Finding a window of opportunity or escaping unemployment? The role of labour market dynamics in individual entrepreneurial decisions.

Marcin Rataj

Abstract

This paper draws on the analytical framework of the job search theory to explore how labour market dynamics influence individual decisions to start a company. It investigates the role of short and long-term unemployment levels as well as the matching efficiency of regional labour markets in the entrepreneurial decisions of employed and unemployed individuals. The empirical findings suggest that unemployed individuals have a higher probability of starting their own company than employed individuals. In addition, changes in regional unemployment levels have stronger impact on the propensity to start one's own company among unemployed than employed people. These differences are also moderated by the matching efficiency of regional labour markets. These findings imply the need to consider not only individual resources and motivations, but also the labour market efficiency when considering the impact of unemployment fluctuations on entrepreneurial activity.

Introduction

This paper investigates how employed and unemployed individuals compare in terms of the probability of setting up a company, and how this probability is moderated by the dynamics of the regional labour market. Traditionally, the literature about entrepreneurial decisions has distinguished between opportunity-driven and necessity-driven entrepreneurship (Acs, 2006; Reynolds et al., 2001; Verheul et al., 2010). This paper instead draws on the analytical framework of the job search theory (McCall, 1970; Mortensen and Pissarides, 1999; Pissarides, 1994) which has not been applied to date in the context of an investigation into entrepreneurial decisions. Applying job search theory in this context provides universal theoretical framework for the analysis of number factors related to entrepreneurial decisions. As shown in this paper, the job search theory allows us to formulate precise theoretical predictions considering the entrepreneurial decisions of employed and unemployed individuals: how they respond to long and short-term unemployment levels and to a difference in the matching efficiency between labour markets. From this perspective, the propensity to start a business might evolve differently for

unemployed and employed individuals over the course of economic cycle, and in labour markets with dissimilar matching efficiency.

The starting point of the theoretical investigation in this paper is the analysis of how changing opportunity costs and the quality of matching between employers and employees affect a decision to start a company. The empirical investigation supports the predictions, based on the job search theory, that favourable long-term labour market conditions (low unemployment levels) facilitate entrepreneurial decisions while short-term labour market improvements decrease the probability of starting a company. The comparison of unemployed and employed people shows that the unemployed have a higher probability of starting a company than the employed, although this difference is moderated by short-term labour market developments: an improvement in labour market conditions decreases the probability of starting a company to larger degree among the unemployed. At the same time, higher matching efficiency, which characterises thick labour markets, increases the difference in the probability of starting a company between the unemployed and the employed.

To apply job search theory empirically we have to distinguish the individual's labour market characteristics from the influence of regional developments on the labour market. Therefore, it requires extensive individual longitudinal data, which can be linked to data at regional level. This study uses longitudinal register data created by linking several administrative registers at Statistics Sweden, which cover the prior labour market history, personal characteristics and the family background of individuals who eventually become entrepreneurs.

The study accounts for the role of individual endowments and motivations to set up a company. Controlling for these factors often creates methodological challenges due to the simultaneous causality problem. The same factors such as risk-aversion or non-cognitive skills codetermine both the entrepreneurial decisions of individuals and their performance on the labour market (Thurik et al., 2008). Therefore, the empirical analysis is carried out using modelling techniques which consider the potential confounding role of unobserved heterogeneity (Manjón-Antolín and Arauzo-Carod, 2008). Specifically, this means that frailty hazard models are estimated in order to control for the time-varying characteristics of the regional economy in which individuals operate, as well as the individual's fixed-in-time unobserved characteristics.

Theoretical background

Opportunity and necessity-driven entrepreneurship

Previous research on entrepreneurial decisions was based on an examination of two types of factors. First, the push factors represent all the negative labour market conditions (such as unemployment or a lack of prospects for professional development) that motivate an individual to establish a company. Second, pull factors represent the potential benefits of establishing a company (Acs, 2006; Reynolds et al., 2001; Verheul et al., 2010). The individual will establish a company when the net benefits of the decision (determined largely by pull factors) will exceed the present value (influenced by push factors) of wages or unemployment benefits (Svaleryd, 2015). In the case of people unemployed due to a high value of push factors, even small benefits associated with starting a company might trigger a decision to do so which is often referred as necessity-driven entrepreneurship. In the case of employed individuals, the expected benefits usually need to be far greater and therefore most decisions by employed individuals are referred to as opportunity-driven entrepreneurship (Acs, 2006; Reynolds et al., 2001, Verheul et al., 2010). The push/pull factor analysis allows us to predict that, in most cases, unemployed people have a higher probability of starting a company than employed individuals.[1]

