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Intra-urban location of stores and labour turnover in retail

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\textbf{ABSTRACT}
The aim of this paper is to analyse labour turnover in retail firms with stores in different city locations. This case study of a Swedish mid-sized city uses comprehensive longitudinal register data on individuals. In a first step, an unconditional descriptive analysis shows that labour turnover in retail is higher in out-of-town locations, compared to more central locations in the city. In a second step, a generalized linear model (GLM) analysis is conducted where labour turnover in downtown and out-of-town locations are compared. Firm internal and industry factors, as well as employee characteristics, and location-specific factors are controlled for. The results indicate that commuting costs and intra-urban location have no statistically significant effect on labour turnover in retail firms. Instead, firm internal factors, such as human resource management, has a major influence on labour turnover rates. The findings indicate that in particular firms with multiple locations may need to pay extra attention to work conditions across stores in different places in a city, in order to avoid diverging levels of labour mobility. This paper complements previous survey-based studies on labour turnover by using a comprehensive micro-level dataset to analyse revealed rather than stated preferences concerning job-to-job mobility. An elaborated measure of labour turnover is used to analyse differences between shopping areas in different locations within the city. The particular research design used in this paper makes it possible to isolate the effect of intra-organizational conditions by analysing mobility within firms with workplaces in both downtown and out-of-town locations. This is the first comprehensive study of labour turnover and mobility with an intra-urban perspective in the retail sector.

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\textbf{KEYWORDS}
Employee turnover; commuting cost; firm internal factors; firm external factors; generalized linear modelling

\textbf{Introduction}
Work in the retail sector is to a large extent characterized by relatively low paid and insecure jobs, unsocial working hours, permanent or casual part-time work, and other forms of non-standard types of employment conditions (Esbjerg, Buck, and Grunert 2010; Grulgulis and Bozkurt 2011; Whitehouse, Lafferty, and Boreham 1997; Whysall, Foster, and Harris 2009). This is, at least partly, explained by the fact that retail industry faces high levels of seasonality and volatility, something that generates a need for a high degree of numerical workforce flexibility (Whitehouse, Lafferty, and Boreham 1997, 37–38). As a consequence, labour turnover is high in the retail sector. However, these conditions...
also imply that the employees, if economically rational, should be rather sensitive to wage differences, and costs of inconveniences in their choice of workplace location.

Labour turnover is of special interest in retail, since service and selling to costumers, a core process in the industry, often is highly dependent on the skills of the employee as a seller in a face-to-face situation. Surprisingly, research related to labour turnover in retail has not attracted a lot of research over the years, although there are some important exceptions (see e.g. Amdt et al. 2006; Booth and Hamer 2007; DeConick and Bachmann 2005; Foster, Whysall, and Harris 2008; Harrison and Gordon 2014; Heidig et al. 2018; Hendrie 2004; Hicks 2007; Ramaseshan 1997; Siebert et al. 2006; Tang et al. 2014; Tian-Foreman 2009). Research on labour turnover and employee mobility, in general, tends to emphasize the importance of human resource management and working conditions at the workplace (see review below). These conditions are typically firm-specific, in the sense that they can vary a lot between firms but to a lesser extent between workplaces within the same firm. It seems thus reasonable to expect that intra-firm conditions will have a strong effect on labour turnover. However, most research on labour turnover in retail is designed as case studies of individual firms, mainly using questionnaires focusing on information about job satisfaction, career opportunities, retention, and HR management issues. Although these studies have generated a lot of useful knowledge, they are to a large extent based on stated preferences in a limited number of firms and with few distinctions between locations of stores. Thus, there is a need for additional studies that analyse revealed preferences and that covers a wider range of firms in the industry.

Traditionally shopping opportunities have been offered in the centre (downtown) of the city. However, one of the major changes in the retail sector during the last decades is the growth of shopping centres at the urban fringe, or outside the city (Franzén 2004; Fernie 1998; Lowe and Wrigley 2000). These out-of-town shopping areas are often organized as large shopping malls or shopping parks dominated by large retail chains. In contrast to the downtown shopping districts, the out-of-town shopping areas often suffer from little access to other services, such as banks, nurseries, public transportation services, etc. These inconveniences and increased costs for the employee can, if the employee is economically rational, be expected to increase labour turnover in the out-of-town shopping areas. If this is the case it is to the best of our knowledge, not yet researched empirically.

Out-of-town shopping centres are often peripherally located. This implies that an urban population, on average, will have longer travel distance to peripherally located out-of-town shopping areas compared to the downtown shopping area in the city centre. It is well known that the frequency of commuters decreases when commuting distances increase (see e.g. Carra, Mulalic, and Fosgerau 2016; Chuan et al. 2017; Clark, Huang, and Withers 2003). We can thus expect travel costs to be higher for employees in stores with an out-of-town location and consequently labour turnover to be higher in out-of-town stores compared to similar stores in more central locations, if the employee is economically rational. Such a pattern could, however, be counteracted by employees moving closer to where their workplace is located. We are not aware of any empirical study investigating if increased travel costs affect labour turnover at a store with an out-of-town location.

