



Paper to be presented at the DRUID Academy 2012

on

January 19-21

at

University of Cambridge /The Moeller Centre

**Building Organizations from Scratch-Entrepreneurs Qualifications and
Labor Demand in Newly Founded Ventures**

Elisabeth Bublitz

Friedrich Schiller University Jena
School of Economics and Business Administration
elisabeth.bublitz@uni-jena.de

Florian Noseleit

University of Groningen
Faculty of Economics and Business
f.noseleit@rug.nl

Abstract

Small and young firms that are growth-oriented need qualified personnel. Although there has been recognition that human capital is decisive for the success of start-ups, little is known about the interrelation between qualifications of founders and their workforce. Yet, the founders' human capital influences which organizational tasks need to be carried out and thereby which type of labor fits best to the business. Building on the person-organization fit, we argue that during the start-up stage founders preferably employ workers that meet the organizational goal of increasing workforce flexibility. Our results show that founders' qualifications and industry influence the initial workforce composition. As the firm matures the influence of the founders' human capital disappears.

BUILDING ORGANIZATIONS FROM SCRATCH – ENTREPRENEURS' QUALIFICATIONS AND LABOR DEMAND IN NEWLY FOUNDED VENTURES

By Elisabeth Bublitz¹ & Florian Noseleit²

Draft Version – Please do not cite without permission.

Abstract: Small and young firms that are growth-oriented need qualified personnel. Although there has been recognition that human capital is decisive for the success of start-ups, little is known about the interrelation between qualifications of founders and their workforce. Yet, the founders' human capital influences which organizational tasks need to be carried out and thereby which type of labor fits best to the business. Building on the person-organization fit, we argue that during the start-up stage founders preferably employ workers that meet the organizational goal of increasing workforce flexibility. Our results show that founders' qualifications and industry influence the initial workforce composition. As the firm matures the influence of the founders' human capital disappears.

Keywords: labor demand of small firms, human capital

JEL codes: J23, J24

Addresses for correspondence:

¹ Friedrich-Schiller-University Jena
School of Economics and Business Administration
Carl-Zeiss-Str. 3
07743 Jena
elisabeth.bublitz@uni-jena.de

² University of Groningen
Faculty of Economics and Business
Nettelbosje 2
9747 AE Groningen
f.noseleit@rug.nl

1 Introduction

During the first years of a firm's existence, every additional worker has a strong impact on the division of labor inside the emerging venture. It is crucial that the qualification levels of new employees fit to the tasks that founders want to delegate. Although owners of small enterprises have rated labor shortages and human resource management as major obstacles, there exist few theoretical approaches and little empirical evidence on how to tackle these issues (Cardon and Stevens, 2004; Katz et al., 2000; Heneman et al., 2000). We aim to improve the understanding of how entrepreneurs complement and expand their firm's knowledge base by hiring personnel. Therefore we investigate the relationship between characteristics of the founder and the employee structure of the new venture as well as the development of the workforce.

Building from scratch means starting at point zero. This holds true for the start-up stage of new ventures in which founders have not yet implemented a standardized human resources routine but are in need of qualified personnel. It is argued that particularly here the founders' qualification has a decisive impact on the evolution of the division of labor. We are not interested in the total number of jobs created by the newly founded venture but instead we decompose the employment effect by the qualification levels of hired workers. At first the workforce is expected to resemble the qualification of the founder and be more homogeneous. As the firm matures, staffing practices change and the workforce becomes more heterogeneous across qualification levels and occupational groups.

For the empirical analysis we assemble a unique data set that consists of our own survey with personal information about founders and of data from the Establishment History Panel of the German Federal Employment Agency. The results show that founders' human capital and industry can only explain initial differences in the qualification structure of the workforce of a new firm. We also find strong evidence that firms initial employment strategies regarding employees' qualification differ for high and low qualified employees – in contrast medium qualified employees are equally important independent of the formal qualification of the founder. The average number of employees in occupational groups develops constant in manufacturing. In case of knowledge intensive business services (KIBS), however, the workforce composition changes and there are important differences between high and low qualified founders.

The remainder of the paper is structured as follows. Section 2 provides a review of the literature on labor demand and human resource practices of start-ups, complemented with scholarly work on teams. From this we derive our research hypotheses regarding the development of the workforce composition of start-ups. In Section 3 we introduce the data set and our empirical strategy. The results of our analyses can be found in Section 4 and a discussion of them in Section 5. Section 6 concludes.

2 Theory

How do entrepreneurs build up their organizational knowledge base? In the start-up phase of a firm the founder is often synonymous with the business and therefore in charge of everything. According to Lazear (2004), the success of new ventures then depends on the

entrepreneurs' ability to fulfill a variety of tasks, i.e. whether they are to a certain extent "jack-of-all-trades". When they do not achieve a certain degree of skill balance, they cannot perform tasks equally well and are therefore limited by their weakest skill. From our point of view, founders with growing businesses will additionally have to face the fact that they do not have sufficient time to fulfill all tasks on sufficiently high levels. Thus, they have to rely on additional labor and hire workers to divide up the tasks that are necessary to fulfill basic functions of the business. This can imply hiring workers that can cover for own weaknesses (Leung, 2003). However, the type and amount of work that can be potentially delegated has to be weighed against additional personnel expenditures. Rauch et al. (2005) confirm that human resources (measured with the question whether employees were qualified to do their work) are crucial for producing changes in growth of small firms. In sum, hiring high-qualified labor might not always be the best strategy and instead more sophisticated approaches are needed that match founders' qualifications and firms' needs with the right employees. A lack of qualified labor is regarded by small businesses as a threat to growth plans and the survival of small businesses (Baron, 2003).

The extant literature has acknowledged the need for research in this field but, often due to a lack of data on small and young firms, the focus has remained with few exceptions on human resource practices in medium-sized and large firms (Deshpande and Golhar, 1994). A different track of research has looked into the composition of small groups, in particular project teams and founder teams. Following we will attempt to reconcile these strands of research by placing the focus on staffing in start-ups.