A number of studies have already shown that unemployed individuals actually have a higher propensity to make the transition into entrepreneurship, compared to individuals who already have a job (Carrasco, 1999; Evans and Leighton, 1990; Ritsilä and Tervo, 2002). Nevertheless, this theoretical framework does not allow us to make predictions about the impact of changes in economic conditions on entrepreneurial decisions. Better macroeconomic conditions decrease the impact of push factors, but are also associated with better business prospects. Therefore, it is difficult to assess *a priori* if the outcome will be positive, negative or if the decrease in push factors and the increase in pull factors will cancel out each other. Unsurprisingly, the previous research provided mixed evidence (Carrasco, 1999; Ritsilä and Tervo, 2002), also see Audritsch et al. (2015) for a very recent summary of the evidence.

Job search theory

---

[1] This might not hold in some extreme cases when the unemployed benefits are very generous, there is no unemployment stigma, and entrepreneurial prospects are very poor.

This study expands on the previous theoretical perspective and implements the analytical framework of job search theory in entrepreneurship analysis. Similarly to an analysis of the push and pull factors, the job search theory views individuals searching for jobs as rational decision makers, trying to find the jobs which offer the best possible conditions (Rogerson et al., 2005). The key concept in the job search theory is the trade-off between accepting a position, which becomes available at a given point in time, and continuing the search for a more suitable job. Individuals may hope that waiting for the next offer may bring better opportunities, although the job search usually requires time, effort and sometimes also financial expenditure. Jobseekers comprise two groups of individuals: unemployed people as well as employees looking for a new job while already working (Burdett, 1978; Pissarides, 1994). Employment status determines both the individual resources and the opportunity costs related to accepting a new job. The opportunity cost of accepting a current job offer is the value of a future job offer minus the cost of continued search until an offer is received. Employees searching on-the-job face higher opportunity costs compared to people who are unemployed, because starting a new job implies that they have to quit the job they already have.

In this paper, it is hypothesized that starting a business can be viewed as a similar act to accepting a new job. Similarly, for the push-pull analysis this implies that while employed people have more resources to find a job, they also face higher opportunity costs of transition into self-employment compared to the unemployed (Pissarides, 1994). Therefore, according to **Hypothesis 1**, a higher probability of becoming an entrepreneur can be expected among people who are unemployed.

Implementing the job search theory allows also more advanced theoretical predictions to be formulated compared to the push-pull analysis. There are key aspects of starting a company that make it different from accepting a new job. On the one hand, setting up a company allows the individual to use their own resources including financial capital, social networks and knowledge about a specific industry in order to achieve substantial economic gains, more flexibility and autonomy (Beutell, 2007; Gimenez-Nadal et al., 2012; Taylor, 1999). On the other hand, job positions created in businesses that jobseekers start themselves tend to carry a larger risk of job destruction, while at the same time, the financial and social consequences of business failure may be more important than the consequences of losing a job (Blanchflower, 2000). This analysis implies three important features of starting a business compared to changing job. First, starting a business has more profound and longer-lasting consequences. Secondly, the decision depends more on individual resources. Finally, an individual can fully control the moment

they start the business while he or she can only assume when the next job offer may be available. Consequently, the propensity to set up a company may depend not only on the individual labour market status but also on the business prospects related to regional economic conditions. Long-term labour market conditions may proxy business prospects and affect business sentiment and therefore, one can expect (**Hypothesis 2**) that the long-term labour market performance will have a positive impact on entrepreneurial activities both for employed and unemployed people.

