

Public sector unionization, segmentation and professions as determinants of unionization in the public sector – Denmark as a case.

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Introduction

In this paper unionization in the public sector is discussed. The overall question raised is why unionization in the public sector often is higher than in the private sector? How can we explain the relative high level of unionization in the public sector? The intention of the paper is not to explain ‘everything’ with regard to unionization in the public sector. The aim is more modest and the focus in the paper is on analyzing labour market segmentation and professions as determinants of unionization in the public sector. This has not been done on an empirical level before in the literature about unionization and trade union membership.

The basic idea in the paper is that we can observe high level of professionalization in parts of the public sector due to very specialized functions in the sector and that the high level of specialization lead to high levels of labour market segmentation. This can be seen in relation to professions like teachers, nurses, physicians, military personal etc., who all work in a very specialized segment of the labour market. In the paper we try to estimate if higher levels of labour market segmentation in the public sector can be used explaining part of the differences in the level of unionization between the public and the private sector. In the paper Danish data is used covering the whole Danish labour market in 2006 and 2007. It covers the approximately 2 million individuals that worked fulltime in Denmark in 2006 and 2007. Register data is used that has a high level of validity and is based on data collection by the Danish public authorities (e.g. tax authorities).

In the following sections there will first be a discussion of the general literature about unionization and trade union membership determinants. Then the data used for the analysis of trade union membership will be presented. Thirdly we will present the statistical analysis. This is basically a logistic regression analysis having member/non-member of a trade union as the binary dependent variable. Level of segmentation (measured using low levels job mobility out of a given sector as a proxy for high levels of segmentation) is the primary independent variable used to explain unionization in the public sector. This is controlled for by a number of variables. In the fourth section the results of the statistical analysis is discussed in relation to the general theories about unionization and motives for unions membership among employees. The fifth section is the conclusion.

Union membership in the public sector – professions and labour market segmentation

Literature that investigate why employees becomes members of a trade union often take the private sector as a starting point. That has to do with the fact that trade unionism historically mostly were driven by the big unions especially in the industrial sector. In the heydays of unionism it was the workers in the industries that were the key actors in the creating of trade unions and of national systems of industrial relation (Dunlop, 1993; Clegg, 1976; Hyman, 2001). Today the picture has changed quite dramatically. In a number of countries trade unionism and membership of trade unions are most widely developed in the public sector, and not in the private sector (Schnabel, 2013). This can be seen in table 1 that describes the rate of unionization in a number of countries divided in the public and private sector. These data are taken from the ICTWSS database.

Table 1. Union density, public versus private sector, selected countries, in percent of labour force within sector			
Country	Year	Private sector	Public sector

Germany	2010	14,1	31,9
Spain	2009	15,1	32,4
Denmark	2008	64,5	83,4
Austria	2010	21,8	51,6
Netherlands	2008	18,7	27,2
Norway	2008	43,2	67,5
UK	2011	14,0	56,4
Source: ICTWSS database, 4. edition, variable DZ and EA			

The increasing relative importance of trade unionism in the public sector point in the direction that there is a need for analyzing why public sector trade unions still are capable of recruiting members in a situation where trade unions in the private sector generally are under severe pressure.

Analysis of trade union density or changes in trade unions memberships are often framed by two perspectives (Jensen, 2012).

One perspective is what could be called a structural perspective on the development of trade unionism in countries, sectors etc. The structural perspective focus on analyzing changes in for example the composition of sex, industries etc. in a given area and argue that these structural changes lead to more or less unionization (Western, 1997; Toubol & Jensen, 2014; Bryson, Ebbinghaus & Visser, 2011). A classical observation is that the downsizing of the industrial sector and the upsizing of the service sector lead to decreasing unionization.

