# Entry into Swedish Retail- and Wholesale Trade Markets

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Abstract

In this paper, a Poisson regression model is used to study the determinants of entry of new …rms into the Swedish retail- and wholesale trade markets. The results suggest that incumbent …rms engage in strategic behavior to prevent the entry of newcomers. Regional factors are also found to be important determinants of entry.

Key words: Wholesale trade, retail trade, entry, number of …rms, panel data.

JEL classi…cation: L13, L81.

# 1 Introduction

This paper examines the entry process of retail and wholesale trade …rms into the Swedish market between 1990 and 1996. It is generally believed (see e.g., Geroski, 1991) that new …rms produce a number of bene…ts. For instance, the entry, or the threat of entry, of new …rms is assumed to force prices down, thereby eliminating excess pro…ts. Moreover, high entry rates may stimulate innovation, and increase productivity and product quality.

In Sweden, as in other countries, retail and wholesale trade are constantly changing sectors, and in recent years, for example, out-of-town shopping, chain stores' market shares, and the number of international competitors have all increased (see e.g., Bergström, 1999). However, the number of …rms and total employment have increased more over the last decade in the wholesale than in the retail trade sector. Moreover, a relatively larger proportion of the employees in the wholesale trade sector work in a company owned by a …rm headquartered outside Sweden (see Bergström et al., 2002).

Previous empirical studies (see e.g., Love, 1996; Audretsch and Fritsch, 1994; Keeble and Walker, 1994; and Dunne et al., 1988) have generally used aggregated data on …rm entry or have focused excessively on manufacturing …rms. This is unfortunate because the entry process may di¤er between industrial sectors. For instance, Berglund and Brännäs (2001) have found that the determinants of entry di¤er between eight studied industrial sectors in Sweden. Moreover, Troske (1996) and Pakes and Ericson (1998) present results indicating that new non-manufacturing …rms' grow to the size of the incumbents more quickly than do new manufacturing …rms. The latter study is to our knowledge the only one that has examined the dynamics of retail trade …rms, while we have found no study examining the entry pattern of wholesale trade …rms. As the non-manufacturing sector of the economy grows, it has become increasingly important to gather information on the entry process of these …rms as well.

In this paper, a Poisson regression model is used to study the entry process of retail and wholesale trade …rms in Sweden. In contrast to previous empirical studies, who have focused on either …rm (branch) speci…c data or region speci…c data, we are able to access …rm-, branch- and region-speci…c data at the municipality level. We believe this to be important because the entry process of new …rms may be in‡uenced both by …rm and branch speci…c factors, as well as regional characteristics. In addition, this is to our knowledge the …rst paper analyzing new …rm entry into the retail and wholesale trade

markets.

The results indicate that few new …rms enter markets where incumbent …rms face low pro…ts and high sunk costs, or where the market has previously been characterized by the presence of a local monopoly. This is to be expected since economic theory predicts entry to be more common when the minimum e¢cient scale, i.e., sunk costs, are low. Moreover, monopoly …rms can use excess pro…ts to discourage entry in a number of ways. One way would be to use the excess pro…ts for marketing e¤orts, thereby increasing brand loyalty. Our results suggests that incumbent …rms may engage in strategic behavior in order to prevent the entry of new competitors. In addition, we …nd a number of regional variables that a¤ect entry behavior in the retail and wholesale trade sectors.

The paper is organized as follows: the next section presents the theoretical framework of our study; section three describes the data used; section four presents the empirical model and the projected results; and section …ve presents the main conclusions and suggestions for future work.

# 2 The Model

We assume that …rms enter a particular market with the intention of making a pro…t, and that potential entrants face entry costs. Bain (1956) de…ned barriers to entry as the extent to which established …rms can elevate their selling price above their minimum average cost without stimulating entry into the industry. Some possible barriers to entry mentioned in the literature (see e.g., Spence, 1977; Dixit, 1979) include economies of scale or scope, product di¤erentiation and absolute cost advantages of established …rms.

