Putting Social Custom Theory to the Test

A dynamic multi-level analysis of trade union membership

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Abstract
In this paper, we significantly improve existing studies of determinants of union membership by using a large panel data set and multi-level analysis (MLA) to test hypotheses of social custom theory. While some empirical analyses giving support to the social custom theory, existing studies have not adequately taken into account the complex relationships between individual and workplace level characteristics. The MLA presented in this paper accounts separately for the effect of factors at different levels. Moreover, the analysis improves existing studies by synchronizing the moment and individual worker is confronted with social customs at the workplace and the decision to become a member or not. The main finding of the paper is that there is a strong positive and highly significant correlation between workplace union density and the probability of joining the union and we estimate the tipping point for this positive effect. Moreover, workplace union density seems to neutralize hitherto believed positive effects between workplace size and the probability of joining the union, suggesting that the latter correlation is spurious.

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Introduction

While trade unions seem to have fallen out of fashion with workers during the recent decades, research continues to show the considerable effect of unions on the employment conditions of workers (Freeman and Medoff, 1984; Stockhammer and Onaran, 2012; Thelen, 2014). Unions clearly matter, but they seem to matter less than before – primarily due to dwindling union densities (Blanchflower, 1996; Visser, 2013) – begging the question of what factors determine union membership. As Schnabel (2013) notes, numerous studies have approached this question in the past… *but relatively few stylized facts have emerged and some of these are not so stylized and robust at all.* But while robust empirical findings are missing, there seems to be broad agreement that workplace union density matters. For example, in their influential study, Checchi & Visser (2005) build their explanatory models around social custom theory which posits that workers join, leave or do not join unions based on reputational effects at the workplace. The aim of this article is to test this dominant theory and show how much workplace union density matters compared to other factors. We do this using a unique panel dataset from Denmark and employ a multi-level design to analyse individual and workplace characteristics.

Social custom theory entered as a powerful alternative to rational choice based explanations of unionization due its incorporation of reputational effects into workers' decisions. Reputational effects pertain at the group level when individual workers join unions because they want to be part and earn the respect of the group as opposed to be isolated or despised by the group (Van de Vall, 1970). This seems to solve the free-rider

problem of unionization when the collective goods produced by trade unions can be enjoyed at no extra cost and with no exclusivity by non-members (Olson, 1965; Akerlof, 1980). In empirical studies, the strength of reputational effects and thus the social custom have been approximated using either survey data about peer pressures at work (Visser, 2002; Waddington, 2014) or using indicators such as share of manufacturing and manual workers in an economy; presence of workplace representation; job tenure; size of workplaces; public sector workplaces , gender, age and nationality (Checchi and Visser, 2005; Schnabel and Wagner, 2005; Ibsen *et al.*, 2012; Schnabel, 2013). Generally, all these indicators are used as proxies for the strength of social customs at the workplace. However, the *prima facie* variable to measure the strength of social custom surrounding the individual worker is workplace union density (Toubøl and Jensen, 2014). If workplace union density is high the social custom is strong because the reputational effect of non-membership becomes considerable as many union members are there to police the custom of unionization (Akerlof, 1980; Booth, 1985; Checchi and Visser, 2005).

In the article we put social custom theory and the stylized facts surrounding it to the test using Danish administrative data with yearly observations for the entire workforce in the period of 2002-2007. Building on the approach by Toubøl & Jensen (2014), we estimate random intercept multi-level models for workers who joined the union when they entered a new workplace. We go beyond existing studies in a number of ways. Firstly, we isolate the situation in which workers are confronted with social customs which gives a much more precise dependent variable for unionization than simply comparing members with non-members. The Danish data, moreover, combines individual data with workplace data giving us the possibility of calculating workplace union densities and using it as an exogenous independent variable by subtracting the individual from his/her surrounding workplace density. Similarly to Fazekas (2011), we employ the multi-level design, which allows us to decompose variation on the dependent variable to either the workplace or individual level which is usually not possible with conventional methods. Hereby, we can test some of the stylized facts pertaining to workplace characteristics such as workplace size, sector of the workplace, industry of the workplace and job turnover of the workplace. Conventionally, analyses of nested data have been limited due to the large-N requirements at both individual and group level, but since we are analysing data for the entire Danish workforce and over six years, such requirements are easily met.

The article proceeds as follows. In the first section, we outline the main theories on unionization and present the most important stylized facts coming from empirical studies using social custom theory. This serves as hypotheses that we want to test in the analysis. In the second section, we present the data, variable selection and model specifications we use for our multi-level analyses. The third section presents the results. We estimate three models; one for the entire labour market, one for the public sector and one for the private sector. The fourth section discusses the findings against existing literature and provides new insights for the study of unionization. In this section we also discuss some limitations and potential avenues for future analysis arising from our study. Finally, the conclusion summarises the main findings of the analyses and reflects on the practical implications for unionization at the workplace.

Social custom theory and empirical stylized facts

The question of why workers join unions has been approached from various disciplines in social science each stressing particular aspects and dynamics of unionization. Scholars differ about underlying assumptions about decision-making by workers, that is, whether workers are assumed to unionize according to material interests or normative/ideological orientations (Elster, 1989). Economists conventionally regard membership decisions as rational choices based on the utility function and price mechanism. The cost (membership fee) and benefits (collective and individual goods) of membership are weighed against each other and an

aggregate demand and supply for unionism clears. However, this logic runs counter to the free-rider problem when collective goods, e.g. collective agreements, are non-exclusive and non-rival (REF.). Non-members can typically enjoy the collective good without paying to its provision. For Olson the solution could be the introduction of selective (individual) goods that increase the excludability of union membership (Olson, 1965). Alternatively, resourceful actors might be willing to pay the extra costs of the collective good provision (ibid.).