Businesses develop with different velocity. Some founders might hire their first employees shortly after starting their ventures while others stay alone during the first years of existence. In the meantime all businesses pass through different growth stages in which the type of hired labor significantly influences their structural form, degree of formalization and centralization. Hanks et al. (Hanks et al., 1993) develop a taxonomy of growth stages that provides a synthesis of previous life-cycle stage models. Their empirical findings hold for the first stages of the theoretical model out of which the start-up and expansion stage are of most interest to understand early workforce development. Firms in the start-up stage of development can be described as relatively young, small, highly centralized and informal. Firms in the expansion stage are slightly older and larger, have adopted a functional basis of organization, are still centralized in their decision making structure but to a lesser extent than before, and their organization systems are a little bit more formal. The role of staffing is shown to differ across growth stages but it is also expected to vary inside growth stages. First of all, in the analysis of workforce development it is therefore important to ensure that firms are found in the start-up stage when they hire their first employees. According to the results by Hanks et al. (1993) older and small firms do not fit traditional life cycle stages because they are distinctly different in terms of context. Possibly, founders decide to keep their firms small on purpose or go through stages of stagnation in between growth stages. Second, the variable of interest here is the evolution of the division of labor. Therefore, it is useful to start the analysis when the first employees are hired because their presence increases formalization, decreases centralization, and transforms the structural form from simple to departmentalized (Hanks et al., 1993).

Small and emerging firms face liabilities of newness and smallness which imply fewer resources and greater challenges for them than for larger and established firms (Stinchcombe, 1965). Correspondingly, human resources in start-ups are critical in ways that differ from larger, older organizations and results for the latter cannot be converted at their face value (Alvarez and Molloy, 2006; Barber, 2006; for overview see Cardon and Stevens, 2004). The absence of an institutionalized human resource management in small firms makes it more difficult to conduct systematic research. Firms with fewer than 50 employees are unlikely to implement sophisticated personnel systems (Hornsby and Kuratko, 1990; Wagar, 1998; Markman and Baron 2003). Instead, they utilize “muddle-through” strategies where the labor market is screened for what is available (Windolf, 1986). The legitimacy of employers, i.e. whether they are acceptable to future employees, is important during recruitment processes and the organization’s recruitment procedures and human resource policies can serve as a signal in this regard (Williamson, 2000). However, as start-up firms lack human resource departments and systematic strategies, they heavily rely on having the right labor available which means easily accessible during early growth stages. They often hire employees through social networks of friends and relatives (e.g., Leung, 2003).

Sustaining flexibility is necessary during the complete organizational life cycle but most important when the business is not yet well-established. As Katz et al. (2000) point out a fixed division of labor in young organizations can have a negative impact because founders are still in the process of learning and implementing routines. Particularly in times of crises or work overload rigid job descriptions can become a liability. Heneman et al. (2000) find that growth-oriented CEO/founders are mostly concerned with matching characteristics of the person to the values and culture of the organization and not the job. This result is in line with other research (Bowen et al., 1991; Chatman, 1991; Kristof, 1996). Accordingly, founders seek to employ individuals who have the ability to deal with multiple jobs and can take on future jobs as they emerge in the organization (Heneman et al., 2011). Results by Bublitz and Noseleit (2011) show that the number of skills applied on the job increases with job tenure for employees of small businesses while the opposite trend is found for employees of large businesses. In addition, during the first years large business employees apply a higher number of skills than small business employees. This fits the idea that over time small business employees take on additional jobs in the organization but in the beginning they lack a clear job description and carry out more specialized work. Recruitment then becomes problematic because employees have to fulfill multiple roles with unclear boundaries and job responsibilities (May, 1997). Another mean to increase flexibility as the venture grows is the use of contingent labor (Matusik and Hill, 1998). Cardon (2003) argues that the type of labor that is needed will differ between growth stages but that a lack of contingent labor in the organizational environment negatively influences growth. Her categorization of the motivation to use contingent labor is ultimately transferable to the complete workforce: “to help meet organizational challenges of providing specific expertise [...], flexibility [...], cost savings [...], and new insight [...]” (Cardon, 2003, p.358). Since her focus is on contingent labor, which per definition is flexible, the need for flexibility of permanent employees is particularly important as long as the firm is relatively small. As for contingent labor, the appropriate type of workers in the start-up stage is considered to be high-skilled and in the expansion stage low-skilled

(Cardon, 2003). Whether this also holds true for permanent employees is expected to depend on the type of business which determines whether specific expertise can only be provided by high-skilled workers or also by lower-qualified employees. Cost savings and new insights can be assumed to matter during the start-up stage as well, with the first playing a slightly more important role because the business has not yet achieved a consistent growth rate (Hanks et al., 1993).

Small firms might also be analyzed from a team perspective, in that the whole organization is one team. This implies that founders engage in team building when staffing their business. Importantly, employees in small firms need to be team players instead of loners. Research has looked into small group dynamics (Levine and Moreland, 1994) with a focus on project teams that are formed within existing organizations (e.g., Carpenter et al., 2004) or founder teams (e.g., Kamm et al., 1990). Workforces of start-ups, however, combine attributes of founder teams (e.g. young, entrepreneurial ventures) with teams in existing organizations (e.g. formation after market entry) and therefore need not be squeezed into either of the two categories. Furthermore, founders have the luxury and burden of hiring all new employees with “ideal” characteristics instead of relying on existing cohorts of workers. The literature on team composition suggests that the tasks of the team need to be clearly defined to match future team members accordingly. As outlined above this is already an almost insurmountable challenge for small and young businesses. In the context of start-up staffing it appears more suitable to resort to the person-organization fit and thereby choose general organizational goals which can be assumed to reflect team tasks that employees need to be matched with. In the literature workforce flexibility, that is a variable division of labor, is argued to be crucial for start-ups and can therefore be regarded as a prevalent organizational goal. In terms of measurement, the versatility of teams is likely to increase with greater knowledge variety. This idea relates to research on team heterogeneity that looks into the composition of teams (e.g., Vanaelst et al., 2006; Hambrick et al., 1996). In the entrepreneurial context, functional team heterogeneity as net effect has been analyzed by distinguishing between knowledge scope, i.e. the breadth of knowledge, and knowledge disparity (Cantner et al., 2010). Knowledge scope relates positively and knowledge disparity negatively to entrepreneurial performance, i.e. firm survival and employment growth. Knowledge scope shows an inversed u-shaped relationship to innovative performance, i.e. patent applications; knowledge disparity affects it negatively. As regards the workforce versatility of start-ups it is important to remember that in the beginning all knowledge is embodied in few people who therefore need to be very knowledgeable to ensure flexibility. As the workforce grows generalists can be replaced with specialists to take over specific tasks. Thus, organizational flexibility can be achieved by either employing a homogeneous workforce with a high qualification level where individuals can take over a variety of tasks or by employing a heterogeneous workforce where many individuals are responsible for different, single tasks.

