Duration Dependence as an Unemployment Stigma: Evidence from a Field Experiment in Germany

Patrick Nüß[†]

Abstract: Based on a correspondence experiment covering 3,124 fictitious job applications, the paper identifies and quantifies duration dependence in Germany, with a particular emphasis on company and vacancy characteristics as potential determinants. The experiment reveals that duration dependence manifests itself in a sharp decline of 26% to 35% in callbacks when an individual has been unemployed for 10 months, pointing to the existence of an unemployment stigma for Germany. The results are driven by labor market tightness, companies' access to applicants and screening behavior related to company size, with no evidence for an unemployment stigma determined by the contract type.

JEL classification: C93, J68, J23, J64, J71

Keywords: Field Experiments, Public Policy, Labor Demand, Unemployment Duration, Labor Discrimination

[†]Affiliations: Macroeconomic Policy Institute (IMK), Christian Albrechts-University Kiel, Germany. Mail: patrick-nuess@boeckler.de. Acknowledgements: I would like to thank Menusch Khadjavi, Dennis Snower, Henry Farber, Luca Fumarco, Stijn Baert and Eva Van Belle as well as participants of the BeNA Workshop 2017, YEM 2017, EXEL 2017 and FMM 2017 for very helpful comments.

1 Motivation

It is well known from the literature that long-term unemployment is associated with a wide range of problems such as social illness, poverty, deteriorating physical and mental health (Van Horn, 2014), lower levels of well-being and - most seriously - higher mortality (Sullivan and von Wachter, 2009) and suicide rates (Milner et al., 2013). This is why in the aftermath of the great recession, the focus has moved to the situation of the long-term unemployed and their reintegration into the labor market.

Apart from analyzing discrimination, earlier research focused mainly on the search behavior of unemployed individuals. Long-term unemployment can be the result of search intensity (Paserman, 2008; Krueger and Mueller, 2010), the incentives provided by economic policy (Katz and Meyer, 1990; Addison et al., 2004) and discouragement (Krueger and Mueller, 2012). Additional factors such as depreciation of human capital (Ljungqvist and Sargent, 2004), a lack of work experience or the potential loss of motivation, soft skills, resilience and unobservable differences in productivity (Heckman and Singer, 1984; van den Berg and van Ours, 1996) can further prevent the long-term unemployed from finding a job. From this perspective, duration dependence - defined as the causal effect of the duration of unemployment on the job finding probability of an individual - does not exist, and the poor prospects are just the result of differences in motivation and productivity and do not reflect stigmatization of (long-term) unemployed. The consequence for public policy is a focus on training programs and the avoidance of disincentives for unemployed individuals to reintegrate into the labor market. Recent field experiments on the prospects of the long-term unemployed reveal a low explanatory power of factors such as depreciation of human capital. Instead, they highlight the stigma of long-term unemployment as the main reason for poor prospects (Ghayad, 2013), which means that it is not any lack of skills but simply the fact of unemployment itself that is the barrier to reintegration into the labor market. While such an experiment has been carried out for Sweden and the United States, long-term unemployment is a more relevant topic in central and southem Europe, and even in Germany with its low

unemployment rate. Despite recent improvements in the proportion of people in long-term unemployment, 40% of the unemployed have been without a job for longer than 12 months.

This is where the minimum wage in Germany, which was introduced in January 2015, comes into play. While many economists expect the minimum wage to have negative effects on the labor market prospects of low-skilled workers, it allows for an exemption for the long-term unemployed (12 months) for a period of six months. This opens up an interesting opportunity for employees as well as for public policy analysis. While there is an extensive literature about active labor market policy evaluation in Germany, its effect on the long-term unemployed has been given little attention. Furthermore, there is some research on a minimum wage exemption for different groups, whereas up until now there has been no research on the minimum wage exemption for the long-term unemployed.

For this reason this paper first tries to augment the recent literature about duration dependence with a correspondence experiment providing insights into the unemployment stigma for Germany and secondly, tries to evaluate certain aspects of the minimum wage exemption for the long-term unemployed. Furthermore, this paper is the first to consider company and vacancy characteristics as potential determinants of the unemployment stigma. The rest of the paper is organized as follows. Section 2 provides an overview of recent literature on duration dependence. Section 3 gives a detailed explanation of the experimental design. Section 4 provides a non-parametric as well as multivariate analysis of the experimental dataset. Section 5 concludes.

2 Literature Review

Summarizing the literature focused on the supply side aspects, Machin and Manning (1999) argue against the relevance of duration dependence when checking for observable fixed characteristics. While the potential of the demand side for duration dependence in the matching process was pointed out at an early stage by Vishwanath (1989) and was also discussed in the literature, its significance and quantitative relevance has attracted attention in recent years with the rise

of discrimination literature, especially with Oberholzer-Gee (2008) who was the first to analyze duration dependence in a field experiment. Vishwanath (1989) argues that imperfect information on workers' productivity leads companies to use an individual's (un)employment history as a signal of productivity. A long unemployment duration can be associated with a lack of motivation, creativity, flexibility and other work-relevant characteristics, finally resulting in statistical discrimination (Arrow, 1973).

As recent developments in the literature making use of the concept of correspondence experiments show, there is a possibility that such stigma effects do exist. Evidence for duration dependence has been found for Switzerland (Oberholzer-Gee, 2008), Sweden (Eriksson and Rooth, 2014) and the United States (Kroft et al., 2013; Ghayad, 2013). But these findings are inconsistent with the earlier interpretation that duration dependence results purely from individual characteristics and points to the relevance of a company's screening process as a relevant aspect of the matching process. However, further investigation of the United States by Farber et al. (2017) as well as Nunley et al. (2017) do not support these previous findings. While the comparability of these correspondence experiments is limited, due to aspects of their design, they provide a first insight and pose some new questions about duration dependence and the stigma of long-term unemployment.

When Oberholzer-Gee (2008) introduced the first correspondence experiment and found evidence for duration dependence, he augmented this with a survey, finding that duration dependence results from employers' beliefs about productivity as well as by rational herding, the screening behavior of companies. When Kroft et al. (2013) conducted their correspondence experiment comparing the callback rates of labor markets with a different degree of labor market tightness, in line with the model of Lockwood (1991), they found that duration dependence mainly occurs in tight labor markets where unemployment duration is more informative, with most of the decline in callbacks observable in the sixth month of unemployment. To understand the relevance of human capital depreciation as a cause of duration dependence, the design of Ghayad (2013) distinguished between work experience in the same industry and others in order to understand the

relevance of industry-specific human capital. He observed higher callbacks when there was previous industry-specific experience. However, after an unemployment duration of more than six months, the callbacks for unemployed persons with industry-specific human capital dropped to the level of unemployed persons with no industry-specific human capital. This implies the dominance of the stigma of long-term unemployment as the main driver of duration dependence. Eriksson and Rooth (2014) extend this earlier insight to the Swedish labor market, finding an unemployment stigma for low- and medium-skilled workers in the ninth month and observe a stronger unemployment stigma for men than for women. Furthermore they do not find any evidence of an effect on the callback rate from past unemployment spells. All these studies have in common that most of the decline in callbacks manifests itself in a sharp decline within a short period, pointing to an unemployment stigma as the main explanation for duration dependence.

While this literature points toward the crucial role of duration dependence, Farber et al. (2017) and Nunley et al. (2017) weaken these earlier findings with additional experiments for the United States in which they find no evidence of duration dependence. One reason for this mixed evidence is the strong variation in the designs with respect to age, gender, education, occupation and region - as well as the time the experiments were carried out. As pointed out by Farber et al. (2016), there are additional contextual cues in the individuals' résumés which might affect the outcome, but cannot be controlled for and therefore further limit comparability. In addition, since duration dependence is related to employers' perceptions, attitudes, and sociocultural aspects - and might be associated with the design of unemployment benefits (Ghayad, 2013; Eriksson and Rooth, 2014) - this observation is most likely to be country-dependent.

The review suggests there is the possibility of rejecting the idea that duration dependence purely results from an unobservable heterogeneity of the unemployed. Due to these stigma effects, companies' decision-making becomes important for the labor market prospects of the unemployed and highly relevant for understanding the matching process and the optimal design of public policy. To combat unemployment effectively, it is important to further augment

the literature by a deeper insight into the demand side of the matching process. Since this direction of the literature is relatively young, and the reasons for this stigma, if it exists, is still unclear, further evidence for other countries is needed for a deeper understanding of this mechanism. Furthermore, it is striking that duration dependence results from companies' screening behavior, but no experiment takes the relevance of company characteristics and vacancies into account, which might be related to stigma determinants or companies' strategies to solve the issue. In addition, as it is common for research based on correspondence experiments, it is used to detect different treatments of groups, but apart from Farber et al. (2017) there is no attempt to analyze potential solutions. This is why, in a first step, this paper expands the literature with a correspondence experiment for Germany, as a first consideration of the relevance of company and vacancy characteristics, and in a second step tries to evaluate aspects of the minimum wage exemption as a potential solution.