Against this background, the aim of this study is to analyse labour turnover in stores in different city locations, with a particular focus on the explanatory power of commuting
distance, service accessibility and intra-firm working conditions. We use a case study design to investigate differences in labour turnover. The selected study area, the city of Örebro in central Sweden with more than 140,000 inhabitants, has for a long time been a regional centre for shopping, with an extensive downtown shopping area. However, like many other cities, a rapid expansion of an out-of-town shopping centre has taken place since the beginning of the 1990s. Downtown shopping has a mixture of small independent retail companies and large retail chains, whereas the out-of-town shopping centre is dominated by large multi-store shopping chains. In this study, we use longitudinal geocoded register data on individuals in working age (20–64) connected to workplaces in the city of Örebro. The data set is provided by Statistics Sweden, and the information on individuals cover a wide range of socio-economic and demographical characteristics, such as income, labour market attachment, tenure at a specific workplace, family situation, age, etc. Information on workplaces include firm ownership, and the number of employees that enter, leave and stay at the workplace for each year. We use industrial classification of the workplaces at the NACE five-digit level to identify the retail sector and to distinguish between shops selling durables and non-durables. The Swedish national road database (NVDB) is used to calculate commuting distances between the location of the residences and the workplaces.

We analyse labour turnover in two steps. First, we conduct an aggregated unconditional descriptive analysis of employee turnover in retail (including both non-durables and durables) workplaces in downtown, edge-of-town and out-of-town locations. In this part of the paper, we introduce a new way of measuring labour turnover at the workplace level, referred to here as replacement turnover (see review below). Second, we introduce a Generalized Linear Modelling (GLM) approach in a novel way to conduct statistical analysis of factors influencing labour mobility. We focus on durables in this part of the analysis since the stores selling durables are more concentrated to particular locations. To estimate effects related to firm-specific conditions (reflecting differences in human resource management and policies, general work conditions, salaries, etc.), the analysis is focused on firms (mainly large chains) with workplaces in both downtown and out-of-town locations. In the analysis, we control for general market conditions over time in the city, local differences in market conditions in the vicinity to each store, and other location-specific factors. Furthermore, we control for socioeconomic characteristics of the individuals, including income, commuting distance and access to cars among the employees. Thus, two research questions are dealt with in the paper; (1) how does labour turnover vary between different locations in an urban setting, and (2) to what extent is labour turnover in stores with different intra-urban locations affected by intra-firm conditions and commuting distances.

The paper thus contributes to the existing research on labour turnover in retail in a number of ways. First, it complements previous survey-based studies on labour turnover by using a comprehensive micro-level dataset to analyse revealed rather than stated preferences concerning job-to-job mobility. The richness of the database allows us to investigate the combined effects of both individual and workplace characteristics on employee mobility. Second, we introduce an elaborated measure of labour turnover to analyse differences between shopping areas in different locations within the city. Third, the particular research design used in this paper allows us to isolate the effect of intra-organizational conditions by analysing mobility within firms with workplaces in
both downtown and out-of-town locations. Finally, this is to our knowledge the first comprehensive study of labour turnover and mobility with an intra-urban perspective in the retail sector. The findings of this research may be of particular interest to human resource management in firms dealing with stores in different parts of a city.

The remainder of the paper is organized in the following way. After a brief summary of research on labour turnover in general and in the retail sector in the next section, we present the research methodology used in this paper. Thereafter, follows a section where we introduce and describe the retail sector in the city of Örebro, with a particular focus on labour turnover at the workplace level in different city locations. Our GLM results are then reported. The paper ends with a concluding discussion.

Labour turnover – a literature review

For this paper, we have chosen to use the term labour turnover, but there are a number of similar or adjacent concepts applied in the literature. Apart from smaller variations like ‘labour churning’, ‘employee turnover’ or ‘staff turnover’, the concept of ‘labour mobility’ is also often used to analyse the same phenomenon that we focus upon in this paper, i.e. the flow of individual workers in and out of a firm or a workplace during a certain time period. However, labour mobility is a wider concept, sometimes including, for instance, labour migration, or flows in and out of the labour market.