Some work can be found that captures parts of the relationship between founders’ qualifications, workforce structure, and firm characteristics. Purely descriptive results showing the evolution of the workforce structure for start-ups in Germany are provided by Weißhuhn and Wichmann (2000). In separate calculations they show that the average qualification level of employees is higher in East Germany than in West Germany. As firm

age increases, the number of employees with “Abitur” (school-leaving exam) or a University degree increases in both regions. Weißhuhn und Wichmann suggest that this trend could be explained with, on the one hand, a higher survival rate of businesses with higher qualified workers and, on the other hand, a change of the type of labor needed in larger firms. Possibly additional organizational levels call for more high-qualified workers.

Research has investigated the role of founders in the process of firm creation and growth. The founders’ existing human capital influences e.g. their opportunity recognition and exploitation (Shane and Venkataraman, 2000) or the breadth of tasks needed to exploit opportunities (Lazear, 2004). As the collaboration between the founder and the first employees is inevitably going to be quite close, the founders’ cognitive and non-cognitive skills are expected to influence the type of additional human capital required from employees in order to fulfill required functions. From an employee perspective, the qualification level and other characteristics of the founders serve as an important signal for the firm’s legitimacy, i.e. whether it is acceptable as future employer. This implies that a high-skilled employee is possibly less likely to work for a low-skilled founder in the early years of the firm’s existence because the firm might not appear as a legitimate employer due to a lack of qualification. First evidence on the heterogeneous labor demand of new firms subject to the founder’s qualification is provided by Müller (2010). In her analysis she finds that increasing levels of specific and generic human capital of founders (measured as professional experience and educational degree) are associated with workforce skill upgrading in young firms.

We will now build on these theoretical considerations to answer our question with regard to the formation of organizational knowledge bases. Organizational tasks can be classified according to the skill level required for their completion. The higher qualified people are the broader becomes the task spectrum that they can cover. While lower qualified workers might cost less, they might not be as flexible as regards their task assignments. Furthermore, staffing has to be seen in the context of the founders’ qualifications which most likely mirror the type of business activity that is mainly pursued. For instance, a low qualified founder is assumed to be less likely to employ a high-qualified worker than a high-qualified founder. The assumption behind this states that the core competence of a business is by and large determined by the skills of the founder. We use a somewhat similar approach as Müller (2010) but include more detailed information about the qualification of the founder and employees.

Considering the strong impact that employees have on the division of labor in young and small start-ups, our propositions begin with the question of who comes first. Thus we ask how entrepreneurs can exploit complementarities between their own and newly hired labor inputs. Founders are hypothesized to start by hiring workers with qualification levels similar to their own. This hypothesis is based on the central assumption that the task composition of new ventures is in the beginning limited by the founders own human capital. Employees with similar qualification structures as the founder can take over many of the tasks that founders carried out themselves and therefore increase the flexibility in the firm. In addition, since founders themselves develop their business idea and implement it in the first run, it stands to reason that these ideas are framed by the founders’ qualifications and that employees who are higher qualified than the founder are not yet

needed. This also means that on this level the workforce (including the founder) remains homogeneous.

Hypothesis 1a: Founders first hire workers with qualification levels similar to their own ones.

Hypothesis 1b: Founders first hire workers with occupations that match the firm's industry.

As the venture grows, founders may increasingly employ workers with qualification levels and occupations different from their own ones to increase absorptive capacity (Cohen and Levinthal, 1990) and knowledge diversity (Nooteboom et al., 2007). This increase of workforce heterogeneity allows for a more efficient allocation of tasks. In general, high qualified founders are expected to demand more high-skilled labor and low qualified founders more low qualified labor. During recruitment processes founders aim to cover a variety of tasks which implies that they hire workers not only from varying skill levels but also from occupational fields that differ from the core competence of the business.

Hypothesis 2a: As the firm matures founders hire more workers with qualification levels different from their own ones.

Hypothesis 2b: As the firm matures the workforce includes more workers from occupations distant to the industry.

3 Data & Methodology

We collected data from 1,039 founders in Germany using a computer-assisted telephone interviewing software. The businesses in our sample are founded between 1990 and 2008 and are active in manufacturing and knowledge-intensive business services (KIBS). Our survey includes personal information about founders—for example their educational attainment, work experience, and psychological traits—and information about the firm's innovativeness. This data was matched with the Establishment History Panel (BHP) at the Institute for Employment Research of the German Federal Employment Agency (Hethy-Maier and Seth, 2010). The BHP provides reliable information about all employees liable to social security. These individuals can be broken down by gender, age, occupational status, qualification, and nationality. The occupational status contains information about the skill level and the employee's occupational background. This unique data set fits perfectly to our research question about the labor demand of newly founded ventures because we observe the development of the workforce by occupational categories and can relate it to the characteristics of the founder. The first businesses started to hire employees in 2002 and we can observe subsequent employment growth until 2008. Our data therefore reliably captures small and emerging firms and these attributes are indispensable prerequisites for our research question.

Dependent variables

The central outcome variables in this study reflect the human capital usage of new ventures at different stages during their early development phase. Our data allows differentiating

between low, medium, and high qualified employees. Accordingly we generated three count variables that measure the number of employees in each category at different points in time. Low qualified employees are defined as employees who did not complete secondary school successfully or do not have vocational qualification. The group of medium qualified employees consists of graduates from upper secondary school or completed vocational qualification. Finally high qualified employees require as minimum qualification a degree from specialized colleges of higher education or universities.

Occupational groups are determined with the Blossfeld classification of occupations (Blossfeld, 1985, see Table A1). The Blossfeld classification, which is the smallest available unit for occupations on the firm level in the BHP, is based on the three-digit occupation of an individual as it was specified by the employers in the notification to the social security agencies. Blossfeld first distinguishes between three upper-level groups, namely production, service, and administration, and secondly ranks occupations according to the type of skills required. Accordingly, blue-collar workers who are assigned occupations with simple manual tasks and white-collar workers who perform simple services are regarded to be unskilled; blue-collar workers in occupations with complicated tasks, white-collar workers performing qualified tasks, and semi-professionals are regarded to be skilled workers. The third and most highly qualified group includes engineers, technicians, professionals and managers. Due to relatively small number of observations we distinguish only between the three upper-level groups.

Independent variables

Formal qualification of the founder is measured in a similar way as qualification of employees (low, medium, and high qualification). Since the qualification differences between low, medium and high levels cannot be considered of equal size, we construct dummy variables that indicate the qualification of the founder. As a further variable we calculate the corresponding age of the founder. In addition we use information about the number of years founders have previously worked in the same industry where they started their business to calculate the number of years of prior working experience. To proxy the initial start-up size, we calculate the total number of employees in the founding year. A dummy variable was constructed to indicate if a firm was founded by a start-up team.