3 The Experiment

3.1 A Correspondence Experiment to Evaluate Labor Market Policies

The basic idea of correspondence experiments is to send pairs of fictitious job applications for real vacancies. By monitoring the callback rates of companies, this allows an insight into their hiring decisions and - most importantly - allows a causal interpretation of the randomized characteristics of the applications. The crucial feature is that we are able to remove all the mentioned supply-side aspects and focus on the relevance of employer behavior. By using a correspondence experiment, we are able to observe all the information that is available to employers. Monitoring companies' callback rates therefore is an excellent way to analyze first-stage discrimination in the labor market. This procedure has become popular in labor economics for analyzing age discrimination (Riach, 2015; Baert et al., 2015), racial discrimination (Bertrand and Mullainathan, 2004), gender discrimination (Carlsson and Rooth, 2008) and in recent years also

unemployment stigmatization (Oberholzer-Gee, 2008).

Compared to previous research that identifies the stigma of long-term unemployment, the job applications are equal in all productivity-relevant aspects, but include variations in unemployment duration between 0 (still employed) and 15 months of unemployment. In this way, we should be able to identify the timing and quantity of the stigma effect for Germany and to test an aspect of the minimum wage exemption for the long-term unemployed that takes place after 12 months of unemployment.

A first evaluation reveals that there is only minor use of the minimum wage exemption (vom Berge et al., 2016). But it is unclear whether this results from the company's potential fear of negative reciprocity in terms of lower productivity caused by the relatively low payment, or of the long-term unemployed not accepting the lower payment. If the minimum wage exemption is relevant for companies' hiring decisions, we should observe an increase in callback rates after unemployment duration of 12 months and longer, compared to unemployment duration of 11 months and other control groups in a multivariate analysis.

Additional to this principal idea of the experiment, it is important to mention the ethical dilemma, which is based on employer deception and the inconveniences caused by the job applications for companies (Riach and Rich, 2004). Generally, these experiments are justified by the well-known aspect of labor markets that discrimination takes place and is shown by the literature review, which it seems is also true of the long-term unemployed. However, as the literature review also shows, there is still no information about unemployment stigmatization outside the United States and Sweden, which makes a further investigation crucial to understand whether this observation can be generalized across countries and - if this is the case - to understand what affects the timing of the stigma. Knowing this might make it possible to the improve efficiency of active and passive labor market policies. Germany is interesting because of its different kind of welfare state compared to the United States and Sweden, the fact that it has a different unemployment benefit duration and its unique feature of a minimum wage exemption for the long-term unemployed. This might allow an analysis that goes further than just detecting stigmatization, and partly allows

a policy evaluation. Considering all this, the inconveniences resulting from the experiment for the economy are doubtless outweighed.

3.2 General Design

The experiment was carried out between mid-June 2016 and November 2016 in 41 regions, mostly large metropolitan areas in Germany. The sample consists of 3,124 applications sent to 1,562 companies. Vacancies for seven occupations were collected from the website of the Federal Employment Agency and all available company characteristics were reconsidered for later controls. By also collecting data on companies and vacancies, we hoped to be able to identify which characteristics might determine or solve unemployment stigmatization. Regional and occupational variations of the design were intended to avoid potential occupation- and regional-specific phenomena and therefore increase the external validity of the experiment.

For the experiment, seven types of vocational training with a program duration of three years, with the majority occupied with secondary school graduates, were chosen.[1] This is important for the evaluation, since regional and sectoral differences in collective agreements determine the relevance of the minimum wage, due to the so called "favorability principle" and therefore also for the exemptions.[2] To ensure regional variation in addition to the regional unemployment rate as an another aspect the regional Kaitz-Index was taken into account.[3] Furthermore, as shown by Eriksson and Rooth (2014), the unemployment stigma may be heterogeneous by qualification. It is well known that a lower proportion of the (long-term) unemployed have a higher education is lower. This is why choosing individuals with a secondary education and vocational training is

[1]The training programs chosen were: hotel manager, office clerk, retail merchant, specialist in warehouse logistics, wholesale and foreign trader, industrial clerk and commercial agent in dialogue marketing. This kind of training programs provide an opportunity to apply for a wide range of posts such as receptionist, service, sales representatives, export/import clerk, purchase management, accountant, call center agent, customer service positions, some logistics/industry posts and several others.

[2]The principle of favorability is a legal principle applied in labor law by which lower level agreements are only applied when they have an advantage for the employee. This means that the minimum wage, as well as the exemption, are only relevant for a company if there is no collective agreement that sets a higher wage.

[3]Figures A1 to A4 in the appendix provide an insight into all potential relevant measures of labor market tightness identified by Kroft et al. (2013), as well as to the Kaitz-Index.

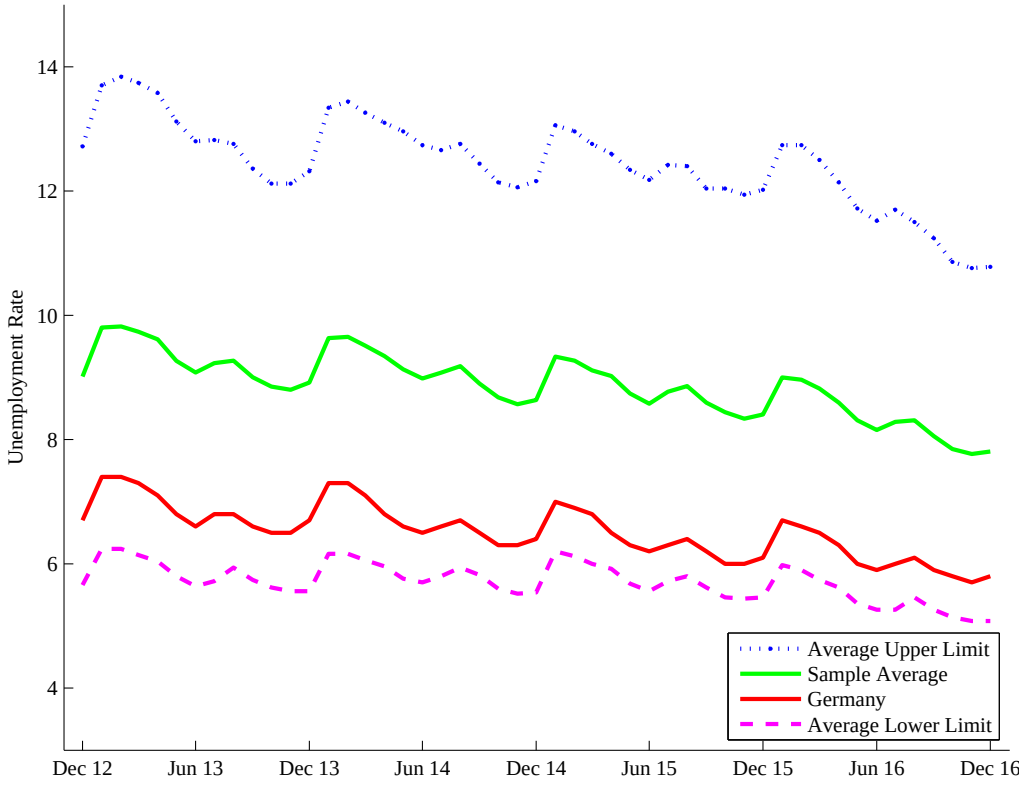

Figure 1: German Labor Market Development

Note: The upper and lower limits are calculated as the average of the 5 regions in the sample with the highest and lowest unemployment rate.
Source: Federal Employment Agency.

a more promising group for understanding unemployment, and is also of higher relevance for economic policy.

To check the representativeness of the experimental sample, Figure 1 shows the overall labor market development in Germany between December 2012 and December 2016, compared with the experimental sample. While the unemployment level of the dataset is on average 2% higher than for Germany as a whole, the observable decrease in unemployment is comparable. The upper and lower limits included are the averages for the 5 regions with the best and worst performance in the sample. While further demonstrating the strong heterogeneity within Germany, a direct comparison of the higher and lower averages implies a stronger market tightening (1.9% decrease in unemployment) in recent years in regions with a high unemployment level compared to regions with a generally low unemployment level (0.6% decrease in unemployment). All these variations and considerations allows a high degree of external validity and makes the findings

more representative for the German economy.

3.3 Design of the Applications

The following section provides a detailed description of the fictitious job applications used for the field experiment. For each occupation, two types of templates (A/B) were designed, consisting of a résumé and a motivation letter. To make the applications realistic, the basic idea for the templates came from examples available online and comments on the Federal Employment Agency website. All applicants were single males, had secondary education, were aged between 25 and 27 as indicated by their date of birth, and had completed vocational training in one out of 7 programs. After they finished their training, they had gained additional work experience in the same company, were unemployed for up to half a year before finding a job in another company for several years, and had a final unemployment duration of between 0 and 15 months. To avoid discrimination caused by gender, race or ethnicity, all applicants were male, born in Germany and – more importantly - had one of six typical German first names and surnames, where the first names were chosen from the most popular boy names of the age cohort, excluding names with a potential negative connotation.[4]

To ensure relevant work experience, real vacancies for the occupations were checked in March/April and the most commonly required skills were included in the work experience of the applicants. Adequate English skills, occupation-specific computer skills[5], hobbies as well as a driver's license were added to all applications. When the vacancy demanded the knowledge of further language or computer skills, they were adjusted on the résumé. To avoid detection resulting from close links between companies, the last/current job position of the applicants was not in the same city as the job they applied for, except in the case of city-states Hamburg and Berlin.

After their design, all applications were compared with real job applications.

[4]The name Kevin is often associated with a low social status. This can be illustrated by the word Alpha-Kevin. Alpha-Kevin was one of the favorites in the ranking for the German Youth Word of the Year meaning the stupidest of them all. A list of the final names are provided in the Appendix.