The completely different impulses may stem from a short-term change on the labour market. A short-term improvement in labour market conditions[2] creates additional jobs, which would otherwise be unavailable, as an alternative to starting a business. This may increase the propensity to continue the job search instead of setting up a company. Therefore, as per **Hypothesis 3** it can be stated that a short-term labour market improvement decreases the probability of the transition to entrepreneurship both for the employed and unemployed. However, according to **Hypothesis 4,** better labour market conditions will have a particularly strong effect on the probability of unemployed people starting a company who on average lack the resources to set up a company and often only start one because of the lack of available job offers. An improvement in the labour market situation, increasing the job arrival rate, may have a larger impact on this category of jobseeker.

Besides the unemployment levels, another important characteristic of the labour market is its matching efficiency, which is influenced by agglomeration economies. A larger market allows for better matching between employers and employees (Puga 2010) and as a result, the average quality of employer-employee match is higher in the case of thicker labour markets (Berliant et al 2000). This, in turn, increases the opportunity costs for employed people compared to unemployed people. Therefore, as per **Hypothesis 5** it can be stated that the size of the labour market will decrease the probability of employed individuals starting a company, compared to unemployed individuals[3].

The formulated hypotheses postulate dissimilar effects for people with different levels of individual endowment, as well for different business cycle phases. There are few existing studies which could be

---

2 A short-term improvement in labour market conditions might suggest a good moment to start a business, but also creates an additional number of job offers, which would otherwise be unavailable, as an alternative to starting a business. Less favourable labour market conditions are likely to overlap with the closure of enterprises, which lowers costs and increases the availability of second-hand business equipment and premises (Ritsilä and Tervo, 2002).

[3] An important remark should be made here that this hypothesis does not speculate about the overall effect of labour market thickness on entrepreneurial rates, as there are many kinds of agglomeration economies and diseconomies which can influence the propensity to start a company. The claim made here is that the higher share of companies founded by employed people, compared to unemployed people, can be expected in thick labour markets.

linked to the theoretical predictions formulated in this paper. The notable exceptions are Tervo (2006) and Svaleryd (2015). Tervo (2006) shows that a high unemployment level pushes individuals with a self-employment family background into self-employment, while at the same time prevents the transition in the case of individuals with a family background of wage earners. Similarly, Svaleryd (2015) shows that people with a higher level of education are pulled while those with lower education are pushed into self-employment, and therefore both groups respond differently to the local business cycle. Both findings are in line with the theoretical predictions formulated in this paper and furthermore, job search theory can provide coherent explanations for both findings.

Method

Hazard models can be particularly useful to investigate the decision to start a company. They allow the incorporation of variables which are not only fixed in time, but also time-varying variables, such as the labour market history of individuals. Hazard models provide an opportunity to take a life course perspective in this analysis, and to follow individuals from the moment they become adults, and are therefore eligible to set up their own company, until they become entrepreneurs. In this study, hazard models are also a more appropriate analytical tool than alternative techniques, such as panel data models, because they deal with right censoring. The basic unit of analysis in the data used in this study, time, i.e. one year, comprises a substantial proportion of the average duration of an individual's labour market career, which means continuous risk hazard models are not well-suited for this assignment. Therefore, the hazard rate model is estimated with a discrete time setting. The models estimated in this paper determine a discrete time hazard that is the conditional probability of experiencing an event - in this case entering self-employment – up to a particular time-period, providing that this event has not occurred earlier (Marshall 2015).

Exploring the determinants of employment-entrepreneurship transitions also requires looking at endogeneity problems, because becoming an entrepreneur is not a random process but rather a choice. The solution applied in this paper is that the unobserved heterogeneity (frailty) component is integrated out from the likelihood function for the hazard model (Furdas and Kohn, 2011; Wooldridge, 2010).

To conduct sensitivity analysis, an alternative approach based on split population hazard models was used. Hazard models were initially developed in research on mortality, where all individuals experience death. As emphasised by Schmidt and Witte, 1989, hazard models assume that all individuals eventually

experience the event of interest – in the context of this paper becoming an entrepreneur. At the same time, previous literature and common knowledge clearly indicate that entrepreneurship is quite selective, meaning that only a small proportion of individuals in any population can become entrepreneurs. In order to address that problem, split population hazard models (cure models) can be employed (Schmidt and Witte, 1989) in which the assumption of the universal probability of becoming an entrepreneur can be relaxed. Split population models explicitly model the probability of entering entrepreneurship, with possible values of below one. In these models, the hazard distribution is calculated in the same way as the standard hazard models, but can be interpreted as only applicable to individuals who eventually become entrepreneurs.

