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5 DETERMINANTS OF PORTS OF ENTRY AND EXIT

A Panel Data Analysis on the Relationship between Firm Characteristics, Financial Performance, and Internal Labor Markets⁷⁵

Personnel economists have become increasingly engaged in the empirical analysis of internal labor markets. Mostly based on single-firm analyses, evidence for the existence of specific stylized facts has been gathered, such as the presence of ports of entry and exit. However, the impact of firm-specific characteristics on the use of internal labor markets in general and ports of entry and exit in particular has not yet been analyzed, with the exception of the literature on CEO-turnover. Previous studies on CEO-turnover found that firm characteristics such as general and financial performance influence CEO turnover decisions. Using a Danish employer-employee linked database, this study empirically investigates the relationship between firm size, firm growth, industry, and profitability, on one side, and ports of entry and exit, on the other. We show that these factors strongly influence the use of ports of entry and exit. Firm heterogeneity should therefore be accounted for when interpreting empirical findings about the functioning of internal labor markets.

5.1 Introduction

How idiosyncratic are the 'stylized facts' of internal labor markets (ILMs)? This question is relevant for economists who have become increasingly interested in what goes on inside organizations. Since the seminal articles by Lazear (1992) and BGH (1994a & 1994b) additional empirical studies have been performed such as Treble et al. (2001) and Kwon (2006). These investigations of ILMs have typically taken a single-firm approach. The potential for generalization of the results is still an open question that can only be answered empirically by means of a multiple-firm approach. This study attempts to provide an answer to that question. It is an empirical study and explorative by nature, which implies that no explicit hypotheses will be tested, but rather the focus will be on an extensive investigation of ILMs on a multi-firm level.

One of the main properties of an ILM is that workers are hired at ports of entry, while other job openings are mainly filled from within (Lazear and Oyer, 2004). In this chapter we focus on the usage of ports of entry and exit and take a multiple-firm approach to investigate how external conditions influence their presence. By doing so, this study resembles the literature on CEO-turnover, which has a long history of analyzing entry and exit of managers using multi-firm data. The literature on CEO-turnover stresses the importance of firm characteristics on hiring and separation decisions. Recent studies in personnel economics (e.g. Eriksson and Werwatz, 2003) have also emphasized the importance of

⁷⁵ This chapter is based on Van Herpen, Cools, Eriksson and Van Praag (2005), which was presented at a seminar in Aarhus. I would like to thank Niels Westergård-Nielsen for helpful comments. The research was supported by means of a European Community Marie Curie Fellowship. (For more information: <http://www.cordis.lu/improving>). Disclaimer: the author is solely responsible for the information communicated, and the European Commission is not responsible for any view or results expressed.

different firm-specific factors, such as the industry and the type of staff. Based on the CEO-turnover literature we distinguish firm-specific variables, such as the size of the firm, the growth rate of the firm, the industry in which it operates, and firm performance variables to investigate how ports of entry and exit are systematically influenced by the characteristics of the firm. We analyze the effects of these dimensions on the entry and exit of lower-level employees, middle-management and top-management, and include CEO-turnover in the analysis as a benchmark. The data source is an employer-employee linked Danish panel data set.

In the next section we will first expound the theory of ILM and provide a survey of the empirical literature. Section 5.3 will discuss the data used, including a brief discussion of the relevant characteristics of the Danish labor market. Section 5.4 will discuss the results, and Section 5.5 concludes.

5.2 Theoretical Background and Determinants of ILM

5.2.1 *The theoretical concept of internal labor markets*

ILM is a concept that has aroused interest from both economists and sociologists (Kwon and Meyersson Milgrom, 2003) and is a cornerstone of personnel economics (see Section 1.1). Personnel economists define ILMs as “sets of careers and relatively detailed defined career paths that in turn lead to long-term attachments” (Eriksson and Werwatz, 2003). An important decision in organizations is whether to hire an insider or an outsider for a job opening. A stylized fact of an ILM is that workers are hired primarily from outside at specific ports of entry (Doeringer and Piore, 1971). Different theoretical explanations have been developed that might explain this decision and a growing collection of empirical work has used the concept (Lazear and Oyer, 2004).

One theory motivating ILMs views internal job flows as an incentive instrument. In the tournament model (Lazear and Rosen, 1981), the wage level and other non-pecuniary rewards that come with the jobs of highly-ranked employees serve as an incentive for all lower-ranked workers within the organization. The (theoretical) ultimate reward in the tournament model is the chance of becoming CEO.⁷⁶

A second rationale for ILMs is explained by human capital theory (Becker, 1962). The existence of firm-specific human capital, i.e. human capital that is only valued by the current employer, produces rents. Employers and employees are only willing to invest in firm-specific training, if they will be able to extract a large enough portion of the rent. Firm-specific human capital makes employees less likely to switch to another firm, since

⁷⁶ Tournament theory was discussed in more detail in Section 2.2.2, while empirical results are presented in Section 2.2.4.3. The incentive effect of promotions was also supported empirically in Chapter 4.

turnover will lead to the loss of this human capital.⁷⁷ Therefore, these workers will have a basic incentive to follow a career inside an organization.⁷⁸

5.2.2 *Potential determinants of inter-firm variation in stylized facts of ILMs*

Section 2.4 – theoretical background – presented existing empirical research that explores ILMs (see Table 2.4). In this section we will discuss potential determinants for the variation of internal mobility that have been established in previous studies. First, we will review a stream of literature that typically uses a multi-firm approach for analyzing the effect of external conditions on a specific port of entry and exit: the CEO-turnover literature.

5.2.2.1 *Determinants from the CEO-turnover literature*

The CEO-turnover literature focuses on the circumstances in which top executives leave a company (e.g. Denis and Denis, 1995; Cools and Van Praag, 2003), evidently using a multi-firm approach. We can extract lessons from this literature that can be used to distinguish potential determinants that influence turnover decisions. The determinant that is studied most is financial firm performance prior to the CEO-turnover, in particular stock returns and accounting profits. The expected inverse relationship between pre-event stock returns and CEO-turnover has been found in numerous studies (e.g. Coughlan and Schmidt, 1985; Warner et al., 1988), suggesting that internal or external disciplining mechanisms affect the turnover of CEOs.⁷⁹ Establishing the expected relationship between accounting profits and CEO-turnover has encountered more obstacles and has been subjected to a meta-analysis, which shows ambiguous results (Dalton et al., 1998).⁸⁰ In addition to performance variables, CEO-turnover is related to two other types of variables: CEO-specific variables (e.g. age, gender or education) and other firm-specific variables (e.g. industry, size) (Lausten, 2002). Especially firm-specific variables are likely to contribute to our understanding of ILMs.

The succession of the CEO, by an insider or an outsider, and firm performance in the period after CEO-turnover have also been studied. Empirical evidence indicates that the decision to hire an outside successor depends on firm performance: companies in distress are more likely to rely on outside hiring. Outsider succession has been shown to have a significantly positive effect on post-turnover performance (Huson et al., 2004). One potential reason is the organizational change that outside managers can bring about,

⁷⁷ Lazear (2003) argues that all human capital of an employee can be general human capital, but that the *combination* in which the employee possesses the different types of human capital is specific. Conceptually, this leads to the same conclusion: the human capital an employee holds in total fits best with one specific firm and the degree to which an employee can use it outside the current firm differs. Evidence of the theoretical concept 'firm-specific human capital' has been found in several empirical studies (e.g. Farber 1999; Neal 1995; Bingley and Westergård-Nielsen 2003).

⁷⁸ Human capital theory is discussed in Section 2.3.1. Also the extensions of human capital theory such as the task assignment model can be used as a rationale for the ILM.

⁷⁹ Other factors can also influence the decision for CEO dismissal. For instance, Fredrickson et al. (1988) stress the importance of mediating factors such as the board of directors' expectations and attributions, the board's allegiances and values, the availability of alternative candidates for CEO, and the power of the incumbent CEO.

⁸⁰ An important distinction, often hard to make and thereby possibly leading to the ambiguity of the results, is the distinction between forced and unforced turnover. For example, when it is not possible to distinguish between forced and unforced turnover, age has a highly significant effect on expected turnover, especially around retirement age (e.g. Barro and Barro, 1990; Coughlan and Schmidt, 1985). Warner et al. (1988), Denis and Denis (1995) and Huson et al. (2004), who were able to make such a distinction, found a strong relationship between financial distress and forced turnover.

whereas insiders are committed to old strategies and historic decisions (Boeker and Goodstein, 1993). Evidently, the determinants of outside versus inside hiring might also be relevant at lower hierarchical levels.