The free-rider problem has since been challenged in a number of ways. Common for most of the challenges is a relaxation of the assumption that individuals perform a strictly material calculus of the cost and benefits for collective action. One strand of literature – based on lab experiments – have thus found that social interaction between individuals can increase the chance of collective action because decisions no longer are taken in insulation from others (Ostrom). Indeed, the build of trust between individuals or social ties might alleviate the temptation to free-ride (REF. Hardin). Another strand of literature – based on formal modelling – shows that individuals derive utility from belonging to and being accepted by groups (Akerlof, 1980; Booth 1985; Naylor 1989). The so called social custom theory is based on this premise and breaks with the strictly material calculus by including reputation effects into the membership decision. The reputation effect depends on social groups in which the individual belongs or wants to belong. Conventionally, social customs represent *acts whose utility to the agent performing it in some way depends on the beliefs or actions of other members of a community* (Akerlof 1980: 749). Breaching the beliefs of the community has a 'reputational-effect' that is usually negative and considerable, thus deferring individuals from doing so (Booth 1985). In union membership research, social customs have thus been used to explain why workers join unions, even when free-riding opportunities apply (Booth 1985; Naylor 1989). Thus common to these two strands of literatures is an appreciation of how social relations between actors can help groups overcome the free-rider problem. So, even workers that are highly individualist can choose membership if the reputation effects are considerable (Checci & Visser, 2005).

Reputation effects in social custom theory are, however, also subject to collective action problems as sanctioning of free-riders comes with a cost. This is often called the second-order collective action problem (REF.). Who wants to be the police of social customs and uphold the norm about membership? The cost of sanctioning is plausible negative related to union density in the group, e.g. the workplace. If there are many members, there are more to sanction non-members (Coleman, 1990; Corneo 1997). Note, however, that higher union density also leads to economies of scale which could lower the cost (union fee) of membership which in turn might confound the mechanisms at play. The theoretical observation that union density is positive related to reputation effects also means that there is a 'tipping point' (Schelling, 1970) where unions get positive feed-back in their recruitment, that is high union density leads to more members which leads to higher union density. Conversely, at lower levels of union density the reputation effect might vanish (Booth & Chatteriji, 1993) or indeed be turned around, that is, union members are the minority and suffer normative sanctions from non-members. These tipping points would seem to suggest that union densities across units might diverge over time, something that the cross-national analysis of Checci & Visser (2005) seems to suggest.

Rational choice and social custom theory give rise to several explanatory models. Broadly speaking, explanations fall under three main models; cyclical explanations, structural explanations and institutional explanations (Ebbinghaus & Visser 1999; Checci & Visser 2005; Schnabel 2013). Given our focus on individual motivations for unionization within a single country and for a restricted period, we only focus on structural explanations. Structural explanations can be divided into two groups. The first group stresses how

the industrial structure affects unionization, and the second group stresses the effect of workforce composition including the employment relationship.

In the first group, various studies have stressed why certain types of companies and workplaces facilitate unionization and why some don't (Ref.). This is intimately connected to the social processes and social customs mentioned above. The transition from manufacturing to services has been highlighted in numerous studies as a key explanation for dwindling union densities as high density workplaces – like the factory – are being replaced with low density workplaces in services which in turn leads to disruption of the social customs by company turnover and disappearance of union strongholds. This is especially true in countries where service sector unions never developed to the same extent as manufacturing (REF.). In contrast, public sector work is positively related to unionization probably due to a composition of benign conditions such as strong occupational identities around many public sector services, e.g. doctors, nurses and teachers (Abbott, 1988; Ibsen et al. 2011), collectivist values of public sector employees (REF.), large establishments, low turnover rates and model-employer industrial relations (Schnabel 2003).

One of the key stylized facts is indeed that establishment size is positively related to unionization. The costs of organizing and sanctioning unionization should *ceteris paribus* diminish with larger establishments due to economies of scale. Moreover, larger establishments on average have higher survival rates than smaller ones, thereby making organizing more feasible. Alternatively, very large establishment might be harder to police as free-riders are harder to identify (Ibsen et al. 2011). Numerous studies seem to confirm that establishment size does matter (Schnabel 2003; Fitzberger et al. 2011; Ebbinghaus et al. 2011; Schnabel & Wagner 2007). One caveat of these studies is that they do not include workplace density as this variable is virtually impossible to get without detailed information about the establishment size and membership rates of colleagues. What this omission suggests is that the positive relationship between unionization and establishment size might be spurious since what matters is workplace density – not size! As the two are highly correlated – as shown in the above mentioned studies – it becomes hard to prove the reputational effect in large establishments other than by fiat based on theories of economies of scale.

The second group of structural explanations focus on the workforce composition and argues that certain groups of workers have lower probability of joining unions for various reasons (see Schabel & Wagner for a thorough review). Previously, it was conceived that female workers would be less prone to join unions. Often working part-time and with child-bearing interruptions this was believe to mean lower labour market attachment than men's and therefore a weaker incentive to join unions and a weaker exposure to reputational effects. This stylized fact has been dispelled in newer studies, probably owing to women's gradually stronger labour market attachment in the service economy and due to the high share of female workers in the public sector (REF.). Labour market attachment is also the main explanation for lower probability of joining unions for atypical workers (contract, agency, short-term and part-time workers). These groups of workers either change often between workplaces or are present less time than standard full-time workers, thus diminishing the incentive for and reputational effect of unionization. In addition, the marginal costs for unions to organize these workers increase compared to standard full-time workers. Some studies seem to support the negative relationship between atypical employment and unionization (REF. from Schnabel 2013), while others do not (REF. from Schnabel 2013), potential owing to different national regulations and spread of atypical employment. Linked to gender, Ibsen et al (2011) suggest that female part-time workers in the public sector are no less prone to joining unions than other full-time workers.

