences in the development of labor demand. *Firm-size* distinguishes small firms (less than 20 employees) from middle-sized firms (between 20 and 50 employees) and large firms (more than 50 employees).

Finally, as we expect the relevance of flexible employment to vary with economic cycles, we control for *overall unemployment rates* during the school-to-work transition, that is, at the time of highest qualification obtainment.

All models are estimated separately for male and female employees to allow for gender-specific effects due to distinct labor market processes for men and women.

RESULTS

The empirical section of the article is divided into two main parts. First, the association between fields of study and the individual risk of holding a temporary contract is evaluated by descriptive measures. Field-specific rates of temporary employment and their variation between the German and the UK labor market will be discussed. Furthermore, the association between fields, specificity, industry sector, and occupational class will be explored to understand the latter factors' power to explain the effects fields have on the type of employment contract. Second, these issues are further investigated. Using multivariate analyses, the findings of the descriptive section are tested for their statistical robustness, taking into account the joint effects of various factors explaining field-specific rates of temporary employment.

Descriptive Findings

Figure 1 depicts rates of temporary employment by fields, gender, and country. There are four aspects that should be particularly highlighted. *First*, the individual likelihood of holding a temporary versus a permanent contract is related to the specific field studied. There is considerable variation in the proportion of temporary jobs between fields. This finding clearly underlines the considerable heterogeneity of highly educated employees in terms of their (early) career chances. However, from a cross-national comparative perspective, there are both clear-cut similarities and striking differences between the UK and Germany. Similarities can be found for arts and humanities (high proportions of temporary jobs) and for business/finance (very low proportions of temporary jobs). Differences between the countries are obvious in the cases of medicine and science/mathematics, with relatively high risks of temporary employment for German employees in those fields.⁶ *Second*, the higher variation between fields indicates a closer association between fields and type of contract in Germany than in the UK, a result that is also confirmed by Cramer's V, which summarizes the association in one number.⁷ *Third*, as indicated by the vertical lines in Figure 1, the average risk of temporary employment is higher for the sub-sample of tertiary degree-holders than for the entire workforce. This effect seems to be more pronounced for women, particularly in Germany. Gender differences are also demonstrated by the fact that temporary jobs are more likely for women than for men. *Fourth*, the risk of being employed on a temporary basis is lower in the UK than in Germany. Remarkably, this is true for every field, as well as for the entire workforce. This presumably reflects the lower employment protection legislation in the UK labor market, which makes the use of temporary employment as a means of flexibilization less likely.

To investigate how such factors as specificity, industry sector or occupational class might explain field-specific risk patterns, Tables 1–3 depict important aspects of the association between these factors and fields of study.

As can be seen from Table 1, specificity (measured by field- as well as by occupation-based dispersion) varies over fields. Certain subjects (media, humanities, arts, social science) are connected to a rather high number of occupations (high field-based dispersion) and to occupational positions that are filled by graduates from various fields (high occupation-based dispersion), respectively. Other fields (medicine or law) clearly lead only to particular and more homogeneous occupations. These patterns are quite similar in Germany and the UK, as well as for men and women. The most striking between-country difference is the higher average dispersion found in the UK compared to that found in Germany. This difference can be found for all field categories. This result is in line with the assumption of a much stronger association between educational titles and job placement in the German labor market compared to the British one. With respect to the potential of the specificity measure to explain some part of the field-effects on type of contract, it becomes apparent that there are some fields