[5]As, for example knowledge in SAP or DATEV.

All information about the name, birthplace, previous employers as well as the unemployment duration was randomized to ensure no systematic bias in the analysis. The unemployment duration was implicitly indicated by the end date of their last job.[6] All applications were sent without references, but in the résumé it was mentioned that the applicant would bring them with him to the job interview if required. While the design tried to include the labor market tightness aspect of Kroft et al. (2013), all applicants were in their late 20's as in Ghayad (2013) and Eriksson and Rooth (2014). While avoiding the research gap in gender and age resulting from Farber et al. (2017) and Nunley et al. (2017) the design allowed a young age comparison between the United States, Sweden and Germany.

3.4 Measurement of Callbacks

Each of the resulting six names was linked to an individual phone number and an email address. The callbacks were received by email and by telephone via a linked voice mail. Due to the fake postal addresses, the experiment was not able to cover callbacks by mail. In this experiment, out of 1,562 companies, four sent an email, mentioning the failure to contact the applicant by mail. To avoid detection as well as for ethical reasons only one vacancy per company was used and each was addressed by two applicants. For the same reason every invitation was immediately declined. Every company was allowed a callback within a month, but in order to take into consideration more aspects of vacancies, when companies were looking for an employee for a later starting date, it was allowed to callback until the planned starting date for the job. The precise direction of the effect was unclear. On the one hand, there might be an increase in the number of callbacks relative to other vacancies because there was get more time. On the other hand, vacancies advertised early might increase the number of applicants - which could decrease the number of invitations. It could also be possible that, as stated by Farber et al. (2017), companies immediately hiring staff were more in need and less likely to reject the long-term unemployed.

In the literature there are commonly two ways to distinguish between posi-

[6] An example résumés can be found in the Appendix.

tive callbacks. Category 1 defines callbacks in a strict way that only interprets a callback as positive when it is a clear invitation to a job interview. Category 2 is a less strict version that also interprets a callback as positive when the applicant was were offered an alternative job proposal, asked to contact the recruiter, or asked for further information. In this analysis, both categorizations were used, with one difference resulting in a third category of callbacks. When companies not only asked for further information but also for certificates and references, they were not counted in callback category 2, since there might be several companies that asked for references without prior screening of the job application. To test the potential sensitivity of the results, category 3 included all invitations in category 2, augmented by those companies requesting certificates and references.

3.5 Limitations of the Experiment

As a result of the concept of correspondence experiments as well as the chosen design, the experiment has some limitations. Correspondence experiments are only able to detect discrimination in the first stage of the hiring process, while discrimination can occur along several dimensions such as the wage, working time or a requirement for higher qualifications (Abraham et al., 2016). The findings are limited to the chosen vacancy channel. However, as shown by Franz (2013), the Federal Employment Agency is the most popular source for job searches. Furthermore, social networks commonly used as a source (Calvo-Armengol, 2004) cannot be accounted for at all. Additionally, as mentioned earlier, the design limits the experiment to a young work force as in Eriksson and Rooth (2014) and Ghayad (2013), and also focuses on males only. Since the findings of Kroft et al. (2013) imply that the unemployment stigma depends on labor market tightness, this means it cannot be guaranteed to be a permanent phenomenon. By having occupational as well as geographical variation over 41 regions in Germany, this should maximize the external validity of the findings for a young low- and medium-skilled male work force depending on the current labor market situation.

Table 1: Callback Rates and Share of Collective Agreements depending on Subcategories

	N	Callbacks Category				Collective
		1	2	3	$3-2$	Agreements
Overall	3124	0.209	0.269	0.356	0.099	0.181
Occupations						
Hotel Manager	422	0.446	0.507	0.628	0.130	0.408
Office Clerk	538	0.056	0.087	0.151	0.073	0.175
Retail Merchant	462	0.193	0.273	0.305	0.041	0.078
Warehouse Logistic Specialist	494	0.215	0.267	0.332	0.077	0.168
Wholesale Foreign Trader	440	0.123	0.155	0.280	0.139	0.159
Industrial Clerk	398	0.123	0.168	0.314	0.158	0.156
Dialogue Marketing Agent	370	0.368	0.505	0.573	0.089	0.127
Company Size						
<6 employees	410	0.181	0.261	0.300	0.056	0.073
6 to 50 employees	1580	0.227	0.270	0.344	0.081	0.139
>50 employees	1134	0.193	0.271	0.392	0.138	0.277
Job Start						
Immediately	1834	0.208	0.265	0.346	0.092	0.177
Within the next 4 weeks	812	0.217	0.293	0.381	0.102	0.165
Later	478	0.197	0.245	0.352	0.119	0.222
Contract Type						
Permanent Contract	2058	0.212	0.270	0.348	0.092	0.165
Non-Permanent Contract	1066	0.202	0.268	0.371	0.111	0.211
Collective Agreement	564	0.261	0.323	0.472	0.154	1.000

Notes: Callbacks show the probability of a job interview; "Collective agreements" indicates the share of collective agreements.

4 Experimental Results

4.1 Non-parametric Evidence

Table 1 provides a detailed overview of the probability of job invitations dependent on several subcategories, for all callback measures, augmented by the difference between the callback measures 3 and 2 $(3-2)$ and provides all subcategories' share of collective agreements. The first row contains the overall sample showing the callbacks depending on the different categories, ranging from 20.9% to 35.6%. The experimental sample has a coverage of collective agreements of 18%. The current data of the Federal Statistical Office displays a coverage of collective agreements for Germany of 45% in 2014. This difference can be explained by the fact that collective agreements are related to higher wages, which might lead to lower turnovers and therefore fewer vacancies.

The callback overview provides initial evidence of potentially relevant aspects. Remarkably, the callback rates strongly depend on the occupation concerned. Comparing different measures of callback categories between the strict and relaxed definition of callbacks, a strong increase in job invitations for the callback category 2 for dialogue marketing agents can be observed, and this can be explained by the nature of its job activity on the phone. Besides this, on average, a high share of collective agreements for hotel managers can be observed. Under more detailed scrutiny, Table 1 indicates no notable pattern for company size, starting date or contract type with respect to callback rates. However, the likelihood of companies asking for references is twice as high in the case of large companies compared to medium companies and even three times as likely as for small companies, which points to potential differences in their screening behavior. Furthermore, large companies are also several times more likely to have a collective agreement. But still, both patterns do not seem to have any effect on the callbacks. The prediction of the literature arguing duration dependence is purely the result of (un)observable heterogeneity in productivity (Machin and Manning, 1999), is a constant of callbacks over the unemployment duration. A preliminary look at the aggregated data using kernel smoothing in Figure 2 shows the development of callbacks using all three implemented callback categories, which clearly rejects the idea of constant callback rates over the duration of unemployment. Overall, the development shows the expected pattern of previous research with correspondence experiments focusing on duration dependence. Currently employed applicants (duration 0) are less likely to receive positive callbacks compared to newly unemployed applicants. In Figure 2, this can be confirmed for the callback categories 2 and 3. Generally, in the case of duration dependence we expect to observe high callback rates for individuals with a low unemployment duration and vice versa. In case of all callback categories, we can observe decreasing callbacks over the unemployment duration that mainly manifests itself in a sharp decrease in the callbacks when an individual has been unemployed for 10 months. Taking this observed timing of the stigma effect as a reference point, the callback ratio of the categories are 1.26, 1.26 and 1.19, implying that the stigma of long-term unemployment decreases the callback rates

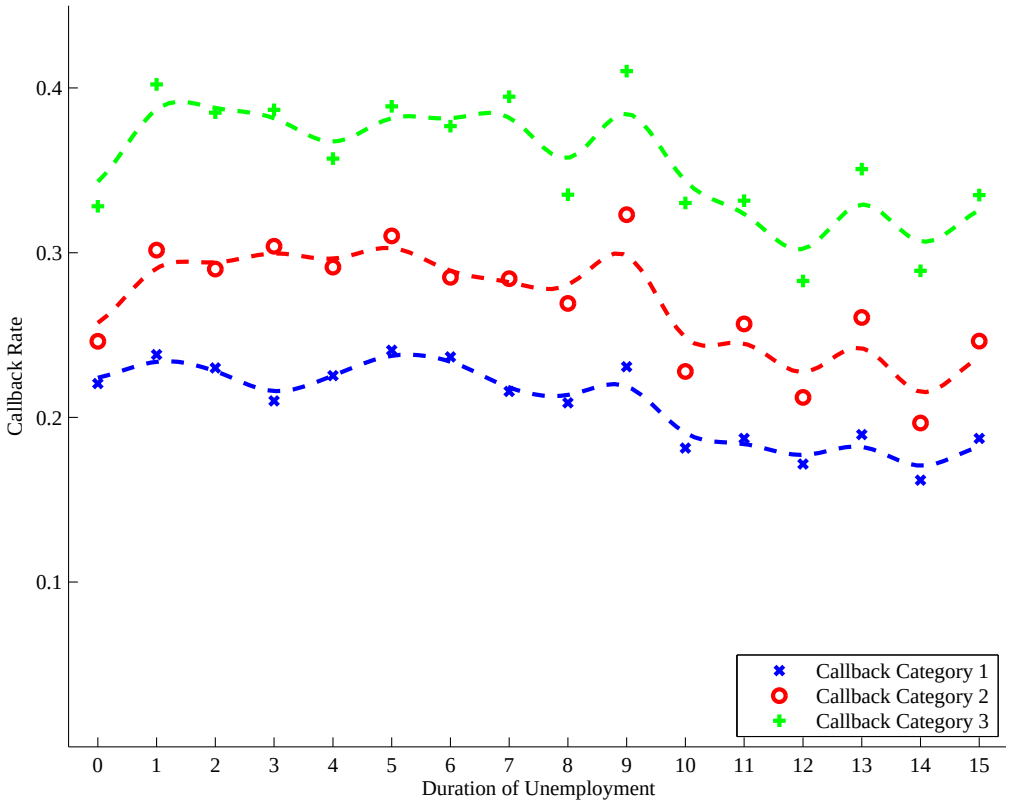

Figure 2: Callbacks over the Unemployment Duration

Note: Callback Category 1 includes all callbacks that clearly requested a job interview; Callback Category 2 includes all kind of requests revealing an interest in the applicant, excluding reference requests; Callback Category 3 includes all requests, including reference requests; Dashed lines are the smoothed callbacks resulting from kernel smoothing with a smoothing parameter of 0.6.

