Entrepreneurial skills and regional development. How new entrepreneurs contribute to transformation of regional economy under diverging regional settings.

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Abstract
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The recent research on regional growth emphasizes that regional development to a large extent is characterized by “branching processes” where new industries spur from related existing activities (Frenken and Boschma; 2007; Boschma and Frenken 2011). Nevertheless, the branching process is not the only mechanism responsible for transformation of a regional industrial structure. For example, Neffke et al. (2014) indicate that a fundamental driver of regional change can be a transfer of activities by external firms and entrepreneurs. The most recent evidence emphasize that non-local actors (firms as well as entrepreneurs) induce significantly more structural change into the regional economy as they introduce activities present in their home regions into industrial structure of the hosting economy (Neffke et al., 2014). In the context of entrepreneurial activity, the role of migrant entrepreneurs (i.e. individuals who were economically active in the other region prior to starting the company) is of particular importance as regional entrepreneurship en masse is strongly embedded in local conditions (Stam 2010).

Despite having potentially profound impact on regional economy migrant entrepreneurs might be in disadvantaged position compared to the local one. This is because they might lack access to local networks, information or locally recognizable credibility. Furthermore, routines they transfer from their home region might not be equally functional in the new region. Nevertheless, having non-local routines might still provide an important advantage over local entrepreneurs if a new business is introducing a novel activity in the new region.
Entrepreneurship and regional path dependence.

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Abstract

By means of matched longitudinal employer-employee data on all firms and workers in Sweden, the aim of this paper is to assess whether the performance of all start-ups established between 1995 and 1997 is conditioned by their embeddedness in the region. This is proxied as entrepreneurs’ previous experience from the region and the degree of fit of the new firm in preexisting industrial structures of the region. The findings point towards the self-reinforcing character of entrepreneurial activities of non-local entrepreneurs. As soon as more structural change is introduced into a regional economy, regional conditions become more favorable for non-local entrepreneurs who in turn have a capacity to introduce more structural change. Nonetheless, the possible outcome of this mechanism might be also a lock-in effect, as according to the results regions with little structural change are the least favorable to environment for non-local entrepreneurs.
1. Introduction

It is generally agreed that entrepreneurship is important for regional development (Fritsch and Wyrwich, 2016). This is because entrepreneurs tend to apply knowledge the founders acquired in the past and hence stimulate regional knowledge spillovers (Acs et al 2013) and introduce new variety (Neffke et al 2011). An important question in this regard is whether it is local or non-local entrepreneurs that contribute to regional change? Previous studies provide an inconclusive answer. While the literature on embeddedness on the one hand argue that local entrepreneurs have a home-advantage through access to local networks, information or locally recognizable credibility that takes time to accumulate (Dahl and Sorenson, 2012; Stam, 2007; Schuijens and Völker 2010; Guimaraes and Woodward, 2002), local entrepreneurs are therefore more likely to be competitive compared to non-locals. On the other hand, it is also argued that locals are less prone to engage in new opportunities and hence less willing to become agents of change (Akgün et al 2011). This latter notion is confirmed in recent studies emphasizing that non-local actors (firms as well as entrepreneurs) induce significantly more structural change into the regional economy than local actors (Neffke et al., 2014). This is because non-local entrepreneurs are more likely to introduce activities present in their home regions into industrial structure of the new region. In the context of entrepreneurial activity, the role of migrant entrepreneurs (i.e. individuals who were economically active in another region prior to starting the company) is therefore likely to be of particular importance as regional entrepreneurship en masse is strongly embedded in local conditions (Stam 2010).

Consequently, as previous studies point towards both positive and negative effects of embeddedness, Habersetzer et al (2017) argue that there is a need for further investigation on what type of regional conditions that are relatively favorable for the success of new business ventures by non-local actors. This is particularly the case since firms that are less embedded in the regional industry-space (i.e., active in unrelated industries) face a higher risk of exiting in the process of regional branching, while related diversifiers tend to be more resilient (Neffke et al, 2011). Hence, while non-local entrepreneurs are more likely to have an advantage over local entrepreneurs if introducing a novel activity (new variety) in the host region, there is also a higher risk of exit as the knowledge they presumably transfer from their home region might not have the same fit in a new regional economy.