Data

This study utilises data from Sweden that matches information from several administrative registers at Statistics Sweden. It includes information on all workers (e.g. workplace, education, work experience) and the characteristics of all plants (e.g. sector, spatial coordinates) in the Swedish economy (Boschma et al., 2014) and regional macro data. The data needed for this project has a longitudinal (panel) form with an annual frequency, and all the variables apart from the date of birth, country of birth, gender and family background are time-varying. The sample used in this study covered all individuals born between 1967 and 1993. The variables describe the characteristics of these individuals from the age of 18 (which is 1985 for the oldest cohort in the sample) until 2012, meaning that the oldest individual in the dataset was observed for 27 years until the age of 45. In total, 2,773,349 individuals were included in the sample.

Variables

The dependent variable is the Transition into Entrepreneurship (TE) - the conditional probability of becoming an entrepreneur. In the sample used in this study, individuals were followed from the age of 18 (which is the age at which they can become an entrepreneur) and in each year of their labour market career they were classified either as being an entrepreneur or not. The dependent variable takes one of two values: 1 if individuals becomes an entrepreneur in a given year and otherwise 0.

The available data allows individuals to be classified as entrepreneurs in two ways: the date of the registration of entrepreneurial activity and the year from which the entrepreneurial activity can be considered as the main professional status. The advantage of the first approach is that it allows a more

precise investigation of when the business activity was started. The second approach allows a differentiation between minor business activities, which cannot be considered as the main professional activity (i.e. if an individual owns a business but remains a full-time employee in another enterprise or institution), and situations where being an entrepreneur is the main professional activity. In a preliminary analysis, both methods were compared and turned out to provide similar results. Similarly to Ritsilä and Tervo (2002), the second approach was finally chosen in this study, as data about the date of registration of entrepreneurial activities was only available from 1995, which would considerably shorten the period in which the characteristics of the sample can be observed.

To account for the individual labour market situation, a labour market status variable was created as a dummy indicating the status of each individual as not-working or working. The "not-working" status was used as a reference category. The characteristics of the labour market were captured using three variables: average employment rate, labour market dynamics which account for long-term and short-term unemployment levels, and the labour market thickness which accounts for the labour market matching efficiency. All three variables 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 representing economic, labour market and transportation links between the municipalities (Tillvaxtanalys, 2013). This geographical division reflects the scale of the labour market in which each individual operates, as the functional region reflects most of the commuting opportunities between the place of living and possible job locations.

The average employment rate is a mean value of the number of people employed in the region divided by the amount of the population of productive age (16-64) in that region during the analysed period (1985 -2012)[4]. Labour market dynamics represent the difference between the average employment rate and the employment rate in each year of the analysed period. Besides theoretical reasons, there are also methodological reasons for decomposing the labour market conditions into the time constant mean value and time-varying annual variation. If the regions differ in terms of long-term employment rates, the same level of employment might, in fact, indicate a period of economic growth in one region and recession in another. Demeaning the annual employment rates can solve this problem. Also, regions with high long-term employment rates can provide a better business environment for starting a company,

---

[4] In 1993, Statistics Sweden introduced a change in the data collection methodology (SCB, 2014). Therefore, in this study data was harmonized for the period 1985-1992 and 1993-2012.

which is controlled for the introduction of the average employment rate[5]. From a methodological perspective, this approach allows the modelling of higher and lower level of variations (see Bell and Jones 2015). The labour market thickness is measured by the density of population per square kilometre in each functional region.

Besides the regional labour market conditions, a variable representing productivity growth at the level of functional regions (FA regions) was also introduced in the model. Regional Productivity Growth was calculated as an annual percentage change of the average regional salary. This variable allows the aspects of regional growth to be controlled which are not directly related to the labour market situation but account for general productivity in the region.