Following Rudholm (2001), we assume that the markets are characterized by imperfect competition, and that …rms enter a given market until the pro…t in each period is driven to zero, that is until

$$\pi_{it} = \sum_{k=1}^{K} p_{ikt}(Q_{kt}) q_{ikt} - \sum_{k=1}^{K} C_{ikt}(q_{ikt}) - F_{it} = 0; \qquad (1)$$

where $\pi_{it}$ denotes the pro…t of the potential entrant $i$ ($i = 1; :::; n$) in period $t$ ($t = 1990; :::; 1996$). In equation (1), $p_{ikt}(Q_{kt})$ is the price of product $k$ as a function of the total market sales of that product, $q_{ikt}$ is the sales of product $k$ of the potential entrant conditional on entry, and $C_{ikt}(q_{ikt})$ is the total sales

costs as a function of the sales volume of product k. Thus, $¼_{it}$ represents the total pro…t for a …rm in the wholesale- or retailing trade business selling a total of K di¤erent products. The term $F_{it}$ can be interpreted as the entry cost corresponding to the zero pro…t condition, i.e., when additional entrants are unable to make pro…ts. This means that the pro…ts of already established …rms can be positive without attracting the entry of new …rms. Let $F_{it}$ take the following form:

$$F_{it} = c_0 + c_1 T + '_1 ¢N_t + ½^{0} G_t + ´^{0} X_{jt} + º^{0} Y_{mt} + »_{it} \qquad (2)$$

where c is a constant term, T is a trend variable, and $¢N_t = N_t ¡ N_{t¡1}$ is a measure of net entry in period t, meaning that the entry cost is allowed to depend on recent entry by other …rms. The entry cost also depends on a vector of general components (e.g., business cycles and institutional changes), $G_t$; a vector re‡ecting branch speci…c explanatory variables, $X_{jt}$, and a vector re‡ecting the characteristics of the municipality where the …rm is planning to set up operations, $Y_{mt}$; where the subscripts j and m denote branch and municipality, respectively. Finally, the entry cost also contains a component, $»_{it}$, not observed by the researcher. $»_{it}$ is interpreted as a realization from a distribution of a stochastic variable with zero mean and constant variance.

De…ne $¼^{0}_{it} = \sum_{k=1}^{K} p_{ikt}(Q_{kt}) q_{ikt} ¡ \sum_{k=1}^{K} C_{ikt}(q_{ikt})$ as the pro…t opportunity of the potential entrant in the absence of the entry cost. Substituting equation (2) into equation (1) and solving for $¢N_t = N_t ¡ N_{t¡1}$, our measure of net entry, gives the following expression:

$$¢N_t = ®_0 + ®_1 T + °¼^{0}_{it} + ¹^{0} G_t + ¯^{0} X_{jt} + ±^{0} Y_{mt} + "_{it} \qquad (3)$$

where $®_0 = ¡ c_0/'_1; ®_1 = ¡ c_1/'_1; ° = 1/'_1; ¹^{0} = ¡(1/('_1)½^{0}; ¯^{0} = ¡(1/('_1)´^{0}$ and $±^{0} = ¡(1/('_1)º^{0}$. The parameter $®_0$ is a constant term, ° measures how potential pro…ts a¤ect entry, $¹^{0}$ captures general factors at the national level in‡uencing …rms' entry behavior, $¯^{0}$ is a parameter vector corresponding to the branch-speci…c explanatory variables, and $±^{0}$ is a parameter vector corresponding to region-speci…c e¤ects. Finally, $"_{it} = ¡»_{it}/'_1$ is a random disturbance term which, from the assumptions regarding $»_{it}$, has zero mean and constant variance. The variables used in the estimation of equation (3), and thus related to equations (1) and (2) above, will be discussed thoroughly in the empirical section.

# 3 The Empirical Analysis

## 3.1 Data

We are able to access …rm- and region-speci…c data at the municipality level. All Swedish …rms are legally bound to submit their annual reports to the Swedish patent and registration o¢ce (PRV). Data from the annual reports of …rms active in the wholesale and retail markets between 1989 and 1996 were used in this study. This data set was collected by Upplysningscentralen AB (UC).[1] The data include, among other items, measures of pro…ts, salaries, …xed costs and liquidity.

The municipality-speci…c data were provided by Statistics Sweden. These data cover matters such as the tax levels, expenditures, government grants, demographics, average income, political preferences, educational level and unemployment in each municipality. Due to the division of some municipalities into smaller units, as well as the mergers of three counties in Sweden during the studied period, 56 municipalities were omitted from this study, leaving a total of 233.

The sample was restricted to …rms with documented positive sales during the study period. Before aggregating the data to the proper branch level, our data set contained 31,448 retail trade …rms, and 35,550 wholesale trade …rms (1996). Aggregating the data to the …ve digit SNI-code level[2], we have access to a total of 44,791 observations pertaining to the retail trade sector, and 37,916 observations pertaining to the wholesale trade sector during the study period. In addition,10,700 …rms entered the retail trade sector during the study period, while 3,550 …rms exited the sector. In the wholesale trade sector, there were 12,132 new entrants in the study period, while 3,690 …rms exited the sector. Hence, we can observe a clear positive trend in the number of retail and wholesale trade …rms during the study period.