between 19% to 26% when an individual has been unemployed for 10 months or longer. The previous literature supposes that the timing of the stigma effect coincides with the maturity of unemployment benefits (Ghayad, 2013; Eriksson and Rooth, 2014). The argument is that a longer provision of unemployment benefits allows for a longer job search, delaying the timing before companies' becoming suspicious about the productivity of unemployed. While the duration of unemployment benefits in Germany is 12 months, the expected pattern can roughly be confirmed. It is also of interest for this paper to find out more about the development of callbacks in the case of unemployment lasting 12 months or longer. When the company has an interest in the minimum wage exemption, we would expect to observe an increase in job invitations for applicants with an unemployment duration exceeding 12 months, but this cannot be observed.

Going into more detail, callback category 3 was generated from the possibil-

ity that companies might ask for certificates and references before reading the application at all, which would imply that these callbacks were less informative for the analysis. When we separate the additional callbacks resulting from category 3, we can observe a constant line without any interpretable change in callbacks over the unemployment duration, and at first glance this confirms the suggestion and their lower information value. As a result of these initial insights, the following analysis will focus on callback measure category 2, since it seems to be the most promising with respect to the expected patterns from the literature and the quality of the information concerned. Both alternative measures will be considered as robustness checks in the multivariate analysis. As pointed out by Kroft et al. (2013), duration dependence mainly occurs in tight labor markets where the unemployment duration provides more information about the applicants productivity. This effect even overcompensates the relatively higher opportunity costs of keeping a vacancy open during a period of low unemployment. As shown earlier, the German labor market is characterized by a large heterogeneity in regional labor market tightness in terms of the unemployment rate, and this allows us to test the representativeness of the quantitative effect of the unemployment stigma. For this purpose, the regional labor market tightness is considered to be the unemployment rate, vacancy/unemployment ratio and the change in the unemployment rate in Figure 3. The breakdown of the sample into higher and lower tightness follows a simply splitting into two halves.

Separating the dataset into two samples based on the unemployment rate (Panel A) and the vacancy/unemployment ratio (Panel B), confirms the earlier observed unemployment stigma in month 10. Both cases point to an even stronger stigma effect of long-term unemployment, with a callback ratio of 1.35 and 1.34, compared to their lower tightness counterparts (1.18 and 1.20). This strongly supports the robustness of the relevance of regional labor market tightness for the stigma of long-term unemployment. Using the change in unemployment in Panel C as a third measure of labor market tightness is less promising than the two alternatives. In fact, the opposite of the expected outcome is observable. As discussed in Figure 1, regions with low average unemployment levels recorded lower decreases in the unemployment rate compared to regions

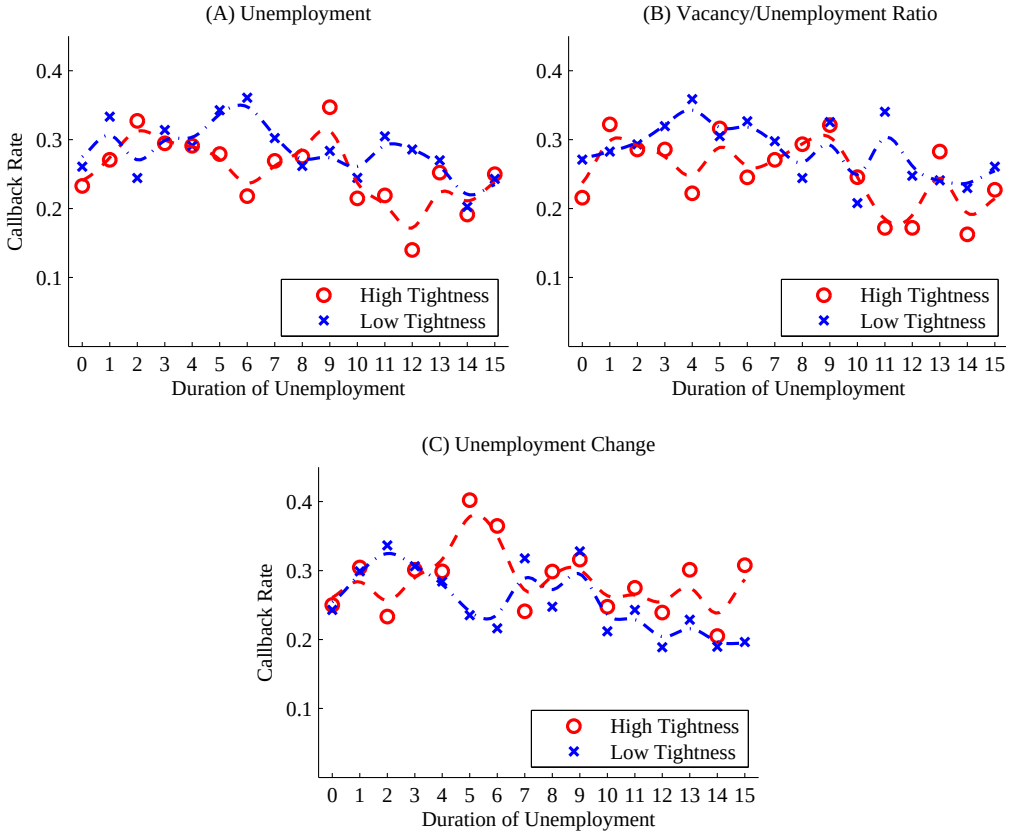

Figure 3: Callbacks over the Unemployment Duration (by Market Tightness)

Note: Following Callback Category 2, includes all kind of requests revealing interest in the applicant, excluding reference requests; In panel A, high tightness implies a regional unemployment rate of $\leq 8.4\%$ and low tightness an unemployment rate of $> 8.4\%$ for 2016; In panel B, high tightness implies a regional vacancy/unemployment ratio of ≥ 0.24 and low tightness an vacancy/unemployment ratio of < 0.24 for 2016; In panel C, high tightness implies a decrease in the unemployment rate of $\geq 1\%$ and low tightness a decrease in the unemployment rate of $< 1\%$ for 2016; Dashed lines are the smoothed callbacks resulting from kernel smoothing with a smoothing parameter of 0.6.

with high unemployment, having a strong impact on the categorization of this labor market tightness measure. This can be interpreted as a higher relevance of the general regional labor market conditions for companies' screening behavior than the business cycle. Despite this first evidence, a multivariate analysis is needed to ensure the robustness of these findings with respect to several controls. This becomes especially important when making a judgement concerning the relevance of the minimum wage exemption.

4.2 Multivariate Analysis

For the empirical part, the analysis will concentrate on multivariate methods, namely OLS, Logit and Probit estimations augmented by several potential fixed effects. The econometric strategy splits into two approaches. The first approach specifies the basic idea of duration dependence analyzing the relevance of continuous decreases of callbacks and stigma effects specified as a sharp decrease in callbacks within a month. The estimations will follow equation 1.

$$Callback_i = \beta_0 + \beta_1 Emp_i + \beta_2 UD_i + \beta_3 S_i + \beta_4 UD_i \times S_i + X_i\beta_5 + \varepsilon_i \qquad (1)$$

Where β_0 is a constant, β_1 is the effect of the dummy for the current employment status, which takes the value 1 if currently employed and 0 otherwise. β_2 is the effect of an additional month of unemployment. β_3 is the effect of an unemployment stigma which takes 1 if unemployed for 10 months or longer, otherwise 0, motivated by the non-parametric occurrence of the unemployment stigma. β_4 is a test for a potential change in the slope of the unemployment duration after the occurrence of the unemployment stigma after 9 months. β_5 includes the effects of various fixed effects for regions, occupations, names, and the layout of the application.