Figure 1 Share of temporary employment by field of study, gender, and country

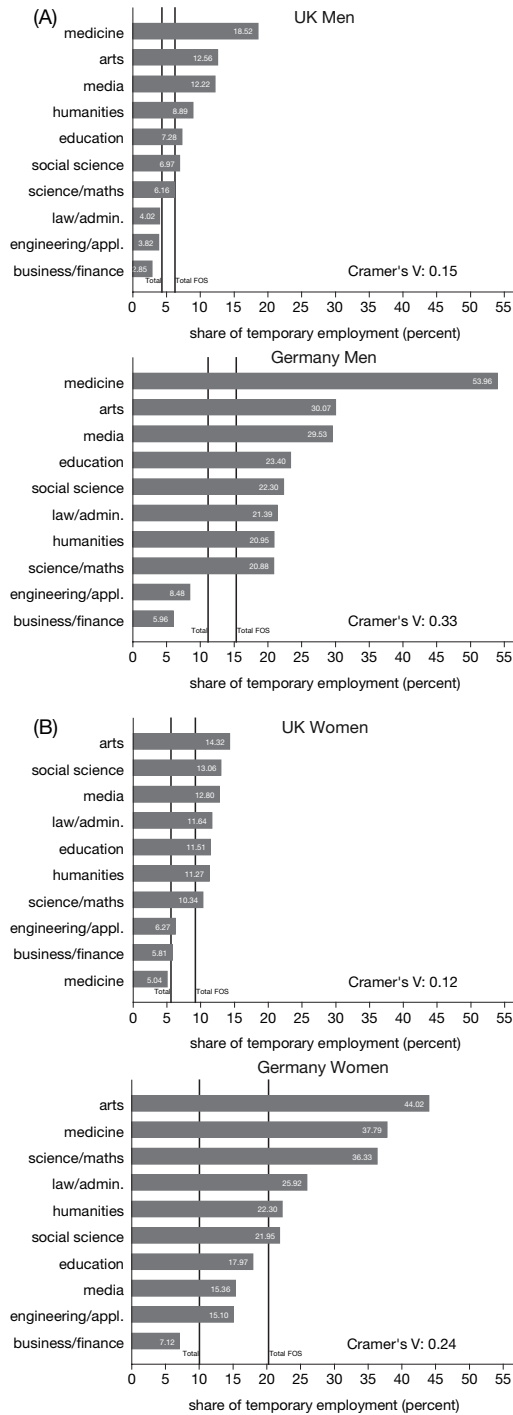


Table 1 Specificity and temporary employment by field of study, gender, and country

	UK				Germany			
	Men		Women		Men		Women	
	Dispersion		Dispersion		Dispersion		Dispersion	
	I	II	I	II	I	II	I	II
Engineering/Appl.	0.87 <i>0.04</i>	0.62	0.93 <i>0.06</i>	0.81	0.65 <i>0.08</i>	0.39	0.78 <i>0.15</i>	0.56
Science/Maths	0.92 <i>0.06</i>	0.71	0.96 <i>0.10</i>	0.78	0.89 <i>0.21</i>	0.53	0.94 <i>0.35</i>	0.52
Social Science	0.95 <i>0.07</i>	0.78	0.97 <i>0.13</i>	0.77	0.89 <i>0.22</i>	0.53	0.89 <i>0.22</i>	0.60
Education	0.80 <i>0.07</i>	0.79	0.73 <i>0.12</i>	0.70	0.74 <i>0.23</i>	0.49	0.76 <i>0.18</i>	0.42
Business/Finance	0.88 <i>0.03</i>	0.79	0.89 <i>0.06</i>	0.84	0.93 <i>0.06</i>	0.63	0.94 <i>0.07</i>	0.70
Medicine	0.83 <i>0.14</i>	0.44	0.77 <i>0.05</i>	0.39	0.17 <i>0.54</i>	0.09	0.47 <i>0.38</i>	0.23
Media	0.91 <i>0.12</i>	0.79	0.91 <i>0.13</i>	0.81	0.85 <i>0.30</i>	0.65	0.89 <i>0.14</i>	0.71
Humanities	0.95 <i>0.09</i>	0.82	0.95 <i>0.11</i>	0.82	0.82 <i>0.21</i>	0.73	0.95 <i>0.22</i>	0.72
Arts	0.93 <i>0.13</i>	0.80	0.95 <i>0.14</i>	0.83	0.77 <i>0.30</i>	0.74	0.71 <i>0.44</i>	0.70
Law/Administration	0.76 <i>0.04</i>	0.67	0.73 <i>0.12</i>	0.62	0.71 <i>0.21</i>	0.32	0.66 <i>0.25</i>	0.36
Total	0.89 <i>0.06</i>	0.72	0.87 <i>0.09</i>	0.70	0.74 <i>0.15</i>	0.46	0.79 <i>0.20</i>	0.52
Correlation with type of contract	0.02	0.02	0.05	0.05	-0.16	-0.11	-0.14	-0.14

Notes: Dispersion I: Field-based dispersion index; Dispersion II: ISCO-based dispersion index (mean); high numbers indicate low field specificity and vice versa; temporary employment rates in italics.