Other individual factors have been proposed as explanations for unionization. As mentioned above, education around professions might be a strong identity driver for unionization (REF.). Similarly, this might

also explain why skilled labour as opposed to unskilled labour is more likely to join workers (Ibsen et al. 2011). As Schnabel (2013) suggests, this finding actually goes counter conventional views that higher-educated workers are less in need of collective voice due to their individual bargaining power. In a social custom lens, professional identity and collectivism in networks (not necessarily at the workplace) might induce a strong reputational effect and even exclude non-members from employment opportunities (REF.). The positive relationship between age and unionization has also become a stylized fact with the more or less common observation, that younger workers are less likely to join unions (REF.). The jury is still out on whether this is a cohort or age-effect, but there is some evidence suggesting that younger cohorts remain unorganized throughout their working life (REF.) – perhaps owing to bad first-encounters with unionization (Budd 2010) or the aforementioned individualisation trends for younger cohorts (Beck & Giddens). If this is the case, one might hypothesise that younger workers would be more immune to the reputational effect. Finally, some studies suggest that migrant workers are less prone to joining unions due to lower labour market attachment – especially if they are circular migrant workers – or due to exclusion mechanisms vis-à-vis domestic workers.

We suggest that our analysis will improve these studies in a number of ways. Firstly, the empirical studies based on social custom theory suggest that the workplace is the main locus for reputational effects and that this effect crucially if not exclusively depends on workplace union density. This means that we should expect a strong positive correlation between high union density in a workplace and the probability that a worker will join the union once she enters this workplace. Most studies, however, are ill-designed to measure this, as they take indicators of social customs – such as establishment size, labour turnover, type of industry, and workplace union representation – instead of workplace union density. Indeed, there is a risk that most of the positive correlations in previous research are spurious due to this analytical design flaw.

Secondly, once we take workplace union density as the main focal independent variable it becomes interesting to estimate the so-called 'tipping point' for workplace union density, where the positive feedback on union density starts because new employees become more likely to join the union than not. Positive feed-back mechanisms are, however, hard to measure due to endogeneity, i.e. how can we establish the effect of union density on union membership of individuals, when the latter feeds into the former. Below, we suggest a method to get around this problem that is based on using the membership and employment history of workers as well as workplace data.

Thirdly, since most studies – with the exception of e.g. Fitzenberger et al (2011) – are based on cross-sectional data, they do not include the membership and employment history of workers. This means that the dependent variable is underspecified as the decision to become a member or not is not synchronized to the measured employment status, i.e. union membership decision y_{it} of individual i is not synchronized with establishment size x, meaning that the individual working at a large establishment but with low union density might have become a member when she worked for a small establishment with high union density. What really matters is workplace union density and its effect on the probability on joining a union once you are exposed to the social custom.

Data, variables and model specification

We use data from two main sources: 1) Statistics Denmark's individual register data which contains micro data on every person with a social security number in Denmark, and 2) Statistics Denmark's company and workplace register data which contains information on all registered companies and their workplaces in Denmark. By matching these two data sources make it possible to link individuals with companies and

workplaces using the social security number and matching it with company and workplace registration numbers. Hereby, we not only get the each individuals employment histories, we also get rich information about the company and workplace they were employed in. Since the data is based on registers with yearly observations we were able to pool several years into our sample which was restricted according to the following criteria: 1) all economic active individuals (employed or unemployed but actively seeking employment) in Denmark in the period 2002-2007. This criteria excludes self-employed, employers and top-level management, and 2) individuals between the age of 15 and 66 years old. Moreover, to investigate the effect of workplace social customs we made the following restrictions: 3) individuals who entered a new workplace at t_1 either from another workplace or from non-employment at t_0, 4) working time in their new job was on average more than 15 hours, 5) there were at least 5 individuals employed at the new workplace (see more on this criteria below), and 6) hourly wages of the individuals > 40 DKK and <1000 DKK (to ensure high quality observations). With these restrictions we are left with a sample of 132.851 individuals and 10.168 workplaces which allows for highly robust results. We included some descriptive statistics on main variables in table x below.

Table 1: Averages of main variables for full, private and public sample

	Full sample					Privat sector sample					Public sector sample				
Variable	N	Mean	S.D.	Min.	Max.	N	Mean	S.D.	Min.	Max.	N	Mean	S.D.	Min.	Max.
Joined union (1=yes)	132.851	0,35	0,48	0	1	94.958	0,31	0,46	0	1	37.656	0,47	0,50	0	1
Partner member (1=yes)	132.851	0,25	0,43	0	1	94.958	0,25	0,44	0	1	37.656	0,25	0,43	0	1
Gender (1=male)	132.851	0,58	0,49	0	1	94.958	0,64	0,48	0	1	37.656	0,42	0,49	0	1
Age (in years)	132.851	33,75	11,13	15	66	94.958	33,34	10,86	15	66	37.656	34,74	11,72	15	66
Education (in months)	132.851	154,20	30,09	0	240	94.958	153,89	29,89	0	240	37.656	154,96	30,55	0	240
Hourly wage (in DKK)	132.851	191,67	91,65	41	994	94.958	201,34	97,40	41	994	37.656	167,29	69,62	41	966
Full time (1=yes)	132.851	0,86	0,35	0	1	94.958	0,87	0,34	0	1	37.656	0,84	0,37	0	1
Years in workforce	132.851	11,89	7,82	0	28	94.958	11,89	7,79	0	28	37.656	11,87	7,92	0	28
Workplace Union Density	10.168	0,65	0,22	0	1	7.621	0,59	0,22	0	1	2.548	0,82	0,12	0	1
Workplace Size (employees)	10.168	389,65	769,95	2	6.731	7.621	265,31	475,63	2	3.936	2.548	705,23	1175,48	2	6731
Workplace Labour Turnover	10.168	0,64	0,21	0	1	7.621	0,63	0,21	0	1	2.548	0,66	0,19	0	1
Workplace Average Age	10.168	38,95	5,37	17,33	62	7.621	37,87	5,40	17	62	2.548	41,67	4,18	24,80	56,42

Dependent variable and focal independent variables

As noted above, one key improvement in this study is how we construct the dependent variable. We follow two criteria: 1) the individual has to enter a new workplace at t1 either from non-employment or a different workplace at t0. This is to ensure that we are capturing a new workplace situation (the treatment) in which the individual has to decide whether to become a member or not, and 2) the individual has be a non-member at t0. We measure the dependent variable as a dummy based on whether the individual joined a union (1) or not (0)[1]. In Denmark, union dues are tax-deductible, with trade unions annually reporting the membership fees paid by their members to the tax authorities. Statistics Denmark has access to these records, and has generated variables telling us whether a given individual paid any union dues in any one year. Because it is the trade unions who report these member payments to the authorities and not the individuals, the data are considered highly reliable. If an individual did not pay any membership fee in one year, t0, but did so in the following year, t1, we conclude that the individual joined a trade union in t1. Because some individual enter new workplaces more than once during the period 2002-2007, we focus on the first year such a workplace shift happens and synchronize the other variables according to this year.