The management literature on CEO turnover is extensive and has investigated many aspects, such as the likelihood of intra-firm, intra-industry and outside-industry succession (Zhang and Rajagopalan, 2003). This literature has for example noted both the positive effects of external hiring of CEO's (e.g. the possibility to initiate change) as well as the potential negative effects (e.g. the lack of firm-specific knowledge, the risk of disrupting firms and the difficulties for the new CEO to find support at senior management level) (Zhang and Rajagopalan, 2004). This literature is quite extensive and we will not try to add to this theory. Rather, we will borrow from this literature and apply the results to personnel economics (i.e. hiring and firing at lower hierarchical organizational levels).

5.2.2.2 *Determinants from personnel economics*

The CEO-turnover literature has shown the importance of using firm performance and has also indicated the usefulness of other firm-specific variables. We wish to distinguish three firm-specific variables (in addition to firm-performance) that have been relevant in previous studies of personnel economics: industry, size, and growth rate. With respect to 'industry', Eriksson and Werwatz (2003) have established that internal job movements are more dominant in utilities and financial services. With respect to company size, it is likely that smaller companies will depend less on internal mobility: in order to offer internal job-movements, the size of a company has to be sufficient since a small firm will have difficulty in offering employees adequate career paths. Gibbs et al. (2003) have provided empirical evidence that larger firms are more effective in organizing occupational and hierarchical changes. Besides organizational size, the number of job openings will depend on the percentage turnover and organizational growth. In order for a position to become available, either the person previously holding that position has to leave (by being promoted, demoted, or leaving the company), or a new slot has to be created. A growing firm (in terms of employees) will create new positions at virtually all hierarchical levels. Thus, organizational growth can improve internal mobility (Baker, 1990). Dohmen et al. (2004) have empirically shown that promotion rates increase in periods of corporate growth and fall in periods of decline.

5.2.3 *Cross-case variation in ports of entry and exit: potential determinants*

The previous discussion has put forth four potential determinants: firm performance, firm size, firm growth, and industry. In Section 2.4 different stylized facts of ILMs were discussed. A large amount of cross-case variation in ports of entry and exit was established, which is one of the main characteristics of an ILM (see Section 1.1 and Doeringer and Piore, 1971). Table 5.1 presents an outline of ten empirical studies on this topic and which are a selection from Table 2.4.

Table 5.1: Empirical investigations of ILMs: Single-firm analysis

Author(s)	Do Specific Ports of Entry (and Exit) exist?	Country	Years	Level (white/blue collar)	Industry	Size – Begin	Size – End	Growth Rate (CAGR)	Profitability
Lazear (1992)	◐	Not available	1978 to 1989	Excludes higher-level managers	Not available	Unknown (roughly 100,000 employees worked in the firm over the 13-year period)		Not available.	Not available
BGH (1994a & 1994b)	◑	U.S.	1969 to 1988	Managerial	Financial Services	1,380	6,022	8%	ROA = 0% to 1% with one negative year (1987)
Ariga et al. (1999)	◑	Japan	1971 to 1994	White-collar and engineers	Manufacturing	~13,000 over the last 10 years		First growth; stable over the past 10 years	Not available
Seltzer and Merrett (2000)	●	Australia	1887 to 1899	White-collar workers (entire careers)	Bank	448	798	5%	No information
Hamilton and MacKinnon (2001)	○	Canada	1921 to 1944	All	Railway	n.a.		-1%	Difficulties in the 1930s
Howlett (2001)	●	U.K.	1870 to 1913	Blue-collar	Railway	~20,000 mid 1880s	~25,000	1%	Not available
Treble et al. (2001)	◑	U.K.	1989 to 1997	All	Financial Services	~45,000	~38,000	-2%	Not available
Lin (2005)	●	Taiwan	1991 to 2000	All	Automotive	~300	~850	12%	Positive in all years, but decline between 1993 and 1998
Dohmen et al. (2004)	○	Holland	1987 to 1996	All	Aerospace	10,275	7,141	-4%	Filed for bankruptcy in 1996
Kwon (2006)	●	U.S.	1993 to 1995	White-collar but not management	Insurance Company	3,373 (not specified over years)		Not available	Not available

Legend of results: ●: Evidence of stylized fact is (most likely) present
 ◑: Some evidence in support of stylized fact has been found
 ○: Evidence in support of stylized fact is (completely) absent

The table shows that not all studies have established the use of specific ports of entry and exit.⁸¹ We want to get some idea as to whether the industry, the size, the growth rate, and the firm performance can have influenced the results. It is noteworthy that five case studies were conducted within the financial service industry (i.e. banking or insurance) (BGH, 1994a & 1994b; Seltzer and Merrett, 2000; Treble et al., 2001; Kwon, 2006) and relied mostly on analyses of white-collar workers. These studies did find evidence of specific ports of entry, consistent with previous studies that have identified financial services as an industry with a predominance of ILMs (Eriksson and Werwatz, 2003). The two case studies that found no or only very limited proof (Dohmen et al., 2004; Hamilton and MacKinnon, 2001) were in the railway and aerospace industry and both experienced financial distress as well as negative growth (in terms of employees). Two different case studies, which both used data from relatively small companies (Seltzer and Merrett, 2000; Lin, 2005), found support for ports of entry, but both companies also had a relatively high growth rate.

Thus, although there is some indication that the potential determinants do indeed influence the ports of entry, more general conclusions can only be drawn based on multi-firm analyses.

5.3 Data and Methodology

5.3.1 *Characteristics of the Danish labor market*

Since we use Danish data we first briefly discuss the main characteristics of the Danish corporate sector. Denmark is a country with a large number of mostly small, privately-owned companies. This stands in contrast with other countries, for example the U.S., where many large publicly-traded companies exist. This might be important, since the size of the company potentially influences the existence of ports of entry and exit. Also, the ownership structure can have a relationship with (parts of) the ILM. For example, in a privately-owned company, where the owner is also the CEO, poor performance is not likely to lead to CEO-turnover.⁸²

Another important characteristic of the Danish labor market concerns the legal rules regarding dismissals and unemployment. Scandinavian countries are typically described as being welfare states in which the rights of employees are considered to be of paramount importance. In general, this also holds for Denmark, but there are some important exceptions. Employees can be laid off on the spot or with short notice, varying between a minimum length of 0 and a maximum of 6 months (depending on the occupation, the contract type and tenure of the employees). The flip side of this system is a generous unemployment system that provides unemployment benefits with hardly any waiting time, with a maximum compensation rate of 90 percent of the previous job and an upper limit for high incomes such that for high incomes the effective percentage will be lower than 90 percent. Pension systems and sickness benefits are portable and not dependent of the employer. These rules and regulations result in a turnover rate that is comparable with that

⁸¹ The studies mainly deal with ports of entry. Therefore, we will discuss the differences and similarities concerning ports of entry and not refer to ports of exit.

⁸² With respect to public companies, Lausten (2002) describes the two-tier Danish corporate governance system with a board of executive directors and a separate supervisory board. The supervisory board appoints the executive board members, including the CEO, and is supposed to act as a control mechanism that should ensure a shareholder orientation (Rose and Mejer, 2003).

of the U.S., and the average tenure is thus remarkably similar: 7.9 years in Denmark versus 7.4 years in the U.S. (OECD, 1997) and lower than in Sweden and Finland (10.5).⁸³ All together, Denmark combines the welfare system of the Scandinavian countries with the ‘hiring and firing’ rules of the United States.

5.3.2 Data, variables and methodology

The data used in this study is a subset of the Integrated Database (IDA) for Labor Market Research constructed for the Danish Center for Corporate Performance, CCP. This database contains data for all Danish residents in the period 1980-2000 and is maintained by Statistics Denmark and CCP. Workplaces and individuals can both be tracked over time with an identification code, while individuals are linked to workplaces in the November of each year. This enables analyses at both the individual and the organizational level. At the individual level, the data set contains information on, for example, age, education, gender, tenure, wage level, and the occupational code (ISCO). The ISCO code identifies job classes of individual employees. At the firm level, the data set contains information on the firm’s industry group and its financial performance. No information is available on private or public ownership of the company.

We identify ports of entry and exit in three steps. A first step is to distinguish levels within the organization, in order to identify where employees enter and leave the organization. The four-digit ISCO code is used to identify the CEO and to distinguish between the top-management level, the middle-management/professionals⁸⁴ (e.g. white-collar workers) and the lower-level employees.⁸⁵

After identifying the job levels, the second step is to identify ports of entry and exit. The number of people entering (leaving) an organization at a certain job level has to be related to the total number of people entering (leaving). We define the relative turnover at level X in year t as:

Relative Turnover at Level X in year t =

$$\left(\frac{\text{\# of employees leaving the company from level X in year t}}{\text{Total \# of employees leaving the company in year t}} \right) \quad (5.1)$$

⁸³ See also Figure 6.1.