A second perspective in the analysis of trade unions membership focus on the individual and the micro level when analyzing what determinates trade union membership (Ebbinghaus, Gobel & Koos, 2011; Fazekas, 2011; Schnabel & Wagner, 2007). The basic analytical framework is here the understanding of the decision making process related to the individual employee. Often the decision making process is conceptualized within a variation over rational choice perspective implying that the researcher tries to explain the choice of membership versus non-membership as a result of a

series of rational considerations made by the single employee. The classical text of Mancur Olson (Olson, 1965) is often used as a point of reference and discussions about incentives, free-riding, collective versus individual forms of actions etc. frame the analysis. If the advantages of being member of a trade union are bigger than the disadvantages then it is expected that the employee becomes member of a trade union.

The need for analyzing public sector unionizations is highly relevant in light of some of the theories that are traditionally used for explaining unionization among employees. As mentioned micro oriented analysis of trade unions membership argue very often within a rational choice perspective when employee membership of trade unions are explained. But it can be difficult to explain the high level of unionization in the public sector using this perspective. Public sector employees are usually covered by collective agreements and have employee rights (wage, working hour) independent of their trade unions membership status. This imply that the individual incentives for being (or becoming) a trade union member is weaker in the public sector than in the private sector. In that respect there is a need for also using other theoretical perspectives, when unionization in the public sector is analyzed.

How can we understand the high level of unionization in the public sector despite the relative weak structure of individualized incentives? A number of different types of explanations could be suggested. One could be that the employer's in the public sector to a higher degree than employers in the private sector accept collective bargaining and unionization (Traxler, 1999; Bach & Bordogna, 2013). That could especially be the case in the more liberal labour markets like UK where there have been discussions of union busting in the private sector (Clark, 2009; Logan, 2006)¹. Another explanation could be that it is easier for trade unions to unionize public employees because of the relative transparent and homogeneous organizational structure of the sector. The cost

¹ In US observations of union busting in the public sector is also observed (Freeman & Han, 2013)

of organizing is lower in the public than in the private sector (Schnabel, 2013). Both these types of explanations can contribute to the understanding of the high level of unionization in the public sector. A third type of explanation is however related to the occupational structure and the occupational characteristics in the public sector and it is also related to the so-called social custom theory that tries to explain trade union membership referring to social customs. The coming part of the paper will focus on occupational explanations and will test it on Danish data.

The social custom theory argue that membership of a trade union is not only motivated by immediate calculations about advantages and disadvantages of membership among the single employees. It is instead argued that membership considerations are embedded in a broader social context depending e.g. on workplace or occupational characteristics. The basic argument is that employees consider ‘social customs’ and social norms at their workplace or within their profession when they decide if they want to join a trade union. The social custom theory seems to be highly relevant if we want to explain the high level of unionization in the public sector. Being employed in a public sector is often connected to strong value systems and to strong professions.

If we look on occupational job characteristics in public sectors (compared to private sectors) we can usually observe a high level of presence of professions. A number of occupational groups within the public sector can be characterized as professions or semi-professions. Professions have historically developed in the public sector (but not alone in the public sector) in relation to institutions like hospitals, universities, administration, military, police etc.. Professions are – as an occupational group - traditionally defined in relation to their specialized educational characteristic and to their specialized work functions (Abbot, 1988). Savage et al. uses the Webbs to identify characteristic of the professions, saying “An oft cited definition of a profession is provided by Webb and Webb (1917, 4) who state that a profession is “a vocation founded upon specialised educational training, the purpose of which is to supply disinterested counsel and service to others,

for a direct and definite compensation, wholly apart from expectation of other business gain.” (Savage, Webber & Butovsky, 2012, p.4). Professions can be characterized as communities that are based on their common educational background and their often specialized occupations (Scheuer, 2000). This imply that the trade union can be seen as an extension of the profession based community. Taken a social custom theoretical point of view it can be argued that occupational groups, that have a high prevalence of professions characteristics, tends to develop social norms that support the commitment to a trade union. Professions are not only characterized by its common norms, they are also often characterized by existing on a rather segmented labor market. This is especially the case regarding the professions in the public sector.