To address this potential contradiction regarding the home-advantage on the one hand, and the competitive advantage of non-locals as they introduce new variety on the other hand, this paper takes a perspective of individual entrepreneurs’ in the context of evolution of regional industrial diversity. By means of matched longitudinal employer-employee data on all firms and workers in Sweden, this is done by, first, analyzing whether the performance of all start-ups established between 1995 and 1997 is conditioned by their embeddedness in the region. This is captured by whether the new firm operates in a region characterized by many firms in the same industry, related industries, or unrelated industries compared to the new entry. Second, we assess whether the determinants on performance of the regional industry-mix is moderated by the entrepreneurs’ different type of attachment to the regional economy. That is, whether they are born in
the region, previously have lived in the region, or have no experience from the region prior to starting their firm. We use two different measurements to capture firm performance: Survival and job growth. This is because although firm survival is the most straightforward proxy for firm success as it from a firm population perspective capture whether the firm is competitive in the market (Boschma, 2015a), survival is a less suited indicator on how entrepreneurship contribute to regional development. In that case, the contribution of new firms to regional job growth is a more useful proxy for performance (Fritsch and Schindele, 2011).

The results show that non-local entrepreneurs have lower probability of survival, but also create more jobs per plant compared to local entrepreneurs. Interestingly these relative (dis-)advantages of local embeddedness are moderated by structural changes in regional economies. Increasing specialization favor local entrepreneurs while increased diversity favor non-locals. Specifically, an increase in number of regional plants in sectors unrelated to the sector the local entrepreneur is active in decreases the survival advantage of local entrepreneurs. Similarly, an increase in number of plants in sectors related to the new firm increases the employment gap in favor for non-local entrepreneurs. Contrariwise, an increase in number of plants in the same sector as local entrepreneur’s activity decreases this employment gap.

These findings point towards the self-reinforcing character of entrepreneurial activities of non-local entrepreneurs. As soon as more structural change is introduced into a regional economy, regional conditions become more favorable for non-local entrepreneurs who in turn have a capacity to introduce more structural change. Nonetheless, the possible outcome of this mechanism might be also a lock-in effect, as regions with moderate structural change are the least favorable environments for non-local entrepreneurs.

From the policy perspective, these findings have profound implications as the most stagnant regional economies, which are in need of new entrepreneurial ventures and diversification, are the least favorable environments for non-local entrepreneurs. Therefore, policies aiming at introducing non-local actors into such regional economies can be the most challenging. Nevertheless, there is also positive aspect of such mechanism as structural change can be introduced into regional economy not only through development, but also through crisis i.e. negative idiosyncratic shock. This suggests that the policy aiming to attract new economic actors and to facilitate regional restructuring rather than supporting affected sector is the most suitable response when idiosyncratic shock occurs.

The remainder of the paper is structured as follows: Section 2 present a literature review and hypotheses, section 3 introduce the data, variables and model. Section 4 presents the results and section 5 concludes.

2. Literature Review

It is generally agreed that both the establishment and performance of new firms is conditioned by agglomeration externalities. This is because agglomeration increase the chances for successful spin-offs, both entry and growth of firms benefit from the access to a pool of skilled workers, and such firms are more likely to enjoy localized spillovers (e.g., Acs et al 2009). Generally, all these traits tend to be found in large
urban agglomerations (Puga, 2010). This is also reflected in the literature on entrepreneurial ecosystems which emphasizes the role of a variety of infrastructures, institutional settings and supporting industries (Spigel 2015; Mack and Mayer 2016). The purpose of this paper is however not to assess whether mass as such influence the success of new entrants but rather the role of the industry-mix of regions.