⁸⁴ We will use these two terms interchangeably.

⁸⁵ To identify the CEO we mostly relied on the 1210 code, normally reserved for the Chief Executive Officers. Since this position was not always filled, or sometimes filled by more than one person at the same time, we also used 122- (production and operations managers), 123- (other specialist managers) and 13--(managers of small enterprises) to ensure we had a sample of the top-managers. A combination of these codes and the wage-level (the highest wage of the organization) was used to identify the CEO. However, for some cases, identifying the CEO was still complicated. If this was the case, we dropped the company in order to ensure the data set contains companies where the factual CEO was identified. We were unable to manually search for the CEO in public sources, since both the company and the individuals are anonymous. All other employees with the codes described are labeled “top-management”. Employees with an ISCO code between 2000 and 3000 are classified as middle-management (professional white-collar workers). Employees in the remaining ISCO codes are labeled as lower-level employees. The ISCO codes are absolute, implying that a firm can consist of mainly white-collar workers, while other firms have mainly blue-collar workers.

and relative inflow as:

Relative Inflow Level X in year t =

$$\left(\frac{\# \text{ of employees entering the company at level X in year t}}{\text{Total \# of employees entering the company in year t}} \right). \quad (5.2)$$

The third step will be to distinguish ports of entry and exit within levels. We will use the relative wages of employees within their level to determine the position within a level at which an employee enters or exits the organization. The definition of this measure is the median wage of the employees leaving (entering) relative to the incumbents' median wage at the same level.⁸⁶

Relative wage of employees leaving at level X in year t =

$$\log \left(\frac{\text{Median wage employees leaving the company level X in year t}}{\text{Median wage incumbents level X in year t}} \right), \quad (5.3)$$

and

Relative wage of employees entering at level X in year t =

$$\log \left(\frac{\text{Median wage employees entering the company level X in year t}}{\text{Median wage incumbents level X in year t}} \right). \quad (5.4)$$

The variables defined by Equations 5.1 to 5.4 serve as the dependent variables of our analyses.

The independent variables consist of two groups. The first group contains the potential determinants of ports of entry and exit that we discussed previously: namely, the profitability level of the company, the size of the company, the growth rate of the company, and the industry in which the company operates. As a performance or profitability indicator we will use Return On Assets (ROA) defined as:

⁸⁶ We use the logarithm since we do not wish to exclude exceptionally high or low wage differentials, but rather take them into account in proportion.

$$Return\ On\ Assets = \left(\frac{Net\ Operating\ Profit}{Operating\ Assets} \right), \tag{5.5}$$

in which operating assets equals the sum of fixed assets, inventory, work in progress and trade and other debtors minus the trade creditors. The logarithm of the total number of employees is used as the size variable, while the change in the number of employees measures the growth rate of the organization.⁸⁷ Furthermore, industry dummies are created using the industry code provided by IDA.⁸⁸

The second group of independent variables consists of control variables. We control for the average age, education, and gender of the employees within the organization. The inclusion of these variables can be compared with the CEO-specific control variables used in the CEO turnover literature. We also include the relative size of a level (number of workers in a level divided by the total number of employees in the organization) in the regression models, where the relative inflow (1) or the relative outflow of the level (2) are the dependent variables. Furthermore, while estimating the relative inflow in a level, we control for the outflow at this level in the period before. Finally, year dummies are included.

Econometrically, we will estimate the relationship between the dependent and independent variables on this panel data set by means of random effects and fixed effects models. The reason for using both methods is the different questions that can be answered from the individual analyses. The random effects model allows us to include certain observable firm-specific characteristics that do not vary over time (such as type of industry). The fixed effects model does not allow for this extra scrutiny but controls for unobserved firm-specific differences. Thus, the fixed effects model provides information on the differences over years within a firm, while the random effects model also helps in finding the determinants of differences between firms. Since the main focus of this study is to find characteristics that differ between firms, the random effects model is predominant in our analyses.

We will separately investigate the determinants of CEO departure and succession. Unfortunately, data on the reason for the departure of executives are not available, and thus a split between forced and unforced turnover cannot be made. The data do, however, give us a good opportunity to investigate whether the CEO is replaced from within the organization (*insider*) or from the outside. We classify the CEO as being an insider if he/she has worked for the organization in the previous two years before being appointed CEO. For analyzing the CEO turnover and replacement, a logit model is used, since the dependent variable is an ordinal variable. Additional independent variables in the CEO-regressions are the age, education, and gender of the incumbent CEO.

5.3.3 Sample

The sample was constructed based on the availability of the different data items. Our preference for using data on financial performance has led to the decision to exclude

⁸⁷ Organizations growing by more than a factor of 3 in a single year or shrinking by a factor of 3 or higher have been excluded. The variable "growth" can therefore take values between 0.33 and 3, with 1 denoting no change in growth (i.e. size is 100 percent of the year before).

⁸⁸ The exclusion of outliers (i.e. companies with exceptional levels of ROA or growth) leads to the omission of less than 1 percent of the total number of observations.

public sector organizations. Since no accounting data were available for financial service companies, this industry has been excluded as well. The period we study is 1992-1997, since these were the only years for which accounting data were available in the database. A total sample of 10,224 firms was reduced to 7,389 firms by selecting only those firms that employ at least 50 employees, in order to ensure that we can distinguish various job levels within an organization. Furthermore, we also exclude companies with less than 5 employees in one of the three job levels. Also, in order to control for outliers, ROA that is above 100 percent or below -100 percent are excluded, as well as companies that grow or shrink by more than a factor of 3 in a year. All this selection leaves a sample of 1,465 firms.⁸⁹

Tables A5.1 and A5.2 in Appendix A5 show an overview of the sample and the descriptive statistics of the dependent variables used (Table A5.2). Table A5.1 presents an overview of the sample that consists of between 731 and 851 firms, depending on the year. Most firms are quite small: roughly 80 percent of the sample companies have fewer than 250 employees. Table A5.1 also shows that over 50 percent of the firms are operating in the manufacturing industry.

5.4 Results

In this section we present the results. First, we focus on the four potential determinants. After analyzing their effect on ports of exit and entry, we focus on the specific case of CEO turnover. Finally, we investigate what portion of the overall variation in the usage of ports of entry and exit is explained by firm characteristics (i.e. the four determinants).

5.4.1 Determinants of ports of entry and exit

Our first estimates focus on ports of exit and exit rates, since the number of employees leaving a firm is a potential determinant of the number of new job openings. These analyses concentrate on both total turnover and turnover at different levels of the organization. Table A5.3 in Appendix A5 presents the estimates of the turnover rate per firm as a whole, i.e. the percentage of workers leaving, without differentiating between levels, while Table A5.4 presents the regression results for top- and middle-management turnover relative to total turnover. The dependent variable of Table A5.4, relative turnover at level X, was explained earlier in Equation 5.1. These estimations show differences in turnover rates *between* levels. An additional control variable in these estimations is the relative size of the level for which the turnover rates are estimated.⁹⁰ The dependent variable used in Table A5.5, relative wage of employees leaving at level X, was explained in Equation 5.3. These estimations provide insights on where employees leave an organization *within* a level.

⁸⁹ Since we wish to control for a survivorship bias, we decided against creating a balanced sample. Thus, for some companies data is available for all 6 years, while other firms are only included in our sample for a spell of 2 years.

⁹⁰ We also estimated the turnover rates for each level, where we immediately controlled for the size of the level in the calculation of the dependent variable rather than using this additional control variable. For example, we estimated the relative turnover at level X using $\log\left(\frac{1 + \text{Percentage Employees Leaving Level X}}{1 + \text{Percentage All Employees Leaving}}\right)$ as the dependent variable. The results proved to be robust and similar to the results presented in Table A5.4.

