



# Do double degrees improve career opportunities?

by

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## 1 Introduction

More and more higher education institutions offer dual, double degree and/or joint degree programmes. The idea of harmonising curricula between partner institutions of different countries and granting degrees from all participating partners was born in Europe in the late 80ies. Today there is an uncountable number of such programmes involving higher education institutions from all over the world and recent studies predict that the number will still increase, see e.g. Kuder, Obst (2009). Whereas the first agreements in Europe were still mainly motivated by the will to further strengthen the friendship between countries, today the European perspective is more ambitious with its aim to harmonize higher education in the EU. The European Commission recognizes joint degrees as principal means for pursuing this aim and therefore financially supports the creation of new joint degree agreements via the ERASMUS mundus programme. Similarly, the Atlantis programme subsidises degree consortia projects between higher education institutions in the EU and the US.

These efforts are mainly politically motivated, but nonetheless they would never have been successful if the dual, double or joint degree programmes (henceforth called DD programmes) were without any benefits for the higher education institutions (henceforth called universities) and for their students. In fact, the literature has identified a couple of reasons for the attractiveness of dual degrees for universities. Knight (2008), e.g., reports that the creation of a DD programme intensifies the relationship between two partner universities, and allows universities to introduce new specialities or programmes into their portfolio. Besides, she notes that DD programmes are used as a means to increase a university's reputation. Similarly, Schüle (2006) emphasizes that universities gain competitive advantages through DD programmes. Kuder and Obst (2009) analyse a sample of 180 universities in the US and EU and identify among the most important reasons (ordered according to their importance) for the creation of DD programmes: advancing internationalization of the campus, raising international visibility and prestige of the institution, broadening the institutions' educational offerings, strengthening academic research collaborations, increasing foreign student enrolments.

What regards the benefits for students most authors unanimously mention an increased employability and degree of internationalisation (see, e.g. Knight (2008), Schüle (2006) and European University Association (2004)). Of course, both factors are linked to each other: A high degree of internationalisation leads to a higher employability when more and more companies globalize and therefore search for employees with an international background. In a survey conducted by IW Consult (2003) a random sample of 311 German companies confirms that roughly 50% of the HR officers find DD attractive or very attractive<sup>1</sup> and that among these companies roughly 60% would prefer applicants with DD. Companies mention as main reasons for the attractiveness of DD the language skills of the candidates, followed by intercultural skills, and international expertise. Referring to these findings the German Rectors' Conference (HRK, 2005) concludes that alumni of DD programmes have extraordinarily good job market opportunities. However, when emphasizing the benefits of DD for students most authors do not control for other ways of internationalisation that students can select, like for example student exchange or international internships. For example, the European University Association (2004) argues as follows:

“From the student perspective, the benefits of participating in a joint Masters programme are immense. Studying in structured programmes that offer learning opportunities in another institution and country stimulates new ways of thinking and generates a wealth of new cultural opportunities, including the possibility to develop and extend language-learning skills and being exposed to new learning methods”.

Obviously, the benefits mentioned here are not particular to DD, they are also valid for exchange semesters or other international programmes. The same is true for the above-mentioned skills analysed by IW Consult (language skills, intercultural skills and international expertise), which can also be acquired with a traditional study or working sojourn in another country. When controlling for exchange semesters or international working experience the findings of IW Consult appear less favourable for DD programmes: First, 83% of all companies

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<sup>1</sup> The exact values are 53.4% for the degree of Diplom, 46.3% for the Master degree, and 45.7% for the Bachelor degree.

rate an international internship as attractive or very attractive, and the corresponding value for a study abroad period is 70%<sup>2</sup> which is much higher than the value of roughly 50% for DD programmes. What is more, the questionnaire of IW Consult does not separate out the attractiveness of DD programmes in particular, because the question for the attractiveness of international experience, like international study periods and internships does not contain DD programmes as a separate category, but asks for these programmes in a different question. Furthermore, the high percentage of companies preferring candidates with DD was conditioned on the subset of companies finding DD attractive. The percentage related to all companies reduces to about 30%. In other words, according to the survey 70% of all companies do not prefer candidates holding a DD. It can be argued that this percentage would have been even higher if the question had explicitly controlled for international experience. So, overall, the findings of the survey do not allow conclusions about the importance of DD for students.

Acknowledging the need to control for exchange programmes Schüle (2006) argues that DD stand for a higher international competence compared to normal international study periods. The same argument applies for Knight (2008), when she points out the higher quality and the higher prestige of DD. There is however, no empirical evidence about the importance of these factors for employability. The present study tries to fill this gap in the literature by empirically analysing the effects of DD. To be more precise, my aim is to provide empirical evidence on the effect that a DD has for a graduate when searching for a job after graduation and during his/her subsequent career. To the best of my knowledge, there is no empirical study focussing on the effects of double degrees for graduates, apart from the above mentioned investigation of IW Consult (2004). My study differs from IW Consult (2004) mainly for two reasons: First, I do not interview companies, but graduates, and secondly, I explicitly control for other forms of international experience. To this end I group the graduates of the sample into three different clusters: (i) graduates who have participated in a DD programme, (ii) graduates who have participated in other international programmes (international internship or exchange semester), but

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<sup>2</sup> For a sojourn of more than one year the value is 77%.

no DD programme, iii) all other graduates which are labelled as having no international experience. In this setting all three groups can be compared to each other. As the literature cited in this section suggests, graduates from the first group are expected to have the best job opportunities, followed by the second group. Graduates from the third group are expected to have significantly worse job opportunities compared to both other groups. In the following I will tests whether these effects are really observable and if so, estimate their size. The findings of this study can help universities as well as students in optimizing their decisions.

The remainder of the paper is organised as follows: The next section is dedicated to the measurement of career opportunities and other key concepts used hereafter as well as to the description of the questionnaire. Section 3 describes the database. The methods applied for the empirical test are exposed in section 4. Section 5 gives the result. The last chapter (section 6) summarizes the main conclusions of this study and discusses possible limitations.

## **2 Measurement Concepts and Questionnaire**

For the purpose of this study it is useful to understand the concept of career as comprising the job entry as well as the progress in the career. A factor improving the career opportunities of a graduate then is a quality which constitutes some added value for the job entry or the progress in the career. Such a factor will *ceteris paribus* lead to a more successful career, or to put it in other words, if all other relevant factors are the same, a person possessing this specific quality will be more successful than a person not possessing it. Hence, to test whether a factor improves career opportunities requires measuring the career success (target variable), the factor of interest (whether a person holds a DD or not) and all other relevant factors (control variables).