4 Preliminary Results

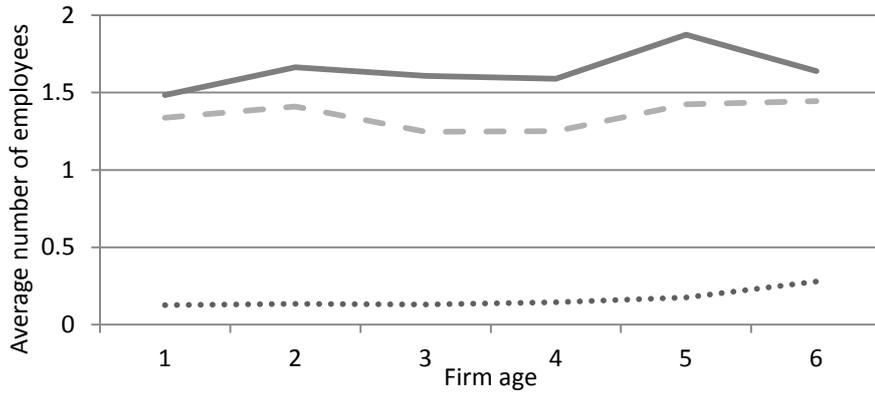
First, we give an overview of the average employment development for the firms in the sample. Figure 1 plots the average employment development covering the first six years of the new firms in a stacked line graph. In this figure firms are grouped according to the formal qualification of the founder: low qualification (LQ), medium qualification (MQ), and high qualification (HQ). In addition figure 1 differentiates between three different groups of employees – again according to their highest level of formal qualification. For the first year we have observations for 88 firms founded by low qualified business owners, 85 founders had medium qualification levels, and 308 firms were started by high qualified individuals. The underlying number of firms in the following years varies since some are recently founded and we cannot observe their development for full six years. In the sixth year we observe 175 firms of which 36 are owned by low qualified, 38 are owned by medium

qualified and 101 are owned by high qualified business owners. In total firms of high qualified entrepreneurs account for 64 % of all observations with a firm age of one year and 58 % of observations with an age of six years. This might be explained by a survivor bias favoring high qualified entrepreneurs.

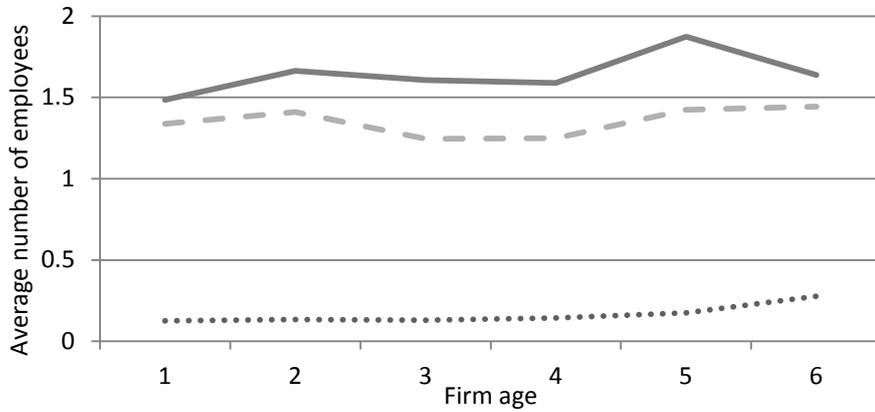
From figure 1 we can observe that the average number of employees is generally very low. The bulk of employees in this sample of new ventures have medium qualification levels. On average, firms run by high qualified business owners employ the lowest number of low qualified and the highest number of high qualified employees. In fact, it seems that high qualified employees are almost exclusively a domain of firms started by high-qualified entrepreneurs. Firms founded by medium qualified business owners' focus on low and medium qualified employment while high-qualified employees play virtually no role at all. For low qualified business owner we observe an emphasis on low and medium qualified employees as well. Interestingly, for all types of start-ups we observe that the average number of low-qualified workers decreases after initial growth. Such a pattern is not observed for employees with relatively higher qualification levels.

Next, to control for other factors, we regress firm level employment at a firm age of two, four, and six years on firm and owner characteristics. Again we group employees according to their level of formal qualification. Table 1 presents regression results for the number of high, medium, and low-qualified employees in the second year of firm existence. Regarding hypothesis H1 we find indication that the reference group of low qualified business owners employs significantly more low qualified employees than high qualified founders but not more than medium qualified owners (Model I). This result is in line with the descriptive evidence of figure 1. For the group of medium qualified employees we find no significant different employment pattern across firms that have founders with different formal qualifications (Model II). Highly qualified workers are significantly more often employed by high qualified entrepreneurs (Model III) which mirrors the descriptive evidence. Furthermore, the only relatively stable predictor of employment levels is the initial firm size. Overall our results support partially hypothesis 1a with the strong exception that the majority of workers during the start-up stage belongs to the group of medium qualified worker, independent of the formal qualification levels of the founders.

Founders with low qualification level



Founders with medium qualification level



Founders with high qualification level



Figure 1: Average employment development for different levels of formal qualification of founders and employees (stacked line graph)

Table 1: Employment after two years

	Low qualified employees I	Medium qualified employees II	High qualified employees III
Founder HQ (1=Yes)	-0.176* (0.0882)	0.00181 (0.2197)	0.331** (0.0978)
Founder MQ (1=Yes)	-0.0179 (0.10184)	-0.1224 (0.246)	-0.0471 (0.0857)
Founder LQ	Reference group	Reference group	Reference group
Age of founder	0.00292 (0.0032)	-0.010863 (0.00997)	0.0123 (0.0124)
Experience	-0.00402+ (0.00238)	0.00345 (0.00865)	-0.0142 (0.0111)
Team start-up (1=Yes)	0.0178 (0.0441)	0.170256 (0.170745)	0.110 (0.125)
Initial firm size	0.0789** (0.0262)	0.578** (0.0889)	0.0496+ (.0281)
Constant	0.00645 (0.12)	0.299 (0.413)	-0.356 (0.399)
R-squared	0.16	0.4141	0.0573
F-test	3.11 (0.00)	9.02 (0.00)	7.36 (0.00)
Number of observations	490	490	490

Note: OLS regression. Robust standard errors in parentheses. ** significant at the 1% level, * significant at the 5% level, + significant at the 10% level. Dependent variables are the number of employees by qualification levels.