Source: Authors' calculations based on UK and German LFS 2004 data, person-specific weights are used.

that match the hypothesized pattern of high (low) specificity and high (low) rates of temporary jobs (e.g. science/mathematics, arts), while others clearly do not match this pattern (e.g. medicine, business/finance). As the correlation coefficients indicate, the statistical association of the two measures of specificity and the type of contract is rather weak and, in the case of Germany, even negative. This means that graduates from more specific fields are more likely to hold a temporary contract. Given these results, the degree of field-inherent specificity does not seem to be a powerful explanatory factor for the observed effects fields have on the risk of holding a temporary contract, and it is thus expected to be of only minor relevance in the multivariate analyses.⁸

With respect to the relationship of fields and industry sector, Table 2 reveals that there are clear patterns of association.⁹ Some fields (e.g. education, medicine) are very likely to lead to positions in the public sector, which exhibits the highest

shares of temporary jobs. Graduates of engineering/applications are more likely to get a position in the private non-service sector, which is characterized by low rates of temporary jobs. Other fields, such as science/mathematics, social science, are more likely to lead to positions in the private service sector, which shows rates of temporary employment that are slightly below total average. Finally, there are differences in the distributional patterns of fields over industry sectors between Germany and the UK. The most striking differences can be found for business/finance (very high shares in the private service sector in the UK), medicine (very high shares in the public sector in the UK), and law/administration (high shares in the public sector in Germany and the private service sector in the UK). Moreover, the overall strength of association between fields and industry sector (measured by Cramer's V) is higher in the German labor market, which again demonstrates the stronger relationship between educational titles and job placement than in the UK.¹⁰ Given the rather similar sectoral differentials in the overall rates of temporary jobs (see first row in Table 2), the potential of industry sector to explain field-effects on type of contract can thus be expected to be somewhat higher in Germany than in the UK. This might be interpreted as a first support for the hypothesized relation, though multivariate analyses are clearly called for to address problems stemming from endogeneity.

Finally, Table 3 allows further insight into the association between occupational class, temporary employment and fields of study. Clearly, holders of higher degree certificates have a rather high chance of entering a service class position: on average, 80 to 90 percent work in service class occupations (see Kim and Kim, 2003). Yet, there is considerable variation between fields. While some fields (engineering or science) are more likely to lead into occupations belonging to the service class I, other fields (humanities, social science, media) increase the likelihood of entering positions below service class I. In both countries, women are more likely than men to work in occupations of service class II or even lower. This is true for almost all fields, the exceptions being media and law. The cross-national comparison reveals that in Germany higher degree-holders are more likely than their UK counterparts to work in occupations belonging to the service class I. Furthermore, as indicated by Cramer's V, the association between fields and occupational class is higher in Germany than in the UK, although this difference is more pronounced for men than for women. All these patterns (variation between fields, gender, and countries) may help explain field-specific rates of temporary employment if there is an effect of occupational class on the type of contract. However, multivariate analyses are clearly needed to take into account the impact of occupational class, fields, and other important influencing variables on the type of contract simultaneously.

Results from Multivariate Analyses

To evaluate the association between fields of study and type of contract more closely, the determinants of temporary employment are analyzed by using logit models. Table 4 displays the results of different model specifications, which

Table 2 Association between industry sector, temporary employment and field of study

	Private non-service sector				Private service sector				Public sector			
	UK		Germany		UK		Germany		UK		Germany	
	M	W	M	W	M	W	M	W	M	W	M	W
Share of temporary employment	0.02	0.06	0.06	0.09	0.05	0.08	0.12	0.16	0.12	0.11	0.33	0.27
Distribution of fields (row percentages)												
Engineering/Appl. Science/Maths.	0.46	0.24	0.59	0.41	0.41	0.46	0.29	0.40	0.13	0.31	0.12	0.19
Social Science	0.17	0.16	0.25	0.15	0.58	0.42	0.49	0.44	0.24	0.43	0.26	0.41
Education	0.13	0.07	0.12	0.12	0.60	0.41	0.54	0.53	0.26	0.52	0.34	0.35
Business/Finance	0.02	0.01	0.05	0.01	0.23	0.16	0.27	0.25	0.75	0.82	0.68	0.74
Medicine	0.16	0.13	0.25	0.22	0.70	0.65	0.60	0.54	0.14	0.22	0.15	0.24
Media	0.07	0.04	0.02	0.03	0.17	0.21	0.40	0.51	0.76	0.75	0.58	0.46
Humanities	0.13	0.08	0.20	0.23	0.40	0.54	0.55	0.58	0.47	0.38	0.25	0.19
Arts	0.17	0.08	0.24	0.17	0.53	0.46	0.45	0.56	0.29	0.46	0.31	0.27
Law/Administration	0.17	0.11	0.00	0.03	0.54	0.46	0.34	0.49	0.29	0.42	0.66	0.48
Total	0.03	0.04	0.01	0.09	0.77	0.72	0.49	0.38	0.19	0.23	0.50	0.54
	0.21	0.09	0.33	0.14	0.53	0.40	0.41	0.42	0.26	0.52	0.26	0.44

Notes: Cramer's V for total association between industry sector and field of study (using all ten industry sector categories): UK 0.20 (Men), 0.19 (Women); Germany 0.27 (Men), 0.25 (Women).