Table 5.2: Summary of results

	Turn-over Rate		Relative Turnover			Relative Wage Level Outflow			Relative Inflow		Relative Wage Level Inflow		
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI		
	Entire org. Table A5.3	Top-man. Table A5.4a	Middle-man. Table A5.4b	Top-man. Table A5.5a	Middle-man. Table A5.5b	Lower-level Table A5.5c	Top-man. Table A5.6a	Middle-man. Table A5.6b	Top-man. Table A5.7a	Middle-man. Table A5.7b	Lower-level Table A5.7c		
	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	
<i>Profitability</i>													
ROA	-	-	-	-			-				-	-	-
<i>Size</i>													
Log(employees)		+		-			-			-			
<i>Growth</i>													
Growth (%)	-	-					-		-	-	-	-	
Growth ^ 2	+	+					+	+	+	+	+	+	
<i>Industry</i>													
Manuf. of food, beverages and tobacco	-		+	+			+			+			
Manuf. of textiles, clothing, leather	-			+		-		-	+	+		-	
Manuf. of wood products, printing and publ.	-		+	+			-		+	+		-	
Manuf. of chemicals, plastic products, etc.	-		+	+				-		+			
Manuf. of other non-metallic mineral products	-		+	+					+				
Manuf. of basic metals and fabr. metal prod.	-		+	+					+	+			
Manuf. of furniture; manufacturing n.e.s.	-		+	+					+	+		-	
Sale and repair of motor vehicles, etc.	-							+		-		-	
Ws. and commis. trade, excl. m. vehicles	-		+	+					-			-	
Re. trade and repair work excl. m. vehicles	-		+	+					+			-	
Hotels and restaurants			+	+				+					
Transport	-		+	+					-	+		-	
Letting and sale of real estate													
Business activities, etc.			+	+					+	+			
Ref. disposal, organiz., entertainment, etc.			+	+					+				

Legend of results: +: Coefficient is estimated to be significantly positive (at least at 10% level).
 -: Coefficient is estimated to be significantly negative (at least at 10% level).

Similar to the ports of exit, Tables A5.6 and A5.7 present the estimations of differences in inflow rates *between* levels (see Equation 5.2) and differences *within* levels (see Equation 5.4).⁹¹ Because of the great number of tables we present a summary of all the results in Table 5.2. This table concentrates on the variables of interest (the four determinants) and gives an overview of the results of both the random effects estimations (RE) and the fixed effects estimations (FE).

5.4.1.1 Profitability

The first column (I) of Table 5.2 refers to Table A5.3 in Appendix A5 and investigates the number of employees leaving the organization (relative to the size of the organization). As can be seen from the results of both the fixed effects and the random effects estimations, the profitability rate in a year (ROA, see Equation 5.5) has a significantly negative relationship with the level of turnover of the entire organization. This indicates that companies with a relatively low profitability have higher turnover rates (random effects model) and also that companies with a low profitability in a certain year (i.e. below their average profitability level) have a higher turnover rate (fixed effects model). When looking at turnover rates per level, the results show a significantly negative relationship of ROA with top-management turnover. Whereas we first concluded that poor financial performance and higher turnover are related for the entire organization, this result is more distinct at the top-management level relative to the rest of the organization. We do not find the same effect of financial performance on the turnover rate of middle-managers in column III (refers to Table A5.4b).⁹²

Next, we analyze the ports of exit within the three different levels (see the results in columns IV-VI). Here, we only find a significant relationship for profitability when investigating the middle-management. Low profitability is related to separation of those middle-managers who have a high wage level. Overall, profitability seems to have a distinct relationship with ports of exit: low profitability and high turnover are related in general, but a relationship also exists with relative high turnover of top-managers and of highly paid middle-managers. This might be explained by two phenomena. First of all, poorly performing managers are likely to be fired when their performance is low. Secondly, better performing managers potentially voluntarily leave the organization and explore the external labor market to find an organization that offers more career opportunities.

Our analyses indicate further that profitability has no relationship with the level at which employees enter a company, as can be seen in columns VII and VIII. Whereas we previously found that a lower profitability is connected to relatively high top-management turnover rates, we do not find evidence that managers are more likely to be replaced by outsiders (relative to hiring outsiders at other levels). The results show that profitability has a negative effect on the entrant's relative wage levels for both the top- and the middle-management of the organization. This implies that highly profitable companies have managers entering at relatively low wage levels, whereas companies with a low profitability hire managers at a relatively high wage position. Possible explanations are that experienced managers are hired to restructure the company, and that managers require a

⁹¹ We do not present the inflow rates for the complete organization, since estimating this variable is mainly determined by the growth rate of the company, and the results do not provide additional insights on ports of entry.

⁹² We do not present the analyses for the lower-level workers. Naturally, this group would show the direct opposite results since the dependent variables correct for the turnover of the entire organization. Thus, where we find that poor financial results lead to higher turnover rates at the top-management level and have no effect on the middle-management, the estimations for the low-level workers show that good financial results lead to higher turnover rates at the lower-level of organizations.

type of risk premium for the hazard of working at a less profitable company.⁹³ Thus, we conclude that ports of entry, when looking within a level, are also related to the profitability level of the firm.

5.4.1.2 Size

The next determinant is the size of the company. When looking at ports of exit, the estimations in the two models (random effects and fixed effects) lead to different results. The number of employees has no significant effect on turnover rate in the random effects model, whereas the effect is significantly positive for the fixed effects model. This result implies that turnover rate is higher if a firm is larger in a specific year than its average size over the years, which is an expected outcome of the fixed effects technique. More noteworthy, when looking at the different levels, the results show that the size of the company has a negative effect on turnover at the higher management level. Within larger organizations turnover rates appear to be higher at the lower-levels relative to the top-management in the fixed effects model. Apparently, organizations that are larger in a certain year than their average size return to their normal standard by down-sizing more fiercely in the lower and middle ranks than in the top-management. Overall, firm size is not a determinant that helps understand differences in ports of exit between firms. The fixed effects models, studying within firm variation, show that the size of a company helps to explain in what way companies return to their theoretical mean size in the sample period.

Regarding ports of entry, we find a noteworthy significant relationship between the size of the company and at what position the employees enter a company. Transecting the organization into three levels, we find that larger firms have significantly less inflow at the top level relative to inflow at other levels. Thus, comparing between firms, larger firms tend to make less use of the top-management level as a port of entry and prefer homegrown management. A possible explanation is that larger firms have a larger reserve of potential top-managers. Alternatively, larger firms can have the critical mass to provide training opportunities for prospective managers, which enables them to slowly develop into a new role, which is potentially less or absent for small firms.

5.4.1.3 Growth

Concerning the firm's growth rate, measured by the change in the number of employees, both the random effects and the fixed effects model indicate that firms with higher growth rates have lower turnover rates, as can be expected. Hence, firms that grow faster than their competitors have lower turnover rates (random effects model), and firms that grow faster in a specific year than their average growth rate over the period analyzed also have lower turnover rates (see the results in column II of Table 5.2). Furthermore, when looking at relative turnover, the results show that a company's growth rate has, if anything, a negative relationship with exit rates at the middle-management level. The determinant 'growth' also is connected to the wage level at which workers exit an organization at the middle-management level (results in column V). Thus, employees who leave an organization at the middle-management level in a high growth situation are those employees with a lower wage level: for example, employees who miss out on the internal career opportunities. In two instances (i.e. turnover at the entire organization and relative wage level of employees leaving the middle-management), the estimations indicate that the negative effect of growth on turnover is somewhat overridden by the significant positive effect of the quadratic term. The positive coefficient for growth squared combined with the

⁹³ Theoretically, an alternative explanation would be that poor financial conditions have lowered the wages of the incumbent workers, leading to similar outcomes. In practice, nominal wage decreases are exceptional (see the results in Table 2.4 and Chapter 4), and thus this explanation is improbable.

negative coefficient for growth indicates a concave function (U-shaped). Since the growth variable can take values between 0.33 and 3, this leaves the minimum of the function within the distribution of potential values. In fact, in these two cases the estimated minimum is larger than 1 (1.6 for top-management and 1.3 for middle-management), indicating that only high growth (larger than 60 percent or 30 percent growth in a single year) is beyond the minimum. Up until the minimum, growth has a significant negative relationship with turnover rates. A possible explanation is that a merger or acquisition is the reason for the large growth (i.e. larger than 30, 60 percent) and the post merger integration causes turnover in these higher ranks.

All equations relating to entry show that high growth firms have less inflow at the top- and middle-management level than low growth firms. Again, the results show a concave function, with the minimum being larger than 1.7 (i.e. more than 70 percent growth in a single year) in both cases. Furthermore, the results show that growth has a negative relationship with the relative wage level of newly-entering top-managers, both relative to other companies (random effects model) and relative to other years (fixed effects model). The estimates indicate that high growth companies attract managers at a lower wage level, which leaves them with the opportunity to obtain wage increases within the organization. For example, young and less experienced workers, who can develop themselves within the organization in the future, are attracted at lower-levels, while incumbents are already following this internal career track and fulfilling job openings at higher wage levels. Again, the growth-squared variable has a tendency to reduce the result, the minimum being at 1.5 (i.e. 50 percent growth). In contrast, high growth firms attract relatively high-paid employees at the lower-level (see column XI). Apparently, high growth firms have a requirement to hire lower-level employees with high capabilities.