The broad literature on entrepreneurship provides evidence that the probability of starting a business is mediated by individual resources as well as family background. Consequently, in the hazard model estimated in this paper, a wide range of both fixed and time-varying control variables were incorporated in order to capture the impact of potential confounders. The baseline hazard is a function of age, which captures life experiences and maturity, i.e. factors crucial to the opportunity to start a business. The following age intervals were considered: 18-24, 25-29, 30-34, 35-39 as well as over 40. The hazard model also controls gender, which is considered as one of the key factors shaping entrepreneurial activity (Beutell, 2007; Gimenez-Nadal et al., 2012; Taylor, 1999). Education attainment is another important individual characteristic moderating the probability of starting business activities, because it comprises the skills necessary to start and keep running a business. To control this, variables indicating the level of education were introduced. A set of dummy variables were created indicating primary, secondary and tertiary education with primary education as the baseline scenario.

The family education background as well as the parental entrepreneurial experience might moderate the probability of starting business activities, because individuals with better-educated parents may receive more support from family members in the form of know-how or financial resources. The entrepreneurial experience of a parent is also important because of the inter-generational transfer of entrepreneurial norms and attitudes (Niittykangas and Tervo, 2005). Therefore, a variable indicating the

---

[5] As a sensitivity analysis, an alternative approach was also tested where the variable accounting for labour market dynamics was calculated based on a growth or decrease in employment compared to the previous year. This approach provides similar results to those presented in this paper where changes in employment are concerned, but does not take into account the role of average long-term employment in the same way as the proposed method.

education level of the father[6], designed in the same way as individual's education level, was introduced to the hazard model. In addition, a dummy variable distinguishing individuals whose parent, or both parents, owned a business for at least one year was used in the analysis.

In the case of immigration-attracting countries such as Sweden, the population of migrants can constitute a group in a potentially disadvantaged position on the labour market due to the lower presence of locally valued professional skills, weaker social networks and ethnic discrimination. As a result, they might be a group with a higher than average share of necessity-driven entrepreneurs. Therefore, a dummy variable indicating whether an individual was born in Sweden was included into the model.

Empirical results

The key results of Model 1, presented in Table 1, show how an individual's labour market experience affects the probability of transition to self-employment. The results show that being employed is associated with a lower probability of transition to self-employment compared to being unemployed. Consistently with **Hypothesis 1**, the low opportunity costs implied by unemployment encourage entrepreneurship. This confirms the theoretical assumptions based on an analysis of push and pull factors as well as job search theory, and is in line with previous empirical findings. The results of Model 1 also provide a picture of the role of the regional labour market conditions. Consistent with **Hypothesis 2,** a higher average employment rate is associated with a higher probability of setting up a company. This confirms the theoretical predictions based on the job search theory, stating that individuals take into account long-term business prospects when considering starting a business. The results are also consistent with **Hypothesis 3**, which states that short-term improvements in labour market conditions have a negative impact on entrepreneurial activities, because of the abundance of alternatives on the labour market to starting a company.

In order to test **Hypothesis 4**, which postulates that better labour market conditions will have a particularly strong effect on the probability of unemployed people starting a company, Model 2 was estimated which includes the interaction variable of the labour market status and labour market dynamics with the "not-working interaction" as a baseline scenario. The results of Model 2 show that a good labour market situation decreases the probability of starting a business to a larger degree among

---

[6] The father's educational background traditionally reflects the economic situation of families, see Oosterbeek, H., Van Praag, M., & Ijsselstein, A. (2010)

the unemployed. This therefore confirms Hypothesis 4. These results are consistent with the only two existing studies (to the author's knowledge) that investigate a comparable problem - Tervo (2006) and Svaleryd (2015). The results can be interpreted as individuals with weaker connections to the labour market - the unemployed in the case of this paper, with a family background of self-employment in the case of Tervo (2006) and lower levels of education in the case of Svaleryd (2015) - being in a disadvantaged position during periods of economic difficulties and their entrepreneurial activity reflects a lack of other options being available to them on the labour market. As soon as the labour market conditions improve, the probability of individuals in this group starting a company decreases the most because the disadvantaged group has no true entrepreneurial intentions and at this point alternative options become available.

The following model was estimated in order to test **Hypothesis 5**, which postulates that the size of the labour market will decrease the probability of employed people starting a company compared to unemployed people. Model 3 includes the interaction variable of the labour market status and labour market thickness with the "not-working" interaction as a baseline scenario. The results show that while the thickness of the labour market increases the probability of starting a company for all individuals (main effect) the effect is weaker for the employed (interaction effect) and therefore the difference between the unemployed and the employed is larger in the case of thick labour markets. This confirms Hypothesis 5. These results are consistent with the recent studies for Sweden: (Andersson et al 2016) reports the highest share of start-ups are funded by unemployed people in metropolitan regions, followed by other urban regions and the lowest are in the most remote regions of the countryside.