Typically, a high level of labour turnover is considered a problem that needs to be tackled by the industry or the management of the specific firm. The negative aspects of turnover include, among other things, loss of firm-specific human capital, skills and knowledge, disruptions in the production process, and high costs for recruitment and training of replacements. Taken together, the negative aspects of high labour turnover suggest that the productivity of the firm or workplace is affected in a negative way. However, some claim a certain level of labour turnover at a workplace can be positive for productivity (Harris, Tang, and Tseng 2002; Siebert et al. 2006). The basic idea in such a view is that persons that leave a workplace and an organization tend to be the ones least suited for the job, and thus are not the most productive workers. It is also claimed that, although recruiting processes may be costly, hiring new personnel is an opportunity for management to make necessary adjustments to the competence profile of the workforce. In general and in retail, there are basically three core mechanisms that stand out as very persistent results from turnover research; attitudes toward the job and the organization where you work (e.g. job satisfaction, organizational commitment), job-searching mechanisms (both objective and perceived job opportunities in the labour market), and turnover intentions, i.e. intentions to quit or stay at the job (see e.g. Chung, Rutherford, and Park 2012; Ganesan and Weitz 1996; Griffeth, Hom, and Gaertner 2000; Hom and Griffeth 1995; Muchinsky and Tuttle 1979; Ongori 2007; Orkan 1974; Porter and Steers 1973; Rubenstein et al. 2018; Steel and Lounsbury 2009). Job dissatisfaction as an explanation of quitting behaviour is perhaps the most pervasive and recurrent of the three mechanisms in turnover research. Behind job (dis-) satisfaction we find specific elements like satisfaction with pay, work content, work autonomy, work supervision, promotion opportunities, expectations of the present job, and social interaction at the workplace (Muchinsky and Tuttle 1979).
Apart from these core explanations, there is a large number of ‘secondary’ mechanisms that also influence turnover behaviour. Some of them are linked to the individual, like personality and values, personal history, age, tenure, education, skills and training, and family situation (see e.g. Heidig et al. 2018). Other explanations relate to the workplace or the organization, such as work unit size, type of employment contract and working hours per month, and type of industrial sector or type of technology applied at the workplace (Griffeth, Hom, and Gaertner 2000; Muchinsky and Tuttle 1979; Orkan 1974, 32–71; Steel and Lounsbury 2009, 275–278). Although many of the variables listed above show significant relationships with employee turnover, the overall predictability of the applied statistical models is relatively low in most cases.

Studies of labour turnover in the retail sector are relatively rare in the literature. The studies that we have identified typically use a research design based on case studies of individual firms or organizations, and use employee questionnaires as the primary source of information (for a recent example, see e.g. Tang et al. 2014). A good representative of this research strategy is Booth and Hamer’s (2007) study of a large UK food retailer, based on a questionnaire to more than 130 000 employees (88% response rate) in more than 500 stores in different locations all over the country. Typically, the questions asked in the survey revolves around commitment to the firm’s overall values, job satisfaction, work conditions, trust and respect among workers, management support, career opportunities, and fairness of pay. Most of the results were the expected ones, but an interesting paradox was revealed from the statistical analysis; the more embedded and familiar the workers were with the firm’s values and goals (organizational commitment), the higher the turnover was at the store level.

Booth and Hamer’s (2007) study labour turnover in a large UK food retailer is of particular interest to the present paper, since it also takes location into consideration. The study shows that turnover is significantly higher in the southern regions and in Wales, compared to the North, indicating the importance of general labour market conditions for employee turnover. However, no comparison was made between downtown and out-of-town locations in this research and the commuting costs of the employees were not studied.

The development towards more peripheral locations in out-of-town locations can be expected to lead to longer commuting distances unless an adjustment of the resident’s locations takes place. No review study and no empirical study that we have found have dealt with the possibility that intra-urban location and employees commuting distances could affect labour turnover in retail workplaces. However, in the labour commuting literature, this question is extensively researched. A finding is that although individual characteristics are seen as having a major effect on commuting distances (see e.g. Carra, Mulalic, and Fosgerau 2016; Chuan et al. 2017) it is also obvious that commuting frequencies diminish with increased distance between employees residency and workplace (see e.g. Clark, Huang, and Withers 2003; Helminen and Ristimaki 2007). Berry et al. (2016) find similar patterns between the employees who commuted by train or metro and those with high social class’ professionals, managers or directors’ working full time in Inner London. Mistro, Proctor, and Moyo (2017) showed that the utility for choosing a job decreases as the distance from home to work increases in Cape Town. Since many jobs in the retail sector are low paid, the workers could be expected to be sensitive to personal costs that are job related, for instance, transportation costs and other inconveniences...
related to the location (lack of access to public transport or child care and other services). This study therefore scrutinizes this question, first by comparing labour turnover in workplaces at different locations within a city and, secondly, by conducting a statistical analysis in which commuting costs, other inconvenience costs and inter-firm differences are controlled for. Besides that we also control for individual and market characteristics.