Labour market segmentation is usually discussed in relation to theories about the dual labour market or the multi-segmented labour in the private sector (Wilkinson, 2013; Piore, 1983). Segmentation theory argue that labour markets consist of number of separate unities, with low levels of labour exchange between the segments. Usually segmentation theory is used to explain e.g. wage differences or difference in general working condition between groups of employees. The public labour market can however also be seen as highly segmented. The functional specialization and the educational specialization that are related to the management of different tasks within the public sector creates rather segmented internal labour markets. Labour markets are dominated by different professions. Employees working in public schools, at universities, in hospitals, in kindergartens, in the police, in public administration etc. have specialized educational backgrounds and perform specialized functions that primarily exists in segmented part of the labour market. These groups – or professions – works on segmented labour markets and will to a lesser degree than employees in other sectors or other part of the labour market change job from one sector to another, due to their high level of specialization. Professions might have high job mobility, but the mobility will be within the domain of the profession (sector).

The segmentation of the labour market also influences the incentives for being member of a trade union. The segmented labour market increases the awareness among the employees of belonging to a special group at the labour market. It supports the establishment of common norms among the employees within the sector and ‘membership of a trade union’ can often become one of the normative expectations.

In the coming statistical analysis we use levels of job mobility from one sector to another sector to measure levels of segmentation within specific parts of a labour market. If we can observe low job mobility (compared to the average job mobility in other sectors) from e.g. sector I to other sectors, we argue that sector I has a high level of labour market segmentation. Employees in sector I tends to stay in this sector and do not move to other domains of employment. This is expected to lead to – all other things being equal – high levels of unionization, due to the development of common professional norms among the employees in the sector².

Data and Variables

Data used in this study comes from Statistic Denmark’s register data. It is data mainly sampled for administrative reasons but the data can be used for research purposes after application³. The database (sample) used for this study contains information about the labour market active population in Denmark in 2006 and 2007. It covers all fulltime employed individuals between the age of 16 – 65 and the main variable used in the analysis is trade union membership (2006), gender, educational background (2006) (measured in years of education), age (2006), employment in public or private sector (2006), employment in specific sector according to NACE specification (both 2006 and 2007). The gross database contains 2.261.818 individuals (before data loss related to the statistical

² The low level of job mobility will also decrease the trade unions cost of organizing employees. This will underpin the tendency that low level of mobility will lead to high levels of unionization.

³ Center for Survey and Survey/Register Data (CSSR) provided and prepared the data. A special thanks to Leif Jensen at CSSR for assisting the process.

analysis e.g. missing information about some of the individuals). It is a rather unique data sample that provides us with the opportunity to make very specific and detailed analysis of trade union membership composition at a very disaggregated level (e.g. in relation to sector affiliation).

The purpose of the statistical analysis is to analyse if we can observe a correlation between labour market segmentation, occupational professions and union density in the public sector. Can we explain the high level of unionization in the public sector in Denmark compared to the private sector by occupational characteristics of the employees in the public sector (high level of presence of professions and high level of labour market segmentation).

It is not possible to measure the actual level of presence of professions in the public versus the private sector in the data, but as argued in the former section occupational professions are traditionally very much developed within the framework of a public sector structure. We take that observation for granted, and uses levels of segmentation as a kind of proxy for levels of presence of professions and specific occupational characteristics in the statistical analysis. The basic argument is – as explained in the former section - that the labour markets of the professions are – compared to other occupational groups - relatively segmented, which is expected lead to low levels of occupational mobility out of occupations group among the professions. The basic idea in the statistical analysis is then to estimate if we can explain the high trade union density by high levels of segmentation in the public sector. High levels of segmentation is expected to lead to high levels of unionization. This has not be done before in the literature on trade union memberships development.