Recent research on regional growth emphasizes that the regional development is to a large extent characterized by “branching processes” where new industries spur from related existing activities (Boschma and Frenken, 2011; Frenken and Boschma, 2007). This regional process can take place within existing companies resulting in modified product portfolio or through the foundation of new economic entities. New enterprises might be linked to mother companies through both capital and personal links or through personal links only in case if the former employees decide to start new economic venture independently. In both cases through the spins-off and/or labor mobility mechanisms (Frenken and Boschma, 2007; Klepper and Sleeper, 2005) newly formed enterprises inherit part of the mother enterprise routines. That is, “organizational skills which cannot be reduced to the sum of individual skills” (Stam, 2010). However, over time, new routines, which are not shared with its mother company, are accumulated.

From an evolutionary perspective, the newly founded companies can be seen as a part of the evolution of the regional industrial structure. At the same time, a newly founded company can be viewed as an evolution of routines of the mother company in terms of how the new routines are combined with the inherited one. Contrariwise, an inception of a company established by the migrant entrepreneur might be interpreted as introduction of new routines to the region. As shown by Neffke et al. (2014), a transfer of activities by external firms and entrepreneurs can be a fundamental driver of regional change. However, despite having potentially profound impact on regional economy, migrant entrepreneurs might be still in disadvantaged position compared to the local one. This is because they might lack an access to local networks, information or locally recognizable credibility that takes time to accumulate (Dahl and Sorenson, 2012; Stam, 2007; Schujtens and Völker 2010; Guimaraes and Woodward, 2002). Furthermore, the routines and skills they transfer from their home region might not be equally functional in the new region. Therefore, we can formulate the following hypothesis:

Hypothesis 1: Survival rates of business activities established by non-local entrepreneurs are lower compared to local ones.

Nevertheless, having non-local skills and routines might also provide an important advantage over local entrepreneurs if a new business is introducing a novel activity into the host region, creating a new market niche. Whether this statement actually holds is less clear in the literature. By means of a meta-analysis of 22 ethnographic case-studies, Akgün et al. (2011) concludes that newcomer entrepreneurs in particularly rural regions tend to be more likely to be engaged in different type of economic activities than the local entrepreneurs and in particular contribute more to the regional accumulation of capital. Although, based on the meta-analysis, Akgün et al (2011) cannot find that non-local entrepreneurs are the main instigators of economic renewal and development, this notion is confirmed by (Neffke et al. (2014) who analyses whether
local or non-local agents are more likely to contribute to a diversification of the regional economy. Their findings suggest that non-local actors (firms as well as entrepreneurs) induce significantly more structural change into the regional economy than local actors. This finding holds even if controlling for the initial selection effect that impede the survival chances. Hence, the likelihood that a regional newcomer brings in new knowledge and routines to the region might result in a fast growth of such a company and therefore, it is expected that:

*Hypothesis 2: In case of non-local entrepreneurs, number of jobs created per newly established plant is higher compared to local entrepreneurs.*

Present literature points that only small degree of entrepreneurial activities has potential to introduce change into regional development trajectory. Regional levels of entrepreneurial activities are rather stable over time (Stam, 2010) with variations in entrepreneurship levels having chiefly an evolutionary but not a revolutionary character. Furthermore, the activities of local entrepreneurs can be perceived as the factor having limited capacity for diversifying the regional economy for two main reasons. First and foremost, there are strong empirical indications of a “locational inertia” of entrepreneurs (Stam, 2007). That is, the preference to start businesses in a region where the individual has worked or lived prior to starting a company. The externalities of being embedded in the regional economy can be explained by various factors such as taking advantage of personal and localized networks to maintain access to suppliers, customers information etc., utilizing one’s credibility or for family reasons (c.f., Kalantaridis and Bika, 2006; Figureiredo et al 2002; Dahl and Sorenson 2009). Secondly, entrepreneurs are often characterized by “sectoral inertia” as they tend to start a new company in sectors related to their professional experience where they can benefit implement routines of the past in the new firm (Nelson and Winter, 1982) as well as enjoying assets like social ties, experience or cognitive proximity (Klepper, 2001; Stam, 2010). Several empirical studies show that these type of entrants (spinoffs) increase the survival chances of new entrants (Agrawal et al 2004; Klepper 2009) and that these types of firms contribute to regional branching (Neffke et al 2011).