Against the literature background, our theoretical model to be tested in this study is that the turnover rate at the workplace \( T_{itls} \) for individual \( i \) at time \( t \) in store \( s \) in location \( l \) is dependent on location-specific factors \( (L_s) \) of a store. The location-specific conditions include commuting distance and other inconvenience costs as well as local market conditions. Turnover rate is also dependent on firm internal management specific factors for firm \( f \) \( (F_f) \), store specific factors \( (S_s) \), industry-specific factors in industry \( j \) \( (K_j) \), and individual employer-specific factors \( (X_i) \). It is also obvious that global market conditions affect the possibility to change job. Thus, we also assume that employee turnover rate at a store is dependent on the general market conditions \( (M_s) \) in the city where the store is located.

\[
T_{itls} = g(L_s, F_f, S_s, K_j, X_i, M_s)
\]  

(1)

For the specific variables that we use to measure these factors, see the specification of the empirical model later.

**Research methodology**

Research design in labour turnover studies normally identifies turnover for each workplace as the response variable and then use average figures for some explanatory variables like salary or income, age of the workforce, gender, commuting distance, and educational level and so on for each individual workplace (see e.g. Booth and Hamer 2007; Martin 2003; Ramaseshan 1997). A problem with such an approach is a loss of information in the analysis since the full variability of the human capital that the workforce possesses is not part of the analysis. In this study, we will take into account the full variability in the workforce. To do so each individual in the workforce at each workplace and some socioeconomic characteristics of the individual are identified and modelled.

In our case, the modelled response variable is the turnover rate at the workplace \( T_{itls} \) and it is measured for each individual employee. We cannot use a linear model (LM) due to the proportional character that the data have. The response variable in LM is assumed to have a normal distribution. Proportional response variables take values between 0 and 1 and this assumption is violated. Usually, proportional data is considered as the frequency when we count numbers of binary outcomes in repeated random experiments. The generalized linear model (GLM) is used for modelling such type of data. The assumptions made in GLM are that each response variable \( y_i \) has a distribution which belongs to an exponential family of distributions that include normal, Poisson, gamma and binomial distributions. In this case, we need to model and analyse our data using a binomial distribution. Moreover, instead of modelling \( \mu = E(T_{itls}) \) as in an LM, we model a function \( g \) of \( \mu \). The model becomes \( g(\mu) = X\beta \). In this paper, we fit our model by a logistic GLM and let \( g(\mu) = \log \frac{\mu}{1-\mu} \). A commonly used method for estimation of this kind of models is the iteratively reweighted least squares (McCullagh and Nelder 1989; Olsson 2003) which we also use.
The empirical logistic GLM in this study is as in Equation 2:

\[
\log \frac{\mu_1}{1-\mu} = \beta_0 + \beta_1 L_{sd} + \beta_2 L_{sm} + \beta_3 L_{so} + \beta_4 F_{fi} + \beta_5 S_{ss} + \beta_6 K_{jk} + \beta_7 M_{sm} + \beta_8 X_{ia} + \beta_9 X_{is} \\
+ \beta_{10} X_{ic} + \beta_{11} X_{im} + \beta_{12} X_{ie} + \beta_{13} X_{iv}
\]  

(2)

The variable to be explained is \( \log \frac{\mu_1}{1-\mu} \) for individuals employed in a store. Individuals in the same store have the same turnover rate for each year. The turnover rate for employees in a store can change from year to year if the turnover in the store in which they are employed change. \( \beta_0 \) is the intercept.

To conduct the analysis we select firms that have two locations of stores in Örebro, one in a downtown location and one in an out-of-town location. After this selection, we end up with 80 workplaces/stores that are included in the analysis. The number of employees working in the selected stores for five years between 2004 and 2008 is 1,970. As indicator of turnover, we measure the number of employees that begin or end their employment at a workplace during a year. These employees generated 638 workplace changes annually, including new employees in the retail sector, employees being employed by an employer outside the retail sector as well as those changing employer within the retail sector. Among the 638 workplace changes, 2.8% of employees changed their jobs as a result of factors unrelated to location (e.g. retirement).

To control for the location-specific effect (\( L_j \)) we use three measures. First, we identify the commuting distances in road network (\( L_{sd} \)) in the road network to each workplace in kilometres. Second, to control for variations in local market conditions in the vicinity of a store (\( L_{sm} \)) we measure the number of new stores established within 5 km. As a third measure of a location-specific effect, we use a dummy variable for out-of-town and downtown location (\( L_{so} \)). This measure should capture other unobserved location-specific factors as costs for other inconveniences. The areas for downtown and out-of-town locations are shown in Figure 1. If \( \beta_1 \) is positive it indicates a higher turnover when commuting distance increase. If \( \beta_3 \) is positive it indicates that an out-of-town location increases labour turnover.