The literature on the concept of career opportunities is immense. A good general overview is given, for example, by Viswesvaran (2001), for an overview which is particularly related to the measurement concepts I refer to Dette et al. (2004). According to Dette et al. (2004) the data sources for measuring career success can be either documentations or human judgement, where human judgement comprises either the assessment by a third party or self-assessment. In my study the data entirely rely on the self-assessment of the interviewed

graduates. Dette et al. (2004) further specify that self-assessment can be about neutral facts, about success or about job satisfaction and these categories constitute the guideline for the questionnaire used here: Neutral facts in my study include salary, job searching time, type of work (administrative, executive, analytic) and type of contract (permanent or temporary), length of (un-) employment and the number of job changes. The assessment of success is related to the chances to find an (adequate) job after graduation, the adequacy of the present job and the importance of international skills for the career. When measuring job satisfaction I adopt the scale proposed by Greenhaus et al (1990), which includes questions about the professional success, the change of positions, the salary and the acquirement of new skills. Additionally, I ask for the overall satisfaction with the present job and the job entry.

Identifying the factor of interest is more straightforward than measuring career opportunities. One may directly ask whether a person has participated in a DD programme or not and – as it is important to control for international skills acquired outside of DD programmes – whether the person has participated in student exchange programmes and/or international internships.

Finally, it is important to observe the control variables. As stated above these are all factors relevant to the career apart from international experience. Examples are the graduate's academic performance (final grade, length of study, self-assessment of success), personal factors (age, gender, number of children, mobility, personal attitude towards work and success) and macro-economic factors.

The survey was carried out with an electronic questionnaire in German language.<sup>3</sup> The questions were displayed on four different pages. The arrangement and grouping of the questions in the questionnaire were designed to make the answering process as simple as possible and do not necessarily follow the function of the variables in the empirical test. Moreover, questions for consistency checks were added ("technical variables"). The first page of the online questionnaire included questions about the academic focus, the second page included questions about the entrance into the workforce and first job after

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<sup>3</sup> I thank Darla Domke-Dalmonte, Susanne Rank and Hannes Spengler for their helpful comments in selecting and formulating the questions.

graduation, the third page was about the professional development<sup>4</sup>, and the fourth page concluded with some demographic questions. There was a total of 84 questions.

The questions have been used to calculate the variable “international experience” which is a categorical variable containing the categories “DD” when the graduate has taken part in a DD programme, “yes, but no DD” when the graduate has taken part in an international exchange programme and/or internship but not in a DD programme and “none” if none of the above categories apply. Moreover, 27 target variables and 23 control variables have been generated from the questionnaire. Complete lists of these variables are given in the appendix (see table 1 for the target variables and table 2 for the control variables).

It should be noted that the questions and variables were aligned with the local conditions in Germany. For example, in Germany the final grade point average of an academic degree plays an important role for measuring the academic performance, or for gauging the professional success it is important to know whether the job is based on a temporary or permanent contract. Both factors might have a different importance in other countries.

### **3 Database**

The population used in this survey consists of all graduates from the School of Business of Fachhochschule Mainz (FH Mainz). Restricting the population to the graduates of one university may impair the representativeness of the findings. On the other hand, in Germany universities are considered as more homogenous by employers than in many other countries, at least within the subgroup of universities of applied sciences. Data collection took place in June 2009. In that month the questionnaire was sent to all alumni of the FH Mainz who were registered in the social network Xing. The Xing platform was used

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<sup>4</sup> This page was only shown if the respondent had made some changes in his/her job after graduation.

because at the time of the data collection it was the most comprehensive electronic database of FH Mainz alumni.<sup>5</sup>

The sample contains 180 graduates who have answered the questionnaire, 92 of which having no international experience (defined as no DD, no study period abroad and no international internship), 55 of which having international experience (study period abroad and/or international internship) but no DD, and 33 of which holding a DD. The appendix includes tables and histograms which show the distribution of the sample over the study programme (table 4), the final grade point average (table 5), the gender (table 6), the year of graduation (figure 1), the lengths of the studies (figure 2), and the age (figure 3). Most interestingly, the sample does not contain graduates with a final grade point average of 4 (which is the passing minimum). The fact that only the more successful students seem to have answered the questionnaire underpins the need to control for academic success.

#### **4 Methods**

The impact of double degrees on career opportunities can be estimated by regressing all target variables one after another on the three-category-variable “International experience” and on a set of control variables. Since “International experience” is categorical it has to enter the model in the form of two dummy variables: “Dummy-none” takes the value one when “International experience” is “none”, otherwise it is zero. “Dummy-DD” is one if “International experience” is “DD” and otherwise it is zero. In this setting the category “yes, but no DD” is the basic category, so that the regression coefficient of “Dummy-none” captures the difference between graduates without international experience and graduates with international experience (but no DD) whereas the coefficient of “Dummy-DD” represents the difference of DD graduates compared to internationally experienced graduates without DD. All ordinal and nominal control variables were also transformed into sets of dummy variables. Estimation for the numerical target variables of table 1 can be carried out with a

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<sup>5</sup> FH Mainz only recently has started developing its own alumni database which at the time of the survey contained less members than the Xing alumni group.

linear OLS regression. For the ordinal target variables of the same list the ordered logit model has to be applied.<sup>6</sup>

A further methodological issue that has to be resolved is the selection of an appropriate set of control variables. For a couple of reasons it is impossible to estimate a model including all control variables: first, the number of control variables is high compared to the sample size, second the transformation into dummies consumes a considerable number of degrees of freedom, and finally, many control variables measure similar aspects, which will be manifested in high correlations, thus impairing the precision of the estimation. The reason for having selected highly correlated control variables is that they represent proxies for unobservable constructs. For example, a person's achievement potential in this study is measured with the final average grade point, the lengths of studies and a self-assessment. The role of the family in a person's life, on the other hand, is measured with the number of children, a self-assessment about mobility and the length of maternity / paternity leave.

The problem of the high number of (potentially highly correlated) control variables will be addressed by analysing each target variables with three differently sized models: First, I will analyse the impact of "International experience" on each target variable without any control variable. In this case the method reduces to comparing the three groups of "International Experience" and testing whether the three subsamples are drawn from different populations. Secondly, the relationship between each target variable and "International experience" will be analysed while adding each of the control variables one by one to the linear regression model (when the target is numerical) or to the ordered logit model (when the target is ordinal). The advantage of estimating one single control variable in the model is that it saves degrees of freedom by keeping the number of covariates small. The disadvantage is that the controlling conditions may be unrealistically simple and therefore lead bias the results. For this reason it is necessary to allow for richer patterns of control variables. I address the selection problem with factor analysis. Generally, factor analysis is used to transform a large set of correlated proxy variables into a reduced number of factors which capture the underlying (and unobservable) concepts.

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<sup>6</sup> Stata 10.1 was used for all estimations and calculations in this paper.

The variable reduction usually comes at the cost of a loss of information. In this study I will reduce the set of control variables into a maximum of 6 factors. In a second step I will use these factors as covariates in the model.

## 5 Results

Before turning to the relationship between international experience and career opportunities I will report the results from factor analysis.