In this respect, it is usually claimed that new firms operating in a regional environment characterized by industry-specialization outperform firms not having access to industry-specific externalities. Still, according to Audretsch (2012) the exact mechanisms of specialization on entrepreneurial success is far from conclusive. Apart from having externalities related to both matching and sharing (Puga, 2010), a strong regional concentration of firms in the same industry also involve fierce competition (Porter, 1998). Hence, empirical analyses report that specialization could have both negative and positive effects on new firm survival depending on region and type of industry (Borggren et al, 2016; Cainelli et al, 2014). Hence, we can expect the role of specialization to act as a double-edged sword in the sense that there should be high entry rates in regions with many firms operating in the same sector, but also high rates of exit due to competition. In all, this implies that only the most innovative firms with the best fit to the region are able to survive.
Also as shown by Neffke et al. (2011) on the industrial evolution of Swedish regions between 1969 and 2002, new industries that were technologically related to the pre-existing industries had a greater chance of entering the regional economy. Contrariwise, industries that were technologically different (or unrelated) faced a greater risk of exiting. Hence, while the heritage approach emphasizes how experienced entrepreneurs have an advantage on inexperienced ones by arguing that industry experience is crucial for both survival and future growth, we can expect that the relative fit of the new firm in a region’s industry-space also have an impact on both survival and performance. For example, as non-local actors are more likely to induce more radical changes in a region (Neffke et al. 2014), the development of new sectors in the region might undermine the benefits of embeddedness as the sector – and the benefits related to better attachment to this sector – a local entrepreneur is active in loses its relative importance. However, as non-local entrepreneurs are less embedded in the region and also likely to engage in activities that are new to the region, they might be less dependent on pre-existing industry specializations. Consequently, the final hypothesis can be formulated as:

**Hypothesis 3:** An increase in plants in the same industrial sector will benefit the performance of local entrepreneurs, while non-local entrepreneurs benefit from the development of other sectors

### 3. Research design

In the focus of this paper are firms that were established by individual persons between year 1996 and 1998. Their performance is followed until year 2012, which is the last year the information is available on. This particular period is characterized by two main events. First, Sweden joined the EU in 1995 and this year also marked the recovery from the deep recession in the early 1990-ies. Selecting plants established just after year 1995 allows observing their performance both during the recovery period as well as during the global downturn 2008-2009.

Years 1996-2012 are also a period of transformation of the Swedish economy towards more liberal and free market economy. One of the outcome of this transformation are increasing (but still quite low in international comparison) levels of entrepreneurial activity. Despite a reduction of social protection, Sweden remains a country with a highly developed welfare system and the levels of unemployment in the country remain relatively low. As a result, while entrepreneurial activities indeed have increased over the last years, Sweden has one of the lowest shares of necessity-driven entrepreneurs among OECD countries (Kelley et al., 2016; Singer et al., 2015), which makes it a perfect context for an investigation of foundations and outcomes of a growth oriented entrepreneurship.

**Method**

The economic performance of enterprises depends on a whole range of factors, and while some of them can be identified based on previous research and directly observable for a researcher, many cannot be identified and incorporated in modeling framework. Such omitted characteristics may bias the results and lead to misleading conclusions. However, some present panel data methods give the opportunity to mitigate
the impact of such confounders. To verify our theoretical hypotheses, we need to analyze the performance of new plants in terms of job creation and survival. This requires application of two different modelling methods to model quantified outcomes and probability.