Source: Authors' calculations based on UK and German LFS 2004 data, person-specific weights are used.

Table 3 Association between occupation class, temporary employment and field of study

	Service class I				Service class II				Below service class I+II			
	UK		Germany		UK		Germany		UK		Germany	
	M	W	M	W	M	W	M	W	M	W	M	W
Share of temporary employment	0.03	0.06	0.16	0.22	0.06	0.10	0.11	0.14	0.19	0.14	0.15	0.16
Distribution of fields (row percentages)												
Engineering/Appl. Science/Maths.	0.68	0.53	0.82	0.66	0.18	0.33	0.09	0.13	0.14	0.14	0.09	0.21
Social Science	0.67	0.50	0.88	0.77	0.20	0.29	0.07	0.14	0.13	0.21	0.05	0.09
Education	0.54	0.38	0.78	0.63	0.23	0.31	0.13	0.20	0.23	0.32	0.09	0.17
Business/Finance	0.46	0.31	0.68	0.63	0.45	0.55	0.24	0.26	0.09	0.14	0.08	0.11
Medicine	0.67	0.54	0.58	0.50	0.20	0.29	0.33	0.25	0.13	0.17	0.09	0.25
Media	0.60	0.38	0.92	0.78	0.31	0.41	0.04	0.18	0.09	0.22	0.04	0.04
Humanities	0.46	0.42	0.53	0.49	0.38	0.43	0.29	0.31	0.16	0.15	0.18	0.20
Arts	0.51	0.36	0.84	0.46	0.32	0.39	0.05	0.22	0.16	0.26	0.11	0.32
Law/Administration	0.40	0.27	0.61	0.54	0.40	0.48	0.35	0.35	0.20	0.25	0.03	0.11
Total	0.76	0.70	0.73	0.77	0.16	0.21	0.16	0.10	0.09	0.08	0.11	0.12
	0.62	0.42	0.76	0.63	0.24	0.38	0.15	0.21	0.14	0.21	0.08	0.16

Notes: Cramer's V for total association between occupational class and field of study: UK 0.15 (Men), 0.18 (Women); Germany 0.21 (Men), 0.19 (Women). Source: Authors' calculations based on UK and German LFS 2004 data, person-specific weights are used.