In order to save as many degrees of freedom as possible, I run two separate factor analyses, one for the full sample of 180 observations (excluding all variables measuring the progress in career) and another for the restricted sample of all 145 respondents who have experienced changes in their career (keeping all control variables). The factors from the full sample are used for target variables related to the job entry and the factors from the second factor analysis were used for the target variables related to the progress in the career.<sup>7</sup>

Table 7 shows the factor loadings and the uniqueness for the full sample when 6 factors are extracted. One of the main difficulties of factor analysis is the interpretation of the factors which for our purpose, however, is of second-rate importance. Nevertheless, here the factor loadings suggest some meaningful interpretation. The first factor, for instance, seems to be demographic factor since it is highly correlated with the year of birth, the number of children and the year of graduation. Factor 2 is related to the academic success, as can be seen from the high loadings to all variables related to the grading and to the self-assessment of success. Factor 3 seems to cover the concept of family/mobility for the strongest correlations are with mobility and partnership. Factor 4 may stand for the importance of the professional career (see the high correlations with the variables measuring the importance of different aspects of career, but also with the months of maternity leave and the gender). Factor 5 is highly correlated with the variables economy and major, therefore it captures the changing demand for a specific specialisation on the labour market. Finally, factor 6 is moderately correlated with many variables which makes it hard to

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<sup>7</sup> In the sample 35 respondents have had no changes in the career and thus the control variables asking for the progress in career are all missing. In the estimation the actual samples reduce to 176 and 140 observations due to additional missing observations.

understand. The values for uniqueness (see table 7) imply that not all control variables can be well explained by the factors. For example, the unexplained variation of lengths of studies or of the number of languages aside from English is quite high with values of uniqueness exceeding 80%. For the majority of the control variables, however, the fit is much better.

The factor loadings for the whole set of control variables are listed in table 8 of the appendix. Apart from the order of the factors, the interpretations are similar to table 7, only that the correlations between the variables and the factors are generally smaller, so that attributing meaningful concepts to the factors is more difficult than before. As stated above, for our purpose it is not necessary to understand the factors, for they are only used as control variables in the subsequent estimations of the impact of international experience on the target variables.

The results of these estimations will be discussed with the help of figures 4 and 5 of the appendix. Figures 4 and 5 refer to the simple model where each target variable is regressed on “International experience” without any control variables. The outcome of the models that include control variables or factors from factor analysis is not reported, because it is very similar to that of figures 4 and 5.<sup>8</sup> Whenever a result changes qualitatively by adding control variables it will be mentioned in the following interpretations.

Figure 4 (plots 1 to 13) is related to the numerical target variables and show the mean values for all three groups. Each plot reports the coefficients (and p-values) of the OLS estimation of the target variable on “Dummy-none” and “Dummy-DD”. As explained in section 4 the coding of the dummy variables is such that the coefficients measure the difference of the category (“DD” or “none”) to the basic category “yes, but no DD”.

Figure 5 (plots 1 to 20) is about the categorical target variables and reports the distribution of the sample over the different categories conditioned on the variable “International experience”. Here the coefficients and p-values are from the ordered logit model where the target variable is coded as defined in table 1.

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<sup>8</sup> Another reason for not reporting all results is to save space. For my 33 target variables and 23 control variables a total of 759 models have to be estimated. Furthermore, all target variables were fitted to the factors extracted from factor analysis. Starting with the first factor and adding step-by-step up to 6 factors yields an additional number of 198 estimations. All results not reported here are available from the author upon request.

From this coding the coefficients measure the tendency to disagree to the statements of the target variable. For example, a positive coefficient of “Dummy-none” would mean that a graduate without any double degree was more likely to disagree to the statement in question than a graduate from the category “yes, but no DD”.

I will first regard the career entry, i.e. the entry job after graduation, before I discuss the progress in career. Plot 1 in figure 4 is about the period of unemployment after graduation and accordingly DD graduates on average are longer unemployed than both other groups. In the sample, the group of graduates without international experience has the lowest average unemployment period after graduation. The p-value of both coefficients, 0.827 and 0.455, indicate that the differences are all insignificant. Nevertheless, a similar result is given in plot 2 of figure 4 where the average job searching time after graduation is plotted for the different groups. Again DD graduates rank behind the other groups and graduates without international experience perform best with the lowest searching time on average. It has to be noted that the difference in average between the DD graduates and other graduates with international experience is small and insignificant whereas the difference to the group without international experience is large and significant. This finding is robust to the inclusion of all control variables and factors. Similarly, graduates without international experience significantly outperform the other groups concerning the employment after graduation (see plot 19 in figure 5). What's more, most of the unemployed and job-searching graduates come from the group of DD graduates and again this result – albeit insignificant - does not change when adding factors or control variables. In line with these findings, graduates with international experience rate their chances to be employed worse than graduates without international experience (see plot 1 in figure 5), but similar to other internationally experienced graduates. Once more the difference between the groups is insignificant. Overall, the sample provides evidence that the job entry process after graduation is more difficult for graduates with international experience. The situation might be even worse for graduates holding a DD compared to graduates without DD, but these differences are not statistically significant. For all groups, however, the period of unemployment is small: Graduates without any international experience are

even hired before a month (on average), ie most of them start working immediately after graduation, and to this end they must have initialised their job searching efforts before graduation, possibly through part-time jobs during their studies or through their diploma or bachelor thesis. This, of course, is more difficult for DD graduates who according to their program are out of Germany during the semesters preceding their graduation.<sup>9</sup> Considering these difficulties the average period of unemployment of DD graduates (less than 1.5 months) seems quite low and can also be taken as an indicator of a high employability.

Similarly, the assessment of the adequacy of the first employment (“My first occupation after my graduation fits my qualifications”, plot 2 in figure 5) does not reveal any difference between the groups, as shown by the low absolute values of the coefficients and the high p-values. Relating this finding with the job searching time one might suppose that finding similarly adequate jobs is more time consuming for internationally experienced graduates.

Plot 3 in figure 5 implies that DD graduates are more satisfied with their job entry than other graduates, but aside from being insignificant the difference virtually disappears when adding control variables.

The impacts of DD on salary seem to be positive at first sight: On average graduates holding a DD have started with a higher salary than both other groups (see plot 7 in figure 4). The difference in average salary can, however, purely depend on the fact that less DD graduates work part-time, as shown in plot 3 of the same figure. At any rate, the difference in the average starting salaries reverses its sign (while remaining insignificant) when adding the control variable age or year of graduation. A possible explanation for this effect is that DD programmes have been created in the later years of the sample when nominal wages on average were higher than over the whole period. And finally, the differences described so far are all insignificant. To sum up, the sample provides no evidence for a higher starting salary of DD graduates. However, DD graduates are more satisfied with their entry salary when compared to both other groups (see plot 4 of figure 5). Although not being significant, a similarly sized difference can be observed when including all possible control variables or factors.

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<sup>9</sup> I thank Ulrich Schüle for pointing out this argument.

International experience and language skills seem to have helped DD graduates in finding their first job (see plot 7 and 8 in figure 5). In both cases the positive effects are higher for DD than for internationally experienced graduates without DD and lowest for graduates without international experience. The differences are significant at a 95%-level and robust to the inclusion of control variables or factors. However, DD students also rate the importance of international experience and of language skills for their entry jobs significantly higher than internationally inexperienced graduates (see plots 5 and 6 of figure 5). Possibly, the positive career effects from internationality and language skills are more pronounced for DD graduates, because of their opting for specific jobs which require these qualifications. This explanation goes conform to the longer job searching time of DD graduates granted that these specific jobs are harder to find.