To control for firm internal factors (\( F_f \)) we use a dummy variable for the firm identity (\( F_{fi} \)). We also control for store specific factors (\( S_s \)) such as the size of the workplace in terms of number of employees (\( S_{ss} \)). Sometimes stores in the same company can be registered in different industries. The industry-specific factors (\( K_j \)) is controlled for by using a dummy variable to indicate if the store in the downtown location and the store in the out-of-town location within the same firm have the same industry code (5 digit) or not (\( K_{jk} \)). Since turnover is dependent on the level of economic activity in general (\( M_s \)), and this can vary substantially from year to year, we use a dummy variable for each year in the study (\( M_{sm} \)). This variable indicates variations in the global conditions in the city over time.

A number of individual-specific (\( X_i \)) control variables are used in the model. We control for age (\( X_{ia} \)), sex (\( X_{is} \)), number of children (\( X_{ic} \)), income (\( X_{im} \)), educational level (\( X_{ie} \)) and car ownership (\( X_{iv} \)).

In Table 2 descriptive statistics of the included variables in the statistical model are shown. The number of employees in downtown locations is slightly higher. On average an employee works in a store where the annual turnover rate is 46%.
average employee residence is located almost 11 minutes from the workplace. The travel distance to work shows a rather skewed distribution, with an average distance of 10.94 km (which is somewhat lower than for the retail sector as a whole in Örebro, see Table 1), but a median distance of only 8.43 km. This variable consists of some outliers, with very long travel distances between workplace and residence. However, these outliers do not affect the results significantly. These basic figures correspond well with the aggregated data presented in Table 2. There are substantial variations (a range between 3 and 35 new stores) and a skewed distribution with

Figure 1. Retail employment in Örebro by SAMS areas in 2011 and the selected shopping areas for the analysis in the study.
regard to entrances of new stores in the close vicinity of the stores that are part of the analysis. A skewed pattern in the distribution is also obvious for workplace sizes. However, the skewed distribution and outliers of these two variables do not significantly affect the analysis.

The labour force in the selected stores is rather young (34.4 years on average) compared to the total workforce in Örebro. The labour force is dominated by females (83%, which is higher than for the retail sector as a whole in Örebro), and a large proportion of the labour force do not have children. Income in this subset of retail industry in Örebro is somewhat lower than for the sector as a whole.

### Table 1. Workforce characteristics in the three shopping locations in Örebro city in 2011. Source: statistics Sweden.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Downtown</th>
<th>Edge-of-town</th>
<th>Out-of-town</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (ave.)</td>
<td>36.3</td>
<td>35.0</td>
<td>32.0</td>
</tr>
<tr>
<td>Share female (%)</td>
<td>71.0</td>
<td>61.4</td>
<td>64.8</td>
</tr>
<tr>
<td>Income, SEK (ave.)</td>
<td>199 300</td>
<td>218 200</td>
<td>196 300</td>
</tr>
<tr>
<td>Share self-empl. (%)</td>
<td>11.1</td>
<td>3.0</td>
<td>1.9</td>
</tr>
<tr>
<td>Univ. educ. (%)</td>
<td>18.5</td>
<td>19.0</td>
<td>21.3</td>
</tr>
<tr>
<td>Ave. distance to work in km (median in brackets)</td>
<td>13.0 (2.2)</td>
<td>16.7 (4.0)</td>
<td>19.0 (9.3)</td>
</tr>
</tbody>
</table>

### Table 2. Descriptive statistics of variables included in the GLM analysis of labour turnover 2004 to 2008. Source: statistics Sweden.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>25th</th>
<th>50th</th>
<th>75th</th>
<th>Mean</th>
<th>Std.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover rate (T Ital)</td>
<td>1970</td>
<td>0</td>
<td>0.98</td>
<td>0.33</td>
<td>0.46</td>
<td>0.58</td>
<td>0.46</td>
<td>0.20</td>
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<tr>
<td>Location (Lso)</td>
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<tr>
<td>Downtown</td>
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<tr>
<td>Out-of-town</td>
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<tr>
<td>Dist. (Lsd) to work in km</td>
<td>1970</td>
<td>0.17</td>
<td>124.5</td>
<td>2.37</td>
<td>8.43</td>
<td>11.53</td>
<td>10.94</td>
<td>14.12</td>
</tr>
<tr>
<td>No. of workplaces with new entrance within 5km (Lsm)</td>
<td>1970</td>
<td>3</td>
<td>35</td>
<td>4</td>
<td>12</td>
<td>15</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Workplace size (Sss)</td>
<td>1970</td>
<td>1</td>
<td>42</td>
<td>6</td>
<td>9</td>
<td>19</td>
<td>13.62</td>
<td>10.32</td>
</tr>
<tr>
<td>Age (Xia)</td>
<td>1970</td>
<td>20</td>
<td>64</td>
<td>24</td>
<td>32</td>
<td>42</td>
<td>34.41</td>
<td>11.94</td>
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<td>Sex (Xis)</td>
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<tr>
<td>Income (Xim)</td>
<td>1970</td>
<td>0.4</td>
<td>820</td>
<td>124.3</td>
<td>194.6</td>
<td>240.4</td>
<td>188.0</td>
<td>93.06</td>
</tr>
<tr>
<td>Children aged 0–10 (Xie)</td>
<td>1970</td>
<td>545</td>
<td>1425</td>
<td>976</td>
<td>900</td>
<td>94</td>
<td>672</td>
<td>1298</td>
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<td>Educational level (Xie)</td>
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To calculate the relative effect of each variable we rearrange (2) into an exponential form as shown in (3).