Table 4 Allocation to temporary employment

	Model						Relative reduction (percent) ^a							
	I	II	III	IV	V	VI	III vs. I	IV vs. I	V vs. I	VI vs. I	III vs. I	IV vs. I	V vs. I	VI vs. I
Field of Study (Ref.: Business/Finance)														
<i>UK Men</i>														
Engineering/Appl.	0.28		0.34+	0.29	0.33+	0.26		28.3	14.2		22.0	28.3	14.2	15.6
Science and Maths	0.41*		0.32+	0.30+	0.35*	0.35*		23.8	14.0		15.5	23.8	14.0	42.5
Social Science	0.53*		0.45*	0.40+	0.45*	0.30		59.9	42.6		48.8	59.9	42.6	40.9
Education	0.59*		0.30	0.24	0.34	0.35		36.5	19.7		30.9	36.5	19.7	19.8
Medicine	0.88***		0.61**	0.56**	0.71***	0.42		45.2	20.8		25.0	45.2	20.8	40.6
Media	0.71*		0.53	0.39	0.56+	0.42*		33.0	20.7		21.5	33.0	20.7	33.6
Humanities	0.63**		0.49*	0.42*	0.50*	0.42*		21.6	11.1		11.2	21.6	11.1	27.1
Arts	0.80***		0.71***	0.63**	0.71***	0.58**		35.5	20.4		25.0	35.5	20.4	31.4
Law/Administration	0.17		0.15	0.14	0.12	0.22								
<i>UK Women</i>														
Engineering/Appl.	0.11		0.11	0.06	0.10	0.06		21.3	5.8		14.6	21.3	5.8	26.2
Science and Maths	0.32*		0.28+	0.26	0.31+	0.24		30.1	16.5		20.0	30.1	16.5	45.3
Social Science	0.44**		0.35*	0.31+	0.37*	0.24		48.0	29.9		35.8	48.0	29.9	58.7
Education	0.42**		0.27+	0.22	0.29+	0.17								
Medicine	0.08		-0.05	-0.09	0.01	-0.07								
Media	0.42		0.38	0.33	0.39	0.34		27.5	14.6		18.2	27.5	14.6	41.7
Humanities	0.36*		0.30+	0.26+	0.31*	0.21		17.6	9.7		10.6	17.6	9.7	27.1
Arts	0.49**		0.44*	0.41*	0.44*	0.36*		10.3	0.8		1.1	10.3	0.8	3.8
Law/Administration	0.45*		0.45*	0.41+	0.45*	0.44+		25.8	12.9		16.7	25.8	12.9	33.8
<i>Germany Men</i>														
Engineering/Appl.	0.28*		0.32*	0.24+	0.39**	0.23+		15.1	12.5		17.8	15.1	12.5	17.2
Science and Maths	0.59***		0.48***	0.41**	0.51***	0.41**		51.6	8.8		46.1	51.6	8.8	54.4
Social Science	0.68***		0.56**	0.33+	0.62***	0.31+		78.8	26.3		61.6	78.8	26.3	79.1
Education	0.75***		0.41**	0.16	0.56***	0.16		49.0	18.8		19.6	49.0	18.8	50.3
Medicine	1.37***		1.10***	0.70***	1.11***	0.68***		29.0	8.7		7.8	29.0	8.7	32.4
Media	0.79**		0.73*	0.56+	0.72*	0.54+								

(Continued)

Table 4 (Continued)

	Model						Relative reduction (percent) ^a							
	I	II	III	IV	V	VI	III vs. I	IV vs. I	V vs. I	VI vs. I	III vs. I	IV vs. I	V vs. I	VI vs. I
Humanities	0.64*		0.52*	0.41*	0.61*	0.40+	18.9	35.8	5.3	37.0				
Arts	0.88**		0.55+	0.25	0.64*	0.26	37.7	71.4	26.9	70.5				
Law/Administration	0.61***		0.38**	0.24+	0.45***	Average	37.3	60.7	25.8	62.5				
							25.3	46.9	16.7	48.2				
<i>Germany Women</i>														
Engineering/Appl.	0.45**		0.48***	0.41**	0.50***	0.41**		9.4		8.6				
Science and Maths	0.88***		0.77***	0.70***	0.81***	0.72***	11.8	20.0	8.1	18.5				
Social Science	0.60***		0.54**	0.34+	0.57**	0.38*	8.9	42.7	3.9	35.9				
Education	0.49***		0.25+	0.09	0.40**	0.16	49.1	82.5	18.7	66.9				
Medicine	0.95***		0.83***	0.61***	0.86***	0.63***	12.6	35.7	9.2	33.3				
Media	0.36		0.38	0.33	0.41+	0.40+								
Humanities	0.46*		0.43*	0.32+	0.47**	0.34+	7.8	30.4		26.5				
Arts	1.03***		0.89***	0.66**	0.98***	0.74**	13.1	35.9	4.9	28.1				
Law/Administration	0.55***		0.38*	0.25	0.44**	0.26+	31.1	53.3	20.0	52.1				
						Average	19.2	38.7	10.8	33.7				
Specificity (Field-based Dispersion) ^b														
<i>Germany Men</i>														
<i>Germany Women</i>														
<i>Industry Sector (Ref.: in Model III: Private Non-Service, in Model IV and VI: Manufacturing)^c</i>														
<i>UK Men</i>														
Private Service														
Health/Education														
Public Service														
<i>UK Women</i>														
Private Service														
Health/Education														
Public Service														

Specificity (Field-based Dispersion)^b
Germany Men -1.20***
Germany Women -1.10***

Industry Sector (Ref.: in Model III: Private Non-Service, in Model IV and VI: Manufacturing)^c

UK Men
 Private Service 0.34+
 Health/Education 0.58+
 Public Service 0.78*** 0.90***
UK Women
 Private Service 0.16
 Health/Education 0.51*
 Public Service 0.40* 0.58**