## 3.2 Econometric Methods

Turning to the econometric speci…cation of the model, two aspects of the data must be considered. First, since the number of …rms entering a market is a

[1] UC is a Swedish credit information …rm that collects economic information on both …rms and individuals residing in Sweden.

[2] SNI refers to the Swedish standard industrial classi…cation.

positive integer, a count data model is used. Second, there are only a few non-zero observations on entry, that is, $n_{it}$ is in many cases equal to $n_{it-1}$. The Poisson regression model meets these requirements and corresponds directly to the model presented in Section 2. Thus, we estimate a Poisson regression model where net entry is regressed on a number of independent variables separately for the retail and the wholesale trade sectors. As the focus of this paper is entry into a specific branch of business, all firm-specific data have been aggregated to the proper branch level j.[3] More formally, the following model is estimated:

$$Prob(\text{¢}N_{jt}) = \frac{e^{-\lambda_{jt}}\lambda_{jt}^{\text{¢}N_{jt}}}{\text{¢}N_{jt}!}; \qquad \text{¢}N_{jt} = 0;1;2;3:::: \tag{4}$$

where

$$\ln \lambda_{jt} = \beta_0 + \beta_1 T + \gamma \pi_{jt-1} + \delta_j F_{jt} + \mu_k' G_t + \theta_s' X_{jt} + \varepsilon_z' Y_{mt} + u_{it}: \tag{5}$$

Profit opportunities for the entrant are captured by $\pi_{jt-1}$; which measures operating profits. Equation (5) also includes branch-specific fixed effects ($F_{jt}$) in the sense that different intercepts are estimated for each type of business. General factors at the national level that influence the entry behavior of individual firms are captured by $G_t$ , $X_{jt}$ contain characteristics of the incumbents that are assumed to prevent entry , $Y_{mt}$ is a vector of regional determinants of entry , $\beta_0$ is a constant, $u_{it}$ is a disturbance term with zero mean and constant variance, and $\beta_1$; $\gamma$, $\delta$, $\mu_g'$ (g = 1;2;3), $\theta_s'$ (s = 1;2), and $\varepsilon_z'$ (z = 1;:::;13) are parameters to be estimated.

The variable representing profit opportunities for entrants, as well as all branch-specific variables, have been lagged one period. Lagging these variables has two advantages. First, this corresponds directly to the potential entrant's decision problem, since entrants only have access to other firms' annual reports with a one year time lag. Second, this setup makes it possible to reduce a possible endogeneity problem. The data contains several profit measures. We have chosen to use operating profits since this measure corresponds to the profit/loss from the main line of business of the firm. The branch-specific fixed effects have been included in the study, because barriers

[3] For the retail trade sector j = 1;2;:::;68:; for the wholesale trade sector j = 1;2;:::;56.

to entry may vary systematically with unobserved factors such as, marketing e¤orts.[4]

General determinants of entry at the national level, $G_t$, include the gross domestic product (GDP), and two dummy variables re‡ecting the 1995 decision to increase the minimum capital necessary for starting up a limited company from SEK 50,000 to SEK 100,000. We expect to …nd both transitory and permanent e¤ects following on this change. First, potential entrants may have chosen to enter the market before the increased capital requirement was enacted. This transitory e¤ect is captured by a dummy variable taking the value one in the year 1994, i.e., the last year a new …rm could be started at a cost of SEK 50,000. Another dummy variable takes the value one for the 1995-1997 period, re‡ecting a regime shift in the cost of starting up new businesses. As the cost increased, this variable is expected to have a negative e¤ect on entry.[5]

Branch-speci…c factors, $X_{jt}$, that are assumed to characterize barriers to entry include sunk costs and a dummy variable re‡ecting regions with local monopolies in the preceding period. Large sunk costs are believed to re‡ect a commitment by incumbent …rms to stay in the market, as these investments cannot be recouped if a …rm has to leave the market. We used the level of long-term …xed assets (in relation to total assets), such as buildings and machinery, as a proxy for the level of sunk costs. A dummy variable re‡ecting regions with a local monopoly in time period $t - 1$ was added because local monopolies can earn excess pro…ts which later can be used to fund entry deterring behavior.

Net entry is, …nally, also assumed to be determined by region-speci…c factors, $Y_{mt}$. The regional characteristics used in the estimation of equation (5) are population, population density, the municipality tax level, government investment grants, local government debt, average per capita income, the presence of a university or a university college, educational level of the population, net migration, political preferences, political stability and local unemployment.