Levels of labour market segmentation is measured using NACE codes as a starting point. NACE code system is a European Union developed system for identifying specific economic sector. It contains up to 615 specific economic sectors. In the statistical analysis we use the NACE version from 2003 (because data is from 2006-2007). A 113 sector level NACE-coding is used in the

statistical analysis (European Commission, 2008). Labour market segmentation is measured by identifying levels of job mobility from one sector to another from 2006 to 2007. The number of individuals that have changed occupational sector from 2006 to 2007 are identified for each of the 113 sectors. We identify in which of the 113 sectors a given person was employed in 2006 and compare it with sector affiliation in 2007. If the person in 2007 is employed in another sector compared to 2006 we know that the person has changed job and sector. This is done for all individuals.

This makes it possible to develop a variable that measures the average level of job mobility out of each of the 113 sectors from 2006 to 2007. Low levels of job mobility out of a given sector is interpreted as the sector having a high level of segmentation. The employees are staying within the sector and don't so often change jobs to other sectors. High levels of job mobility out of a given sector is, using the same logic, interpreted as the sector having a low level of segmentation. The variable is called 'segmentation'.

All together we are able to identify job and sector change from 2006 to 2007 among 16.24% of the 2.031.665 (fulltime) employed persons (gross population). If we divide the average sector change (from one of the 113 NACE sectors to another of the 113 NACE sectors) among the employed in the private and the public sector, then 17.75 % of the employed in the private sector changed sector and 13.62 % of the employed in the public sector changed sector from 2006 to 2007. An overview of the levels of mobility out of (mostly unspecified) sectors can be seen in the appendix⁴.

⁴ We have also tried to use a 67 NACE substructure in the analysis. When a mobility analysis from one sector to another sector is using a NACE substructure with a smaller number of sectors, then the level of overall mobility naturally decreases. We are measuring movements between fewer sectors. The overall level of mobility when we use a 67 NACE substructure 14.94% from 2006 to 2007, and 16.24% when we use a 113 NACE substructure. It should be noted that the overall level of mobility from one job to another job generally is higher. We are only measuring job mobility between sectors, and not job mobility within sectors.

The ‘mobility/segmentation’ variable is used as the primary independent variable in the statistical analysis when trying to explain the union density. If the ‘mobility/segmentation’ variable is significant and the analysis show that low levels of job mobility out of a sector increases the probability of high trade unions density in the sector, then it points in the direction that high levels of segmentation and presence of professions lead to high levels of unionization.

The depend variable is as mentioned union membership or non-union membership. As this is a binary variable the overall regression analysis is performed as a logistic regression analysis (Rabe-Hesketh, Everitt & Elliott, 2007). The number of trade union members in the private and the public sector is shown in table 2.

Table 2. Trade unions membership**, full time employed, 2006, descriptive data			
Sector	Non member	Member	Total
Public	92.977	665.337	758.314
	12.26%	87.74%	100.00%
Private	374.721	937.868	1.312.589
	28.55%	71.45%	100.00%
Total	467.698	1.603.205	2.070.903*
	22.58%	77.42%	100.00

*It should be noted that the sample measuring membership is a bit smaller than the gross sample. This is due to data loss related to missing values.

**Note that the measure only covers full time employed and not part time employed. There are generally more part time employed in the private sector than in the public sector. And part time employed are generally to a lesser extend members of a trade union than full time employed. This explains also the differences in the level of unionization for Denmark in table 1 and table 2.

The analysis of the correlation between the primary independent variable ('mobility/segmentation') and 'trade union membership' is supplemented by a number of control variables. These variables are expected to influence the likelihood of membership of a trade unions. The choice of control variables are chosen rather standard and are in accordance with tradition in the literature focusing on age, gender, educational background and private versus public sector. Age and education are continuous variables, while gender and sector (private/public) are categorical variables.

Statistical analysis

The statistical model used is a logistic regression model predicting the likelihood of individuals being member of a trade union in 2007. The model has 'mobility/segmentation' as the primary independent variable and the dependent variable is member/non-member of trade union.