Germany Men									
Private Service Health/Education									0.98***
Public Service									0.85***
Germany Women									
Private Service Health/Education									0.76***
Public Service									0.82***
Occupational Class (Ref.: Service Class I)^b									
UK Men									
Below Service Class									0.71***
UK Women									
Below Service Class									0.35**
Industry Properties^d									
Firm-size	No	No	No	No	No	No	No	Yes	No
	No	No	No	No	No	No	Yes	Yes	Yes
Pseudo-R²									
UK Men	0.14	0.10	0.17	0.18	0.16	0.23	0.23	0.23	0.11
UK Women	0.06	0.04	0.06	0.07	0.06	0.08	0.08	0.08	0.04
Germany Men	0.20	0.15	0.24	0.28	0.23	0.28	0.28	0.28	0.12
Germany Women	0.17	0.14	0.20	0.22	0.19	0.23	0.23	0.23	0.12
Standard Deviation of Latent Variable									
UK Men	2.12	2.05	2.19	2.23	2.16	2.31	2.31	2.31	2.31
UK Women	1.95	1.92	1.97	2.00	1.96	2.02	2.02	2.02	2.02
Germany Men	2.22	2.12	2.31	2.44	2.33	2.46	2.46	2.46	2.46
Germany Women	2.20	2.12	2.27	2.34	2.25	2.35	2.35	2.35	2.35

+ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

^aonly positive differences where at least one coefficient is significant at the 5 percent significance level are displayed.

^bonly significant coefficients are shown.

^cmodels IV and VI use a total of ten industry sectors.

^dshare of female/of service class workers, relative expansion rates.

^econtrol variables only (age and age squared, nationality, marital status, unemployment rate at time of highest qualification obtainment, lower vs. higher degrees)

Source: Authors' calculations based on UK and German LFS 2004 data, person-specific weights are used.

were estimated separately by gender and country. Because the estimates are to be compared across models, y -standardized coefficients are calculated (Long, 1997). Due to space limitations, only the effects of variables that are explicitly discussed are reported.¹¹

In the first model specification, only fields and control variables are included. This model closely mirrors the descriptive findings (see Figure 1), though the effects of fields are net of the impact of the control variables and significant tests for the field-differentials (with business/finance being the reference category) are available. As is evident, not all differences are statistically significant, especially for the UK sample. However, the main findings of the descriptive analysis on field-differentials are supported by this model.

In addition to testing field-effects on type of contract, this model can be used to check the strength of association between fields and the individual risk of holding a temporary contract and its variation between countries. The descriptive findings already indicated a higher association between fields and type of contract for the German labor market. By considering the Pseudo- R^2 values (at the bottom of Table 4), it is clear that the model fit is much better for Germany: compared to the UK, the variables utilized are more closely associated with the type of contract. To investigate the part of the association that is solely due to fields (net of the control variables), the Pseudo- R^2 values of the first model can be compared with those values from a base model specification (containing no fields, but only the control variables). This comparison clearly shows a higher association for the German data: Pseudo- R^2 increases by about 8 and 5 points for German men and women, but only by about 3 and 1.5 points for British men and women, respectively. Thus, the hypothesized relation is supported by the data in both the bivariate and multivariate analysis.

The second model, which contains the field-based dispersion index instead of the field dummies used in the first model,¹² is used to check the hypothesis that the degree of specificity can contribute to the explanation of the field-effects on type of contract. If the hypothesized relation was true, a higher dispersion value should increase the risk of holding a temporary contract. However, the descriptive analysis of the association between fields and specificity already cast some doubts on the potential of the degree of specificity to explain field-effects. The results of the multivariate analysis are in line with these findings: while in the UK sample the coefficient of the field-based dispersion index is very low and not significant (and thus not displayed in Table 4), it turns out to be *negative* in the German case, indicating a higher risk of holding a temporary contract for graduates from more specific fields. The latter effect is partly driven by the special pattern of medicine: if graduates from the field of medicine are excluded from the sample, the effect of the dispersion index shrinks toward zero and is no longer significant (results not shown). Thus, the degree of field specificity does not seem to contribute to the explanation of the field-effects on type of contract.