\[
\mu = \frac{\exp(X\beta)}{1 + \exp(X\beta)}
\]

(3)

where \(X\beta\) is the linear predictor. By holding all the explaining variables but one constant the effect for each variable on turnover can be calculated.

**Retail development and labour turnover in different locations in Örebro**

Turnover in the Swedish retail sector reached 77 Billion Euros in 2017 which is about 9% of the Swedish GDP (HUI Research 2018a). Turnover in the sector has grown by 34% between 2007 and 2017. The retail sector has presently about 250 000 employees of which almost 60% is between 16 and 34 years of age (HUI Research 2018a). For a long time retail in Sweden was dominated by small companies. However, during the last decades, small retail companies have faced increasing competition, first from larger multistore Swedish retailers and lately from even larger international retail companies. Traditionally stores have been located in the city centres. However, over the last decades, the growth of external shopping centres has been rapid. Today 16% of retail activities are located in the city centres, whereas almost 40% of the retail firms are located in external locations (HUI Research 2018b). Downtown shopping areas typically have a mixture of small independent retail companies and large retail chains, whereas the out-of-town shopping centres are largely dominated by large multi-store shopping chains.

The retail labour market in the city of Örebro has been chosen as the empirical case study area in this research. Örebro is in many ways typical for mid-sized cities in Sweden, functioning as a regional centre with a considerable growth in population over the last 30 years. The municipality is dominated by public services (a university, a large hospital, municipal and county administration, and a branch of Statistics Sweden). Today Örebro represents one of the larger trading areas in Sweden, partly explained by its advantageous location within the Swedish transport system, with the European motorways E18 and E20 passing close to the city.

Over the last 15–20 years, Örebro has become a flourishing retail centre for an extensive market area in central Sweden (WSP 2014, 33–37). This expansion is explained by two related developments; a general population growth in the city, combined with a regional concentration process in shopping and retail. The expansion is to a large degree concentrated to a particular out-of-town location, Marieberg Shopping Centre. Marieberg is located about 20 km south of the city centre, on the E20 motorway, and IKEA was established in the area in 1991. Apart from Marieberg, the retail sector in Örebro municipality consists of a number of shopping areas located relatively close to the city centre, here referred to as edge-of-town locations in the remainder of this section. Further, Örebro city centre has a vibrant retailing sector with shopping malls and a large number of mostly smaller stores. This type of location is here referred to as downtown locations.

Employment in the out-of-town location has increased rapidly from the late 1990s until 2011 (by 171% between 1993 and 2011), whereas employment in the edge-of-town locations shows a more moderate increase (51%), and the selected downtown locations have decreased slightly during the period. Stores with a downtown location are generally
smaller in employment terms. Close to 70% of the downtown stores have less than 5 employees. In the edge-of-town and out-of-town locations stores with more than 10 employees are much more common, and the larger stores employ 82% and 74% of the workforce in the edge- and out-of-town areas, respectively, in 2011. In both non-downtown categories, shopping is dominated by durable goods and large-scale chain stores with high volume sales. Downtown shopping is also dominated by durable goods. However, the shopping establishments are more mixed with shopping galleries alongside with small independent stores.

For the analysis of labour turnover at the workplace level presented below, we identified and selected 11 SAMS areas (Small Area Market Statistics) that will represent the three types of retail location within the municipality of Örebro (see Figure 1). SAMS areas cover the whole country and are defined locally by each municipality in Sweden. They should reflect residential neighbourhoods, as well as workplace areas with few or no residents (SCB 20). The selection of SAMS areas is based on our local knowledge of the retail sector in Örebro, as well as on information in a recent consultancy report on the present situation and the future prospects for retail areas in Örebro municipality (WSP 2014). In 2011 the selected SAMS areas had 366 workplaces and just over 3,100 employees in the retail sector. Taken together they stand for about 56% of the total employment in retail in Örebro municipality in 2011.