Two different models of predicting union membership is presented. In the first model (model I) focus is only on the relation between 'mobility/segmentation' and 'trade union membership'. In the second model (model II) the effects of the control variables are included. Model II was developed by including the different control variable successively. Only the final model is however reported.

The output is presented in odds ratio. Odds ratio below one indicate a negative correlation between the variables, while odds ratios beyond one indicate a positive correlation (Rabe-Hesketh, Everitt & Elliott, 2007). If we take the first model (which does not include the control variables) as a starting point we can observe an odds ratio on 0.025 between the level of segmentation/presence of professions and trade union membership. It indicate that there is a – expected – negative correlation between job mobility and trade union membership. The higher job mobility out of a given sector the lower union density. As high job mobility indicate no segmentation and low presence of professions the statistical analysis in model I confirm the thesis that high level of segmentation correlate with unionization.

In Model II the control variables have been included. The statistical analysis between segmentation (job mobility) and probability of membership of a trade union is supplemented by four other variables. These are gender (man/women (male as reference category)), age, age squared, education in years and employment in private or public sector (public sector as reference category). Model two also confirms the picture from model I indicating that segmentation influence the probability for employees to be member of a trade union. Model II also show that being a women increases the probability of trade union membership, that age is positively correlated with membership and that more education decreases the probability of trade union membership. Finally it shows that people employed in the private sector have a lower probability of being member of a trade union (controlled for the other variables). This confirms the overall impression that public employed are more willing to join a trade unions than individuals employed in the private sector.

Both in model I and in model II the results are highly statistical significant. This is not surprising taking the number of cases (2.266.131 persons in model I, and 2.037.107 persons in model II) into account. There is some data loss from model I to model II. That is related to missing values in some of the control variables. The pseudo R is increasing from model I to model II (from 0.0121 to 0.0527). This indicate that the variance is explained better in model II than in model I, although the pseudo R is not so easy to interpret in statistical analysis using logistic regression. It cannot be interpreted in the same straight forward way as the R in ordinary OLS regression analysis (Rabe-Hesketh, Everitt & Elliott, 2007).

Odds ratio can be a bit difficult to interpret. Therefor some post estimations are presented for both models. Margins are estimated for both model I and model II. These are presented in connection with the models. In relation to model I it is estimated that the average likelihood of being member of a trade union is 76% if the level of mobility is 20%. In model II the same estimation is made presenting estimation for different levels of mobility. If the level of mobility is

5% then the average level of trade unions membership is 82% compared to 71% if the level of mobility is 30%.

Model I

```
. logistic tradeunionmember levelofsegmentation
```

```
Logistic regression                Number of obs   =   2266131
                                   LR chi2(1)        =   29388.36
                                   Prob > chi2         =    0.0000
Log likelihood = -1199216.1         Pseudo R2      =    0.0121
```

tradeunionmember	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
levelofsegmentation	.025203	.0005384	-172.29	0.000	.0241695	.0262808
_cons	6.685466	.0288683	440.00	0.000	6.629124	6.742287

```
. margin, at ( levelofsegmentation = 0.2)
```

```
Adjusted predictions                Number of obs   =   2266131
Model VCE      : OIM
Expression    : Pr(tradeunionmember), predict()
at            : levelofseg~n      =           .2
```

	Delta-method		z	P> z	[95% Conf. Interval]	
	Margin	Std. Err.				
_cons	.7620185	.0002934	2597.21	0.000	.7614434	.7625935