Table 2: Employment after four years

	Low qualified employees IV	Medium qualified employees V	High qualified employees VI
Founder HQ (1=Yes)	-0.224+ (0.134)	0.144 (0.247)	0.494** (0.122)
Founder MQ (1=Yes)	0.0752 (0.184)	0.30618 (0.3352)	-0.1534 (0.10596)
Founder LQ	Reference group	Reference group	Reference group
Age of founder	-0.0008065 (0.00631)	-0.0274+ (0.0143)	0.000679 (0.007)
Experience	-0.00205 (0.00481)	0.0117 (0.0135)	-0.00488 (0.00549)
Team start-up (1=Yes)	-0.0114 (0.0843)	0.0646 (0.224)	0.10319 (0.10953)
Initial firm size	0.0995* (0.0419)	0.314** (0.0784)	0.10152* (0.0428)
Constant	0.181 (0.262)	1.454* (0.573)	-0.1005 (0.288)
R-squared	0.1373	0.1537	0.1286
F-test	2.25 (0.00)	3.73 (0.00)	8.43 (0.00)
Number of observations	323	323	323

Note: OLS regression. Robust standard errors in parentheses. ** significant at the 1% level, * significant at the 5% level, + significant at the 10% level. Dependent variables are the number of employees by qualification levels.

Table 3: Employment after six years

	Low qualified employees VII	Medium qualified employees VIII	High qualified employees IX
Founder HQ (1=Yes)	-0.0778 (0.0882)	0.4296 (0.452)	0.368 (0.231)
Founder MQ (1=Yes)	0.0824 (0.133)	0.2296 (0.525)	-0.201 (0.179)
Founder LQ	Reference group	Reference group	Reference group
Age of founder	-0.00549 (0.0050197)	-0.00561 (0.0282)	0.00769 (0.0115)
Experience	0.00398 (0.0054)	(0.0074) (0.0310)	-0.0132 (0.0101)
Team start-up (1=Yes)	-0.058994 (0.0735)	0.201 (0.40396)	0.363+ (0.191)
Initial firm size	0.0265 (0.0183)	0.388** (0.141)	.0742* (0.0374)
Constant	0.363+ (0.219)	0.493 (1.0791)	-0.257 (0.411)
R-squared	0.0689	0.1572	0.1005
F-test	1.29 (0.27)	1.64 (0.14)	3.30 (0.00)
Number of observations	174	174	174

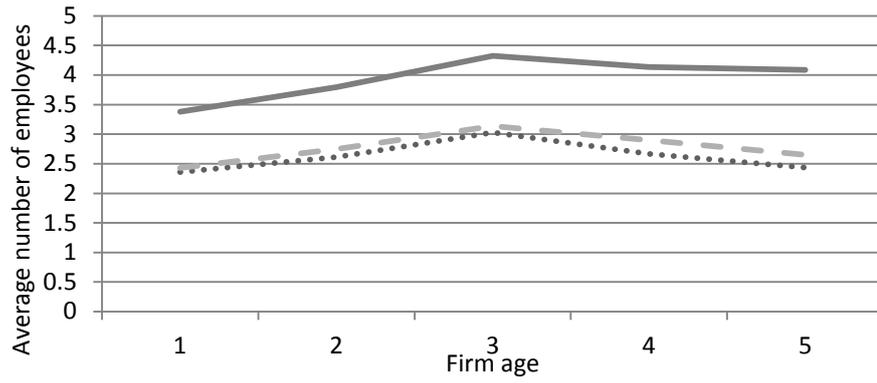
Note: OLS regression. Robust standard errors in parentheses. ** significant at the 1% level, * significant at the 5% level, + significant at the 10% level. Dependent variables are the numbers of employees by qualification levels.

In Table 2 we report the results for the workforce structure four years after starting the business. Again we find indication that business founded by high qualified entrepreneurs are the central domain for high-qualified employees (Model VI) while there is only weak evidence that high qualified owners continue to employ significantly less low qualified employees (Model IV). Medium qualified workers continue to be employed at comparable levels at firms with founders of different qualification levels. Initial firm size remains a good predictor of subsequent employment while again we cannot identify further stable indicators for employment levels of the young firms in our sample.

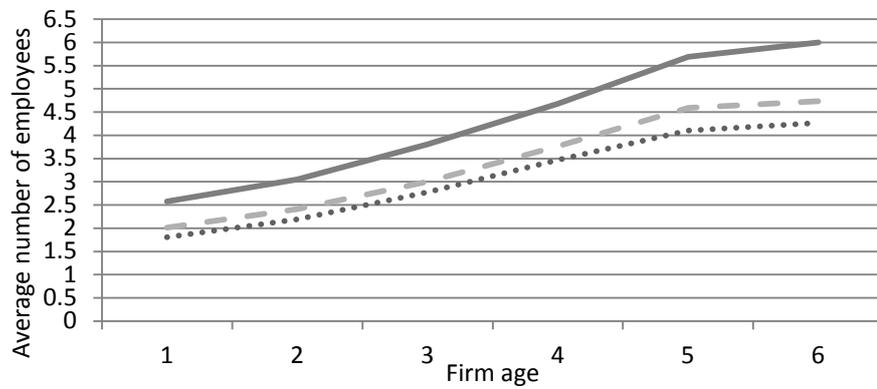
The results for employment six years after firm foundation are unfruitful (Table 3). For low and medium qualified employment our models prove to be of little value in explaining firm level differences as indicated by insignificant F-tests. For all three groups of employees we are not able to identify any differences between firms founded by entrepreneurs exhibiting different qualification levels.

In terms of our hypothesis 2a we can state that the initial significant differences in the composition of employees for firms with differences in the qualification of their founders vanish over time. This gives some support to the idea that founders hire workers with qualification levels different from their own ones at later stages.