When evaluating the progress in career, DD graduates also rate internationality and language skills as more important than the other groups (see plot 17 and 18 in figure 5). The difference however, is smaller than for the first job after graduation and no longer significant when compared to the group of other internationally experienced students. However, in figure 5 a significantly higher percentage of DD graduates mention that for performing their present job internationality is critical. The fact that the difference to the other groups has increased compared to the job entry suggests that DD are less ready to change their field of specialisation. On the other hand it has to be noted that DD graduates are the group with the lowest percentage of executive tasks in their first job, but with the highest percentage of executive tasks in their current job (see plot 6 and 12 of figure 4). The low percentage of executive tasks reflects that DD graduates typically work in large (international) companies where it is uncommon to start with executive tasks. In fact, DD graduates have rated internationality for getting their first job as more important than the other groups, and as a matter of fact, big companies offer more jobs of this type than SMEs. Graduates without international experience, on the other hand, have rated internationality as being less important for their first job, so more they are probably less focussed on large companies. In small and medium-sized enterprises, internationality is less required, but starting jobs with executive functions are more easily available. Also, as pointed out before, graduates

without international experience have better opportunities to build up contacts to companies during their studies which facilitates job entries at a higher hierarchical level. The fact that during their career DD graduates end up with the highest percentage of executive task therefore speaks for particularly dynamic career opportunities of DD graduates.<sup>10</sup>

The change in salary (plot 19, figure 4) is lower for DD graduates than for the other groups, but again the difference is insignificant. When including age, year of graduation or one of the factors into the regression equation, the average rate of change for DD graduates and internationally experienced graduates exceeds that of the other graduates. I used the rate of change in salary and the starting salary to estimate the current salary and found that the current salary of DD graduates was higher than in all other groups. The difference was insignificant, but robust to the inclusion of control variables. Also, in the self-assessment (plot 10, figure 5) DD are more satisfied with their changes in salary than other graduates.

In the sample, DD graduates are more satisfied with their career as can be seen from the answers to “I am satisfied with the professional success in my career” (plot 10), “I am satisfied with the change of positions in my career” (plot 11), “I am satisfied with the learning of new skills in my career” (plot 13) and “On the whole I am satisfied with my career” (plot 14), but again, the results are all insignificant.

From plot 9 in figure 4, DD graduates on average change less times the employer, but apart from insignificance, the differences between the categories are not robust to the inclusion of age and year of graduation as control variables.

For the remaining variables (plots 4, 5, 6, 10 and 11 of figure 4 and plots 9 and 20 of figure 5) the differences found in the sample were all small and insignificant. Additionally, most of them changed their sign when adding control variables, so that the existence and size of a potential difference remain unclear.

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<sup>10</sup> I thank Ulrich Schüle for pointing out this argument.

## 6 Summary and limitations

When summarizing the results it has to be noted first that for most dimensions of career opportunities DD graduates do not perform significantly better than other graduates. The evidence from the present sample therefore contradicts the postulate of “extraordinarily good job market opportunities” of DD graduates. On the contrary, the only significant results are that (i) all internationally experienced graduates take a longer time in finding entry jobs after graduation, that (ii) more DD graduates rate internationality and language skills as positive drivers in their careers and that (iii) more DD graduates do jobs where international experience and language skills are required. A possible explanation is that DD graduates have a particularly high degree of specialisation in international topics and skills which induces them to search for jobs which require these qualifications and that during the years of the sample this qualification was not more advantageous for finding adequate jobs than others. As pointed out, the longer job searching time cannot be taken as evidence for a lower employability of internationally experienced students when considering their limited opportunities of building up contacts to local companies during their studies. My findings are in line with the literature associating a particularly high level of international skills to DD, but they contradict the hypothesis that these skills have improved employability in the past. However, as long as the process of globalisation is expected to continue, the future labour market probably will ask for more of these skills and in this scenario DD might indeed improve the job entry opportunities.

For the job satisfaction and salary, the difference between DD graduates and the other groups are all insignificant. This may be either attributed to the irrelevance of DD for the career opportunities or to the small sample and thus to the low power of the statistical tests. The in-sample evidence clearly favours the latter assumption, because in-sample DD graduates outperform the other groups for many target variables: When ignoring the statistical significance DD graduates are more satisfied with their career (including salary, the learning of new skills and the professional success), have a higher salary and a more dynamic career concerning the increase of executive tasks. Also, for all these variables the difference to the graduates without any international experience is higher than to the graduates with other international experience indicating that

DD lead to a higher level of international skills than the other forms of international experience considered in this paper. Of course, the insignificance of the differences should not be ignored, but the fact that these differences are small in size, but robust to the inclusion of all control variables and factors used here calls for more research based on a bigger sample. In my sample the total number of DD graduates amounts to 33, and in such a small sample it will be hard to observe significant test results, when the differences between the groups is small.

Apart from size, the selection of the sample makes it difficult to generalise the findings of this paper. The main problem with the selection is that the graduates interviewed here are all from the same university. Although in Germany the reputation of a university plays a minor role than in many other countries, there is a pronounced difference between traditional universities and universities of applied sciences. I therefore take my results as representative for graduates from German universities of applied sciences only.

Nevertheless, my paper is the first attempt to provide empirical evidence on the impact of DD programmes for career opportunities and the results cast some doubt on the obvious benefits claimed by many authors in this field. For future research I suggest to increase the sample, preferably by selecting graduates from different universities and different countries.

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# Appendix

## TABLES AND FIGURES

Table 1: List of Target Variables

Variable	Scale
How many months after graduation from our university were you not employed (except for maternity/ paternity) leave?	numerical (months)
How many months did you search for a professional job in your field before you were hired to begin?	numerical (months)
What percent were you employed in this first professional position? (0 – 100%, where 100% is full-time)	numerical (per cent)
How much of your activities in your first job were analytical/ planning / creative tasks?	numerical (per cent)
How much of your activities in your first job were administrative / supervisory tasks?	numerical (per cent)
How much of your activities in your first job were executive tasks?	numerical (per cent)
What was your annual salary for your first job after graduation (gross salary in Euros, including bonuses and special payments)?	numerical (EUR)
What percent are you employed in your current position? (0 – 100%, where 100% is full-time)	numerical (per cent)
How many times have you changed your employer after graduation?	numerical
How much of your activities in your present job are analytical/ planning / creative tasks?	numerical (per cent)
How much of your activities in your present job are administrative / supervisory tasks?	numerical (per cent)
How much of your activities in your present job are executive tasks?	numerical (per cent)
At what rate has your salary changed since your first job after graduation (gross salary in Euros, including bonuses and special payments)?	numerical
My chances to be employed after my graduation were good.	ordinal (scale 1)
My first occupation after my graduation fits my qualifications.	ordinal (scale 1)
Overall, I was satisfied with my entry level job after graduation.	ordinal (scale 1)
I was satisfied with my entry salary.	ordinal (scale 1)
Internationality was critical to me performing my entry job.	ordinal (scale 1)
Familiarity with a foreign language was critical to me performing my entry job.	ordinal (scale 1)
My international experience was important to my getting my first job after university.	ordinal (scale 1)
My knowledge of foreign languages was important to my getting my first job after university.	ordinal (scale 1)
My present occupation fits my qualifications.	ordinal (scale 1)
I am satisfied with the professional success in my career.	ordinal (scale 1)
I am satisfied with the change of positions in my career.	ordinal (scale 1)
I am satisfied with the changes in my salary.	ordinal (scale 1)
I am satisfied with the learning of new skills in my career	ordinal (scale 1)
On the whole, I am satisfied with my career.	ordinal (scale 1)
Internationality is critical to me performing my present job.	ordinal (scale 1)
Familiarity with a foreign language is critical to me performing my present job.	ordinal (scale 1)
My international experience has positively influenced my career.	ordinal (scale 1)
My knowledge of foreign languages has positively influenced my career.	ordinal (scale 1)
Employment immediately following your graduation	ordinal (scale 3)
Present employment	ordinal (scale 3)