The second approach follows equation 2 and will analyze the relevance of the minimum wage exemption for long-term unemployed individuals. As mentioned earlier, Germany allows an exemption from the minimum wage if an individual has been unemployed for 12 months or longer. Because of the favorability principle, this exemption is only relevant for companies without a collective agreement. This is why equation 2 is an augmentation of the first approach.

$$\begin{aligned} Callback_i = \beta_0 + \beta_1 Emp_i + \beta_2 UD_i + \beta_3 S_i + \beta_4 UD_i^{Larger12m} + \beta_5 CA_i \\ +\beta_6 MW_i + X_i\beta_7 + \varepsilon_i \end{aligned} \qquad (2)$$

The augmentation is based on an unemployment duration dummy in case of unemployment exceeding 12 months $UD_i^{Larger12m}$ and callbacks resulting from a collective agreement CA_i. Using the term MW_i equal to 1 if $UD_i^{Larger12m}$ is equal to 1 and no collective agreement exists, which finally should result in β_6 as

Table 2: The Effect of Unemployment Duration on the Probability of Callback (Baseline)

	(1)	(2)	(3)	(4)	(5)
Employed	-0.0564	-0.0434	-0.0246	-0.0194	-0.0232
	(0.0370)	(0.0343)	(0.0389)	(0.0398)	(0.0401)
Month Unemployed	-0.0045*		0.0038	0.0047	0.0041
	(0.0019)		(0.0036)	(0.0040)	(0.0041)
Stigma		-0.0575***	-0.0858**		-0.0727
		(0.0168)	(0.0317)		(0.0990)
Month Unemployed × Stigma				-0.0072**	-0.0012
				(0.0028)	(0.0087)
Average Callback Rate	0.269	0.269	0.269	0.269	0.269
N	3124	3124	3124	3124	3124
pseudo R^2	0.1076	0.1093	0.1096	0.1095	0.1096
Probit	X	X	X	X	X
Occupation	X	X	X	X	X
Layout	X	X	X	X	X
Week	X	X	X	X	X
Order	X	X	X	X	X

Notes: Dependent variable is the probability of receiving an invitation for a job interview, following Callback Category 2; The table reports marginal effects for the probability of a callback; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

the effect of the minimum wage exemption on companies' hiring decision. In this analysis, we are therefore able to analyze possible effects of companies' awareness of/willingness for the exemption itself.[7] Table 2 reports results based on Probit estimates while controlling for the most important factors of the experimental design, namely occupation, layout, week and order of the applications. Due to the nature of correspondence experiments, it allows a direct causal interpretation of the estimates. Specification 1 implies a decrease in job invitations of approximately 0.5% with each additional month of unemployment, significant at the 5% level.[8] When specifying duration dependence as a stigma only, column 2 implies a decrease in job invitations when unemployed for 10 months by 5.8%, significant at the 0.1% level. Combining the unemployment duration variable

[7]It is important to mention that the experimental design is not ideal for the evaluation of the minimum wage exemption, since it requires the company's willingness and knowledge of the minimum wage exemption and is further weakened by the small proportion of collective agreements in the experimental sample. As an alternative, the minimum wage exemption can be evaluated in a better way by sending certificates for the authorization of the minimum wage exemption directly with the job application.

[8]Note that the marginal effect of a Probit estimate is not constant over the variation in the unemployment duration, which is why here OLS would be preferable. However, first OLS estimates in the analysis are approximately equal in their coefficients and second, a specification focusing on the unemployment duration only is not the most promising specification for the further investigation.

with the stigma dummy results in a positive but insignificant coefficient for the unemployment duration, but an even stronger and significant stigma effect. Considering a change in the slope in month 10 without the stigma dummy, the effect size and significance are comparable with the previous estimates. When checking for differences in the slope before and after the stigma in combination with the stigma dummy, the estimates reveal no significant results. For all specifications, employed individuals have lower but insignificant callbacks. Because previous findings suggest there is a steady decrease, it is important to control for this possibility in the following analysis, which is why specification 3 will be concentrated on in the further analysis. All the following findings for specification 3 are also in line when using specification 1, 2 and 4[9], even more robust and with higher statistical significance.

Table 3 provides evidence for the robustness of the baseline specification with respect to a set of alternative controls. The step-by-step extension of controls in the first four columns shows the robustness of the baseline findings. The same stable results as for the first four columns are observable for regional fixed effects and also when removing temporary employment agencies (TEA) from the sample. As before, these results are further investigated for robustness by alternative callback definitions as well as with OLS and Logit, resulting largely in the same results, with lower statistical significance with regard to alternative callback definitions. The signs of the coefficients are the same across models, and the same variables are statistically significant in each of them. In most estimations, being employed decreases the probability of callbacks and as in the baseline specifications, the unemployment duration shows a positive, but economically irrelevant and insignificant trend. Apart from these main findings, there is also an additional interesting and robust observation with respect to the weekly control variable. While there is no specific pattern for most weekly controls, when sending a job application in the last week of a month, there is an overall decrease in callbacks of 6.3% observable, which is almost as large as the stigma of long-term unemployment itself. A possible reason is signaling

[9]This additional robustness checks are provided in the Appendix. An overview of all other specifications, with respect to OLS and Logit as well as to all callback categories is available on request.

Table 3: The Effect of Unemployment Duration on the Probability of Callback (Robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed	-0.0285	-0.0357	-0.0326	-0.0327	-0.0392	-0.0224	0.0075	-0.0401	-0.0235	-0.0277
	(0.0389)	(0.0391)	(0.0391)	(0.0390)	(0.0389)	(0.0383)	(0.0332)	(0.0435)	(0.0353)	(0.0392)
Month Unemployed	0.0040	0.0038	0.0038	0.0039	0.0035	0.0025	0.0023	0.0024	0.0036	0.0038
	(0.0036)	(0.0036)	(0.0036)	(0.0036)	(0.0036)	(0.0036)	(0.0032)	(0.0040)	(0.0034)	(0.0035)
Stigma	-0.0870**	-0.0854**	-0.0871**	-0.0873**	-0.0831**	-0.0729*	-0.0579*	-0.0721*	-0.0779**	-0.0828**
	(0.0317)	(0.0317)	(0.0318)	(0.0318)	(0.0317)	(0.0321)	(0.0280)	(0.0353)	(0.0295)	(0.0312)
Average Callback Rate	0.269	0.269	0.269	0.269	0.269	0.264	0.209	0.356	0.269	0.269
N	3124	3124	3124	3124	3124	3038	3124	3124	3124	3124
(pseudo) R^2	0.1143	0.1143	0.1442	0.1443	0.1706	0.1451	0.1443	0.1111	0.1629	0.1450
Callbacks 2	X	X	X	X	X	X			X	X
Probit	X	X	X	X	X	X	X	X		
Baseline Controls	X	X	X	X	X	X	X	X	X	X
Distance	X	X	X	X	X	X	X	X	X	X
Company Infos		X	X	X	X	X	X	X	X	X
Vacancy Infos			X	X	X	X	X	X	X	X
Contract Infos				X	X	X	X	X	X	X
Regional FE					X					
Exclude TEA						X				
Callbacks 1							X			
Callbacks 3								X		
OLS									X	
Logit										X

Notes: Dependent variable is the probability of receiving an invitation for a job interview; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

of deferred work, interpreted as low motivation and work moral. As for the previous evidence, estimates reported in Table 3 indicate overall robust evidence for the existence of duration dependence in terms of an unemployment stigma in Germany.

However, the sample has on average a lower tightness than Germany as a whole, implying an underestimation of the true quantitative stigma effect. To avoid neglecting an important piece of robustness and representativeness of the experiment, the data are also proof of the potential relevance of labor market tightness as provided by Kroft et al. (2013). Due to the insignificance of the trend component, a specification using $log(month\,unemployed)$ as proposed by Kroft et al. (2013) leads to insignificant results and is thus avoided. But as the non-parametric evidence suggests, there is a relevance of labor market tightness.

Following the earlier non-parametric procedure, the results in Table 4 support the relevance of labor market tightness for duration dependence. Compared to the full sample in column 1, there is an increasing stigma effect in tight labor markets conditional on the regional unemployment rate and the vacancy/unemployment ratio, while revealing negative but insignificant coefficients for their low tightness counterparts. To focus on the representativeness, the full sample is representative with respect to its vacancy/unemployment ratio for Germany, which is also the case for the high tightness unemployment rate sample. This implies a representative stigma of long-term unemployment for Germany of 26% to 35%.

In the next step, the analysis investigates the impact of the minimum wage exemption on the already mentioned feature of the favorability principle. Column 1 covers the full sample including the maximum set of controls from previous analysis and column 2 the same without temporary employment agencies. Furthermore, additional estimations change the specification of duration dependence and vary the sample size by excluding observations before the unemployment stigma. The results of all samples and specifications point to the irrelevance of the minimum wage exemption for companies' hiring decisions, with an even negative, yet insignificant coefficient for the relevant companies. Next we consider the possibility that these findings are not related to the minimum wage exemption,

Table 4: The Effect of Labor Market Conditions on the Unemployment Stigma

	(1)	(2)	(3)	(4)	(5)
	Full Sample	Unemployment Rate		Vacancy/Unemployment Ratio	
		High Tightness	Low Tightness	High Tightness	Low Tightness
Employed	-0.0327	-0.0345	-0.0289	-0.0374	-0.0338
	(0.0390)	(0.0518)	(0.0590)	(0.0559)	(0.0549)
Month Unemployed	0.0039	0.0057	0.0020	0.0049	0.0028
	(0.0036)	(0.0048)	(0.0055)	(0.0051)	(0.0051)
Stigma	-0.0873**	-0.1216**	-0.0460	-0.1054*	-0.0696
	(0.0318)	(0.0418)	(0.0489)	(0.0434)	(0.0464)
Average Callback Rate	0.269	0.269	0.269	0.269	0.269
N	3124	1678	1446	1510	1614
pseudo R^2	0.1443	0.1660	0.1398	0.1703	0.1352
Callbacks 2	X	X	X	X	X
Baseline Controls	X	X	X	X	X
Distance	X	X	X	X	X
Company Infos	X	X	X	X	X
Vacancy Infos	X	X	X	X	X
Contract Infos	X	X	X	X	X