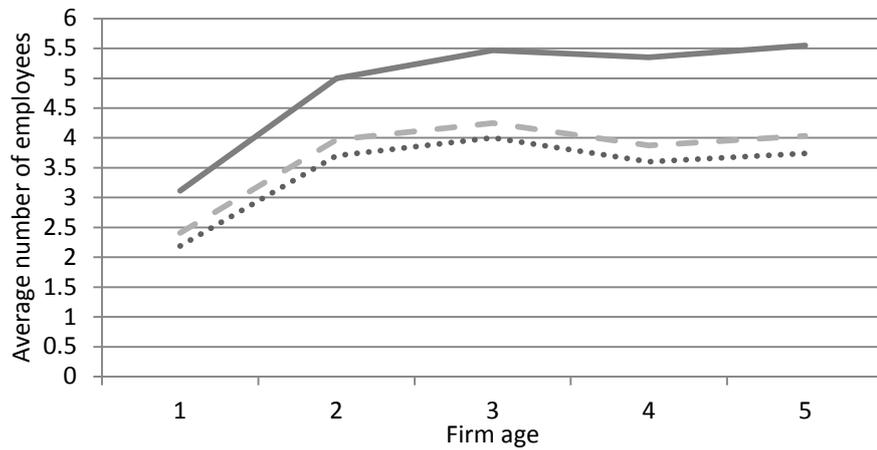
Founders with low qualification level



Founders with medium qualification level



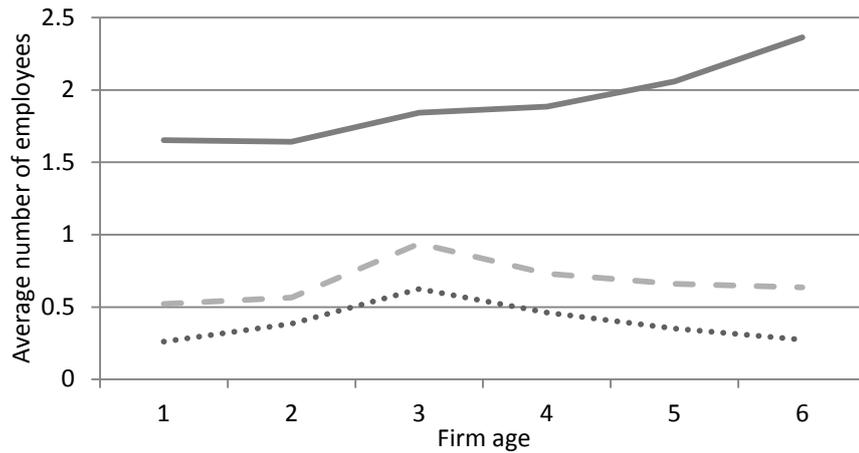
Founders with high qualification level



- Average number of workers in production
- - - Average number of workers in services
- Average number of workers in administration

Figure 2: Average employment development for different levels of formal qualification of founders and occupational groups of employees in manufacturing (stacked line graph)

Founders with low qualification level



Founders with high qualification level

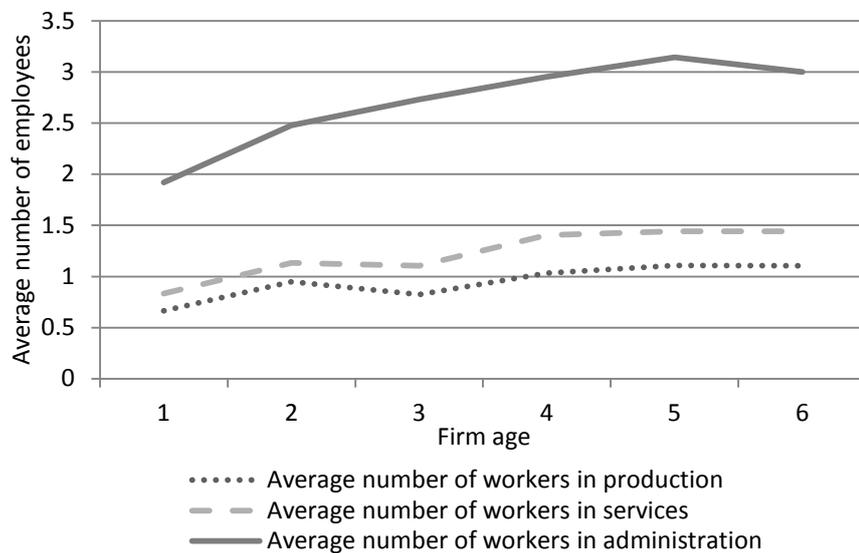


Figure 3: Average employment development for different levels of formal qualification of founders and occupational groups of employees in knowledge intensive business services (stacked line graph)

In separate calculations we look at the workforce development of occupational groups and distinguish between manufacturing and KIBS. The industry classification is added to see how workers relate to the business in term of qualification content instead of qualification level. Due to a lack of observations no results can be reported regarding founders with medium qualification level in KIBS. Figure 2 shows that all firms in manufacturing employ mostly workers in production, followed by workers in administration, and a very small number in service occupations. At first the average number of employees increases for founders of all qualification levels. However, after a slight increase low qualified founders experience a decrease again. Medium qualified founders steadily increase their average number of employees while high-qualified remain, after a sharp increase, on a rather constant level. The results for KIBS are depicted in Figure 3. These firms are generally smaller than firms in manufacturing. The majority of their workers is found in administration, followed by workers in production, and finally in service occupations. In firms of low qualified founders the average number of employees in administration

occupations increases steadily while in service and administration occupation it decreases after an initial increase. High qualified founders experience a relatively constant increase of workers in administration occupations at first but after some time there appears to be a slight decrease. The number of workers in other occupations remains rather constant with small increases in the beginning. These results strongly support hypothesis 1b that first workers are hired that match the industry of the firm. In case of manufacturing that would be workers in production occupations and in case of KIBS workers in administration.¹ The results for hypothesis 2b are mixed. The workforce distribution in manufacturing remains constant over time. In KIBS, there appear to be different trends for different qualification levels of founders.

5 Discussion

Our results point to some interesting properties of the employment structure in newly founded ventures. First, we present evidence that the qualification level of the founder has an influence on the employment composition of the workforce in terms of workers formal qualification levels. Second, these differences are restricted to the tails of the qualification distribution – namely high and low qualified employees. Employees with medium qualification levels can be considered to be the workhorses for new start-ups during the early growth development of a firm. Third, initial differences in the workforce composition that can be explained with the formal qualification of the founder vanish over time. This last aspect offers possible interpretations. One interpretation is based on our claim that founders start to hire additionally workers with qualification levels different from their own ones. However, another interpretation could be based on possible market selection that reduces the variance. Thus we have to leave open if the labor demand of firms differs during the early growth stages because founders start to follow more similar strategies when hiring employees as the firm gets older or because firms with inefficient and therefore later on unsuccessful employment composition strategies drop out of the market. In both cases the variation would be reduced to such a degree that the model chosen is only able to explain growth differences in the workforce composition of start-ups after some years (see Table 3). Finally, since the knowledge base of the firm is no longer equivalent to the founders' human capital but instead has been augmented with employees' human capital, the explanatory power of founders' human capital can be expected to decrease as well.

Also, the number of low qualified workers is observed to decrease after an initial increase in all types of start-ups. Such a pattern is not observed for employees with relatively higher qualification levels. This could again be explained with a selection effect according to which firms with more low qualified workers fail after some years. Another possible reason could be that low qualified workers who in this data include individuals without complete secondary school successfully or vocational qualification are continually replaced with workers with higher qualification levels.