To analyze the performance of new plants in terms of job creation we use the so-called ‘hybrid’ models (Bell and Jones, 2015) which combine the efficiency of random effects (RE) models and accuracy of FE-models to avoid the problem of heterogeneity bias. In hybrid models, the unobserved time-constant effect is decomposed into a random effect which is uncorrelated with the explanatory variables and the mean values of the time-varying regressors that are expected to be correlated with the individual random effects. As emphasized by Bell and Jones (2015) such a specification makes it possible for the RE model to incorporate time-invariant variables and cross-level interactions to explicitly allow for modelling variation in effects across space and time. This makes this method very suitable for our research purpose as it allows to analyze the role of time-invariant regressors (such as an individual entrepreneur being born in the region of his economic activity) which is not possible in case of fixed effects (FE) models.

Regarding the analysis of plants survival, hazard models can be particularly of use. Hazard models allow incorporating fixed in time and time-varying variables. They are also an appropriate analytical tool, because they deal with right censoring. This is important issue in this study, as observations are right-censored in the dataset if the exit of a firm is not observed until year 2012. The basic time-unit used in this study is year, which means continuous risk hazard models are not well-suited for this assignment. Therefore, the hazard rate model is estimated in a discrete time setting using logit function. The models estimated in this paper determine a discrete time hazard that is the conditional probability of experiencing an event - in this case a firm exit – up to a particular time-period, providing that this event has not occurred earlier. Additionally, similarly to the model estimations considering job creation, the unobserved time-constant effect was decomposed into an uncorrelated random effect and the mean values.

The final comment regarding estimation method considers using exit as an indicator of business failure. In certain types of industries and regional settings an exit might not be necessary an indicator of failure but also a type of business strategy. For example, even though exit rates tend to be high in specialized industry-clusters, it is not certain that this is a matter of exit by closure. Rather, it could be due to mergers and acquisitions, which tend to be far more common in specialized regions. Some case studies on the Italian ICT sector (Weterings and Marsili, 2015), Swedish bio-tech firms (Rekers and Grillitsch, 2013) and the video gaming industry (Balland et al, 2013) show that regional specialization favor the general firm population by mitigating the risk of exit by closure, while increasing the chance of exit by acquisition. The estimation approach deals with this problem the following way: first regional and industrial fixed effect are used to control for region and industry specific features. Second the survival is measured using a plant not company identification number, which remains unchanged when a company is taken over by other business entity.
Data

This paper uses longitudinal micro-database created by merging several administrative registers at Statistics Sweden. It contains matched information on the individuals and their resources of human capital (e.g., education, industry- and firm-specific working experience) and characteristics of all enterprises (such as entry, exit, sector, location, productivity) in the Swedish economy (Boschma et al., 2014). The data needed for this project takes longitudinal (panel) form with an annual frequency. The sample used in this study covers all companies founded by individual entrepreneurs between 1996 and 1998. The information about companies has been linked with the information on individuals who have been identified as their owners and the information about regional industrial structure takes into account all existing plants in Swedish economy.

Variables

The dependent variable in this study is the performance of new firms measured by job creation (number of employees) and the risk of exit, measured as the conditional probability of a firm exit, if a firm did not exit in an earlier period.

The independent variables are regional characteristics as well as characteristics of business founder. Table II in Annex I presents summary of all variables. All regional characteristics were calculated at the level of functional regions (FA regions) where each of the 290 Swedish municipalities is assigned to one of the 72 regions (Tillvaxtanalys, 2013). This geographical division reflects the scale of the labour market in which each individual operates as well as potential business connections, as the functional region reflects most of the commuting opportunities between the places of living and business locations.