Notes: Dependent variable is the probability of receiving an invitation for a job interview, following Callback Category 2; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5: The Effect of the Minimum Wage Exemption on Callbacks

	(1)	(2)	(3)	(4)	(5)
Employed	-0.0325	-0.0209			
	(0.0398)	(0.0392)			
Month Unemployed	0.0039	0.0028	-0.0041		
	(0.0039)	(0.0040)	(0.0138)		
Stigma	-0.0877**	-0.0728*			
	(0.0318)	(0.0321)			
Minimum Wage Exemption	-0.0728	-0.0730	-0.0995	-0.1141	-0.0901
	(0.0522)	(0.0529)	(0.0638)	(0.0624)	(0.0644)
Average Callback Rate	0.269	0.264	0.234	0.234	0.231
N	3124	3038	1187	1187	1159
pseudo R^2	0.1448	0.1456	0.1921	0.1920	0.1904
Probit	X	X	X	X	X
Baseline Controls	X	X	X	X	X
Distance	X	X	X	X	X
Company Infos	X	X	X	X	X
Vacancy Infos	X	X	X	X	X
Contract Infos	X	X	X	X	X
Unemployment Duration > 9			X	X	X
Exclude TEA		X			X

Notes: Dependent variable is the probability of receiving an invitation for a job interview, following Callback Category 2; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

but rather to alternative relevant company- and vacancy-specific characteristics that might determine the unemployment stigma. As the following shows, this does allow for interesting additional insights, and also explains the failure of the evaluation. A first possibility is that companies with collective agreements treat the long-term unemployed differently, which is an intuitive source since it is directly related to the minimum wage evaluation specification. Table 6 tries to control for this by sorting the sample into companies with and without a collective agreement. Column 1 does not find evidence of duration dependence for companies with a collective agreement, while column 3 shows an unemployment stigma with an effect in line with the full sample. However, as the preliminary overview of callbacks in Table 1 revealed, collective agreements are also strongly related to company size, which might be an more important aspect.

Table 6 therefore additionally provides an overview of the sensitivity of the unemployment stigma with respect to three company size categories. The estimates confirm the previous suspicion related to the relevance of company size for their screening process. While a negative coefficient for an unemployment stigma

Table 6: The Effect of Company Characteristics on the Unemployment Stigma

	(1)	(2)	(3)	(4)	(5)
	Collective Agreement	No Collective Agreement	Company Size < 6	6 to 50	50 <
Employed	-0.1032	-0.0404	-0.0456	0.0105	-0.1350*
	(0.0930)	(0.0425)	(0.1167)	(0.0540)	(0.0630)
Month Unemployed	-0.0027	0.0020	0.0074	0.0042	-0.0074
	(0.0089)	(0.0039)	(0.0104)	(0.0052)	(0.0058)
Stigma	-0.0288	-0.0843*	-0.0353	-0.0919*	-0.0490
	(0.0758)	(0.0350)	(0.0889)	(0.0463)	(0.0511)
Average Callback Rate	0.323	0.257	0.261	0.270	0.271
N	564	2560	410	1580	1134
pseudo R^2	0.1551	0.1674	0.1066	0.0595	0.0798
Probit	X	X	X	X	X
Baseline Controls	X	X	X	X	X
Distance	X	X	X	X	X
Company Infos	X	X	X	X	X
Vacancy Infos	X	X	X	X	X
Contract Infos	X	X	X	X	X

Notes: Dependent variable is the probability of receiving an invitation for a job interview, following Callback Category 2; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

is observable for all categories, it is largest and significant only for medium-size companies with 6 to 50 employees. An explanation for the unemployment stigma not occurring in all companies can lie in the differences in company structures and characteristics. Larger companies are more likely to have their own human resource departments with employees concentrating on this process and are more likely to have works councils (Addison et al., 2003), resulting in different screening procedures. This is also supported by the observation of Table 1 that larger companies are three times more likely to ask for references, which would imply they are more able to detect unobservable heterogeneity at a later screening stage or even are less sensitive to the potential risk due to the risk spreading over their own employees.

However, when this is the case and larger companies are able to avoid stereotypes and unobservable differences in productivity, we would expect to observe the same unemployment stigma for medium-size and small companies, which is not the case. An explanation for this could be small companies' low degree of prominence, resulting in fewer applicants, which does not allow them to be selective in the hiring process. This explanation would be in line with Farber

Table 7: The Effect of the Contract Type on the Unemployment Stigma

	(1)	(2)	(3)	(4)	(5)
	Permanent Contract		Non-Permanent Contract	Temporary Employment	
Employed	-0.0323	-0.0274	-0.0578	-0.1002	-0.1749
	(0.0481)	(0.0482)	(0.0660)	(0.3068)	(0.3059)
Month Unemployed	0.0017	-0.0005	0.0007	0.0690*	0.0539
	(0.0045)	(0.0045)	(0.0061)	(0.0326)	(0.0331)
Stigma	-0.0852*	-0.0622	-0.0468	-0.8161**	-0.7700**
	(0.0396)	(0.0404)	(0.0537)	(0.2764)	(0.2707)
Average Callback Rate	0.270	0.261	0.268	0.465	0.446
N	2058	1972	1066	86	83
pseudo R^2	0.0547	0.3241	0.0491	0.0703	0.2774
Baseline Controls	X	X	X	X	X
Distance	X	X	X	X	X
Company Infos	X	X	X	X	X
Vacancy Infos	X	X	X	X	X
Excluding TEA		X			
Unemployment < 14m					X

Notes: Dependent variable is the probability of receiving an invitation for a job interview, following Callback Category 2; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

et al. (2017), who observe that companies with immediate needs are more likely to invite long-term unemployed individuals. Due to the available vacancy characteristics, we are able to test this hypothesis by separating the sample into vacancies with immediate and later need, revealing no evidence for a relation of the stigma to a companies's urgency.[10] However, this do not guarantee the irrelevance of this hypothesis for small companies in general.

In a last step, the analysis considers that the results are driven by the contract type. As Boockmann and Hagen (2008) show, fixed term contracts are a potentially relevant instrument for companies' screening processes, which could break the unemployment stigma. The implication for long-term unemployed and job centers would be to concentrate their search effort on vacancies with non-permanent contracts for efficient reintegration into the labor market. Possible reasons are the greater number of applicants for permanent contract jobs or alternatively that companies fear that the probation period does not provide enough flexibility to allow them to take the risk of hiring the long-term unemployed. This would also imply employment protection as a potential determinant

[10]The results are available on request.

for the unemployment stigma, since it determines the firing restrictions after the probation period. Table 7 therefore provides estimates for a sample separating permanent and non-permanent contracts. At first sight, column 1 reveals a significant stigma of long-term unemployment for permanent contracts, compared to no significant stigma for the case of non-permanent contracts in column 3. However, a closer look at the data shows that vacancies of temporary employment agencies are classified as permanent contracts in all cases. When further distinguishing between samples of temporary employment agency and permanent contracts without temporary employment agencies, the earlier observation is disproved and no significant stigma for permanent contracts is found, implying no relevance of the contract type as an instrument for breaking the unemployment stigma. Interestingly, while the temporary employment agency sample consists only of 86 observations of 43 companies, and results have to be interpreted with caution, they show a tendency towards preferences for unemployed individuals with an increasing unemployment duration, with an observable strong unemployment stigma in month 10. However, when the three observations with an unemployment duration of 14 and 15 month, which are all positive callbacks, are excluded, column 5 shows the sensitivity of the results with respect to these observations. While the positive tendency of the unemployment duration remains, the only statistically significant component is the unemployment stigma itself. Thus, the results do not allow any final judgement about differences in the screening behavior of temporary employment agencies, but points to their potential for future research.

5 Conclusion

This paper provides a correspondence experiment aimed at reaching new evidence about the stigma of long-term unemployment. While past research focused on the search behavior of unemployed individuals where duration dependence is the result of differences in motivation and productivity and does not reflect stigmatization of (long-term) unemployed, recent research points to the

relevance of companies' screening behavior for duration dependence. The aim of the experiment was to identify and quantify the stigma of long-term unemployment in Germany, test the relevance of company and vacancy characteristics and analyze aspects of the minimum wage exemption for the long-term unemployed.

In the case of all callback categories, we can observe decreasing callbacks over the unemployment duration, mainly observable in terms of a sharp decrease of callbacks when a person was unemployed for 10 months or longer. The experimental design is based on young applicants as in Ghayad (2013) and Eriksson and Rooth (2014) in order to provide better comparability between countries. Despite the mixed evidence resulting from recent experiments by Farber et al. (2017) and Nunley et al. (2017), this paper supports the existence of duration dependence in Germany. Overall, the significance and size of the effect is stable over all specifications and points to a sharp decrease in callbacks by 8.5 to 12 percentage points, implying an unemployment stigma of between 26% and 35% for a representative sample for Germany. Despite the failure of the minimum wage exemption evaluation, investigation of company and vacancy characteristics allows further insight into determinants of the unemployment stigma, providing a potential explanation for the mixed evidence of previous studies. The results are largely driven by labor market tightness, as previously shown by Kroft et al. (2013), and companies' screening behavior related to their size, while there is no evidence for an unemployment stigma determined by the contract type - which rules out employment protection as a potentially relevant aspect for European labor markets. Due to these stigma effects, companies' hiring decision becomes important for the labor market prospects of unemployed, and is highly relevant for understanding the matching process and the optimal design – for example the optimal timing of training programs to avoid carrying unemployed individuals into the stigma - and the relation of the unemployment stigma and the duration of unemployment benefits. The question, however, remains as to whether these findings are also representative for the working population as a whole or just for a young population. Without question, even if the stigma is a youth phenomenon, it is important for economic policy. When the unemployment stigma is a young workers' problem and even when previous spells of unemployment have no effect,

work experience and therefore wages and future labor market outcomes will be affected.