¹ The service occupations in the Blossfeld classification do not match with KIBS, even though the name might suggest otherwise (compare Table A1).

Analyzing the employment structure with occupational groups has shown that the founders first aim to find support for the core competence of the business. The amount of worker needed in other occupations appears to be constant in relative terms for manufacturing while it changes for KIBS. These industry-specific differences are an interesting result as they suggest that in manufacturing the delegation of tasks is developing at a constant level for all occupations. In contrast, tasks incurring in KIBS appear to differ not only by firm age but also by founder qualification.

6 Conclusions

The fact that young firms employ few workers during their early years of existence and often lack an established human resource department does not mean that their staffing practices should be disregarded. In contrast, it has been shown that having employees who are qualified to fulfill the tasks increases small business growth (Rauch et al., 2005). This study provides a first contribution to the little that is known about human resources in small and young firms. It shows that founders' human capital and industry can explain initial differences in the qualification structure of the workforce of a new firm. As firms mature founders formal qualification is no longer able to explain firm differences in the qualification structure of its employees. Furthermore, we find strong evidence that firms initial employment strategies regarding employees' qualification differ for high and low qualified employees – in contrast medium qualified employees are equally important independent of the formal qualification of the founder. The workforce composition in terms of occupational groups develops constant for manufacturing. In case of KIBS, the proportions of occupational groups change and there are differences between high and low qualified founders.

This work fills an important research gap with regard to the founding and evolution of new organizations and their labor demand. We present one of the first empirical studies directly assessing the relationship between the qualification of founders and their demand for additional skills. Our study sheds light on the fundamental question of human resource strategy in small and young enterprises. While founders will always start from scratch, they will not have to make everything from scratch. This work provides information to policy makers about the specific type of labor that needs to be made available to founders during their first years of existence to avoid labor shortages and to encourage new venture growth.

References

- Alvarez, Sharon A.; Molloy, Janice C. (2006). Why Human Resource Management differs in Entrepreneurial and Established Firms, in Tansky, Judith W.; Heneman, Robert L. (2006), *Human resource strategies for the high growth entrepreneurial firm*, Greenwich, Conn: Information Age Pub., 1-12.
- Barber, Alison E. (2006). The Hiring Challenge. Recruitment in Small Firms, in Tansky, Judith W.; Heneman, Robert L. (2006), *Human resource strategies for the high growth entrepreneurial firm*, Greenwich, Conn: Information Age Pub., 99-113.
- Baron, Robert A. (). Human resource management and entrepreneurship: some reciprocal benefits of closer links. *Human Resource Management Review*, 13(2), 253.
- Blossfeld, Hans-Peter (1985). *Bildungsexpansion und Berufschancen*, Frankfurt/Main, Mannheim: Campus-Verl.
- Bowen, David E.; Ledford, Gerald E., JR; Nathan, Barry R. (1991). Hiring for the Organization, Not the Job. *The Executive*, 5(4), 35-51.
- Bublitz, Elisabeth; Noseleit, Florian (2011). The Skill Balancing Act: Determinants of and Returns to Balanced Skills. *Jena Economic Research Papers # 2011-025*, Friedrich Schiller University and Max Planck Institute of Economics.
- Cantner, Uwe; Goethner, Maximilian; Stuetzer, Michael (2010). Disentangling the Effects of New Venture Team Functional Heterogeneity on New Venture Performance. *Jena Economic Research Papers #2010-029*, Friedrich Schiller University and the Max Planck Institute of Economics.
- Cardon, Melissa S. (2003). Contingent labor as an enabler of entrepreneurial growth. *Human Resource Management*, 42(4), 357-373.
- Cardon, Melissa S.; Stevens, Christopher E. (2004). Managing human resources in small organizations: What do we know? *Human Resource Management Review*, 14(3), 295-323.
- Carpenter, Mason A.; Geletkanycz, Marta A.; Sanders, Wm Gerard (2004). Upper Echelons Research Revisited: Antecedents, Elements, and Consequences of Top Management Team Composition. *Journal of Management*, 30(6), 749-778.
- Chatman, Jennifer A. (1991). Matching People and Organizations: Selection and Socialization in Public Accounting Firms. *Administrative Science Quarterly*, 36(3), 459-484.
- Cohen, Wesley M.; Levinthal, Daniel A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1), 128-152.
- Deshpande, Satish P.; Golhar, Damodar Y. (1994). HRM Practices in Large and Small Manufacturing Firms: A Comparative Study. *Journal of Small Business Management*, 32(2), 49-56.
- Hambrick, Donald C.; Cho, Theresa Seung; Chen, Ming-Jer (1996). The Influence of Top Management Team Heterogeneity on Firms' Competitive Moves. *Administrative Science Quarterly*, 41(4), 659-684.

- Hanks, Steven H.; Watson, Collin J.; Jansen, Erik; Chandler, Gaylen N. (1993). Tightening the Life-Cycle Construct: A Taxonomic Study of Growth Stage Configurations in High-Technology Organizations. *Entrepreneurship: Theory & Practice*, 18(2), 5-30.
- Heneman, Herbert G.; Heneman, Robert L.; Judge, Timothy A. (2011). *Staffing Organizations*, Middleton, Wisc.: McGraw-Hill Irwin.
- Heneman, Robert L.; Tansky, Judith W.; Camp, S. Michael (2000). Human Resource Management Practices in Small and Medium-Sized Enterprises: Unanswered Questions and Future Research Perspectives. *Entrepreneurship: Theory & Practice*, 25(1), 11.
- Hethey-Maier, Tanja; Seth, Stefan (2010). The Establishment History Panel (BHP) 1975 – 2008 Handbook Version 1.0.2. *FDZ-Methodenreport*, 04/2010, Nürnberg: Research Data Centre (FDZ).
- Hornsby, Jeffrey S.; Kuratko, Donald F. (1990). Human Resource Management in Small Business: Critical Issues for the 1990s. *Journal of Small Business Management*, 28(3), 9-18.
- Kamm, Judith B.; Shuman, Jeffrey C.; Seeger, John A.; Nurick, Aaron J. (1990). Entrepreneurial Teams in New Venture Creation: A Research Agenda. *Entrepreneurship: Theory & Practice*, 14(4), 7-17.
- Katz, Jerome A.; Aldrich, Howard E.; Welbourne, Theresa M.; Williams, Pamela M. (2000). Special Issue on Human Resource Management and the SME: Toward a New Synthesis. *Entrepreneurship: Theory & Practice*, 25(1), 7.
- Kristof, Amy L. (1996). Person-Organization Fit: An Integrative Review of its Conceptualizations, Measurement, and Implications. *Personnel Psychology*, 49(1), 1-49.
- Lazear, Edward P. (2004). Balanced Skills and Entrepreneurship. *American Economic Review*, 94(2), 208-211.
- Leung, Aegean (2003). Different ties for different needs: Recruitment practices of entrepreneurial firms at different developmental phases. *Human Resource Management*, 42(4), 303-320.
- Levine, John M.; Moreland, Richard L. (1994). Progress in Small Group Research. *Annual Review of Psychology*, 41, 585-634.
- Matusik, Sharon F.; Hill, Charles W. L. (1998). The Utilization of Contingent Work, Knowledge Creation, and Competitive Advantage. *The Academy of Management Review*, 23(4), 680-697.
- May, Karen E. (1997). Work in the 21st Century: Understanding the Needs of Small Businesses, 35July, 94-97.
- Müller, Kathrin (2010). Entrepreneurs' Human Capital and Heterogeneous Labor Demand of Newly Established Firms. *Centre for European Economic Research (ZEW), Mannheim*,
- Nooteboom, Bart; van Haverbeke, Wim; Duysters, Geert; Gilsing, Victor; van den Oord, Ad (2007). Optimal cognitive distance and absorptive capacity. *Research policy*, 36(7), 1016-1034.

