

# **Regional Differences in the Human Capital Acquisition of Start-ups**

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## **Short abstract**

Entrepreneurship forms an important part of the regional economic growth system. But for young firms realising growth is not always easy because they face difficulties in attracting workers. Recent studies confirm that young firms hire workers with less human capital more often than incumbent firms. This study contributes to recent research by taking a regional approach based on the fact that searching costs for employees differ regionally. Based on new linked-employer-employee data for Germany we estimate how aggregate local conditions affect the human capital acquisition of start-ups. We expect to find a negative relationship between the chances of young firms to hire skilled personnel and the economic conditions on the regional labour markets.

## **Extended abstract**

Entrepreneurship is considered an important driver of job creation within regional economies, fostering structural change and innovation. Thus, start-ups (all types of new firms) form an important part of the regional economic growth system. But realising growth is not easy for young firms. For several reasons they face difficulties to attract workers. Coad et al. (2014) approach the question of who is hired by high-growth start-ups from a supply-side and a demand-side perspective. The supply-side comprises the motivation of individuals to take up employment in a specific firm. From this perspective, young firms offer relatively insecure jobs, pay less on average and do not offer organised promotion prospects. This causes problems especially for hiring skilled human capital. Nevertheless some individuals might feel attracted by some of the typical features of young firms. The former could be attractive to young workers willing to take risks concerning job security because they offer a challenging environment with flat hierarchical structures. It is also conceivable that workers with a weaker labour-market position seek employment in start-ups owing to a lack of other employment opportunities. From the demand-side, start-ups might prefer younger, more flexible workers who are a better match

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for the unstable conditions start-ups can offer (cf. Ouiment & Zarutskie 2014). It is also of concern that newly founded firms have to make compromises concerning the quality of their new hires in order to save search costs (cf. Coad et al. 2014).

We contribute to this debate by taking a regional approach exploiting the fact that there are regional differences in search costs (cf. Blanchflower & Oswald 2005, Baltagi et al. 2012, Blien et al. 2013). It is reasonable to assume that the chances of young firms hiring especially skilled personnel are negatively related to the economic conditions on regional labour markets. This would give new firms in lagging regions an advantage towards those founded in flourishing regions. This topic has, to the best of our knowledge, not been studied so far.

Recent studies confirm that new firms hire workers with less human capital than incumbent firms. Measuring the quality of workers by wages, Dahl & Klepper (2015) find that new firms with more experienced founders hire higher-quality workers, but they do not provide any information about the specific characteristics of the employees. A recent study by Ouiment & Zarutskie (2014) provides evidence that young firms more often employ younger workers. Coad et al. (2014) investigate the employees of high-growth start-ups and find that they are more likely to employ young people, poorly-educated individuals, immigrants and people who experienced longer unemployment periods. Schnabel et al. (2011) find that individuals with a good employment record are less likely to join a new firm and that new firms hire individuals who are currently unemployed. Start-ups hire fewer individuals with longer unemployment duration in the past as well as individuals who have just left the educational system. According to results of previous studies (cf. Brixy et al. 2006, Schnabel et al. 2011, Nyström & Elvung 2014, Nyström & Elvung 2015), start-ups offer less secure working conditions and pay lower wages than incumbent firms. These results strengthen the argument that newly founded firms are in an unfavourable position for hiring skilled workers.

This also shows up during cyclical movements. In times of an economic downturn incumbent firms lay off employees and refrain from hiring new staff. This gives new firms founded during a downswing a competitive advantage compared to those founded during an upswing. As recently shown by Brixy & Murmann (2016), start-ups founded during the Great Recession displayed stronger growth and higher employment levels for up to seven years compared to their counterparts which were founded before or after the crisis.

Our paper investigates how aggregate local conditions affect the human capital acquisition of start-ups. To analyse the relevant regional economic conditions we refer to a set of variables that reflect labour market conditions, first of all the regional unemployment rate. We also exploit regional differences by using short-term working schemes as an alternative measure for the tightness of regional labour markets: since the Great Recession of 2008/9 short-term working

schemes have been of great importance. The interesting feature is that firms that make use of this scheme are legally prohibited to hire workers while using the scheme. Thus, young professionals who just left the educational system to start a career are faced with the problem that the usual entry positions in incumbent firms are missing. The ratio of full-time equivalent short-time workers and the number of employees in a region is a proxy for the conditions of the supply-side on the labour market and due to the Great Recession the regional variation of this measure is exceptionally large.

For the empirical analyses, we use new linked-employer-employee data for Germany. The data matches the employer data of the IAB/ZEW Start-up Panel with employee register data from the employment statistics of the German Federal Employment Agency. We can thus observe in detail the build-up of a workforce in each new firm and can link it with each worker's employment history. Due to the sample design, each year new firms founded during the previous three years are added to the sample ("dynamic panel"). The survey data provide information on revenue, profit, investments and innovation as well as on the human capital and prior employment status of firm founders. The register data from the employment statistics of the German Federal Employment Agency yield detailed information on the education and vocational qualifications of all reportable employees, their occupational status (including full-time or part-time employment), as well as the start and end dates of all employment and unemployment spells in each individual's employment history. In order to make comparisons with incumbent firms we expand the IAB/ZEW Start-up Panel by the IAB-Establishment Panel. The IAB-Establishment Panel is an annual survey of individual establishments from all branches in Germany. Like the IAB/ZEW Start-up Panel, this data is linked to the employment statistics of the Federal Employment Agency in order to gain information on the employment history of the employees.

To reduce the risk of survivorship biases due to firms that already existed before being included in the sample, we only keep firms that were first interviewed in the spring or summer following their year of foundation. This reduces our main regression sample to 6960 firms founded between 2007 and 2013. We use the full sample from 2005 to 2013 for robustness checks and find that our results remain robust when using the full sample.

We take a supply-side approach to investigate the characteristics of a young firm's workforce in contrast to an incumbent firm's workforce. More specifically we estimate the following Logit-model:

$$Pr(H_{ifjrt} = 1) = \alpha_0 + \mathbf{X}_{it}\boldsymbol{\beta} + \mathbf{Z}_{rt}\boldsymbol{\gamma} + \delta_f + \eta_j + \mu_r + \varepsilon_{ifjrt}$$

The model's dependent variable refers to the probability of individual  $i$  in firm  $f$ , sector  $j$ , region  $r$  and time  $t$  being hired by a start-up as opposed to an incumbent firm. At the individual level,

the set of explanatory variables,  $X_{it}$ , contains information on an employee's characteristics including age, sex, qualification, wages, the number and mean duration of employment and unemployment spells. At the aggregate level, we control for local labour market conditions,  $Z_{rt}$ , which include the regional unemployment rate, mean duration of employment-spells, the start-up rate while controlling among others for seasonality and mean establishment size. Dummy variables are used to account for unobserved heterogeneity at the firm ( $\delta_i$ ) and the sectoral ( $\eta_j$ ) level, as well as year fixed effects ( $\mu_t$ ). Furthermore, modifying the dependent variable allows for investigating differences in the hires of high-quality and non-high-quality start-ups, high-tech-start-ups and high-tech incumbents.

We expect to find significant differences in the human capital of the employees of start-ups and compared to incumbent firms. Furthermore, we expect a negative relationship between the human capital of employees of young firms and the regional labour market conditions. First results confirm our expectations but still need to be refined.

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