It is important to further extend the literature on duration dependence to consider the gender aspect as well as covering additional age cohorts in order to acquire deeper insights into the mechanism of duration dependence at work. Furthermore, an extension of these experiments to cover other countries would be fruitful in order to ensure its relation to labor market structures and more importantly, its potential relevance for efficient design of active and passive labor market policies.

A Appendix

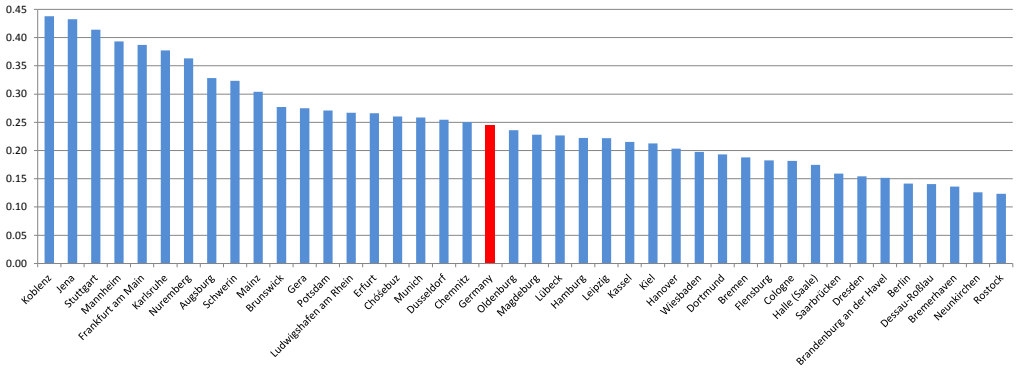

Figure A1: Regional Tightness

Source: Federal Employment Agency; Average 2016.; Own calculations.

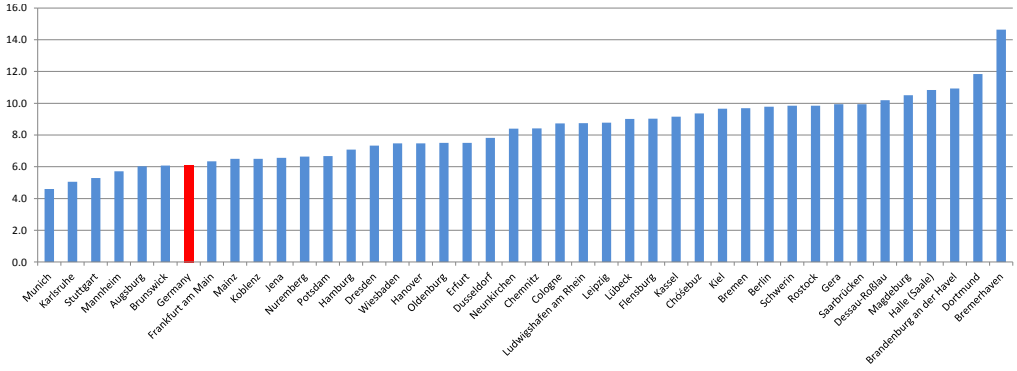

Figure A2: Regional Unemployment

Source: Federal Employment Agency; Average 2016.

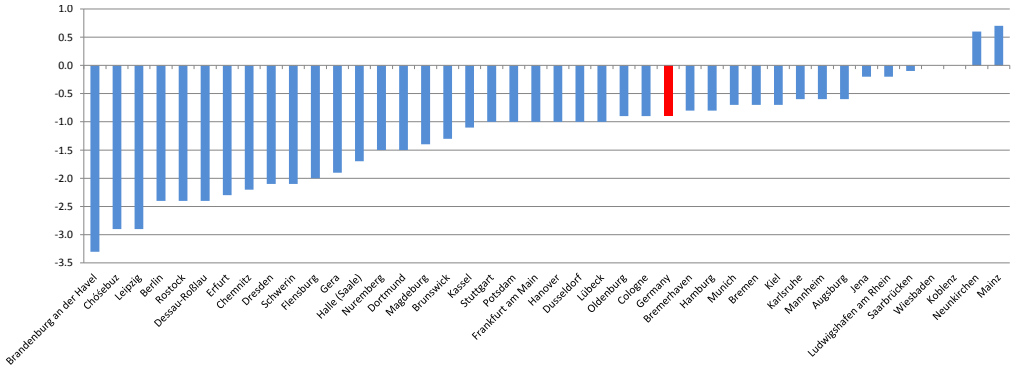

Figure A3: Unemployment Change December 2012 to December 2016

Source: Federal Employment Agency; Average 2016.

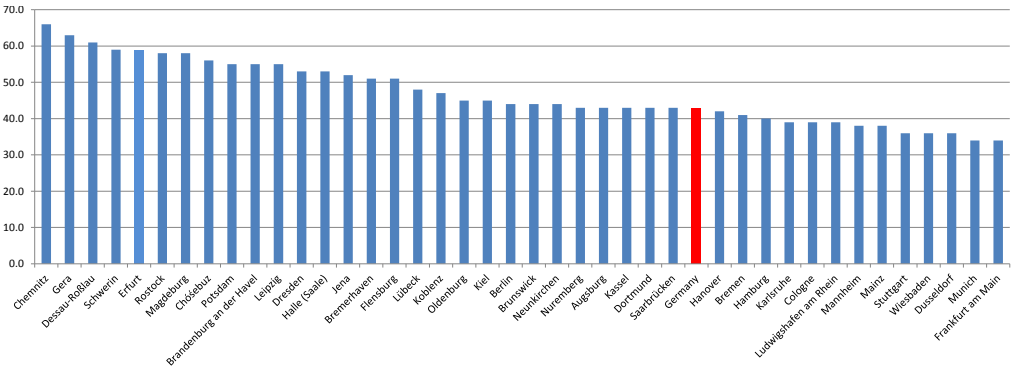

Figure A4: Regional Kaitz Index

Source: DeStatis - Structure of Earnings Survey 2014.

References

Abraham, K. G., J. C. Haltiwanger, K. Sandusky, and J. Spletzer (2016). The Consequences of Long Term Unemployment: Evidence from Matched Employer-Employee Data. NBER Working Papers 22665, National Bureau of Economic Research, Inc.

Addison, J. T., L. Bellmann, C. Schnabel, and J. Wagner (2003). German Works Councils Old and New: Incidence, Coverage and Determinants. *Schmollers Jahrbuch : Journal of Applied Social Science Studies / Zeitschrift für Wirtschafts- und Sozialwissenschaften 123*(3), 339–358.

Addison, J. T., M. Centeno, and P. Portugal (2004). Reservation Wages, Search Duration, and Accepted Wages in Europe. IZA Discussion Papers 1252, Institute for the Study of Labor (IZA).

Arrow, K. J. (1973). The Theory of Discrimination. In O. Ashenfelter and A. Rees (Eds.), *Discrimination in Labor Markets*. Princeton University Press.

Baert, S., J. Norga, Y. Thuy, and M. Van Hecke (2015). Getting Grey Hairs in the Labour Market: An Alternative Experiment on Age Discrimination. IZA Discussion Papers 9289, Institute for the Study of Labor (IZA).

Bertrand, M. and S. Mullainathan (2004). Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *American Economic Review 94*(4), 991–1013.

Boockmann, B. and T. Hagen (2008). Fixed-term Contracts as Sorting Mechanisms: Evidence from Job Durations in West Germany. *Labour Economics 15*(5), 984–1005.

Calvo-Armengol, A. (2004). Job Contact Networks. *Journal of Economic Theory 115*(1), 191–206.

Carlsson, M. and D.-O. Rooth (2008). An Experimental Study of Sex Segregation in the Swedish Labour Market: Is Discrimination the Explanation? IZA Discussion Papers 3811, Institute for the Study of Labor (IZA).

Eriksson, S. and D.-O. Rooth (2014). Do Employers Use Unemployment as a Sorting Criterion When Hiring? Evidence from a Field Experiment. *American Economic Review 104*(3), 1014–39.

Farber, H. S., D. Silverman, and T. von Wachter (2016, May). Determinants of Callbacks to Job Applications: An Audit Study. *American Economic Review 106*(5), 314–318.

Farber, H. S., D. Silverman, and T. von Wachter (2017, April). Factors Determining Callbacks to Job Applications by the Unemployed: An Audit Study. *The Russell Sage Foundation Journal of the Social Sciences 3*(3), 168–201.

Franz, W. (2013). *Arbeitsmarktökonomik*. Springer-Verlag.

Ghayad, R. (2013). The Jobless Trap. Job Market Paper, Northeastern University.

Heckman, J. and B. Singer (1984). The Identifiability of the Proportional Hazard Model. *Review of Economic Studies 51*(2), 231–241.

Katz, L. F. and B. D. Meyer (1990). Unemployment Insurance, Recall Expectations, and Unemployment Outcomes. *The Quarterly Journal of Economics 105*(4), 973–1002.