As the focus of this paper is the role of local embeddedness of an entrepreneur, a set of dummy variables was introduced which indicate different types of individual links with a region in which the business was started. We divide entrepreneurs into four categories based on two types of relations to the region the company was started: being born the region and living there prior to starting a company. The reference category is a person who neither lived nor was born in the region the business was started. The other categories used in our model estimations are: Born and Living. This is a dummy variable reflecting that a business founder was born in the region where the company was started and he/she lived in this region at least for one year during five years period prior to starting the company. Only born – a dummy variable indicating that a business founder was born in the region where the company was started, but he/she has not lived in this region during any of five years period prior to starting the company. Only living - a dummy variable indicating that a business founder was born in another region where the company was started, but he/she lived in this region at least for one year during five years period prior to starting the company.

To account for other individual characteristics of the entrepreneur, which are considered as factors shaping entrepreneurial activity, the following variables were introduced: having higher education (at least 3-year university diploma), gender, year of birth as well as dummy variables distinguishing individuals whose
mother or father owned a business for at least one year. (compare (Beutell, 2007; Gimenez-Nadal et al., 2012; Niittykangas and Tervo, 2005; Taylor, 1999)).

To account for the role of embeddedness of each started company in regional industry-space, measures of both specialization and variety were introduced. Absolute specialization measures number of plants active in the same industry sector in the region (measured by 4 digit SNI - Swedish Standard Industrial Classification code) and indicates the size of the industry with the highest cognitive proximity to a started company. Variety is divided in two different variables: Related variety and unrelated variety (c.f., Frenken et al, 2007). Related variety measures number of plants active in the related industries and indicates the size of the industry with some degree of cognitive proximity (Boschma and Frenken 2009). The labor flows between sectors has been used to identify related sectors, as the industries, which require similar skills are expected to enhance regional labor matching (compare (Neffke and Henning, 2013). Finally, unrelated variety indicates total number of plants excluding those in the same and related industries and indicates the industries with the largest cognitive distance.

Finally, our estimation strategy takes into account other regional characteristics potentially important for entrepreneurial success. Population – number of people leaving in FA region during analyzed period (1996-2012) was introduced to account for the region size and demand. Average salary – an average regional salary in 100 SEK for the population of productive age (16-64) to account for average regional productivity. GDP growth – additionally to regional characteristics national GDP growth was used to account for the change in national demand and general economic situation.

4. Empirical results

The estimation results are presented in Table I in Annex I. Model 1-3 present estimation results for probability of exit of new plants while Model 4-6 for performance in terms of employment. Model 1 and Model 4 present estimation results without interaction effects while Model 2 and Model 5 include interaction effects between being local entrepreneur and measures of industrial structure (specialization, related and unrelated variety).

For both types of estimations, the same stepwise procedure was maintained. First only measures of specialization, related and unrelated variety as well as age of company were introduced to the model. The latter variable is imperative in a discrete survival model. In the following step other macroeconomic factors were added: national GDP growth as well as regional population and average salary on regional level. Next as presented in Model 1 and Model 4 individual characteristics of entrepreneur including measures of local exposure were introduced. Finally, as presented in Model 2 and Model 5 interaction effects between being local and measures of industrial structure (specialization, related and unrelated variety) were introduced. The main findings remained robust across different model specifications, therefore in the result table we present final steps of estimation procedure.
For time-variant variables the table reports within variation effects, i.e. they should be interpreted as how a change in a given explanatory variable influence a change in the dependent variable (similarly to interpretation of Fixed Effects models).

Across different model specifications, living in the region prior to starting a company turns out to be significant measure of local embeddedness while being born or not in the region tend to not differentiate the results. For this reason and to make the discussion of the result simpler in the next paragraphs we differentiate only between individuals who lived in the region prior to starting a company (local) and those who did not (non-local).

The results of Model 2 show that local entrepreneurs (i.e. being Born and Living or just Living in the region prior to starting a company) have lower probability of exit (confirmed Hypothesis I), but also according to the results of Model 5 create less jobs compared to non-local entrepreneurs (confirmed Hypothesis II). Interestingly these relative advantages and disadvantages of the local embeddedness are moderated by structural changes in regional economies as foreseen by Hypothesis III, but only for some measures of performance.