scale 1 1=Completely true, 2=Somewhat true, 3=Neutral, 4=Somewhat false, 5=Completely false

scale 3 permanent contract, temporary contract, searching for employment (self-employment, maternity leave and others have been excluded)

Table 2: List of Control Variables

variable	scale
Year of graduation	numerical (year)
How many months after graduation from our university were you on maternity/paternity leave?	numerical (months)
Year of birth	numerical (year)
Number of children	numerical
How many semesters did you study at our university?	numerical (months)
Aside from English and your native language, how many other languages do you speak?	numerical
The general work situation positively influenced my entry level job availability.	ordinal (scale 1)
My major in my study programme positively influenced my entry job.	ordinal (scale 1)
The general work situation positively influenced my career.	ordinal (scale 1)
My major in my study programme positively influenced my career.	ordinal (scale 1)
With my entry job, I was very mobile.	ordinal (scale 1)
Because of my partner, I had restricted mobility (for my entry job).	ordinal (scale 1)
I am mobile.	ordinal (scale 1)
Because of my partner, I have a restricted mobility.	ordinal (scale 1)
Gender	nominal (male, female)
How would you evaluate the importance of work in your life?	ordinal (scale 2)
How would you evaluate the importance of personal achievement in your life?	ordinal (scale 2)
How would you evaluate the importance of success in your job in your life?	ordinal (scale 2)
How would you evaluate the success of your studies?	ordinal (scale 2)
What was your final grade point average at our university?	ordinal (1, 2, 3, 4)
My grades in my studies at the university were important to my getting my first job after university.	ordinal (scale 1)
My grades in my studies at the university have positively influenced my career.	ordinal (scale 1)
Knowledge of the English language	ordinal (scale 4)

scale 1 1=Completely true, 2=Somewhat true, 3=Neutral, 4=Somewhat false, 5=Completely false

scale 2 1=below average, 2=average, 3=above average

scale 4 1=excellent, 2=good, 3=basic, 4=none

Table 3: Sample Distribution of the Variable International Experience

	Freq.	Percent
none	92	51.11
yes but no DD	55	30.56
DD	33	18.33
Total	180	100

Table 4: Sample Distribution of the Variable Degree Programme

	Freq.	Percent
Business (Full-time)	98	50.56
Business Law (Full-time)	26	13.33
Business (Part-time)	29	16.11
International Business	27	15
Total	180	100

Table 5: Sample Distribution of the Variable Final Grade Point Average

	Freq.	Percent
1	35	19.44
2	131	72.78
3	14	7.78
Total	180	100

1 = best grade, 2 = second best grade,  
3 = third best grade, 4 = minimum passing

Table 6: Sample Distribution of the Variable Gender

	Freq.	Percent
male	111	61.67
female	69	38.33
Total	180	100

Table 7: Factor Loadings for the Whole Sample

	f1	f2	f3	f4	f5	f6	Uniqueness
year of grad.	0.96	0.06	0.02	0.01	-0.01	-0.06	0.11
year of birth	0.92	-0.06	0.01	0.00	0.05	0.04	0.10
no. of children	-0.46	0.07	0.13	0.07	0.08	-0.25	0.67
maternity	-0.09	-0.12	0.04	0.49	0.02	-0.18	0.77
final grade	0.01	0.67	-0.08	0.00	0.07	-0.10	0.51
imp. grading 1	-0.08	0.47	0.10	-0.02	0.24	0.16	0.63
length o. studies	0.16	0.08	0.25	-0.01	-0.07	-0.18	0.88
languages	0.09	-0.11	-0.15	-0.02	0.00	0.36	0.82
economy 1	0.07	-0.13	-0.10	0.10	0.50	0.01	0.70
major1	0.06	0.14	0.07	-0.04	0.59	-0.04	0.58
mobility1	0.02	0.09	0.73	0.00	-0.04	0.06	0.46
partnership1	0.00	0.14	-0.68	-0.01	-0.06	0.07	0.49
gender	0.11	-0.38	0.09	0.22	0.14	0.28	0.62
imp. work	0.15	0.08	0.06	0.50	-0.05	0.15	0.64
imp. achievm.	-0.08	0.08	0.08	0.19	-0.05	0.45	0.69
imp. success	-0.07	0.24	-0.13	0.41	0.19	0.12	0.59
success stud.	-0.01	0.68	0.02	0.07	-0.03	0.07	0.53

The number of observations is 176. The loadings are from the rotated factors (oblique rotation with the quartimin criterion) extracted with principal-factor method.

Variable abbreviations in table 7:

f1, ... ,f6	Factor 1, ..., Factor 6
no. of children	Number of children
maternity	How many months after grad. from our univ. were you on maternity/pat. leave?
final grade	What was your final grade point average at our university?
imp. grading 1	My grades in my studies at the univ. were important to my getting my 1st job
length o. studies	How many semesters did you study at our university?
languages	Aside from English and your native language, how many languages do you speak?
economy 1	The general work situation positively influenced my entry level job availability
major1	My major in my study programme positively influenced my entry job
mobility1	With my entry job, I was very mobile
partnership1	Because of my partner, I had restricted mobility (for my entry job)
gender	Gender
imp. work	How would you evaluate the importance of work in your life?
imp. achievm.	How would you evaluate the importance of personal achievement in your life?
imp. success	How would you evaluate the importance of success in your job in your life?
success stud.	How would you evaluate the success of your studies?