To test if the effects fields have on the type of contract are mediated by sectoral effects, information on the industry sector was added to the specification

of the first model (see column III and IV). The descriptive analysis of the last section already provided some support for the hypothesized relationship. In a multivariate setting, this issue can be checked by comparing (y-standardized) coefficients across models. If field-effects are mediated by industry sector, they should decline in size once information on industry sector is included in the model. To explicitly model the impact of sectoral differentials in the degree of employment protection, the third model (column III) uses a condensed version of the industry sector variable, distinguishing only between the private sector (service and non-service) and the public service. As the results show, there is a higher risk of holding a temporary contract for graduates working in the public sector compared to those in the private sector. This is true for men and women, and for both countries under investigation. Moreover, as some fields (particularly education, medicine, humanities) are more likely than others to lead to positions in the public sector where temporary contracts are used more often than in the private sector(s), sectoral effects play a substantial role in explaining the observed field-differentials in the rate of temporary employment for most fields of study, the exception being the field of engineering/applications. On average, this link can help to explain 15 to 25 percent of the field-effects on type of contract, though there is clearly variation between fields.

If the industry sector variable is further differentiated (thereby explicitly modeling some of the heterogeneity within the private service and non-service sector), the mediating role of industry sector is even more pronounced (see column IV). As the results of the fourth model show, in addition to the public sector, there are industry sectors that also make use of temporary employment more frequently than other sectors (e.g. health/education).¹³ Taking into account these conditions, as well as the association between fields and industry sector, helps to explain, on average, 25 to 47 percent of the effects fields have on the type of contract. Thus, together with the descriptive findings, these results support the hypothesis that field-effects on type of contract can (at least partly) be explained by sectoral effects. With respect to between-country differences in the amount field-effects are being mediated by industry sector, the results suggest that (with the exception of media) field-differentials are better explained by sectoral differences in Germany than in the UK. Combined with the descriptive findings of a tighter association between fields and industry sector in the German labor market these results confirm the theoretical reflections on this matter.

To determine to what extent the effects of industry sector on the type of contract can be ascribed to processes of industry expansion or to labor market segmentation, the fifth model uses relative expansion rates as well as the share of female/service class workers (average values per industry) and the size of the firm the employee is currently working at as additional information, the latter three being indicators of the labor market segments a particular industry belongs to.¹⁴ As the results show, these indicators capture some of the mediating effects of industry sector (about 50 percent and about 30 percent in the case of

the UK and Germany, respectively).¹⁵ Moreover, by taking these indicators into account, the model fit is higher than that of the first model, though it is lower when compared to the third and the fourth models. In sum, these results indicate that a substantial part of the mediating as well as the direct effects of industry sector cannot be attributed to the used indicators. Thus, fully equating industry effects on temporary employment with effects of secondary labor market structures seem to be unwarranted.

Finally, in the sixth model, positional effects are investigated with respect to the occupational class. To do so, information on the class position (distinguishing service class I, service class II and positions below service class) was added to the model. By looking at the effects of class position, as well as at the model fit, it is clear that occupational class is an important predictor of the risk of holding a temporary contract in the UK, but is not so in the German labor market. For the UK, the results indicate that positions below service class II are more likely to be temporary, particularly for men. However, there does not appear to be a difference in this likelihood between the service classes. Contrary to this, in the German labor market, the incidence of temporary jobs seems to be evenly distributed among classes, once fields of study are controlled for.¹⁶ Moreover, as an additional explanatory factor of the effects fields have on the type of contract, the class position turns out to be of 'value' only in the case of British women, for whom the average explanation of field-effects is increased to about one third. For British men, taking into account the class position is relevant for enhancing the explanation of the effects of social science and arts, but is of the opposite effect in most other fields. Thus, the hypothesized relation is only supported for the sample of women in the UK. Furthermore, since there are no significant effects of occupational class, for the German case this variable cannot be regarded as being an explanatory factor for the effects fields of study have on the risk of holding a temporary contract.

CONCLUSION

While there have been some studies either on fields of study or on labor market flexibilization, there has so far not been a study that connects both strands of research. In this article, we attempted to do so by investigating the effects fields have on temporary employment, a very prominent form of flexible work. Empirically, a clear variation in the rates of temporary employment between fields can be found, which suggests that fields play a role in the process of allocating people to positions with temporary contracts.

One possible way to explain these differentials is to refer to the degree of field specificity. However, as the empirical analyses showed, there is almost no support for this notion from the data. An alternative argument suggests positional characteristics to be of importance for explaining differing shares of temporary jobs between fields. The results support this argument by showing industry sector to be indeed a relevant explanatory factor for the effects fields have on the risk of holding a temporary contract.

Furthermore, as the empirical analyses revealed, institutional settings exert an important influence on the relation of fields and the type of contract. The nexus of educational titles and labor market positions clearly influences the role fields play in the process of allocating people to (temporary) jobs. A high degree of standardization (as it is found in Germany) strengthens the link between educational qualifications and occupational position, thereby making fields more important for the allocation process to jobs.