Model II

```
. logistic tradeunionmember levelofsegmentation i.gender age ageinsecond i.sector yearsofeduca
> tion
```

```
Logistic regression                Number of obs   =   2037107
                                   LR chi2(6)        =   113744.69
                                   Prob > chi2         =    0.0000
Log likelihood = -1021897.1         Pseudo R2      =    0.0527
```

tradeunionmember	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
levelofsegmentation	.0598485	.0015097	-111.63	0.000	.0569615	.0628818
1.gender	1.101388	.0040392	26.33	0.000	1.093499	1.109333
age	1.119359	.0011387	110.84	0.000	1.117129	1.121593
ageinsecond	.9988348	.0000124	-94.19	0.000	.9988106	.9988591
sector						
Private	.4066602	.001786	-204.87	0.000	.4031747	.4101758
yearsofeducation	.975897	.0007216	-33.00	0.000	.9744837	.9773124
_cons	1.179059	.0248355	7.82	0.000	1.131373	1.228754

```
. margins, at ( levelofsegmentation = 0.05 levelofsegmentation=0.10 levelofsegmentation=0.2 le
> velofsegmentation = 0.3)
```

```
Predictive margins                                Number of obs   =   2037107
Model VCE      : OIM
```

```
Expression   : Pr(tradeunionmember), predict()
```

```
1._at       : levelofseg~n   =       .05
```

```
2._at       : levelofseg~n   =       .1
```

```
3._at       : levelofseg~n   =       .2
```

```
4._at       : levelofseg~n   =       .3
```

	Margin	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
_at						
1	.8335672	.0005133	1624.05	0.000	.8325612	.8345731
2	.8138967	.0004028	2020.54	0.000	.8131072	.8146862
3	.7695373	.0003007	2558.73	0.000	.7689479	.7701268
4	.7186278	.0006509	1104.06	0.000	.7173521	.7199036

Discussion of the results

The results from the statistical analysis are clear: high levels of segmentation increases the probability of observing high levels of trade union membership. Or to take it the other way around, high levels of mobility out of a given sector increases the probability of observing low levels of trade union membership in the specific sector.

Knowing that the overall average level of mobility is lower in the public sector (13.62%) than in the private sector (17.75%) (cf. above) it points in the direction that the high level of segmentation in the public sector can explain part of the higher level of unionization in the sector.

It should however also be noticed that the impact of increasing mobility on trade union membership generally also is high in the private sector. In the private sector high levels of out sectoral mobility decreases the likelihood of employees being member of a trade union. This observation is in line with theories arguing that that cost of organizing is high if we have high levels of labour turnover. In the appendix the model II regression analysis is presented separately for the private and the public sector. It shows that the effect on high levels of mobility (low levels of

segmentation) on unionization is highest in the private sector. The probability of having a employees that is member of a trade union is 63% if the outgoing mobility is 30% in a given NACE sector belong to the private sector. If the outgoing mobility is only 5% the average level of unionization is 80.7 % in the private sector. In the public sector the difference and the effect is not at the same level (due to the generally high level of segmentation (professions)). If the outgoing mobility in a NACE sector belong to the public sector in average is 30%, then the union probability is 86%, while it is 89% if the mobility is 5%. See appendix, regression model II, sector vice, margins.

These figures also indicate that although level of segmentation can be seen one proxy for professions in the public sector other factors are also important when we try to estimate the effects of professions for unionization. In the private/public regression (see appendix) we can also observe differences in the effects of education. In the private sector longer education tends to imply lower levels of union density. In the public sector the opposite is the case. This is highly connected with the fact that we have more professions in the public sector. Most professions have more or less evident educational standards as a precondition for individuals becoming a member of the profession. A post estimation of the regression analysis for the public and private sector indicate huge differences in the impact of education in the two sectors. In average the likelihood that an employee with 10 years education in the public sector is member of a trade union is 85%. If the education is 14 years the likelihood is 88,4% (see appendix, margins, public sector, education). This imply that long education leads to trade union membership in the public sector. In the private sector the opposite is the case. Longer education leads on average to lower levels of unionization. In average the likelihood that an employee with 10 years education in the private sector is member of a trade union is 74.4 %. If the education is 14 years the likelihood is 70% (see appendix, margins,

private sector, education). The figures underline the thesis that professions in the public sector are generally more organized than other groups on the labour market.