Note that each municipality is formally free to set its tax level independently. However, during the recession years from 1991 to 1993 local gov-

[4] For an overview concerning how advertising can create an advantage for incumbents, see Comanor and Wilson (1979).

[5] A potential problem is that there might be other events a¤ecting entry during these years. Hence, the parameter estimates for the dummy variables should be interpreted with caution.

ernments were temporarily deprived of this right. The availability of higher education is represented by a dummy variable assigned the value one if a university or a university college is located in the region. Data concerning educational level within the municipality refers to the percentage of the population that has at least enrolled in courses at a university or a university college. Political preferences are indicated by a dummy variable representing all local parliaments where non-socialist parties have the majority, while political strength is measured by the Her…ndahl index.[6]

It is reasonable to expect the following results when estimating equation (5). First, intercept terms may di¤er among branches. This follows because the barriers to entry may vary systematically with unobserved factors, such as marketing e¤orts. From the theoretical framework, it follows that more entry should occur in branches where pro…ts are high, while sunk costs and the presence of local monopolies should prevent entry.

Turning to the region-speci…c variables, population size, population density and average income in the municipality are used to measure the market size for the potential entrant. A number of previous studies (see e.g., Audretsh and Fritsch, 1994; Davidsson et al., 1994; and Guesnier, 1994) have indicated that more entry occurs in regions where markets are large. Audretsh and Fritsch (1994) among others have also found that entry is positively in‡uenced by the level of education in the region, possibly indicating that …rms demand highly skilled labor. More entry is, therefore, expected in municipalities with established universities and/or university colleges and where a high percentage of the population have enrolled in higher education. Entry may also be in‡uenced by the local unemployment rate. Davidsson et al. (1994) note, however, that this e¤ect may be positive or negative. A high level of unemployment may attract entry because this indicates that the …rm has a large labor pool to draw from when recruiting. On the other hand, high unemployment may discourage entry because it serves as an indicator of lower regional demand in the future. Entry of new …rms may also be in‡uenced by the municipality tax rate. For instance, high taxes may prevent entry of new …rms because a relatively large share of the local ser-

[6] The Her…ndahl index is de…ned as

$$H = \sum_{p=1}^{P} SHARE_p^2$$

where SHARE is the percentage of representatives from party p.

vices are provided the public sector (see e.g., Fölster, 2000). On the other hand, Sinn (1996) argues that redistributive taxation promotes risk-taking and thereby stimulates self-employment. Turning to the variables concerning political preference, we expect entry to be more common in municipalities where there is a strong political leadership, as measured by the Her…ndahl index, because this may creates a stable working environment for the …rm. In addition, …rms may prefer a non-socialist local government because this leadership is likely to implement more bene…cial policies for the …rm compared to a socialistic local government. Hence, the type of the political leadership, socialist or non-socialist, might have an e¤ect on entry.

## 3.3 Estimation Results

Equation (5) is estimated by means of an iterative maximum likelihood technique. The estimation results are presented in Table 1.

The estimate of the time trend is negative and signi…cant for both sectors. Turning to the parameter estimate for our GDP index, these are negative and signi…cant at the one-percent signi…cance level for both sectors. This result is rather unexpected, but might re‡ect the fact that self-employment increased during the recession of the early 1990s.

The dummy variable re‡ecting the regime shift is positive and signi…cant for both sectors, contrary to our expectations. Note, however, that the dummy variables re‡ecting the costs of starting new companies also re‡ect all other period-speci…c events that a¤ect entry.

Turning to branch-speci…c variables, we …nd that there is more entry into branches where pro…ts are high. The parameter estimates for pro…ts are signi…cant at the ten-percent level for retail trade, and at the one-percent level for wholesale trade businesses. Although this is as one would expect from microeconomic theory, it has not been widely reported in previous empirical studies of entry behavior (see e.g., Geroski, 1995). In this paper, we used the level of long-term …xed assets (in relation to total assets) such as buildings and machinery as a proxy for the level of sunk costs. The results indicate that higher sunk costs decrease entry into the retail trade sector. Finally, the parameter estimates regarding local monopolies are negative and statistically signi…cant at the one-percent level for both sectors, indicating that entry is less likely in branches where the incumbent …rm had a local monopoly in the previous period.