Table 8: Factor Loadings for the Subsample

	f1	f2	f3	f4	f5	f6	Uniqueness
year of grad.	0.95	0.03	0.01	0.01	-0.06	0.03	0.13
year of birth	0.92	-0.03	0.03	0.01	0.04	-0.03	0.12
no. of children	-0.46	0.18	0.08	0.16	-0.26	0.07	0.61
maternity	-0.18	-0.29	0.22	0.05	0.31	0.01	0.84
final grade	-0.01	0.12	0.17	-0.12	-0.03	0.57	0.55
imp. grading 1	0.01	0.71	-0.01	0.02	0.13	0.11	0.40
length o. studies	0.31	0.17	-0.10	0.21	-0.23	0.06	0.82
languages	0.15	-0.19	-0.02	-0.15	0.27	0.04	0.86
economy1	0.06	0.14	0.39	0.05	0.16	-0.26	0.70
major1	0.14	0.01	0.76	0.04	-0.01	0.04	0.40
mobility1	0.07	0.01	-0.04	0.70	0.06	0.07	0.48
partnership1	-0.08	0.10	-0.07	-0.65	0.02	0.08	0.52
gender	0.16	-0.09	0.02	0.17	0.43	-0.29	0.62
imp. work	0.12	0.24	-0.15	0.10	0.52	-0.03	0.60
imp. achievm.	-0.06	0.02	-0.06	0.01	0.61	0.10	0.60
imp. success	-0.10	0.17	0.18	-0.06	0.51	0.10	0.59
success stud.	0.02	0.22	0.05	0.02	0.13	0.54	0.56
imp. grading 2	-0.12	0.62	0.22	-0.04	-0.02	0.03	0.41
economy2	0.06	0.34	0.17	-0.17	-0.05	-0.47	0.64
major2	-0.07	0.02	0.80	-0.01	-0.02	0.02	0.34
mobility2	-0.18	0.10	0.02	0.61	0.05	0.00	0.60
partnership2	0.04	-0.01	-0.06	-0.53	0.13	0.06	0.71

The subsample consists of 140 graduates with changes in their career. The loadings are from the rotated factors (oblique rotation with the quartimin criterion) extracted with principal-factor method.

Variable abbreviations in table 8 (see also table 7):

imp. grading 2	My grades in my studies at the university have positively influenced my career
economy2	The general work situation positively influenced my career
major2	My major in my study programme positively influenced my career
mobility2	I am mobile
partnership2	Because of my partner, I have a restricted mobility