Conclusion

In this paper we have tried to analyze trade union membership development in the public sector in general in order to understand why union density often is higher in the public sector than in the private sector. As described in table one in the paper, in a number of countries unions seems to be strongest in the public sector at least when we measure it by density. In the paper it is has been argued that the high density in the public sector is related to the fact that professions play an important role in the sector. And it is argued that professions often tends to develop norms about membership of unions.

The empirical analysis did use Danish register data related to the Danish labour market 2006 and 2007. The empirical analysis confirms the argument that the public labour market is more segmented than the private labour market, and that education – in the public sector – have a positive influence on unionization. The empirical analysis confirm that professions plays an important role when we try to explain why unionization often is higher in the public sector than in the private sector.

More specifically it is argued that the public sector very often have a structure that leads to the development of professions and highly specialized job functions. This – on the structural level – imply that the public sector generally have more of these kinds of functions and jobs than we generally see in the private sector. It is also argued, that on the micro level these types of professions and job functions creates a specific motivation for employees to become members of a trade union. Professions are often highly segmented and job shifts out of the profession is generally

low here compared to other parts of the labour market. In the paper it is argued that this segmentation and common education support the incentives for employees to become members of a trade union because unionization is part of the formation of professional identities among the single employee. Becoming member of a professional union (e.g. teachers union) is from the point of view of the single employee a way of forming an identity as a teacher.

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Appendix

Regression analysis, private sector

```
. logistic tradeunionmember levelofsegmentation i.gender age ageinsecond yearsofeducation if s
> ector==1
```

```
Logistic regression                               Number of obs   =   1287377
                                                    LR chi2(5)      =   30907.93
                                                    Prob > chi2     =    0.0000
Log likelihood = -749585.33                       Pseudo R2       =    0.0202
```

tradeunionmember	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
levelofsegmentation	.0270508	.0008286	-117.86	0.000	.0254747	.0287245
1.gender	1.042134	.0043656	9.85	0.000	1.033613	1.050726
age	1.11131	.0012749	92.00	0.000	1.108814	1.113812
ageinsecond	.9988724	.000014	-80.23	0.000	.9988449	.9988999
yearsofeducation	.9422587	.0008167	-68.62	0.000	.9406594	.9438608
_cons	1.103789	.0255313	4.27	0.000	1.054866	1.154981

Margins, private sector, variable: level of segmentation

```
. margins, at ( levelofsegmentation = 0.05 levelofsegmentation =0.1 levelofsegmentation= 0.2 1
> evelofsegmentation =0.3)
```

```
Predictive margins                               Number of obs   =   1287377
Model VCE    : OIM
```

```
Expression   : Pr(tradeunionmember), predict()
```

```
1._at       : levelofseg~n   =    .05
2._at       : levelofseg~n   =    .1
3._at       : levelofseg~n   =    .2
4._at       : levelofseg~n   =    .3
```

	Margin	Delta-method Std. Err.	z	P> z	[95% Conf. Interval]	
_at						
1	.8077095	.0007346	1099.59	0.000	.8062697	.8091492
2	.7784452	.0005873	1325.43	0.000	.7772941	.7795963
3	.7109565	.0004056	1752.64	0.000	.7101615	.7117516
4	.6327539	.0008843	715.53	0.000	.6310207	.6344871