In the turnover literature, the most common way to measure labour churning at the level of the firm or the workplace is ‘crude labour turnover rate’ (see e.g. Andersson and Tegsjö 2006; Orkan 1974). Crude labour turnover means that the number of workers leaving an organization or a workplace over a certain time period is divided by the average number of employed during that time period (there are a number of minor variations to this procedure). A problem is, however, that crude labour turnover incorporates the net employment change in the measure, i.e. firms or workplaces that increase or reduce their number of employees tend to show a higher labour turnover. Furthermore, this problem is reinforced by the fact that individuals with a shorter tenure at the workplace are more likely to leave their employment. In this paper, we introduce an alternative measure of labour turnover, Replacement LTO, developed by analysts at Statistics Sweden (Andersson and Tegsjö 2006). In this case growth or decline in employment at the workplace over the studied time period is kept out of the measure. In formula 2 below (retrieved from Andersson and Tegsjö 2006, 22) the sum of recruits and leavers is reduced by the net change at the workplace, resulting in a measure of the number of persons that have quit the job and then been replaced by new employees. Thus, Replacement LTO gives a measure of the exchange of staff in relation to the number of employees at the workplace at the starting point.

\[
\text{Replacement LTO} = \frac{\sum_{i=1}^{S} \left( (y_i + z_i) - |y_i - z_i| \right)}{2 \times \sum_{i-1}^{S} x_{ii}} \times 100 \tag{2}
\]

where \(x_{ii}\) is the number of employees in workplace \(i\) at time 1, \(y_i\) is the number of new employees in workplace \(i\) between time 1 and 2, \(z_i\) is the number of employees leaving the workplace \(i\) between time 1 and 2, and \(S\) is the number of workplaces in each category. In Figure 2 both Crude LTO and Replacement LTO have been calculated for retail workplaces in the three selected shopping areas, as well as for the rest of Örebro municipality (other areas), for the period 2010–2011.
As expected, the Crude LTO measure is higher than the Replacement LTO in all areas. More importantly for the investigation in this paper is, however, that there are significant differences between the shopping areas when we use the Replacement LTO measure. The out-of-town locations clearly have the highest replacement LTO, followed by edge-of-town, whereas the downtown workplaces on an aggregate level show the lowest labour turnover. So far we can thus conclude that there are, in general, distinct differences in labour turnover between retail workplaces located in different parts of the city, and that these differences tend to follow a centre-periphery pattern.

Table 1 shows that the workforce characteristics differ to some extent between the areas. The out-of-town located stores have a slightly younger workforce, and the share of female workers is lower in both non-downtown locations. Average income is higher in the edge-of-town locations, and lower in the out-of-town area (Marieberg). As expected, considering the workplace size structure and the higher presence of independent stores, self-employment is clearly more common in the downtown shopping district. Finally, the share of workers with a university degree is slightly higher in the out-of-town locations.

The average distance to work is calculated based on the centroids of the residential and workplace SAMS areas, respectively, for each retail worker. The aggregate mean and median, expressed in kilometres, follows a centre-periphery pattern, with higher travel-to-work distances for the edge- and out-of-town locations. When comparing mean and median values, it is obvious that the distribution of average distances is heavily influenced by some extreme values.

Since the employees have longer commuting distances in stores in out-of-town locations and since they are younger and earn less than the employees in more central locations, the turnover rates as expected are higher in stores with out-of-town locations. However, this analysis is yet unconditional, for instance in the sense that it does not take into account firm internal HR factors, something that in the literature is seen to be very important for the employees satisfaction with work and therefore their propensity to change workplace.
In the following section, we investigate these differences further. In doing so, we control for firm internal management specific factors as well as other location-specific factors besides commuting distances. We also focus on labour turnover in the part of the retail sector that offers durable goods. The reason for this is that employee turnover in stores mainly selling durables have a more distinct centre-periphery pattern compared to stores mainly offering non-durable goods. In the remainder of this paper retail thus refers to the part of the sector that sells durable goods.

**Estimating the intra-urban location effect on labour turnover in retail**

Table 3 reports the GLM results. In order to compare the models with more controls, we let Model 1 be Equation (2) and add the controls of the firm internal-specific factors and industry-specific factors in Model 2 and Model 3. The variation explained by the model is $1 - \left( \frac{\text{Residualdeviance}}{\text{NullDeviance}} \right)$.