The main focal independent variable is workplace union density. This variable is constructed by dividing the number of union members by the total number of ordinary wage-earners for each workplace (all employees minus self-employed, owners and top-level management). To avoid the obvious endogeneity problems between workplace union density and individual membership, the individuals in our sample have been excluded from the calculation of workplace union density. Otherwise, their behaviour with regard to their choice of joining a union or not, the explanandum, would contribute to the workplace union density variable, the explanans. Hence, the workplace union density variable going from 0 to 100 per cent measures the union density among the workplace colleagues of 132.851 individuals in the sample. Note, however, that it is possible for individual 1 in the sample to be part of the workplace union density of another individual 2 in the sample – just not for individual 1. This is especially important for smaller workplaces where the subtraction of one individual from the workplace union density calculation can have relatively large consequences. As for the other variables we synchronize the workplace union density with the year of the individual entering a new workplace, thus making sure that the treatment year matches the effect year for each individual in the sample.

Control variables

We consider a range of workplace control variables that are most often treated as focal explanatory variables in empirical studies (REF.). All controls are synchronized with the year the individual enters a new workplace (t1). The analysis includes: Workplace size measured as total employment (subject to the wage-earner criteria of the sample) at the workplace; Share of workplace employees at low skill level, medium skill level and high skill level (skill level measured with Danish educational categories); Share of male employees; Average age of employees; Industry of workplace (NACE 03 with 27 categories) and Labour turnover at workplace measured as the share of employees that were also employed at the workplace the year before. Especially, workplace size and labour turnover at workplace are interesting control variables as they have been used as focal independent variables in other studies (REF.). To reiterate, size is supposed to

[1] Note that we exclude members of so called yellow unions, that is, unions that do not participate in collective bargaining but constitute cheaper alternatives. We do so, because in a social custom logic, they constitute free-riders as they do not contribute to the provisions of collective goods, namely the collective agreement. We identify members of yellow unions through their membership of yellow unemployment insurances funds (a-kasser). The yellow union members in 2014 accounted for approximately 9 % of the labour force and 13 % of all union members in Denmark (Ibsen et al. 2014)

increase the likelihood of unionization due to decreasing costs for unions to organise and thus stronger social customs, while labour turnover is assumed to decrease the likelihood of unionization because social customs require some degree of stability in the workforce to make reputational effects possible. Note that, as we estimate three models - one for the entire economy, one for the private sector and one for the public sector – we only include sector as a control variable in the first model.

Turning to individual controls we include the following: Gender; Age (adjusted for the minimum age in the sample = 15); Years of education (adjusted for minimum schooling in Denmark = 7); Occupational categories (ISCO with 25 categories); Country of origin; Full-time/part-time; Children; Living with a partner/single; Days of employment at present employer (seniority); Years on the labour market; Degree of unemployment (calculated as hours of unemployment/hours of possible working time); Entered workplace from other employment/entered from non-employment (job-to-job); Hourly wage and Membership of partner. As noted above, especially the membership of partner is interesting from a social custom perspective as reputational effects are not exclusive to the workplace. A cross-section analysis of Danish workers showed that this variable was highly significant and positively related to the likelihood unionization. Age is also expected to play a role, but the expectation in this analysis might be reverse. For many of the young non-members at t0 in the sample, the new workplace at t1 is their first and therefore joining a union might be the obvious choice for them in a Danish setting with generally high union density (see Budd 2010 for the opposite pattern in the US). In contrast, older workers who are non-members at t0 might be consistently non-members are therefore stick with their choice despite social customs at t1. Therefore, age might actually be negatively related to the probability of joining the union in this study.

Model specification

Table x below reports the results of a simple logistic regression between the dependent variable and workplace union density and as expected there seems to be a strong significant positive relationship which warrants further analysis.

Table 2: Logit regression for focal variables

	Dependent variable: Joined union when entering new workplace					
	Coefficient	S.D.	z	P>|z|	95% Confidence Interval	
Workplace Union Density	3,056612***	0,0304227	100,47	0,000	2,996985	3,11624.00
Constant	-2,676903***	0,0221532	-120,84	0,000	-2,720323	-2,633483
Test statistics						
Log likelihood	-80363,09***					
Number of observations	132.851					

* = p < 0.05; ** = p < 0.01; *** = p < 0.001

Sources: Statistics Denmark register data 2002-2007

Due to our assumption that the workplace level matters for social customs and the reputational effect of union membership we choose a multilevel analysis (MLA) design that takes into account that individuals are nested in higher levels groups, in this analysis workplaces (Snijders & Bosker 2011, see Fazekas 2011 for a multilevel analysis using countries as groups). The MLA handles that individuals within the same workplace cannot be regarded as independent observations – in contrast to regular linear regression analysis such as OLS. This gives better estimations of standard deviations for independent variables at both the individual

and group levels. The basic equation for the so called empty MLA model (without independent variables) reads as follows:

$$y_{it} = \gamma_{00} + u_{0j} + e_{ij} \quad 1)$$

where y_{it} is the unobserved union membership for individual *i* (*i* =1……nj) at workplace *j* (*j* =1…..N). y_{it} is the sum of γ_{00} which is an unobserved general mean, u_{0j} which is an unobserved random effect at the group level and e_{ij} which is an unobserved random effect at the individual level. The equation shows us that the total variance of the dependent variable is composed by the variance at the group level and variance at the individual level. This is important for our purpose as it gives us a chance to decompose the variance in union membership to workplace characteristics, most importantly workplace union density, vis-à-vis individual characteristics. When we include independent variables, the equation reads:

$$y_{it} = \gamma_{00} + \beta_1 x_{ij} + \gamma_{01} z_j + u_{0j} + e_{ij} \quad 2)$$

where β_1 is the unobserved coefficient for the individual level independent variable x_{ij} (for person i in workplace j) and γ_{01} is the unobserved coefficient for workplace level independent variable z_j (for workplace j). For each model, we estimate the intra-class correlation (ICC), which measures the proportion of total variance (between 0-1) accounted for by the workplace level (Snijders & Bosker 2011: 39). A high ICC can also be interpreted as a high correlation between the union membership decisions measured for two randomly drawn different individuals at the same workplace. As (REF.) notes, even low ICC scores (<10) can be substantial in social sciences.

We estimate models based on samples for the entire economy (public and private sector), the public sector and the private sector as we assume that are parameters matter differently according to sector. For each sample population we estimate 1) the empty model; 2) a model with only the focal variable; 3) a model including individual level controls and 4) a model including both individual and workplace level controls. We include year fixed effects in all models to account for unobserved economic and political factors and general trends of union density decline across the years 2002-2007. To test robustness we run and report Log likelihood, Wald chi2 and LR test vs. logistic regression values for all models. The log-likelihood calculations are based on the Laplacian approximation (REF.).

Results

In order to substantiate the claim that workplace characteristics matter for union membership we assess the variance components for joining a union in a new workplace from the empty model (only including year fixed effects). We do this using the intra-class correlation (ICC) which is based on dividing the between-workplace variance component by the sum of the between-individual variance component and the between-workplace variance component ($\tau_0/\tau_0 + \sigma^2$). In the table below, we report the ICC for the empty model for the entire labour market, for the private sector and for the public sector.

Table 3: Intra-class correlations of models

	ICC – empty model
Entire labour market	0,2338351
Private sector	0,2499238

Public sector	0,1344981

The ICC-scores show that a great share of the variance in joining a union at a new workplace lies between workplace but the size of the workplace variance component seems to differ across sectors. For the entire labour market 23 per cent of the variance lies between workplace. In the private sector, 25 per cent lies between workplace while in the public sector only 13 per cent lies between workplaces. This seems to confirm our assumption about the importance of the workplace level for union membership decisions, thus warranting a MLA-design.

Tables x, y and z report the estimates of the MLA models for the entire labour market, the private sector and the public sector, respectively. For each sample population we estimated M1: a model with only the focal variable; M2) a model including individual level controls; and M3) a model including both individual and workplace level controls. In the following, we write the model and its sample together, e.g. M3-private for the private sector model including both individual and workplace level controls, and M1-full for the entire labour market with only the focal variable. M1-full, M1-private and M1-public all show that workplace union density is positively related to the chance of workers joining a union when entering a new workplace (standardized coefficient $\gamma^* = 2{,}768$; $P < 0{,}001$ in M1-full; $\gamma^* = 2{,}685$; $P < 0{,}001$ in M1-private; and $\gamma^* = 2{,}817$; $P < 0{,}001$ in M1-public). This is a first-cut indication that the result from our simple logit-model above also hold when taking into account the workplace-level clustering of individuals. Moreover, we see that the ICC drops considerably across the models (ICC= 0,134 inM1-full; 0,151 in M1-private; and 0,097 in M1-public) indicating that the workplace union density explains away a substantial part of the between-workplace variance component (more on this below).

In M2, we introduce individual level variables to assess whether the positive relationship between workplace union density and chance of joining a union holds. Indeed, across M2-full, M2-private and M2-public the positive relationship holds and continues to be highly significant ($\gamma^* = 2{,}853$; $P < 0{,}001$ in M2-full; $\gamma^* = 2{,}821$; $P < 0{,}001$ in M2-private; and $\gamma^* = 3{,}193$; $P < 0{,}001$ in M2-public). Note that the coefficients seem to be higher when including individual controls, but as Karlson (YEAR) show, we should be careful of comparing coefficients across logit models with different independent variables. Interestingly, there is also a positive relationship between membership of partner and the chance of joining a union, suggesting a social custom effect in the household. It is also interesting that age seems to be negatively related to chances of joining a union – a result in contrast to most other studies (REF.). We interpret this relationship as the result of the different employment situations of young labour market entrants and established older workers. Young workers in the samples entering the labour market might be entering their first workplace explaining why they came from with non-membership status. Conversely, older workers with non-membership status entering a new, but not their first, workplace might remain hard-core anti-unionist. Indeed, years on the labour market and seniority are also negatively related to the chance of joining the union, which also seems to suggest that the longer an individual has been a non-member, the lower chance of joining a union when entering a new workplace, all else being equal. Finally, the M2 models show that women are more likely than men to join the union – a result that is consistent with other Danish studies (REF.), but runs counter studies in other national settings (REF.).

In M3, we include workplace level variables. Again, there is a strong positive relation between workplace union density and the chance of joining a union ($\gamma^* = 2{,}553$; $P < 0{,}001$ in M3-full; $\gamma^* = 2{,}401$; $P < 0{,}001$ in M3-private; and $\gamma^* = 3{,}326$; $P < 0{,}001$ in M3-public). A key issue for this study was whether workplace size

(in number of employees) is indeed important for social customs or spurious since workplace union density is the cause behind the positive relationship between workplace size and unionization. Indeed, the results of M3-full show that there is a very modest and insignificant impact of workplace size on the chance of joining a union (γ^* = 0.00002; P < 0,427 in M3-full). The general result covers sector specific differences. In M3-private the relationship between workplace size and chance of joining is indeed positive, but very weak and less significant than other variables (γ^* = 0,0001; P < 0,01). Conversely, in the M3-public, the relationship is negative (γ^* = -0,0001; P < 0,05). We check for multicollinearity (there is a relatively modest correlation between workplace union density and workplace size, $r^2 = 0{,}056$ in the full sample), and due to the very small coefficients, it seems fair to argue that workplace size is of minor importance when new employees decide whether to become a union member or not.