Margins, private sector, years of education

Regression analysis, public sector

```
. logistic tradeunionmember levelofsegmentation i.gender age ageinsecond yearsofeducation if s
> ector==0
```

```
Logistic regression                               Number of obs   =    749730
                                                    LR chi2(5)      =   19501.26
                                                    Prob > chi2     =    0.0000
Log likelihood = -265798.78                       Pseudo R2       =    0.0354
```

tradeunionmember	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
levelofsegmentation	.3393865	.0166461	-22.03	0.000	.30828	.3736319
1.gender	1.394767	.0104543	44.39	0.000	1.374426	1.415408
age	1.194994	.0026748	79.59	0.000	1.189763	1.200248
ageinsecond	.9982173	.0000267	-66.71	0.000	.998165	.9982697
yearsofeducation	1.076353	.0015355	51.58	0.000	1.073348	1.079367
_cons	.0428399	.0019543	-69.06	0.000	.0391758	.0468468

Margins, public sector, level of segmentation

```
. margins, at ( levelofsegmentation = 0.05 levelofsegmentation =0.1 levelofsegmentation= 0.2 1
> evelofsegmentation =0.3)
```

```
Predictive margins                               Number of obs   =    749730
Model VCE    : OIM
```

```
Expression   : Pr(tradeunionmember), predict()
```

```
1._at       : levelofseg~n   =    .05
2._at       : levelofseg~n   =    .1
3._at       : levelofseg~n   =    .2
4._at       : levelofseg~n   =    .3
```

_at	Delta-method		z	P> z	[95% Conf. Interval]	
	Margin	Std. Err.				
1	.8911685	.0006112	1457.98	0.000	.8899705	.8923665
2	.8859762	.0004563	1941.70	0.000	.8850819	.8868705
3	.8749566	.0004353	2010.09	0.000	.8741034	.8758097
4	.863057	.0008868	973.18	0.000	.8613188	.8647951

Margins, public sector, years of education.

.1836686	17,206	0.76	60.43
.1840382	33,346	1.47	61.90
.1844017	17,293	0.76	62.67
.1844365	13,789	0.61	63.27
.1845597	4,224	0.19	63.46
.1846684	5,633	0.25	63.71
.1866979	28,782	1.27	64.98
.1890692	33,870	1.49	66.47
.1897334	17,967	0.79	67.27
.1909928	51,045	2.25	69.52
.1956896	15,443	0.68	70.20
.1966559	5,340	0.24	70.44
.1990817	24,837	1.10	71.53
.2006289	43,951	1.94	73.47
.2024996	5,601	0.25	73.72
.202945	11,755	0.52	74.24
.206236	11,961	0.53	74.77
.2066339	17,174	0.76	75.52
.2104289	6,624	0.29	75.82
.2112236	16,207	0.72	76.53
.2116058	2,041	0.09	76.62
.2129296	6,228	0.27	76.90
.2145309	1,839	0.08	76.98
.2145651	17,241	0.76	77.74
.2149641	5,260	0.23	77.97
.2166042	18,051	0.80	78.77
.2178522	20,585	0.91	79.67
.224462	8,271	0.36	80.04
.2260215	9,596	0.42	80.46
.22608	11,584	0.51	80.97
.2286269	24,323	1.07	82.05
.2303096	9,372	0.41	82.46
.2308886	5,410	0.24	82.70
.231083	20,731	0.91	83.61
.2315757	26,507	1.17	84.78
.2386856	15,261	0.67	85.46
.249545	24,734	1.09	86.55
.2578207	4,926	0.22	86.77
.25805	4,517	0.20	86.97
.2679038	7,425	0.33	87.29
.2714538	14,413	0.64	87.93
.2740022	2,835	0.13	88.05
.276422	21,464	0.95	89.00
.2807183	13,262	0.59	89.59
.2822862	29,279	1.29	90.88
.2849604	1,952	0.09	90.97
.289296	53,645	2.37	93.33
.2951899	2,005	0.09	93.42
.299705	33,178	1.46	94.89
.3078159	5,197	0.23	95.11
.3098039	5,477	0.24	95.36
.3147082	35,535	1.57	96.92
.3784056	60,047	2.65	99.57
.3835281	3,785	0.17	99.74
.6007828	1,557	0.07	99.81
.614437	4,313	0.19	100.00
Total	2,266,131	100.00	