As shown in Model 5 an increased specialization tends to favor local entrepreneurs in terms of employment. A positive and significant interaction effect of specialization and being local entrepreneur indicates that an increase in number of plants in the very same sector as local entrepreneur’s activity increases employment rate among plants established by local entrepreneurs.

Also in line with Hypothesis III increasing unrelated variety favors migrant entrepreneurs in terms of business survival and related variety in terms of employment growth. As shown in Model 2, a positive and significant interaction effect of unrelated variety and being local entrepreneur indicates that an increase in number of plants in unrelated sector increases probability of exit of local entrepreneurs. Similarly, as shown in Model 5 a negative and significant interaction effect of related variety and being local entrepreneur indicates that an increase in number of plants in related industries decreases employment rate among plants established by local entrepreneurs.

**Model extensions – sensitivity analysis**

While only part of interaction effects is significant and confirms Hypothesis III it should be emphasized that none of expected effects points towards the opposite direction.

In order to further check the robustness of the results Model 3 (for probability of exit) and Model 6 (for employment rates) were introduced, which contain an additional set of individual characteristics of entrepreneur, which might confound the main results. In Model 3 and Model 6 we control for the following additional characteristics of the entrepreneur, which are linked to the labor market career: being unemployed prior to starting a business, having entrepreneurial experience prior to starting a business, having experience in same or related sector to the one a new company is active. Model 3 and Model 6 also
introduce variables controlling the direction of migration of non-local entrepreneur, as entrepreneurs moving from peripheral to core regions might bring different sets of skills than those moving into opposite direction or not changing the type of regional environment. Introduction of additional controllers does not change the results compared to Model 2 and Model 5 and interestingly the direction of migration seems to be not related to the mechanism investigated in this paper.

5. Discussion

Our results show that local embeddedness can be perceived as supportive as well as detrimental factor for entrepreneurial success depending how such entrepreneurial success is defined. More locally embedded entrepreneurs have lower exit rates, but their businesses tend to grow less compared to non-local entrepreneurs. Our results also show that benefits stemming from an access to local networks, information or locally recognizable credibility can be diminished when more structural change is introduced into local economy.

These findings point towards the self-reinforcing character of entrepreneurial activities of non-local entrepreneurs. As soon as more structural change is introduced into a regional economy, regional conditions become more favorable for non-local entrepreneurs who in turn have a capacity to introduce more structural change. Nonetheless, the possible outcome of this mechanism might be also a lock-in effect, as according to the results regions with little structural change are the least favorable to environment for non-local entrepreneurs.

This finding has important policy implication as the introduction of new, non-local economic actors is considered as a tool of regional development policy and as such is relevant in the first place for regions facing economic hardships rather than those with diverse and dynamic economy. In light of these findings the regions with the most stagnant economy, which are in need of new entrepreneurial ventures and diversification are also the least favorable for non-local entrepreneurs. Therefore, policies aiming at introducing non-local actors into such regional economies can be the most challenging.

Nevertheless, there is also positive aspect of such mechanism as structural change can be introduced into regional economy not only through development, but also through crisis i.e. negative idiosyncratic shock. If the key sector is affected by the shock, the window of opportunity might open for non-local entrepreneurs as the benefits of local embeddedness are weaken. In such case, new non-local entrepreneurs might introduce even more structural change into the region and therefore start self-reinforcing regional transformation. This finding suggests that the policy aiming to attract new economic actors and to facilitate regional restructuring rather than supporting affected sector is the most suitable response when idiosyncratic shock occurs.
References


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### Appendix I – Model Results