Finally, it is noteworthy that workplace labour turnover is related in different ways across the sectors. Across the models, we estimate main effects of labour turnover and an interaction terms between turnover and workplace union density as we expect that the effect of turnover varies across workplace union densities. In M3-full, there seems to be a significant negative main effect of labour turnover on the chance of joining the union (γ^* = -0.489; P < 0,001). The interaction term is, however, positive ($\gamma^*\delta = 1{,}141; P < 0{,}001$), suggesting that the effect of labour turnover changes as workplace union density increases. However, this negative main effect only pertains to the private sector (γ^* = -0.592; P < 0,001 and $\gamma^*\delta = 1{,}301; P < 0{,}001$) in M3-private), whereas in M3-public, the main effect of labour turnover and the interaction term are insignificant. This result could indicate that labour turnover only erodes social customs in the private sector and that this effect disappears when workplace union density increases.

Table 4: Full models for entire labour market (public + private sector)

	Dependent variable: Joined union when entering new workplace					
	M1: Focal explanatory variable		M2: Including individual controls		M3: Including individual and workplace controls	
Parameter	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Workplace union density (wpUD)	2.768176***	0.0468364	2.852967***	0.044557	2.552984***	0.1311362
Partner is union member (partner)	-	-	0.2799164***	0.0185526	0.2801863***	0.0185454
Male worker (male)	-	-	- 0.1460341***	0.0161306	- 0.1487598***	0.016611
Age (age)	-	-	- 0.039795***	0.0011328	- 0.0380614***	0.0011434
Years of education (edu)	-	-	0.0008616**	0.0003026	0.0010363**	0.0003049
Hourly wage (wage)	-	-	- 0.0020096***	0.0001211	- 0.0018446***	0.0001226
Full time (ftime)		-	0.4778557***	0.0205298	0.5037631***	0.0204975
Seniority (sen)	-	-	- 0.0009171***	0.0000673	-0.0008496***	0.0000676***
Years on the labour market (lmYEARS)	-	-	- 0.0191899***	0.0015928	-0.0186869***	0.0015931
Workplace Size (wpSIZE)	-	-	-	-	0.0000186	0.0000262
Workplace labour turnover (wpLT)	-	-	-	-	- 0.4885674***	0.1380729
Interaction wpLT*wpUD	-	-	-	-	1.141139***	0.1937141
Workplace av. age employees (wpAGE)	-	-	-	-	-0.0238495***	0.0024358
Constant	-3.063068	0.0366394	- 1.648556***	0.0840832	-0.7634406***	0.1729166
Random-effect (workplace)	0.7133787	0.0112098	0.5270968***	0.0116228	0.4705042***	0.0116786
Intra-class correlation (ICC workplace)	0.1339666	0.0036462	0.077874	0.0031669	0.0630473	0.0029325
Test statistics						
Log likelihood	-75606.745***		-68600.999***		-68247.052***	
Wald chi2	5967.45***		17555.77***		.	
LR test vs. logistic regression	5999.04***		1898.61***		1268.23***	
Number of observations	132.851		132.851		132.824	
Number of groups	10.168		10.168		10.165	

** = p < 0.05; ** = p < 0.01; *** = p < 0.001*

Sources: Statistics Denmark register data 2002-2007

Note: Full list of control variable coefficients available from the authors upon request. The workplace level variables not reported in the tables are: Share of workplace employees at low skill level, medium skill level and high skill level (skill level measured with Danish educational categories); Share of male employees; Industry of workplace (NACE 03 with 27 categories). The individual level variables not reported in the tables are: Occupational categories (ISCO with 25 categories); Country of origin; Children; Living with a partner/single; Degree of unemployment (calculated as hours of unemployment/hours of possible working time); Entered workplace from other employment/entered from non-employment (job-to-job).

Table 5: Models for private sector

	Dependent variable: Joined union when entering new workplace					
	M1: Focal explanatory variable		M2: Including individual controls		M3: Including individual and workplace controls	
Parameter	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Workplace union density (wpUD)	2.685238***	0.0563652	2.820775***	0.0529819	2.400505***	0.1498162
Partner is union member (mpartner)	-	-	0.3012926***	0.0230181	0.2998153***	0.0230062
Male worker (male)	-	-	- 0.104501***	0.0196356	- 0.0875451***	0.0200824
Age (age)	-	-	- 0.0363433***	0.0015289	- 0.0345064***	0.0015391
Years of education (edu)	-	-	- 0.0003543	0.0003711	- 0.0003067	0.0003733
Hourly wage (wage)	-	-	- 0.0020298	0.0001435	- 0.0019626***	0.0001444
Full time (ftime)	-	-	0.4778557***	0.0205298	0.504964***	0.0259477
Seniority (sen)	-	-	- 0.0012913***	0.0000856	- 0.0012134***	0.000086
Years on the labour market (lmYEARS)	-	-	- 0.0245603***	0.002056	- 0.0236879***	0.0020563
Workplace Size (wpSIZE)	-	-	-	-	0.0001261**	0.000047
Workplace labour turnover (wpLT)	-	-	-	-	- 0.5916042***	0.1496583
Interaction wpLT*wpUD	-	-	-	-	1.301052***	0.2264671
Workplace av. age employees (wpAGE)	-	-	-	-	- 0.0195662***	0.0028038
Constant	- 3.00408	0.0411614	-1.513448	0.1815738	- 0.8057538	0.2350369
Random-effect (workplace)	0.765929	0.0137041	0.5363827	0.0143827	0.4787256	0.0144349
Intra-class correlation (ICC workplace)	0.1513337	0.0045958	0.0804194	0.0039659	0.0651251	0.0036716
Test statistics						
Log likelihood	-51593.035***		-46073.05***		-45803.758***	
Wald chi2	3700.70		12876.17		13491.25	
LR test vs. logistic regression	4151.91***		1057.86***		778.65***	
Number of observations	94.980		94.964		94.948	
Number of groups	7.621		7.619		7.618	

** = p < 0.05; ** = p < 0.01; *** = p < 0.001*

Sources: Statistics Denmark register data 2002-2007

Note: Full list of control variable coefficients available from the authors upon request. The workplace level variables not reported in the tables are: Share of workplace employees at low skill level, medium skill level and high skill level (skill level measured with Danish educational categories); Share of male employees; Industry of workplace (NACE 03 with 27 categories). The individual level variables not reported in the tables are: Occupational categories (ISCO with 25 categories); Country of origin; Children; Living with a partner/single; Degree of unemployment (calculated as hours of unemployment/hours of possible working time); Entered workplace from other employment/entered from non-employment (job-to-job).