Figure 1: Sample Distribution of the Year of Graduation

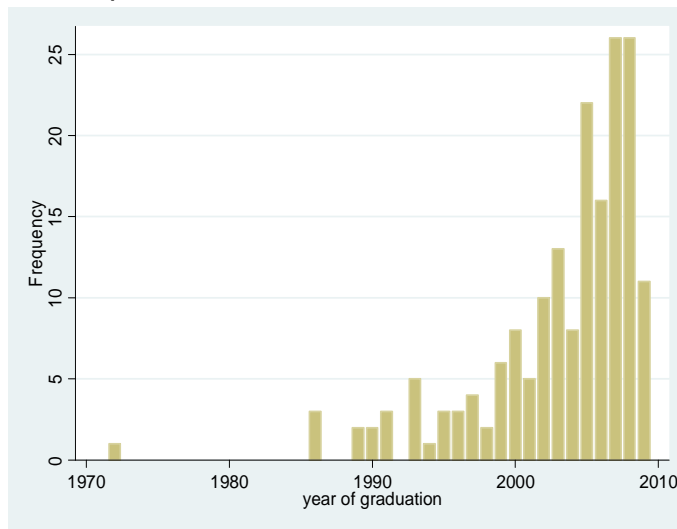


Figure 2: Sample Distribution of the Length of Studies

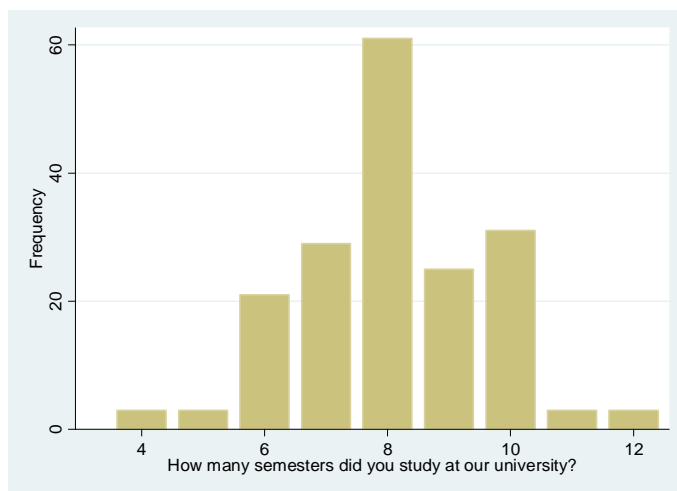


Figure 3: Sample Distribution of the Year of Birth

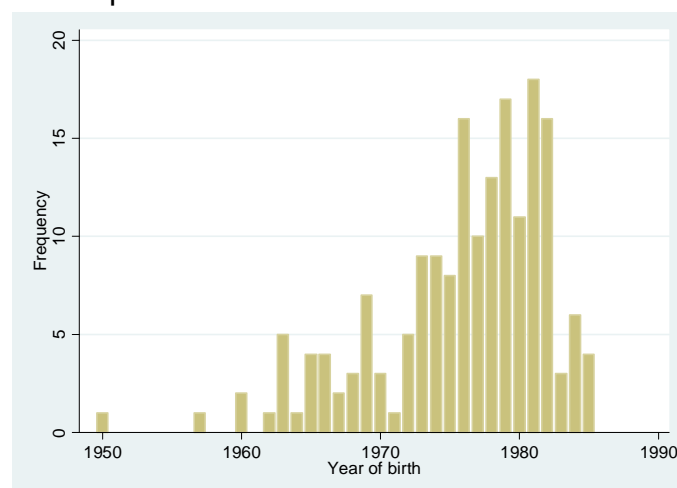


Figure 4: Results for Quantitative Target Variables

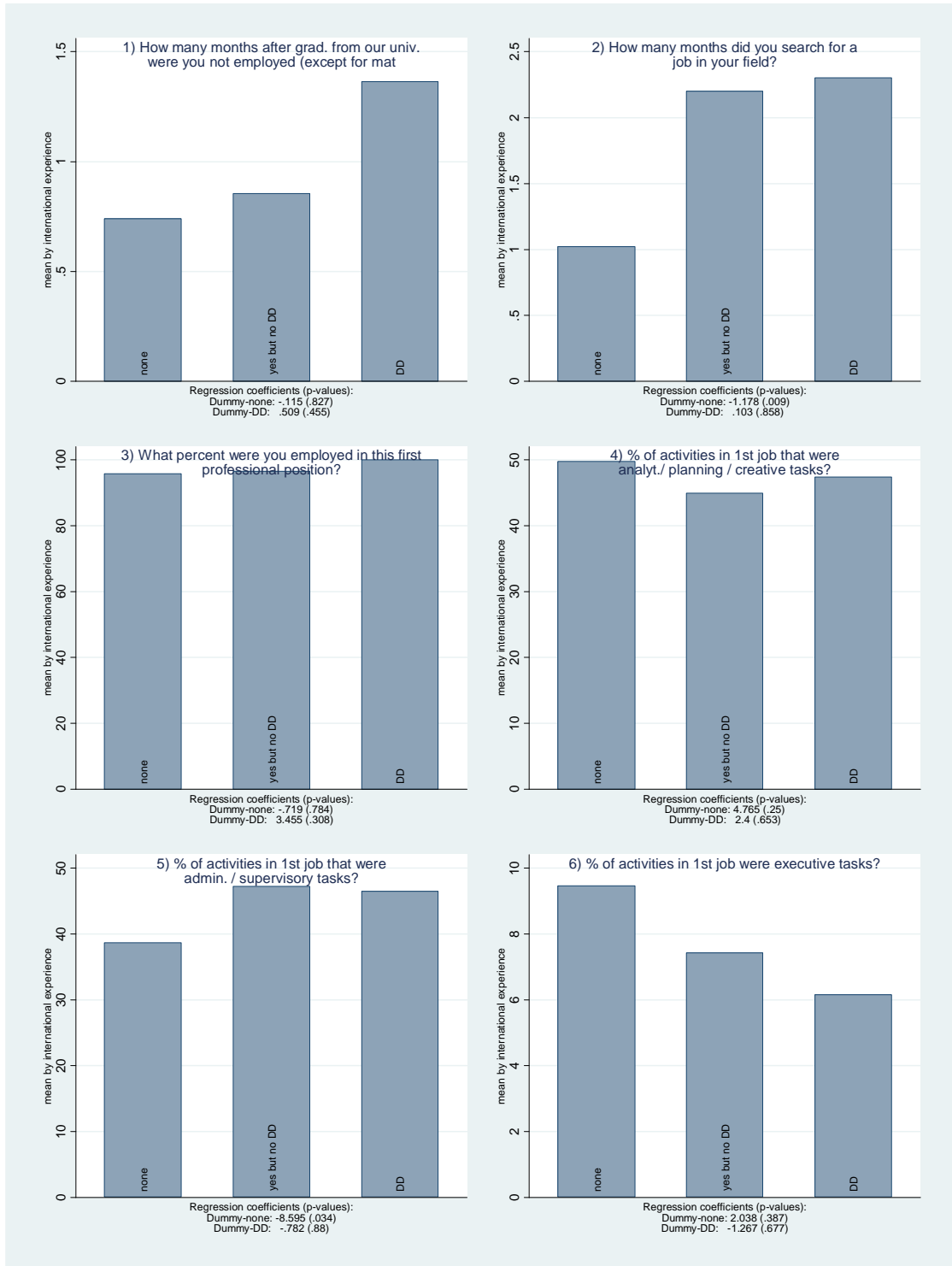


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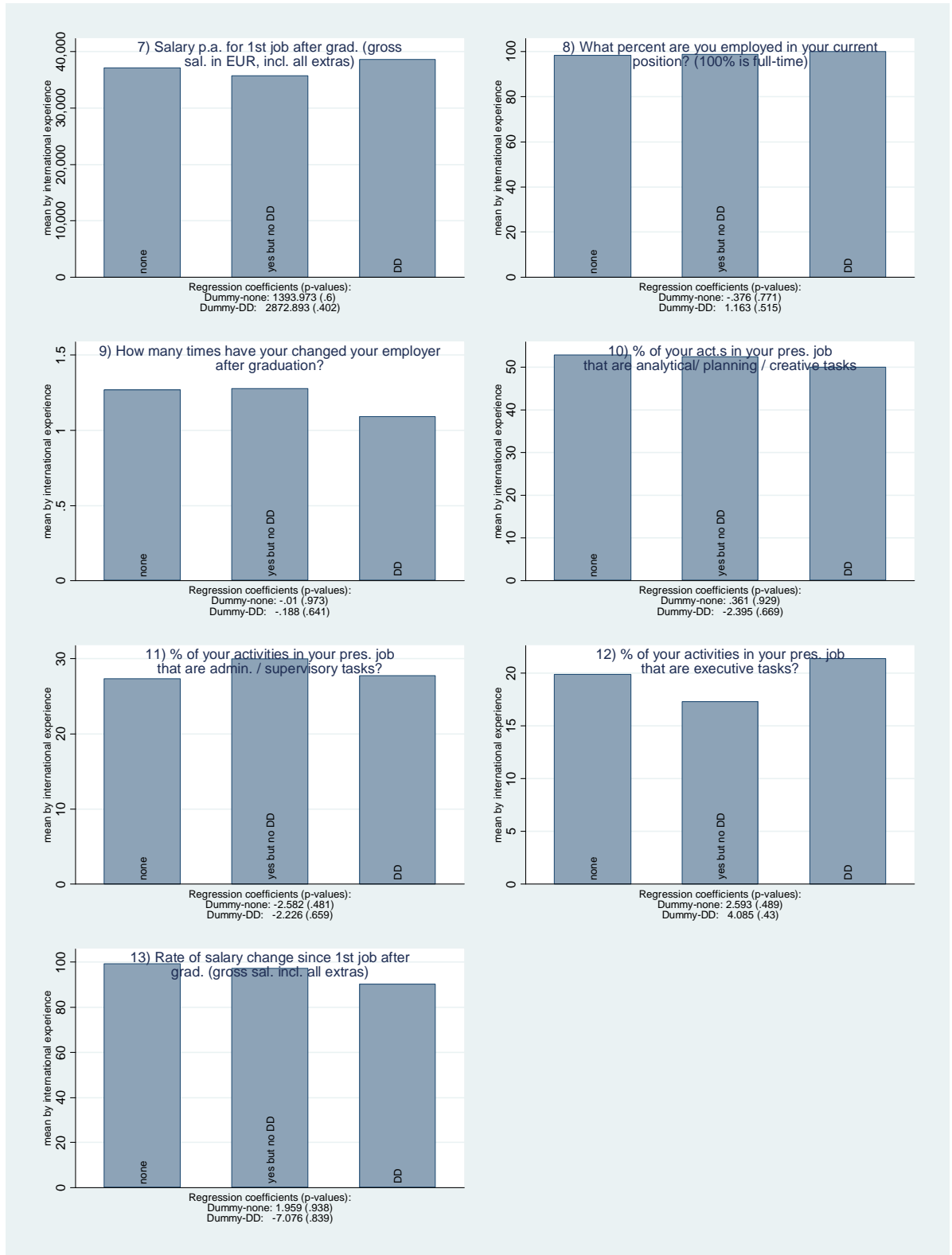