#### Table I – Probability of exit

<table>
<thead>
<tr>
<th></th>
<th>Model 1 Probability of exit</th>
<th>Model 2 Probability of exit</th>
<th>Model 3 Probability of exit</th>
<th>Model 4 Employment rates</th>
<th>Model 5 Employment rates</th>
<th>Model 6 Employment rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute specialization</td>
<td>0.0918*** (4.63)</td>
<td>0.0870 (1.07)</td>
<td>0.0874 (1.08)</td>
<td>-0.0388*** (-6.83)</td>
<td>-0.133*** (-3.46)</td>
<td>-0.133*** (-3.46)</td>
</tr>
<tr>
<td>Related variety</td>
<td>0.0199** (3.23)</td>
<td>0.00119 (0.15)</td>
<td>0.00117 (0.15)</td>
<td>0.00436* (2.44)</td>
<td>0.0124*** (4.10)</td>
<td>0.0124*** (4.10)</td>
</tr>
<tr>
<td>Unrelated variety</td>
<td>0.0158** (2.58)</td>
<td>-0.0115 (-1.70)</td>
<td>-0.0115 (-1.70)</td>
<td>0.00588*** (3.32)</td>
<td>0.00481* (2.19)</td>
<td>0.00474* (2.16)</td>
</tr>
<tr>
<td>Firm age (square)</td>
<td>-0.323*** (-11.21)</td>
<td>-0.324*** (-11.25)</td>
<td>-0.324*** (-11.25)</td>
<td>0.0362* (2.36)</td>
<td>0.0358* (2.34)</td>
<td>0.0360* (2.35)</td>
</tr>
<tr>
<td>Firm age (cube)</td>
<td>-0.00107*** (-5.22)</td>
<td>-0.00105*** (-5.14)</td>
<td>-0.00105*** (-5.14)</td>
<td>0.000467*** (7.73)</td>
<td>0.000466*** (7.71)</td>
<td>0.000464*** (7.68)</td>
</tr>
<tr>
<td>GDP</td>
<td>-0.436 (-1.76)</td>
<td>-0.520* (-2.10)</td>
<td>-0.520* (-2.09)</td>
<td>-0.230*** (-8.56)</td>
<td>-0.230*** (-8.57)</td>
<td>-0.229*** (-8.54)</td>
</tr>
<tr>
<td>Population</td>
<td>0.000183 (0.10)</td>
<td>-0.000396 (-0.21)</td>
<td>-0.000407 (-0.21)</td>
<td>-0.00236*** (-4.26)</td>
<td>-0.00238*** (-4.30)</td>
<td>-0.00237*** (-4.28)</td>
</tr>
<tr>
<td>Average salary</td>
<td>0.00184*** (3.05)</td>
<td>0.00235*** (3.89)</td>
<td>0.00234*** (3.89)</td>
<td>0.000650*** (3.44)</td>
<td>0.000651*** (3.45)</td>
<td>0.000651*** (3.45)</td>
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<td>0.143*** (8.34)</td>
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<td>-0.220*** (-9.80)</td>
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<td>-0.0208* (-2.00)</td>
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<td>-0.0461*** (-2.99)</td>
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<td>0.0354 (1.96)</td>
<td>0.0355 (1.96)</td>
<td>0.0347 (1.92)</td>
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<td>0.0582* (2.33)</td>
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<td>0.0246*** (31.48)</td>
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<td>-0.155 (-0.84)</td>
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<td>-0.314*** (-5.42)</td>
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<td>-0.204** (-3.14)</td>
<td>-0.222** (-2.83)</td>
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<tr>
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<td>Only Living</td>
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<td>(2.31)</td>
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<tr>
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_t statistics in parentheses
*p < 0.05, ** p < 0.01, *** p < 0.001
Table II - Variables description

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<th>Max</th>
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<table>
<thead>
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<th>Dummy variables</th>
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</table>
| Female                                                    | 29.2%
| Father Entrepreneur                                       | 7.1%
| Mother Entrepreneur                                       | 1.1%
| Higher Education                                          | 23.5%
| Only Born                                                 | 0.8%
| Only Living                                               | 31.5%
| Born and Living                                           | 66.2%