Kroft, K., F. Lange, and M. J. Notowidigdo (2013). Duration Dependence and Labor Market Conditions: Evidence from a Field Experiment. *The Quarterly Journal of Economics 128*(3), 1123–1167.

Krueger, A. B. and A. I. Mueller (2010). Job Search and Unemployment Insurance: New Evidence from Time Use Data. *Journal of Public Economics 94*(3-4), 298–307.

Krueger, A. B. and A. I. Mueller (2012). The lot of the Unemployed: A Time Use Perspective. *Journal of the European Economic Association 10*(4), 765–794.

Ljungqvist, L. and T. J. Sargent (2004, 04/05). European Unemployment and Turbulence Revisited in a Matching Model. *Journal of the European Economic Association 2*(2-3), 456–468.

Lockwood, B. (1991). Information Externalities in the Labour Market and the Duration of Unemployment. *The Review of Economic Studies 58*(4), 733–753.

Machin, S. and A. Manning (1999). The Causes and Consequences of Long-Term Unemployment in Europe. In O. Ashenfelter and D. Card (Eds.), *Handbook of Labor Economics*, Volume 3 of *Handbook of Labor Economics*, Chapter 47, pp. 3085–3139. Elsevier.

Milner, A., A. Page, and A. D. LaMontagne (2013). Long-Term Unemployment and Suicide: a Systematic Review and Meta-Analysis. *PloS one 8*(1), e51333.

Nunley, J. M., A. Pugh, N. Romero, and R. A. Seals (2017, May). The Effects of Unemployment and Underemployment on Employment Opportunities. *ILR Review 70*(3), 642–669.

Oberholzer-Gee, F. (2008). Nonemployment Stigma as Rational Herding: A Field Experiment. *Journal of Economic Behavior & Organization 65*(1), 30–40.

Paserman, M. D. (2008). Job Search and Hyperbolic Discounting: Structural Estimation and Policy Evaluation. *Economic Journal 118*(531), 1418–1452.

Riach, P. A. (2015). A Field Experiment investigating Age Discrimination in four European Labour Markets. *International Review of Applied Economics 29*(5), 608–619.

Riach, P. A. and J. Rich (2004). Deceptive Field Experiments of Discrimination: Are they Ethical? *Kyklos 57*(3), 457–470.

Sullivan, D. and T. von Wachter (2009). Average Earnings and Long-Term Mortality: Evidence from Administrative Data. *American Economic Review 99*(2), 133–38.

van den Berg, G. J. and J. C. van Ours (1996). Unemployment Dynamics and Duration Dependence. *Journal of Labor Economics 14*(1), 100–125.

Van Horn, C. E. (2014). *Working scared (or not at all): The lost decade, great recession, and restoring the shattered American dream.* Rowman & Littlefield.

Vishwanath, T. (1989). Job Search, Stigma Effect, and Escape Rate from Unemployment. *Journal of Labor Economics* 7(4), 487–502.

vom Berge, P., I. Klingert, S. Becker, J. Lenhart, S. Trenkle, and M. Umkehrer (2016). Mindestlohnbegleitforschung-Überprüfung der Ausnahmeregelung für Langzeitarbeitslose. Forschungsauftrag des Bundesministeriums für Arbeit und Soziales (BMAS). IAB-Forschungsbericht.

Resume

Daniel Hoffmann
****
****** Munich
Phone: **********
E-Mail: **********

Personal Data

Birth: ********** in Nuremberg
Marital Status: Single

Professional Career

03/2012 to 05/2016	********** GmbH Munich Callcenteragent
08/2010 to 08/2011	********** GmbH Kiel Callcenteragent

Education

08/2007 to 07/2010	********** GmbH Kiel Vocational training as a Commercial Agent in Dialoge Marketing
to 2007	**********Secondary School, Nuremberg Graduation: Middle Maturity

Further Qualifications

Computer Skills:	Microsoft Office (Word, Excel, Power Point) SAP
Language Skills:	German (Mother Tongue) English (Fluently Spoken and Written)
Driving License:	Class B
Hobbies:	Jogging, Schwimming

Munich, **.08.2016

Daniel Hoffmann

Figure A5: Sample résumé - Callcenter Agent

Table A1: Alternative Specification 1 of Duration Dependence (Robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed	-0.0607	-0.0673	-0.0648	-0.0651	-0.0703	-0.0495	-0.0139	-0.0672	-0.0527	-0.0583
	(0.0370)	(0.0372)	(0.0372)	(0.0371)	(0.0370)	(0.0364)	(0.0315)	(0.0414)	(0.0335)	(0.0373)
Month Unemployed	-0.0044*	-0.0044*	-0.0046*	-0.0045*	-0.0045*	-0.0045*	-0.0033*	-0.0046*	-0.0040*	-0.0041*
	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0019)	(0.0016)	(0.0021)	(0.0017)	(0.0019)
Average Callback Rate	0.269	0.269	0.269	0.269	0.269	0.264	0.209	0.356	0.269	0.269
N	3124	3124	3124	3124	3124	3038	3124	3124	3124	3124
(pseudo) R^2	0.112	0.130	0.130	0.142	0.169	0.144	0.143	0.110	0.163	0.143
Callbacks 2	X	X	X	X	X	X			X	X
Probit	X	X	X	X	X	X	X	X		
Baseline Controls	X	X	X	X	X	X	X	X	X	X
Distance	X	X	X	X	X	X	X	X	X	X
Company Infos		X	X	X	X	X	X	X	X	X
Vacancy Infos			X	X	X	X	X	X	X	X
Contract Infos				X	X	X	X	X	X	X
Regional FE					X					
Exclude TEA						X				
Callbacks 1							X			
Callbacks 3								X		
OLS									X	
Logit										X

Notes: Dependent variable is the probability of receiving an invitation for a job interview; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A2: Alternative Specification 2 of Duration Dependence (Robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed	-0.0482	-0.0547	-0.0515	-0.0519	-0.0567	-0.0351	-0.0037	-0.0521	-0.0413	-0.0468
	(0.0344)	(0.0347)	(0.0346)	(0.0346)	(0.0344)	(0.0337)	(0.0292)	(0.0384)	(0.0308)	(0.0349)
Stigma	-0.0573***	-0.0569***	-0.0587***	-0.0585***	-0.0570***	-0.0539**	-0.0410**	-0.0544**	-0.0513***	-0.0542**
	(0.0168)	(0.0168)	(0.0168)	(0.0168)	(0.0167)	(0.0169)	(0.0148)	(0.0187)	(0.0152)	(0.0166)
Average Callback Rate	0.269	0.269	0.269	0.269	0.269	0.264	0.209	0.356	0.269	0.269
N	3124	3124	3124	3124	3124	3038	3124	3124	3124	3124
(pseudo) R^2	0.114	0.132	0.144	0.144	0.170	0.145	0.144	0.111	0.163	0.145
Callbacks 2	X	X	X	X	X	X			X	X
Probit	X	X	X	X	X	X	X	X		
Baseline Controls	X	X	X	X	X	X	X	X	X	X
Distance	X	X	X	X	X	X	X	X	X	X
Company Infos		X	X	X	X	X	X	X	X	X
Vacancy Infos			X	X	X	X	X	X	X	X
Contract Infos				X	X	X	X	X	X	X
Regional FE					X					
Exclude TEA						X				
Callbacks 1							X			
Callbacks 3								X		
OLS									X	
Logit										X

Notes: Dependent variable is the probability of receiving an invitation for a job interview; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A3: Alternative Specification 3 of Duration Dependence (Robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employed	-0.0227	-0.0298	-0.0263	-0.0264	-0.0332	-0.0159	0.0120	-0.0346	-0.0178	-0.0221
	(0.0398)	(0.0400)	(0.0399)	(0.0399)	(0.0397)	(0.0392)	(0.0339)	(0.0445)	(0.0363)	(0.0400)
Month Unemployed	0.0050	0.0049	0.0050	0.0050	0.0046	0.0038	0.0031	0.0034	0.0046	0.0049
	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0040)	(0.0035)	(0.0045)	(0.0038)	(0.0039)
Month Unemployed × Stigma	-0.0074**	-0.0074**	-0.0076**	-0.0076**	-0.0072**	-0.0066*	-0.0051*	-0.0063*	-0.0067*	-0.0071**
	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0024)	(0.0031)	(0.0026)	(0.0027)
Average Callback Rate	0.269	0.269	0.269	0.269	0.269	0.264	0.209	0.356	0.269	0.269
N	3124	3124	3124	3124	3124	3038	3124	3124	3124	3124
(pseudo) R^2	0.1142	0.1322	0.1441	0.1443	0.1705	0.1451	0.1444	0.1111	0.1628	0.1449
Callbacks 2	X	X	X	X	X	X			X	X
Probit	X	X	X	X	X	X	X	X		
Baseline Controls	X	X	X	X	X	X	X	X	X	X
Distance	X	X	X	X	X	X	X	X	X	X
Company Infos		X	X	X	X	X	X	X	X	X
Vacancy Infos			X	X	X	X	X	X	X	X
Contract Infos				X	X	X	X	X	X	X
Regional FE					X					
Exclude TEA						X				
Callbacks 1							X			
Callbacks 3								X		
OLS									X	
Logit										X

Notes: Dependent variable is the probability of receiving an invitation for a job interview; The table reports marginal effects for the probability of a callback; The baseline controls are the controls listed in Table 2; Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.