Figure 5: Results for Qualitative Target Variables

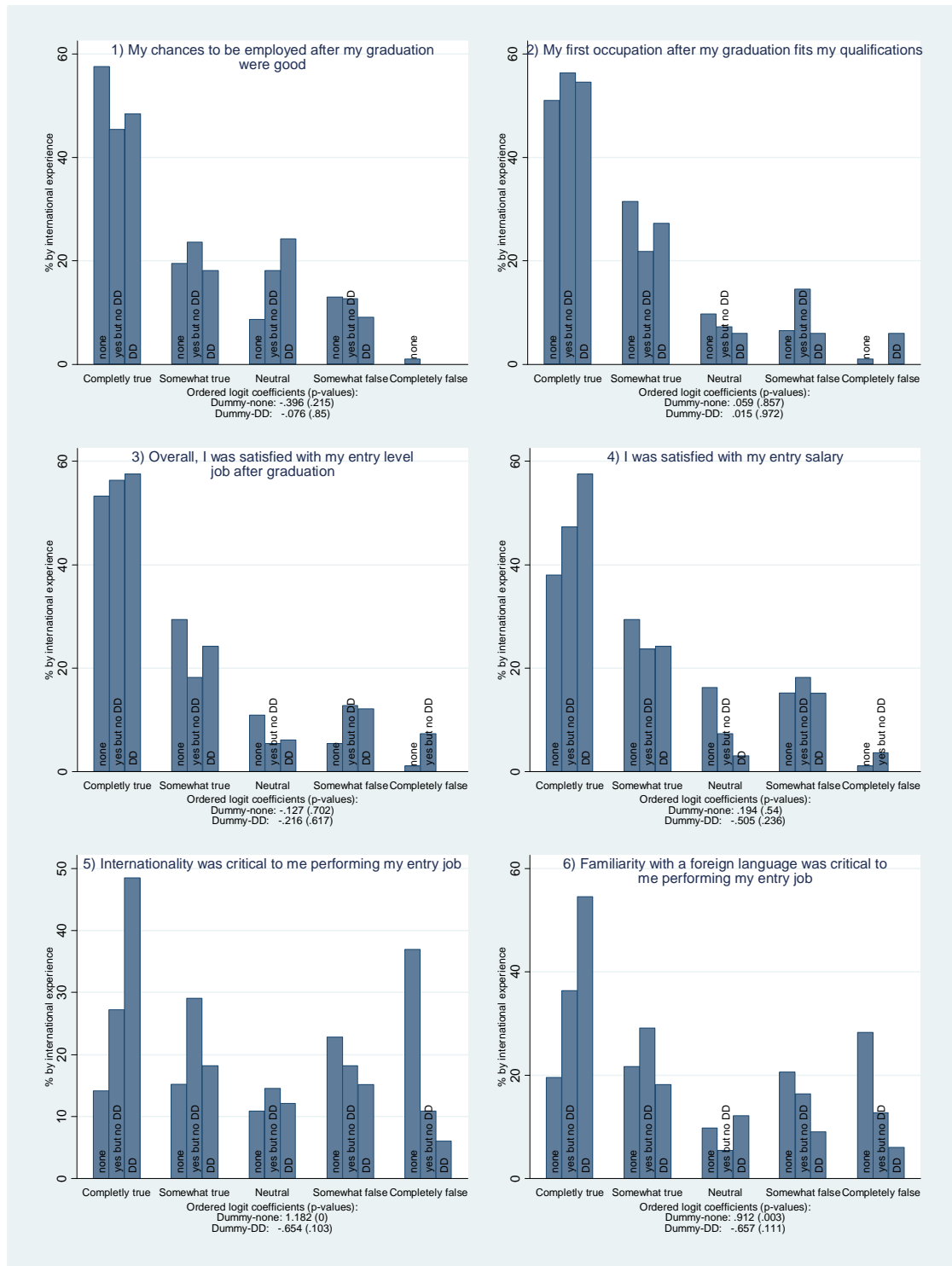


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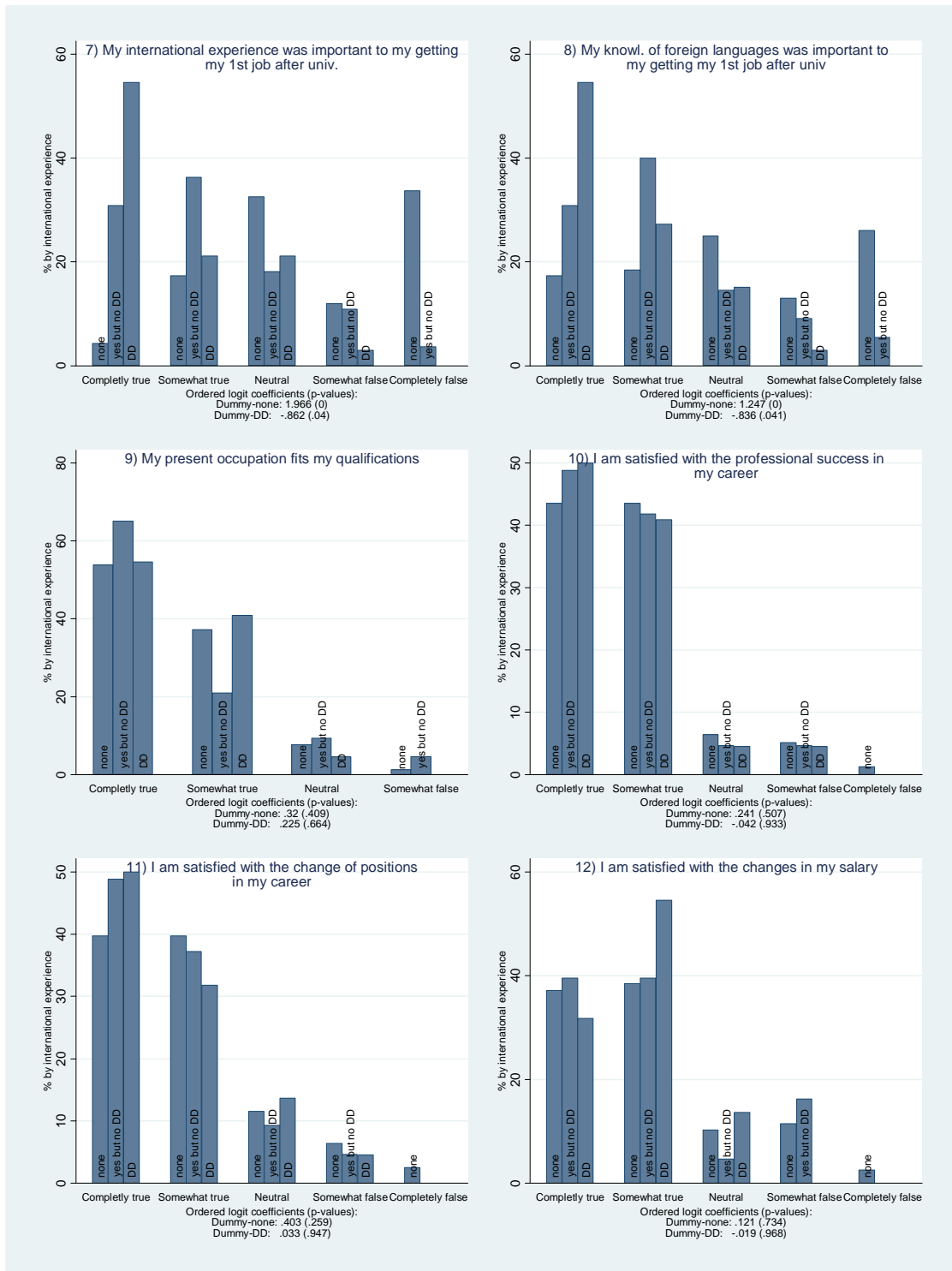


Figure 5 (continued):