Table 1. Estimation results*

| | Retail | | Wholesale | |
|---|---|---|---|---|
| Variable (parameter) | Estimate | t-value | Estimate | t-value |
| Constant ($\beta_0$) | 2.88 | 3.25 | 1.81 | 1.84 |
| Trend ($\beta_1$) | -0.11 | -6.34 | -0.14 | -6.96 |
| Pro…ts ($\gamma$) | 2.69E-9 | 1.66 | 6.49E-10 | 4.74 |
| GDP ($\mu_1$) | -0.038 | -4.29 | -0.049 | -4.91 |
| Dcapital ($\mu_2$) | 0.23 | 3.47 | 0.21 | 2.87 |
| Dcapital94 ($\mu_3$) | 0.021 | 0.35 | -0.0037 | -0.05 |
| Sunk cost ($\delta_1$) | -0.18 | -2.39 | -0.027 | -1.60 |
| Dmonopoly ($\delta_2$) | -0.71 | -22.71 | -0.73 | -23.17 |
| Population ($\alpha_1$) | 4.9E-6 | 18.53 | 4.59E-6 | 19.45 |
| Population density ($\alpha_2$) | -0.00013 | -3.20 | 0.000096 | 3.08 |
| Migration ($\alpha_3$) | -2.4E-6 | -0.12 | -0.000061 | -2.81 |
| Unemployment ($\alpha_4$) | -0.000016 | -2.84 | -0.000011 | -1.88 |
| Education ($\alpha_5$) | 3.07 | 11.35 | 4.40 | 16.80 |
| Income ($\alpha_6$) | 0.000024 | 1.03 | 0.000037 | 2.53 |
| Tax rate ($\alpha_7$) | 0.018 | 3.36 | 0.031 | 5.37 |
| Debt ($\alpha_8$) | 0.22 | 3.85 | 0.38 | 6.45 |
| Investment grants ($\alpha_9$) | -0.00019 | -0.89 | -0.000042 | -0.15 |
| Dconservative ($\alpha_{10}$) | 0.024 | 0.82 | 0.13 | 3.81 |
| Political strength ($\alpha_{11}$) | 0.79 | 3.01 | 1.16 | 4.00 |
| Duniversity ($\alpha_{12}$) | 0.23 | 5.91 | 0.13 | 3.33 |
| Number of obs | 44791 | | 37916 | |
| Pseudo $R^2$ | 0.20 | | 0.29 | |

*t-values are robust against overdispersion.

Turning to the variables re‡ecting regional di¤erences, we …nd that entry is more common in areas with large populations. This result is statistically signi…cant at the one-percent level for both sectors. However, the population density seem to have a negative e¤ect on entry into retail trade, while it has the expected positive e¤ect on entry into the wholesale trade sector.

Local unemployment rates have a negative impact on entry, suggesting

that unemployment may serve as an indicator of regional demand. The proportion of the population having a university and/or university college education has a positive impact on entry, and …rms are more likely to enter markets where they have access to a large stock of well-educated workers. The variable re‡ecting average income per capita is positive for both sectors, but statistically signi…cant only in the model concerning entry into wholesale trade markets.

The parameter estimate concerning local tax rates shows that entry is more common in regional markets where the tax rate is high. A variable we consider to be closely related to taxes is the level of debt in relation to total assets in the municipality. Municipalities with a large level of debt might be forced to raise taxes in the future to repay their loans. Firms considering entering a market in a particular area recognize this, and are thus reluctant to enter. However, we …nd that the parameter estimates are positive for both sectors, as well as statistically signi…cant at the one-percent level. We have not been able to …nd any reasonable explanation for this unexpected result.

Turning to the variables re‡ecting political preference and the political strength of local government, we …nd that entry into wholesale trade markets is more common in municipalities governed by non-socialists parties. In addition, the parameter estimates show that entry is more common for both sectors in municipalities where there is a strong political leadership, irrespectively of the ideological inclination of the government. Our results indicate, moreover, that municipalities with a university or a university college attract more entries. Note, …nally, that the determinants of …rm entry into a local market are similar for the retail and wholesale trade sectors.

# 4 Conclusions

This paper examines the determinants of …rm entry into the Swedish retail and wholesale trade markets. The results suggest that entry is more common in markets where the incumbents have high pro…ts, while entry is found to be less common in markets characterized by a single incumbent (i.e., markets subject to local monopolies). Moreover, high required investments in sunk costs were also found to discourage entry in the retail trade sector.

Regional factors are also found to in‡uence entry behavior. According to the results, regions characterized by large populations, high educational level, the presence of a university college or university, large debts, high taxes and

strong political leadership are more likely to attract entry from other regions.

We observe a clear positive trend in the number of …rms despite the recession during the years under study. This may indicate that …rms have some other mechanism, aside from exiting, by which to adapt to changing market conditions. One such mechanism could, for instance, be investments/disinvestments in capital and/or labor. This is, therefore, an interesting question for further research.

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