- Rauch, Andreas; Frese, Michael; Utsch, Andreas (2005). Effects of Human Capital and Long-Term Human Resources Development and Utilization on Employment Growth of Small-Scale Businesses: A Causal Analysis1. *Entrepreneurship Theory and Practice*, 29(6), 681-698.
- Shane, Scott; Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research. *The Academy of Management Review*, 25(1), 217-226.
- Stinchcombe, A.L (1965). Social Structure and Organizations, in March, J.G (1965), *Handbook of Organizations*, Chicago: Rand-McNally, 142-193.
- Tansky, Judith W.; Heneman, Robert L. (2006). *Human resource strategies for the high growth entrepreneurial firm*, Greenwich, Conn: Information Age Pub.
- Vanaelst, Iris; Clarysse, Bart; Wright, Mike; Lockett, Andy; Moray, Nathalie; S'Jegers, Rosette (2006). Entrepreneurial Team Development in Academic Spinouts: An Examination of Team Heterogeneity. *Entrepreneurship Theory and Practice*, 30(2), 249-271.
- Wagar, Terry H. (1998). Determinants of human resource management practices in small firms: Some evidence from Atlantic... *Journal of Small Business Management*, 36(2), 13-23.
- Weißhuhn, Gernot; Wichmann, Thorsten (2000). *Beschäftigungseffekte von Unternehmensgründungen*, Norderstedt: Berlecon Research; Books on Demand GmbH.
- Williamson, Ian O. (2000). Employer Legitimacy and Recruitment Success in Small Businesses. *Entrepreneurship: Theory & Practice*, 25(1), 27.
- Windolf, Paul (1986). Recruitment, Selection, and Internal Labour Markets in Britain and Germany. *Organization Studies*, 7(3), 235-254.

Annex

Table A 1: The 12 classifications of occupations by Blossfeld (Source: author following Blossfeld, 1985)

Blossfeld 1998 "Occupational Groups"			Composition of the occupational groups according to the German occupational classification (1970)	Examples	
Abk.	Full Name	Description			
Production					
1	AGR	Agricultural occupations	Occupations with a dominant agricultural orientation	011-022, 041-051, 053-062	Farmers, agricultural workers, gardeners, workers in the forest economy, fishermen, etc.
2	EMB	unskilled manual occupations	All manual occupations that showed at least 60 percent unskilled workers in 1970	071-133, 135-141, 143, 151-162,164, 176-193, 203-213, 222-244,252, 263, 301, 313, 321-323, 332-346, 352.371, 373, 375-377, 402-403, 412, 423-433, 442, 452-463,465-472, 482, 486, 504, 512-531,543-549	Miners, rockbreakers, papermakers, wood industry occupations, printing industry occupations, welders, riveters, unskilled workers, road and railroad construction workers, etc.
3	QMB	skilled manual occupations	All manual occupations that showed at most 40 percent unskilled workers in 1970	134, 142, 144, 163, 171-175, 201-202, 221, 251, 261-262, 270-291, 302, 305-312, 314-315, 331, 351, 372, 374, 378-401, 411, 421-422, 441, 451, 464, 481, 483-485, 491-503, 511, 541-542	Glassblowers, bookbinders, typesetters, locksmiths, precision instrument makers, electrical mechanics, coopers, brewers, carpenters, etc.
4	TEC	technicians	all technically trained specialists	303, 304, 621-635, 721-722, 733, 857	Machinery technicians, electrical technicians, construction technicians, mining technicians, etc.

5	ING	engineers	highly trained specialists who solve technical and natural science problems	032, 052, 601-612, 726, 883	Construction engineering, electrical engineers, production designers, chemical engineers, physicists, mathematicians, etc.
Service					
6	EDB	unskilled services	all unskilled personal services	685-686, 688, 706, 713-716, 723-725, 741-744, 791-794, 805, 838, 911-913, 923-937	Cleaner, waiters, servers, etc.
7	QDB	skilled services	essentially order and security occupations as well as skilled service occupations	684, 704-705, 711-712, 801-804, 812, 814, 831, 837, 851-852, 854-856, 892-902, 921-922	Policemen, firemen, locomotive engineers, photographers, hairdressers, etc.
8	SEMI	semiprofessions	service positions which are characterized by professional specialization	821-823, 853, 861-864, 873-877	Nurses, educators, elementary school teachers, Kindergarten teachers, etc.
9	PROF	professions	all liberal professions and service positions which require a university degree	811, 813, 841-844, 871-872, 881-882, 891	Dentists, doctors, pharmacists, judges, secondary education teachers, university professors, etc.
Administration					
10	EVB	unskilled commercial and administrative occupations	relatively unskilled office and commerce occupations	682, 687, 731-732, 734, 782-784, 773	Postal occupations, shop assistants, typist, etc.
11	QVB	skilled commercial and administrative occupations	occupations with medium and higher administrative and distributive functions	031, 681, 683, 691-703, 771-772, 774-781	Credit and financial assistants, foreign trade assistants, data processing operators, bookkeepers, goods traffic assistants, etc.
12	MAN	managers	occupations which control factors of production as well as functionaries of organizations	751-763	Managers, business administrators, deputies, ministers, social organization leaders, etc.