Table 6: Models for public sector

	Dependent variable: Joined union when entering new workplace					
	M1: Focal explanatory variable		M2: Including individual controls		M3: Including individual and workplace controls	
Parameter	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Workplace union density (wpUD)	2.816911***	0.14569	3.19302***	0.1441276	3.326173***	.4354946
Partner is union member (mpartner)	-	-	0.2514544***	0.0319028	.2517913***	.0318688
Gender (male)	-	-	- 0.2063028***	0.0295087	-.2360324***	.0304215
Age (age)	-	-	- 0.0373171***	0.0018799	-.0349871***	.0018924
Years of education (edu)	-	-	0.0023466***	0.0005436	.0028621***	.0005484
Hourly wage (wage)	-	-	- 0.0011002***	0.0002432	-.0010632***	.0002467
Full time (ftime)	-	-	0.5118473***	0.0337741	.5100043***	.0337849
Seniority (sen)	-	-	- 0.000443***	0.0001121	-.0004073***	.0001127
Years on the labour market (lmYEARS)	-	-	- 0.0224345***	0.0027464	-.0233226***	.0027451
Workplace Size (wpSIZE)	-	-	-	-	-.0000738*	.0000317
Workplace labour turnover (wpLT)	-	-	-	-	.1636152	.5236774
Interaction wpLT*wpUD	-	-	-	-	.4203033	.6359196
Workplace av. age employees (wpAGE)	-	-	-	-	-.0366259***	.0054337
Constant	-3.127144	.126671	-2.953722	.1747076	-1.319192*	.6111394
Standard Deviation at workplace level	.5944117	.0189005	.4930864	.0195773	.441063***	.020148
Intra-class correlation (ICC workplace)	.0969823	.0055694	.068818	.0050886	.0558307	.004816
Test statistics						
Log likelihood	-23829.324		-22001.624		-21898.706	
Wald chi2	1461.32		4382.34		4574.07	
LR test vs. logistic regression	1893.46		814.30		451.29	
Number of observations	37.656		37.656		37.656	
Number of groups	2.548		2.548		2.548	

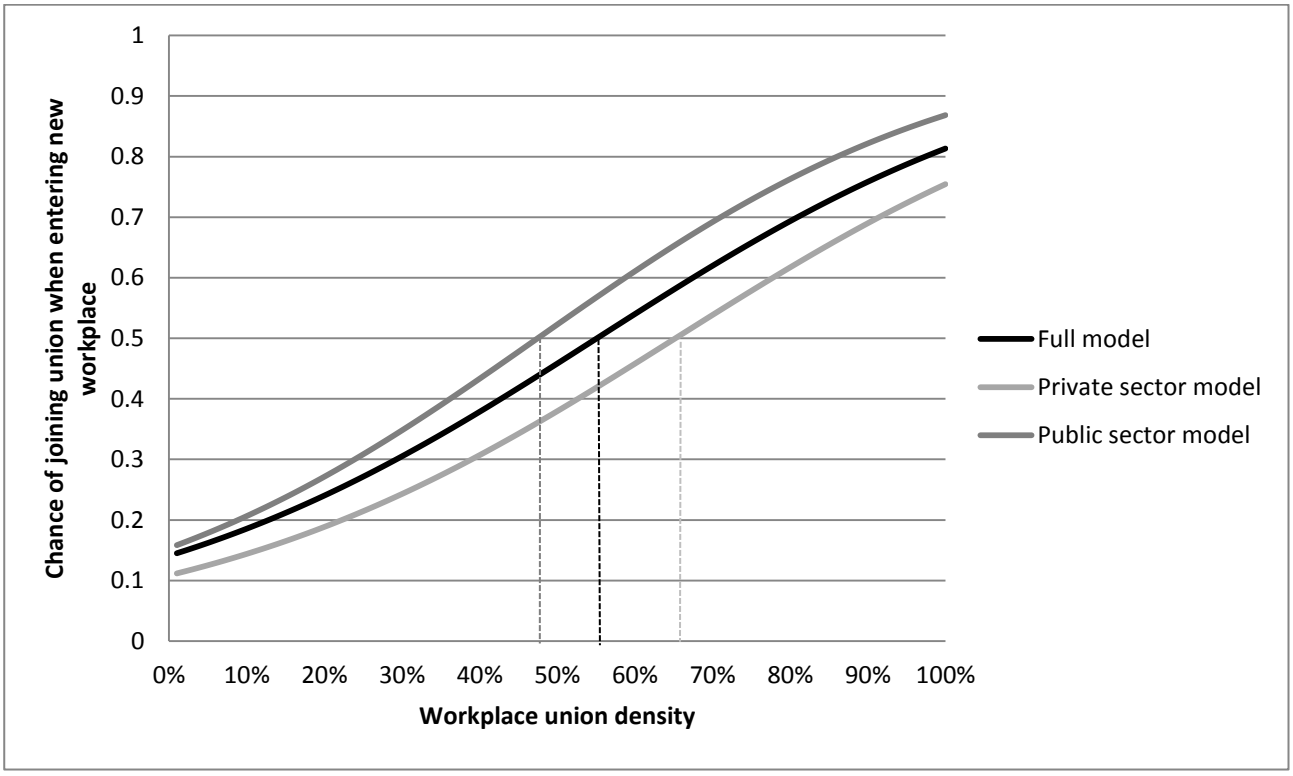
** = p < 0.05; ** = p < 0.01; *** = p < 0.001*

Sources: Statistics Denmark register data 2002-2007

Note: Full list of control variable coefficients available from the authors upon request. The workplace level variables not reported in the tables are: Share of workplace employees at low skill level, medium skill level and high skill level (skill level measured with Danish educational categories); Share of male employees; Industry of workplace (NACE 03 with 27 categories). The individual level variables not reported in the tables are: Occupational categories (ISCO with 25 categories); Country of origin; Children; Living with a partner/single; Degree of unemployment (calculated as hours of unemployment/hours of possible working time); Entered workplace from other employment/entered from non-employment (job-to-job).