5.4.1.4 Industry

The fourth determinant of ports of entry and exit is industry. The effect of industry on ports of entry and exit can only be established through the random effects model. The estimates of the turnover rate of the company shows that, compared with the construction industry (the reference industry), turnover is significantly lower in most of the other industry groups (e.g. manufacturing). Looking inside the company, the results show that turnover is relatively high at the top of the organization within the manufacturing industry, but also at the top in retail, hotels and restaurants, transport and other business activities. This result is persistently found for the top-management level of a company (see column II, corresponding with Table A5.4a in Appendix A5) and holds also for the middle-management. Combining this with the previously found result (i.e. a lower total turnover rate in the manufacturing industry) leads to the conclusion that the construction industry, the benchmark, has a higher turnover rate, in particular for blue-collar workers. This possibly indicates that within the construction industry the flow between blue-collar and white-collar workers is relatively low, leading to increased turnover for blue-collar workers. Industry does not have a large impact on the ports of exit within a level (columns IV-VI).

Regarding ports of entry, the results (see columns VII and VIII) show that some sectors within the manufacturing industry hire relatively more employees at the professional and top-management levels of the organization than the benchmark industry. This indicates that in the manufacturing industry fewer blue-collar workers advance to the middle- and top-management. Apparently, different skills are required since more employees need to be hired from the outside to fill higher positions. Regarding the influence of the industry, the results show that in the wholesale, retail and transportation industries top-managers are hired at lower wage levels (relative to the incumbents) than in other industries. These results do not hold for the middle-management level.

5.4.2 CEO turnover

The position of the CEO is a specific port of entry and exit, since the current firm offers no promotion opportunities for the incumbent CEO. More generally, according to the tournament model, the incentive effect of a promotion for board members depends on the chance that the position of CEO becomes vacant. We include a test for CEO turnover to illustrate (1) the commonalities in approach (technique) between CEO turnover literature and personnel economics and (2) the similarities in outcomes. The left-hand side of Table 5.3 presents the results of the panel regression that uses a dummy for CEO turnover in the next year as the dependent variable. It shows that there is no significant relationship between profitability and the likelihood that the CEO will be replaced, unlike the results concerning top-management turnover shown in Table A5.4a of Appendix A5 (see Section 5.4.1.1). A likely explanation is the high number of family-owned firms in Denmark, where the owner also fulfills the role of CEO. Unfortunately, the data do not permit the identification of family ownership.

The right-hand side of Table 5.3 presents the results regarding the succession of the CEO. The dependent variable is a dummy variable that takes the value 1 if the new CEO comes from the inside, which is the case in 76 percent of CEO successions in the sample. A lower profitability rate in the year previous to the departure of the incumbent CEO increases the chance that the new CEO will be hired from the outside rather than from within, consistent with existing CEO-turnover literature. This might be due to the need for poorly performing companies to attract an outsider who can turn around the financial situation (see Huson et al., 2004). The result is in line with the previous observation that poor performance will increase the wage level of newly hired top-managers (see Section 5.4.1.1), since this newly hired manager can in fact be the new CEO. The other determinants (size, growth rate, and industry) have no significant effect on the succession decision.⁹⁴

5.4.3 Variance explained

The previous section showed in which cases the proposed determinants of entry and exit at various hierarchical levels were significant. But what percentage of the total variance across firms in the usage of ports of entry and exit is explained by the four factors (size, growth rate, industry and profitability)? The answer to this question, i.e. knowledge of the explanatory power of the determinants, is important to better understand the impact of the four determinants on ports of entry and exit.

⁹⁴ In these estimations, we include four industry dummies, which is an aggregate of the previous set of industry dummies (due to sample size). None of these dummies are estimated to have a significant relationship in either of the two specifications of Table 5.3.

Table 5.3: CEO-turnover and succession

	CEO Change Next Year ⁹⁵		Replaced by Insider ⁹⁶	
	(RE Model)			
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.151	(0.809)		
ROA prev. year (t-1)			4.209**	(2.046)
Log(employees)	0.013	(0.113)	0.211	(0.277)
Growth (%)	0.094	(2.749)	7.612	(4.790)
Growth ^ 2	-0.435	(1.230)	-4.043*	(2.110)
Age incumbent	0.006	(0.010)	0.006	(0.020)
Education incumbent	0.032	(0.037)	-0.07	(0.097)
Gender incumbent	-1.140***	(0.375)	1.086	(0.696)
Avg. top size	1.961*	(1.057)	-0.032	(2.008)
Constant	-2.505	(4.883)	-4.104	(3.531)
Industry dummies	Yes		Yes	
Year dummies	Yes		Yes	
Age dummies	Yes			
Education	Yes			
Gender	Yes			
R ²			0.158	
N (Groups)	499			
N (Observations)	1861		239	

**p* < .10, two-tailed tests.
 ***p* < .05, two-tailed tests.
 ****p* < .01, two-tailed tests.

In order to answer this question, all random effects regressions are estimated again, while excluding the proposed determinants and including the control variables. Table 5.4 shows the R² of all regressions for the two distinct situations and also the F-test for the determinants. The results of the different F-tests show that the determinants contribute significantly to the explanation of the variance in the dependent variables; the contribution is significant at the 1 percent level in all cases (but one). The last column shows that the variance explained by the determinants varies between 0.8 and 8.3 percent. Although this seems small, the variance explained by the control variables is low in some cases as well (especially while estimating the relative wage levels), making the relative contribution of these additional determinants quite large (see the last column with relative difference in R²). Nonetheless, much variance remains unexplained, indicating that further research is needed.⁹⁷

⁹⁵ The fixed effects model showed similar results with also no significant effect of ROA on CEO-turnover. Splitting the sample into groups based on the size of the companies did not change the outcomes of the regression.

⁹⁶ Variable takes the value of 1 if the new CEO is an insider.

⁹⁷ R² are commonly small in cross-section analyses (see also Eriksson and Werwatz, 2003).

Table 5.4: Variance explained by the determinants

Dependent Variable	Level	Table	F-Test <i>Prob. > Chi2</i>	Overall R ²		Difference in R ²	
				<i>Complete Regression</i>	<i>Control Variables</i>	<i>Relative</i>	<i>Absolute</i>
<i>Turn-over Rate</i>	Entire org.	A5.3	0.000	0.202	0.119	10%	8.3%
<i>Relative Turnover</i>	Top-man.	A5.4a	0.000	0.299	0.283	6%	1.6%
	Middle-man.	A5.4b	0.000	0.486	0.472	3%	1.4%
<i>Relative Wage Level Outflow</i>	Top-man.	A5.5a	0.022	0.038	0.023	65%	1.5%
	Middle-man.	A5.5b	0.001	0.034	0.017	100%	1.7%
	Lower-level	A5.5c	0.000	0.069	0.054	28%	1.5%
<i>Relative Inflow</i>	Top-man.	A5.6a	0.000	0.317	0.304	4%	1.3%
	Middle-man.	A5.6b	0.000	0.470	0.462	2%	0.8%
<i>Relative Wage Level Inflow</i>	Top-man.	A5.7a	0.000	0.065	0.047	38%	1.8%
	Middle-man.	A5.7b	0.005	0.025	0.008	213%	1.7%
	Lower-level	A5.7c	0.000	0.135	0.107	26%	2.8%

5.5 Conclusion

This chapter has analyzed the variation in stylized facts of ILMs along four firm characteristics. More specifically, we analyzed the impact of the size of the organization, its growth rate, the type of industry, and the financial performance, on employee turnover and ports of entry and exit. Our results show that these factors affect the usage of ports of entry and exit significantly and should be taken into account while reviewing single-firm analyses.

Financial performance affects ports of entry and exit in two ways. First of all, poor performance is related with higher employee turnover rates at all levels in the organization. Poor performance specifically influences the outflow at the top-management level, although the CEO-level is an exception. Possible explanations are that companies wish to dismiss unsuccessful managers and appoint new managers with the ability to restructure the organizations in case of poor company results. A different explanation is that employees leave companies with poor profitability voluntarily to find work elsewhere.

Second, poor performance will generate a tendency to hire new top- and middle-managers at a higher wage level. Two possible explanations for this finding are that (1) better and more experienced managers are required, and (2) new managers have to be compensated for the extra risk entailed by entering a company in financial distress. In line with this result and the existing CEO-turnover literature, we find that outsiders rather than managers from within are succeeding the CEO in situations of poorer financial performance.

The size of a company has only limited impact on ports of exit. We find limited evidence that within firm variation in size explains turnover rates: organizations, when downsizing in a year in which they are relatively large in size, have a tendency to downsize less heavily at the top-management level. Potentially, top-management positions are less suitable to be made vacant when downsizing. Regarding ports of entry, we did find that larger organizations have relatively less inflow at the top layer.

The growth rate of a company has a relationship with the position where workers enter an organization. Fast-growing companies show a preference to hire outside employees at lower positions rather than at the top. Once new managers enter fast-growing organizations, they enter at a relatively low position compared with slower growing (or shrinking) organizations. Overall, larger and faster growing organizations provide more evidence of distinct ports of entry at lower-levels.