The interpretation of results in Table 3 is straightforward. There is no specific location effect on labour turnover of being either in an out-of-town or a downtown location. By far the most important impact on the result has the firm internal factors. The effect is highly significant and it is a major impact on the explanation power of the model. Controlling for firm internal factors (Model 2) reduces the effect of several other variables included in the statistical analysis. Besides the firm internal factors, the general time specific conditions, that is basically general market conditions, is also of major importance for the model result. It varies a lot, some years the effect is strong, other years it does not even have a statistically significant effect on the labour turnover. It also varies from being positive on the labour turnover to being negative. Compared to the base year for the model, labour turnover in year 2006 was almost 23.7% (Model 2) higher than the year 2004, and in 2008 34.2% lower than 2004. Further, as expected individual-specific factors have an effect on

<table>
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<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
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* is 10% significant level; ** is 5% significant level; *** is 1% significant level.
labour turnover. However, when firm internal factors are controlled for, most of these effects disappear. It indicates that firms might differ in strategies when they hire new employees but that the strategies are the same between stores in the same firm. However, when controlling for firm-specific conditions, Table 3 also reveals that education remains a significant factor influencing labour turnover in stores. The interpretation of the result in model two is that employees with a secondary education have some 8.5% higher turnover compared to employees with only primary school as their educational background. This finding might indicate that an employee with secondary education has more opportunities on the labour market to find jobs and therefore changes employer more frequently than those with a primary education.

To conclude, we find that location-specific factors do not have a significant effect on labour turnover in retail stores with both an out-of-town and downtown location. Thus, we find no support for the idea that turnover would be higher in peripheral urban locations.

Concerning commuting distances, one possible explanation to the lack of explanatory power in the models might be that employees adjust their place of living in the city in relation to where their workplace is situated. A t-test of the distributions of the residences shows that there is a significant difference in the distribution of residences working downtown and out-of-town in 2004. Employees working downtown have much shorter commuting distances compared to those working in out-of-town located stores (average 7.5 km compared to 10.5 km). In 2008 there is no longer any statistically significant difference in the distribution in the residencies between the two groups. During the period the average commuting distance have increased with 40% to 10.5 km among those working downtown, while it has decreased with almost 23% to 11 km among those employed in out-of-town stores. We can conclude that the workforce does not seem to choose their place of living in relation to where they work. A plausible explanation to the observed settlement pattern could be that the differences in commuting distances, and their related costs, are not big enough to affect turnover behaviour. Yet another explanation, not investigated in this study, might be that employers compensate worker in out-of-town stores with higher salaries. Unfortunately, we do not have information on salaries at the workplace level to substantiate this. Instead, we find that labour turnover is strongly related to firm internal factors, and from changing economic conditions that affect workforce behaviour in general.

**Concluding discussion**

In this paper, we have analysed whether or not the intra-urban location of stores has an impact on labour turnover. In doing so, we conduct an analysis in two steps. In the first step, we describe and compare labour turnover in different city locations, such as downtown, edge-of-town and out-of-town in a Swedish mid-sized city.

On an aggregate level, we find a distinct centre-periphery pattern, showing higher levels of labour turnover in out-of-town stores compared to stores in downtown locations. It is obvious from this part of the analysis that the employees in out-of-town stores have longer travel distances, earn less and are younger than the employees in downtown stores. As expected, the aggregate analysis also shows that labour turnover, in general, is some 5 percentage points higher in out-of-town locations compared to downtown locations.
However, no controls for firm internal management specific factors, location-specific factors besides commuting distances, store specific factors, or industry-specific factors were used in this part of the analysis.

In a second step, using a GLM model, we analyse labour turnover in workplaces at the level of the individual employee. In doing so we were able to add controls on location-specific conditions, firm internal-specific conditions, employee-specific conditions, industry-specific conditions and time variations in market conditions in the city. Adding these controls, we find that turnover in stores is insensitive to increased costs for travelling and other location-specific factors. We also find that employees seemingly do not adjust their residence in relation to their workplace location. Instead, our result indicates that firm internal management specific factors have a major influence on turnover rates. We also find that turnover rates are highly sensitive to time-dependent factors and to a minor extent to the educational level of the individual.

From a management point of view, this study gives insights, in contradiction to the current labour commuting literature, that differences in location and commuting costs within a city is of no concern for the employee turnover in a store. Instead, the findings suggest, in line with the current management literature, that employee turnover in a store is strongly related to the human resource management within the firm.

The results in this paper might be to some extent seem contradictory. However, they illustrate the importance of methodological choice and of being able to control both for internal and external firm-specific factors in order to understand differences in labour turnover in retail.

Admittedly, this is a limited case study, and more studies are needed to provide further tests of the robustness of the results presented above. Nevertheless, we have developed and outlined a useful methodology based on revealed preferences to evaluate whether or not location and commuting distances have an effect on labour turnover. We believe the methodology used here could be applied both to other geographical settings and in other industrial sectors displaying contrasting locational patterns between firms and their workplaces.

**Note**

1. Distance is measured at different levels of spatial aggregation and using different measures in the two parts of the analysis.

**Disclosure statement**

No potential conflict of interest was reported by the authors.

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Mats Lundmark is a Full professor in Human geography. His main research interest is in the areas' of spatial planning, local and regional development.

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