Having established that the positive relationship between workplace union density and the chance of joining a union is robust across sectors and including several controls, we estimate the so called tipping point, defined here as the level of workplace union density where the probability of joining is higher than the probability of not joining (p>0,5). To be sure, these probabilities should be taken with caution as they are derived on the basis of standard persons in the samples (see note under figure). Figure 1 below illustrates the tipping points for M3-full, M3-private and M3-public, respectively.

Figure 1: Chance of joining union across workplace union densities



Note: The standard person used to calculate probabilities for joining the union across levels of workplace union density: Age: 33,7. Gender: male. Education: 154,2 months. Hourly wage: 191,7 DKK. Seniority: 264,3 days. Yearly unemployment ratio: 19,7. Years on labour market: 11,9. No kids. No partner. Danish origin. Occupation: Metalworker. Workplace size: 389,65 employees. Workplace average age: 39 years. Share of workplace employees at low skill level: 41,75%. Share of workplace employees at medium skill level: 22 % Share of workplace employees at high skill level: 15 %. Share of male employees: 55%. Industry of workplace: Metalworking. Year: 2005.Mean values are used for continuous variables and the most frequent category for categorical variables.

In the M3-full, the tipping point is found at approximately 56 % workplace union density. In M3-private we calculate the tipping point to be approximately 66 %. In M3-public, the calculated tipping point is lower at approximately 48 %. On average, this means that public sector unions 'need' lower workplace union density to create the positive feed-back mechanisms that social custom theory and subsequent research has alluded to (Checchi and Visser, 2005). On the contrary, private sector unions require unionization of two-thirds of the workers to create positive feed-back mechanisms. The figure also suggests that even at 100 % workplace union density, social customs and reputational effects are not perfect. In the private sector, the probability of joining the union at 100 % workplace union density is p = 0,75 – while in the public sector the probability is p = 0,86.

Conclusion

This paper has tested social custom theory and the stylized facts surrounding it. Using Danish administrative data with yearly observations for the entire workforce in the period of 2002-2007 we were able to go beyond existing studies in a number of ways. Firstly, we isolate the situation in which workers are confronted with social customs which gives a much more precise dependent variable for analysis of social customs than simply comparing members with non-members. The Danish data, moreover, combines individual data with workplace data giving us the possibility of calculating workplace union densities and using it as an exogenous independent variable by subtracting the individual from his/her surrounding workplace density. Similarly to Fazekas (2011), we employ the multi-level design, which allows us to decompose variation on the dependent variable to either the workplace or individual level which is usually not possible with conventional methods. Hereby, we can test some of the stylized facts pertaining to workplace characteristics such as workplace size, sector of the workplace, industry of the workplace and job turnover of the workplace. Conventionally, analyses of nested data have been limited due to the large-N requirements at both individual and group level, but since we are analysing data for the entire Danish workforce and over six years, such requirements are easily met.

We estimate models for the entire labour market, the private sector and the public sector. The first multi-level models show the importance of the workplace level warranting the multi-level design. Workplace union density is then included in the models as the focal variable and it is strongly and positively related to the chance of joining a union across the three samples. This supports – as expected – the studies using social custom and arguing that higher workplace union density creates stronger reputational effects for non-members (REF.). The results, moreover, show that the ICC drops considerably when we introduce workplace union density – an indication that between-workplace variance is largely attributable to variance in workplace union density. We then introduce individual controls that have been highlighted in the literature and find that the positive relationship between workplace union density and chance of joining holds. Finally, we introduce workplace level controls and again the relationship holds.

Other interesting results came from the analyses. It was shown that union membership of the partner is positively related to the chance of joining a union – indicating a household social custom. Conversely, workplace size does not seem to matter much for the chance of joining, indicating spuriousness in previous studies that omit workplace union density (REF.). And age was shown to be negatively related to the chance of joining, probably due to the fact that we measure joiners at different employment stages. Older workers who are non-members tend to stay non-members, even when they join a new workplace. This underlines the importance of recruiting workers, once they enter the labour market. Finally, we calculated tipping points for workplace union density. The tipping point is defined as the level of workplace union density at which probability of joining is higher than the probability of not joining. In the private sector, we calculated this tipping point to be approximately 66 %. In the public sector, the calculated tipping point was lower at approximately 48 %. On average, this means that public sector unions 'need' lower workplace union density.

While the results of the analysis are very robust, it's important to highlight a few weaknesses. Firstly, we have omitted subjective factors such as political values which in previous studies have been shown to be important. Toubøl and Jensen (2014) for example show that the effect of workplace union density varies according to political values, that is, you 'need' higher workplace union density for right-wing workers vis-à-vis left-wing workers. Secondly, while the design of our dependent variable enables us to focus on the situation in which a worker enters a new workplace and is therefore exposed to a new social custom, we are unable to measure the actual social processes of reputational effects. This would require more in-depth

qualitative studies (see Lysgaard, 1960 for an excellent early study in manufacturing). Moreover, the dependent variable is by design focusing on joiners and thus recruitment. However, retention of existing members is just as important for trade union (Oesch, 2012) and further analysis of this data-set could illuminate the relationship between workplace union density and retention.

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