The impact of industry effects on ports of entry and exit is more difficult to generalize. We found some evidence that manufacturing companies have more exit and entry at the white-

collar levels, relative to the construction industry. This indicates that *within* manufacturing companies less exchange occurs across blue-collar and white-collar employees, presumably caused by larger differences in the required human capital. Unfortunately, financial services companies were not included in the analyses, and therefore we were unable to locate the strong industry effects that Eriksson and Werwatz (2003) found.

Our findings have implications for the interpretation of previous empirical research. Comparing the results with the characteristics of firms that were used for single-firm analyses in Table 5.1, we conclude that indeed most support for distinct ports of entry has been found in situations of large, growing, profitable companies (e.g. Howlett, 2001; Seltzer and Merrett, 2000). Indeed, Dohmen et al. (2004) and Hamilton and MacKinnon (2001) found no evidence of distinct ports of entry while investigating a slightly shrinking firm in financial distress, which is consistent with our findings. This indicates that the question "Do specific ports of entry (and exit) exist?" can not be answered univocally and in fact challenges the generalization of ILMs.

A closer examination of the variance explained by the four determinants shows that they do indeed contribute significantly to our understanding of ports of entry and exit, although much variance remains undetermined. This indicates a need for further research, potentially in two ways. First of all, the results show that other potential determinants should be included as well: for example, the corporate culture and the skills of incumbent employees. Much variance between organizations in the usage of distinct ports of entry and exit exists, which is shown not only by the results in this study, but also in Table 5.1 and in the study by Lazear and Oyer (2004). Finding other determinants will surely benefit the research in personnel economics, since ports of entry and exit are among the fundamentals of ILMs.

Second, the proxies for ports of entry and exit used in this study include much noise. It was only possible for us to distinguish between three job levels, which could be improved in future work. For example, in this study we were unable to create extensive within-firm job ladders. Some firms could have a vast majority of blue-collar workers, while other firms (in a different industry) consist of a large quantity of white-collar workers. These differences are likely to impact our results. More detailed job descriptions will lead to a better distinction between job levels and might increase the total variance explained.

This touches upon a major difficulty with taking a multi-firm approach, which is to correctly define jobs and thus job levels (e.g. Baker and Holmstrom, 1995) that are valid for firms in different industries. While case studies are able to explore the inside of organizations in such a way that more specific questions regarding ILMs can be answered, it would be impossible to study the same level of detail for a large number of companies simultaneously. Focusing on just two attributes: namely, ports of entry and exit, this study leads to more general conclusions regarding the impact of firm characteristics on the ILM, which is novel in itself. By doing so, we show that the factors discussed should be taken into account when assessing the general validity of conclusions resulting from analyses into aspects of internal labor markets by means of single-firm studies. Promising empirical investigations can be expected from future multi-firm analyses.

Appendix A5

Table A5.1: Sample statistics

		1992	1993	1994	1995	1996	1997
<i>Sample size</i>		779	731	810	804	799	851
<i>Size</i>	50-249	84.2%	82.6%	81.2%	81.5%	78.8%	79.6%
	250-499	10.8%	11.8%	13.2%	13.3%	14.6%	14.6%
	500-749	2.2%	3.4%	3.6%	2.4%	3.3%	2.9%
	750-999	1.9%	1.2%	0.9%	1.7%	1.1%	1.1%
	>1000	0.9%	1.0%	1.1%	1.1%	2.1%	1.9%
<i>Growth rate</i>	< - 2.5%	32.5%	36.1%	16.7%	19.3%	26.7%	21.2%
	- 2.5% / 0%	16.9%	17.6%	16.0%	14.4%	13.4%	13.0%
	0% / 2.5%	17.6%	18.1%	16.7%	21.0%	23.4%	21.9%
	2.5% / 5%	11.4%	10.0%	14.0%	13.6%	12.9%	14.3%
	> 5%	21.6%	18.2%	36.7%	31.7%	23.7%	29.6%
<i>Industry</i>	Manuf. of food, beverages and tobacco	6.3%	6.7%	6.2%	6.0%	5.9%	6.1%
	Manuf. of textiles, clothing, leather	3.2%	2.7%	2.6%	3.0%	3.0%	2.2%
	Manuf. of wood products, printing and publ.	6.4%	7.0%	6.9%	6.8%	7.8%	7.9%
	Manuf. of chemicals, plastic products, etc.	7.5%	6.9%	7.5%	7.9%	6.6%	6.3%
	Manuf. of other non-metallic mineral products	1.7%	1.9%	2.4%	2.1%	2.0%	2.6%
	Manuf. of basic metals and fabr. metal prod.	31.0%	30.0%	31.1%	30.2%	30.4%	30.1%
	Manuf. of furniture; manufacturing n.e.s.	2.9%	2.1%	2.1%	2.4%	3.3%	2.6%
	Construction	5.9%	5.8%	4.1%	5.3%	5.1%	4.6%
	Sale and repair of motor vehicles, etc.	4.1%	3.4%	3.3%	3.3%	3.4%	3.8%
	Ws. and commis, trade, excl. m. vehicles ⁹⁸	18.3%	19.2%	18.8%	19.0%	19.8%	19.5%
	Re. trade and repair work excl. m. vehicles ⁹⁹	4.6%	4.9%	4.8%	4.1%	4.0%	4.0%
	Hotels and restaurants	0.8%	1.1%	1.5%	1.0%	0.8%	0.7%
	Transport	3.3%	3.8%	3.3%	3.9%	3.4%	3.4%
	Letting and sale of real estate	0.5%	0.8%	0.5%	0.6%	0.8%	0.8%
	Business activities, etc.	3.2%	3.6%	4.6%	4.1%	3.5%	4.8%
	Ref. disposal, organiz., entertainment, etc.	0.7%	0.0%	0.2%	0.3%	0.4%	0.6%

⁹⁸ Ws refers to wholesale.⁹⁹ Re refers to retail.

Table A5.2: Descriptive statistics

	Mean	Std. Dev
<i>Dependent variables</i>		
Turn-over Rate (Entire org.)	0.211	(0.137)
Relative Turnover (Top-man.)	0.112	(0.109)
Relative Turnover (Middle-man.)	0.163	(0.154)
Relative Wage Level Outflow (Top-man.)	-0.107	(0.429)
Relative Wage Level Outflow (Middle-man.)	-0.028	(0.316)
Relative Wage Level Outflow (Lower-level)	-0.064	(0.208)
Relative Inflow (Top-Man.)	0.118	(0.114)
Relative Inflow (Middle-man.)	0.155	(0.149)
Relative Wage Level Inflow (Top-man.)	-0.287	(0.434)
Relative Wage Level Inflow (Middle-man.)	-0.135	(0.327)
Relative Wage Level Inflow (Lower-level)	-0.129	(0.249)
CEO Change Next Year	0.104	(0.305)
Replaced by Insider	0.758	(0.429)
<i>Selection of independent variables</i>		
ROA	0.084	(0.110)
Log (Employees)	4.933	(0.698)
Growth rate	1.048	(0.221)

Table A5.3: Turnover rates for total organization

	Turnover Rate (RE model)		Turnover Rate (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.155***	(0.017)	-0.100***	(0.019)
Log(employees)	0.007	(0.004)	0.060***	(0.011)
Growth (%)	-0.134***	(0.033)	-0.093***	(0.036)
Growth ^ 2	0.049***	(0.012)	0.030**	(0.013)
Manuf. of food, beverages and tobacco	-0.054***	(0.018)		
Manuf. of textiles, clothing, leather	-0.071***	(0.022)		
Manuf. of wood products, printing and publ.	-0.061***	(0.016)		
Manuf. of chemicals, plastic products, etc.	-0.078***	(0.017)		
Manuf. of other non-metallic mineral products	-0.059**	(0.024)		
Manuf. of basic metals and fabr. metal prod.	-0.086***	(0.013)		
Manuf. of furniture; manufacturing n.e.s.	-0.087***	(0.021)		
Sale and repair of motor vehicles, etc.	-0.108***	(0.020)		
Ws. and commis. trade, excl. m. vehicles	-0.059***	(0.014)		
Re. trade and repair work excl. m. vehicles	-0.046**	(0.021)		
Hotels and restaurants	-0.009	(0.032)		
Transport	-0.055***	(0.020)		
Letting and sale of real estate	-0.004	(0.036)		
Business activities, etc.	0.022	(0.020)		
Ref. disposal, organiz., entertainment, etc.	-0.033	(0.047)		
Constant	0.495***	(0.125)	0.413*	(0.198)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.060		0.085	
R ² between	0.215		0.001	
R ² overall	0.202		0.002	
N: Groups	1465		1465	
N: Observations	4758		4758	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.4a: Relative turnover of top-management