These results clearly underline the significance of structural factors for the explanation of labor market outcomes. The field-specific risk of holding a temporary contract is not so much influenced by (perceived) productivity differentials, but to a large extent by the direct link of fields and occupational positions. Furthermore, institutional settings are affecting both the overall differentials and the way these differentials develop. The labor market chances of individuals are thus not only governed by individual productivity traits (as suggested by many economic labor market theories), but also by the effects of structural conditions, which are independent of individual characteristics.

However, a substantial part of the association of fields and the type of contract remains unexplained. For most fields, the observed differentials are only partly explained by specificity and positional characteristics. This suggests that other unobserved factors, which might be exogenous (e.g. ability) or endogenous (e.g. detailed firm characteristics) to fields, are affecting the association between fields and temporary employment. Moreover, there are clear gender differences in both labor markets under investigation. Women are more likely than men to hold a temporary contract, while at the same time the variables used in the model are less capable of explaining this individual risk as well as the effects fields have on it. Clearly, further research is needed to investigate these issues more thoroughly.

Finally, as the results indicate the importance of fields for the allocation of people to temporary jobs, it seems to be seminal for future studies to expand research to other forms of flexible employment, such as part-time work or forms of precarious self-employment. This could help to shed more light on the role fields of study play in the process of labor market flexibilization.

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NOTES

- 1 The standard employment relationship is usually defined as being full-time, permanent, and non-self-employment.
- 2 It was not possible to separate social sciences and law for combined subjects in the UK LFS. Thus, this category includes a few students of law in a combined subject. However, law as single subject was coded as 'law/administration'.

- 3 This distinction reflects the differences in the CASMIN classification (group 3b versus 3a). For the UK, the focus on higher degrees implies that below-degree certificates or diplomas (as BTEC, HND, HNC, etc.) are not considered.
- 4 Dispersion-index according to Dekker et al. (2002):

$$D_e = \left(1 - \sum_{o=1}^o \left(\frac{G_{eo}}{G_e} \right) \right) \frac{O}{O-1}$$

D_e = dispersion of ISCO-occupations (ISCO-88 3-digits) for field of study e .

G_{eo} = number of graduates of field e with ISCO-occupation o

G_e = number of graduates of field e

O = total number of ISCO-occupations.

- 5 In order to check the validity of the dispersion indices, we used external data (several German graduate surveys) that allowed us to calculate correlations of these indices with alternative indicators of field specificity. As both indices were highly correlated with these alternative measures, we are confident using valid indicators of field specificity.
- 6 The strikingly high rate of temporary employment among German medics is partly due to the peculiarities of the medical training in Germany. However, even if the age range is extended to 20–65-year-olds, high rates of temporary employment can be observed for the field of medicine.
- 7 Cramer's V is a standardized χ^2 -based measure of association, which can be used to compare the strength of association between two variables across different samples.
- 8 To check to what extent these results are driven by the exceptionally high specificity of medicine, we recalculated the correlations without medicine. While this had little impact for the UK sample, the correlations for the German sample became less negative and shifted toward zero. Thus, even without medicine, there seems to be no relationship between field specificity and the individual risk of holding a temporary contract.
- 9 Due to space limitations, the association between industry sector and fields is displayed only for three broad categories of industry sectors.
- 10 Here, all ten categories of the industry sector classification were used.
- 11 Full details are available on request.
- 12 As this indicator is fully collinear with the variable 'field of study', the dummy variables representing fields had to be removed from the model. When the occupation-based dispersion index is used instead of the field-based index, the results are very similar to those reported.
- 13 Because of space limitations, only the effects of 'health/education' are shown in Table 4.
- 14 See Section 3 for more details on the indicators used. As some of the indicators are fully collinear with the variable 'industry sector', the dummy variables representing industry sectors had to be removed from the model.
- 15 As it turned out, in both countries, high shares of female workers increase the risk of holding a temporary contract (for men and women). Furthermore, in the case of the German labor market, the share of service class workers is positively related to the risk of holding a temporary contract, while higher expansion rates decrease that risk. Firm-size turned out to be statistically not significant, except for German women, who are more likely hold a temporary job if they are working in a large firm.
- 16 In addition to the models presented in Table 4, we ran a model where information on occupational class was entered *before* the information on industry sector. Since the

results of this model are fairly identical to the one reported above, we conclude that the order of entering the positional characteristics does not exert an influence on the conclusions drawn.

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