	Rel. turnover top-management (RE model)		Rel. turnover top-management (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.044***	(0.013)	-0.054***	(0.018)
Log(employees)	-0.003	(0.002)	-0.028***	(0.010)
Growth (%)	-0.039	(0.028)	-0.033	(0.033)
Growth ^ 2	0.012	(0.010)	0.010	(0.012)
Manuf. of food, beverages and tobacco	0.017*	(0.010)		
Manuf. of textiles, clothing, leather	0.005	(0.012)		
Manuf. of wood products, printing and publ.	0.041***	(0.009)		
Manuf. of chemicals, plastic products, etc.	0.023**	(0.009)		
Manuf. of other non-metallic mineral products	0.049***	(0.013)		
Manuf. of basic metals and fabr. metal prod.	0.017**	(0.007)		
Manuf. of furniture; manufacturing n.e.s.	0.051***	(0.012)		
Sale and repair of motor vehicles, etc.	-0.003	(0.011)		
Ws. and commis. trade, excl. m. vehicles	0.008	(0.008)		
Re. trade and repair work excl. m. vehicles	0.023*	(0.012)		
Hotels and restaurants	0.053***	(0.019)		
Transport	0.020*	(0.011)		
Letting and sale of real estate	0.016	(0.021)		
Business activities, etc.	0.046***	(0.011)		
Ref. disposal, organiz., entertainment, etc.	0.116***	(0.027)		
Constant	-0.171**	(0.085)	-0.237	(0.182)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.006		0.034	
R ² between	0.441		0.061	
R ² overall	0.299		0.070	
N: Groups	1460		1460	
N: Observations	4745		4745	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.4b: Relative turnover of middle-management

	Rel. turnover middle management (RE model)		Rel. turnover middle-management (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.003	(0.016)	-0.004	(0.022)
Log(employees)	-0.003	(0.003)	0.001	(0.012)
Growth (%)	-0.056*	(0.034)	-0.048	(0.041)
Growth ^ 2	0.018	(0.013)	0.018	(0.015)
Manuf. of food, beverages and tobacco	0.039***	(0.012)		
Manuf. of textiles, clothing, leather	0.051***	(0.015)		
Manuf. of wood products, printing and publ.	0.035***	(0.011)		
Manuf. of chemicals, plastic products, etc.	0.046***	(0.011)		
Manuf. of other non-metallic mineral products	0.041***	(0.016)		
Manuf. of basic metals and fabr. metal prod.	0.033***	(0.009)		
Manuf. of furniture; manufacturing n.e.s.	0.037**	(0.014)		
Sale and repair of motor vehicles, etc.	0.010	(0.013)		
Ws. and commis. trade, excl. m. vehicles	0.071***	(0.010)		
Re. trade and repair work excl. m. vehicles	0.050***	(0.014)		
Hotels and restaurants	0.063***	(0.023)		
Transport	0.093***	(0.014)		
Letting and sale of real estate	0.019	(0.025)		
Business activities, etc.	0.064***	(0.013)		
Ref. disposal, organiz., entertainment, etc.	0.075**	(0.033)		
Constant	-0.249**	(0.104)	-0.268	(0.225)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.076		0.085	
R ² between	0.632		0.443	
R ² overall	0.486		0.356	
N: Groups	1460		1460	
N: Observations	4745		4745	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.5a: Relative wage of outflow in top-management

	Log(rel. wage outflow top-management) (RE model)		Log(rel. wage outflow top-management) (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.087	(0.071)	-0.032	(0.104)
Log(employees)	-0.001	(0.013)	-0.011	(0.059)
Growth (%)	-0.070	(0.159)	-0.070	(0.202)
Growth ^ 2	0.029	(0.061)	0.026	(0.075)
Manuf. of food, beverages and tobacco	-0.009	(0.056)		
Manuf. of textiles, clothing, leather	-0.160**	(0.073)		
Manuf. of wood products, printing and publ.	0.007	(0.053)		
Manuf. of chemicals, plastic products, etc.	0.002	(0.054)		
Manuf. of other non-metallic mineral products	0.040	(0.077)		
Manuf. of basic metals and fabr. metal prod.	0.046	(0.043)		
Manuf. of furniture; manufacturing n.e.s.	-0.067	(0.070)		
Sale and repair of motor vehicles, etc.	0.049	(0.066)		
Ws. and commis. trade, excl. m. vehicles	-0.017	(0.047)		
Re. trade and repair work excl. m. vehicles	0.042	(0.068)		
Hotels and restaurants	-0.035	(0.104)		
Transport	-0.095	(0.064)		
Letting and sale of real estate	0.010	(0.123)		
Business activities, etc.	-0.127**	(0.062)		
Ref. disposal, organiz., entertainment, etc.	-0.240	(0.172)		
Constant	-0.576	(0.503)	0.319	(1.082)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.006		0.014	
R ² between	0.050		0.000	
R ² overall	0.038		0.000	
N: Groups	1227		1227	
N: Observations	3219		3219	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.5b: Relative wage of outflow in middle-management

	Log(rel. wage outflow middle-management) (RE model)		Log(rel. wage outflow middle-management) (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.112**	(0.050)	-0.086	(0.070)
Log(employees)	-0.016*	(0.009)	0.036	(0.041)
Growth (%)	-0.207*	(0.113)	-0.206	(0.137)
Growth ^ 2	0.078*	(0.043)	0.064	(0.050)
Manuf. of food, beverages and tobacco	0.116***	(0.041)		
Manuf. of textiles, clothing, leather	0.016	(0.052)		
Manuf. of wood products, printing and publ.	0.008	(0.039)		
Manuf. of chemicals, plastic products, etc.	0.064	(0.039)		
Manuf. of other non-metallic mineral products	0.079	(0.055)		
Manuf. of basic metals and fabr. metal prod.	0.061*	(0.032)		
Manuf. of furniture; manufacturing n.e.s.	0.013	(0.053)		
Sale and repair of motor vehicles, etc.	0.107**	(0.047)		
Ws. and commis. trade, excl. m. vehicles	0.022	(0.035)		
Re. trade and repair work excl. m. vehicles	0.041	(0.049)		
Hotels and restaurants	0.170**	(0.082)		
Transport	-0.033	(0.046)		
Letting and sale of real estate	-0.068	(0.083)		
Business activities, etc.	0.025	(0.046)		
Ref. disposal, organiz., entertainment, etc.	-0.140	(0.118)		
Constant	-0.296	(0.351)	0.665	(0.762)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.005		0.011	
R ² between	0.051		0.002	
R ² overall	0.034		0.001	
N: Groups	1294		1294	
N: Observations	3669		3669	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.5c: Relative wage of outflow in lower-levels

	Log(rel. wage outflow lower-levels) (RE model)		Log(rel. wage outflow lower-levels) (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.026	(0.029)	-0.004	(0.040)
Log(employees)	0.009	(0.006)	0.010	(0.023)
Growth (%)	-0.085	(0.063)	-0.044	(0.075)
Growth ^ 2	0.039*	(0.023)	0.024	(0.027)
Manuf. of food, beverages and tobacco	-0.034	(0.023)		
Manuf. of textiles, clothing, leather	-0.080***	(0.029)		
Manuf. of wood products, printing and publ.	-0.073***	(0.021)		
Manuf. of chemicals, plastic products, etc.	-0.036*	(0.022)		
Manuf. of other non-metallic mineral products	-0.032	(0.031)		
Manuf. of basic metals and fabr. metal prod.	-0.019	(0.017)		
Manuf. of furniture; manufacturing n.e.s.	-0.039	(0.028)		
Sale and repair of motor vehicles, etc.	-0.082***	(0.025)		
Ws. and commis. trade, excl. m. vehicles	-0.042**	(0.019)		
Re. trade and repair work excl. m. vehicles	0.018	(0.027)		
Hotels and restaurants	-0.065	(0.043)		
Transport	-0.058**	(0.026)		
Letting and sale of real estate	0.020	(0.050)		
Business activities, etc.	-0.043	(0.026)		
Ref. disposal, organiz., entertainment, etc.	-0.049	(0.067)		
Constant	-0.006	(0.200)	-0.359	(0.410)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.003		0.013	
R ² between	0.110		0.000	
R ² overall	0.069		0.000	
N: Groups	1440		1440	
N: Observations	4657		4657	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.6a: Relative inflow of top-management

	Rel. inflow top-management (RE model)		Rel. inflow top-management (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.011	(0.014)	0.002	(0.019)
Log(employees)	-0.006**	(0.003)	-0.015	(0.011)
Growth (%)	-0.136***	(0.034)	-0.105**	(0.042)
Growth ^ 2	0.040***	(0.012)	0.031**	(0.014)
Manuf. of food, beverages and tobacco	0.009	(0.011)		
Manuf. of textiles, clothing, leather	0.025*	(0.013)		
Manuf. of wood products, printing and publ.	0.042**	(0.010)		
Manuf. of chemicals, plastic products, etc.	0.016	(0.010)		
Manuf. of other non-metallic mineral products	0.034**	(0.014)		
Manuf. of basic metals and fabr. metal prod.	0.019**	(0.008)		
Manuf. of furniture; manufacturing n.e.s.	0.031**	(0.013)		
Sale and repair of motor vehicles, etc.	0.006	(0.012)		
Ws. and commis. trade, excl. m. vehicles	0.007	(0.009)		
Re. trade and repair work excl. m. vehicles	0.008	(0.013)		
Hotels and restaurants	0.024	(0.020)		
Transport	0.012	(0.012)		
Letting and sale of real estate	-0.004	(0.022)		
Business activities, etc.	0.046***	(0.012)		
Ref. disposal, organiz., entertainment, etc.	0.094***	(0.029)		
Constant	-0.008	(0.093)	-0.462**	(0.196)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Relative outflow at this level t-1	Yes		Yes	
Turnover rate t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.032		0.063	
R ² between	0.441		0.174	
R ² overall	0.317		0.152	
N: Groups	1456		1456	
N: Observations	4724		4724	

*p < .10, two-tailed tests.
 **p < .05, two-tailed tests.
 ***p < .01, two-tailed tests.

Table A5.6b: Relative inflow of middle-management

	Rel. inflow middle- management (RE model)		Rel. inflow middle- management (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	0.003	(0.015)	0.004	(0.022)
Log(employees)	-0.002	(0.003)	0.003	(0.013)
Growth (%)	-0.140***	(0.039)	-0.118**	(0.048)
Growth ^ 2	0.040***	(0.014)	0.033**	(0.016)
Manuf. of food, beverages and tobacco	0.029**	(0.011)		
Manuf. of textiles, clothing, leather	0.058***	(0.015)		
Manuf. of wood products, printing and publ.	0.025**	(0.011)		
Manuf. of chemicals, plastic products, etc.	0.029***	(0.011)		
Manuf. of other non-metallic mineral products	0.009	(0.015)		
Manuf. of basic metals and fabr. metal prod.	0.017**	(0.009)		
Manuf. of furniture; manufacturing n.e.s.	0.038***	(0.014)		
Sale and repair of motor vehicles, etc.	0.004	(0.013)		
Ws. and commis. trade, excl. m. vehicles	0.042***	(0.010)		
Re. trade and repair work excl. m. vehicles	0.039***	(0.014)		
Hotels and restaurants	0.034	(0.022)		
Transport	0.044***	(0.013)		
Letting and sale of real estate	0.027	(0.024)		
Business activities, etc.	0.054***	(0.013)		
Ref. disposal, organiz., entertainment, etc.	0.041	(0.032)		
Constant	-0.136	(0.103)	-0.641***	(0.224)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Relative outflow at this level t-1	Yes		Yes	
Turnover rate t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.050		0.065	
R ² between	0.630		0.407	
R ² overall	0.470		0.322	
N: Groups	1456		1456	
N: Observations	4724		4724	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.7a: Relative wage of inflow in top-management

	Log(rel. wage inflow top- management) (RE model)		Log(rel. wage inflow top- management) (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.173**	(0.071)	-0.197*	(0.101)
Log(employees)	0.011	(0.013)	0.043	(0.057)
Growth (%)	-0.422***	(0.153)	-0.280	(0.188)
Growth ^ 2	0.145**	(0.056)	0.082	(0.067)
Manuf. of food, beverages and tobacco	0.027	(0.056)		
Manuf. of textiles, clothing, leather	-0.006	(0.072)		
Manuf. of wood products, printing and publ.	-0.036	(0.053)		
Manuf. of chemicals, plastic products, etc.	0.006	(0.054)		
Manuf. of other non-metallic mineral products	0.031	(0.075)		
Manuf. of basic metals and fabr. metal prod.	0.007	(0.043)		
Manuf. of furniture; manufacturing n.e.s.	-0.012	(0.070)		
Sale and repair of motor vehicles, etc.	-0.157**	(0.063)		
Ws. and commis. trade, excl. m. vehicles	-0.098**	(0.047)		
Re. trade and repair work excl. m. vehicles	-0.133**	(0.067)		
Hotels and restaurants	-0.019	(0.108)		
Transport	-0.130**	(0.064)		
Letting and sale of real estate	-0.135	(0.116)		
Business activities, etc.	-0.069	(0.062)		
Ref. disposal, organiz., entertainment, etc.	0.033	(0.144)		
Constant	-0.981**	(0.497)	-0.289	(1.064)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.015		0.020	
R ² between	0.095		0.031	
R ² overall	0.065		0.027	
N: Groups	1295		1295	
N: Observations	3511		3511	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.7b: Relative wage of inflow in middle-management

	Log(rel. wage inflow middle-management) (RE model)		Log(rel. wage inflow middle-management) (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	-0.141***	(0.053)	-0.177**	(0.076)
Log(employees)	-0.012	(0.010)	-0.011	(0.043)
Growth (%)	0.094	(0.110)	0.155	(0.136)
Growth ^ 2	-0.017	(0.040)	-0.050	(0.048)
Manuf. of food, beverages and tobacco	0.035	(0.042)		
Manuf. of textiles, clothing, leather	-0.048	(0.055)		
Manuf. of wood products, printing and publ.	-0.078*	(0.040)		
Manuf. of chemicals, plastic products, etc.	-0.033	(0.041)		
Manuf. of other non-metallic mineral products	0.021	(0.058)		
Manuf. of basic metals and fabr. metal prod.	0.005	(0.033)		
Manuf. of furniture; manufacturing n.e.s.	0.037	(0.053)		
Sale and repair of motor vehicles, etc.	0.003	(0.048)		
Ws. and commis. trade, excl. m. vehicles	0.007	(0.036)		
Re. trade and repair work excl. m. vehicles	-0.080	(0.051)		
Hotels and restaurants	-0.024	(0.083)		
Transport	-0.049	(0.049)		
Letting and sale of real estate	-0.021	(0.086)		
Business activities, etc.	0.056	(0.047)		
Ref. disposal, organiz., entertainment, etc.	0.136	(0.118)		
Constant	-0.106	(0.368)	-0.971	(0.802)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.006		0.011	
R ² between	0.030		0.004	
R ² overall	0.025		0.006	
N: Groups	1309		1309	
N: Observations	3714		3714	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

Table A5.7c: Relative wage of inflow in lower-levels

	Log(rel. wage inflow lower-levels) (RE model)		Log(rel. wage inflow lower-levels) (FE model)	
	Coef.	Std.Err.	Coef.	Std.Err.
ROA	0.034	(0.035)	0.016	(0.045)
Log(employees)	0.005	(0.007)	-0.043	(0.026)
Growth (%)	0.316***	(0.070)	0.370***	(0.083)
Growth ^ 2	-0.067***	(0.026)	-0.088***	(0.030)
Manuf. of food, beverages and tobacco	-0.010	(0.027)		
Manuf. of textiles, clothing, leather	-0.065*	(0.034)		
Manuf. of wood products, printing and publ.	-0.086***	(0.025)		
Manuf. of chemicals, plastic products, etc.	-0.034	(0.026)		
Manuf. of other non-metallic mineral products	-0.049	(0.037)		
Manuf. of basic metals and fabr. metal prod.	-0.027	(0.021)		
Manuf. of furniture; manufacturing n.e.s.	-0.080**	(0.033)		
Sale and repair of motor vehicles, etc.	-0.122***	(0.030)		
Ws. and commis. trade, excl. m. vehicles	-0.041*	(0.023)		
Re. trade and repair work excl. m. vehicles	0.007	(0.032)		
Hotels and restaurants	0.071	(0.051)		
Transport	-0.079**	(0.032)		
Letting and sale of real estate	-0.024	(0.058)		
Business activities, etc.	-0.022	(0.032)		
Ref. disposal, organiz., entertainment, etc.	0.006	(0.074)		
Constant	0.058	(0.235)	-0.287	(0.464)
Age dummies	Yes		Yes	
Education	Yes		Yes	
Gender	Yes		Yes	
Rel. level size t-1	Yes		Yes	
Year dummies	Yes		Yes	
R ² within	0.041		0.049	
R ² between	0.185		0.013	
R ² overall	0.135		0.018	
N: Groups	1432		1432	
N: Observations	4618		4618	

* $p < .10$, two-tailed tests.** $p < .05$, two-tailed tests.*** $p < .01$, two-tailed tests.