The results of Model 1-3 also confirm a number of findings already present in entrepreneurial literature. As first put forward by (Arenius and Minniti, 2005), "entrepreneurship tends to be a young man's game." According to the model results, the probability of transition into entrepreneurship drops after an individual reaches the age of 40, while being a woman is associated with a lower likelihood of the transition. In this case, the model results are consistent with previous findings. For example, Reynolds et al. (2003) shows that male individuals between the age of 25 and 34 are the most likely to start a company. This group can be seen to consist of individuals who have accumulated sufficient professional experience to decide whether setting up their own company is a good choice.

It appears also that a higher probability of becoming an entrepreneur can be observed among individuals with secondary education, compared to those with primary education (reference group), while there is lower probability of starting a business among highly-educated individuals. The role of education in starting a business depends very much on the national context and in general, the studies for Europe indicate lower probabilities among more educated people, while studies for the US show the opposite (Blanchflower, 2004). In the case of Sweden, Svaleryd (2015) and Hammarstedt (2006) show, similarly to the Model 1 results, that higher education is associated with lower entrepreneurial rates.

The results from Model 1 also provide evidence of the importance of social background. Consistent with previous studies, an immigrant background is associated with increased odds of transition to self-employment (Block et al., 2011; Van Der Sluis et al., 2008). However, there is a positive gradient in parental education, as greater odds of becoming an entrepreneur can be observed, in general, among individuals with better-educated fathers (there is very small negative effect if the father has secondary education). Moreover, in line with literature on the inter-generational transfer of entrepreneurship, having parents with experience of running their own business is associated with an increased probability of transition to self-employment.

To check the robustness of the analysis, Model 4 and Model 5 were introduced. In Model 4, all the interaction effects were concurrently estimated. In order to address the issue raised by the possible selective pattern of entering entrepreneurship (not every individual becomes an entrepreneur if the observation time is long enough), a split population survival model, Model 5, was estimated with the same specifications as Model 4. Neither the introduction of multiple interaction effects nor changing the estimation method alters the modelling results.

Discussion and summary

The aim of this study was to investigate the interaction of labour market developments with individual entrepreneurial activities and, in this regard, the paper contributes both to academic as well policy debates on entrepreneurship. At theoretical level, this study provides evidence that the job search theory is fully applicable to the analysis of entrepreneurial decisions, if starting a company is conceptualized as a specific alternative to gainful employment or economic inactivity. The empirical analysis based on the predictions of job search theory proved that the long-term positive conditions on the labour market facilitate entrepreneurship because they indicate good business perspectives, which are a key factor

taken into account by all individuals planning to start a business. Short-term labour market improvements, on the other hand, decrease the probability of starting a company because these fluctuations on the labour market shape, to a lesser extent, the anticipation of business perspectives and, to greater degree, create attractive alternatives to starting a business. The analysis of differences between unemployed and employed people proved that unemployed people have a higher probability of starting a company compared to employed individuals, although the difference in this probability is moderated by short-term developments on the labour market: an improvement in the labour market situation decreases the probability of starting a company to greater extent among unemployed than employed individuals.

These findings have important implications for policy debate and draw attention to the policy mix approach in entrepreneurship programs. The entrepreneurial behaviour seems not only to be the result of market developments, but also to be shaped by social security. The results suggest, in particular, that periods of labour markets shortages might result in an increased share of start-ups being funded by the unemployed, described in the literature on entrepreneurship as underperforming and having a higher probability of failure. These results and their interpretation in this paper are also fully in line with recent findings by Svaleryd (2015), which show that individuals with lower education tend to enter self-employment on average more often during labour market shortages, while highly educated individuals tend to enter self-employment more often when the regional labour market is more favourable. These results suggest that, while entrepreneurial activities might be a tool to absorb some redundant employees during times of labour market difficulties, entrepreneurial policies cannot be considered as a universal and anticyclical driver of economic growth during a crisis on the labour market. According to the results, the more acute the labour market conditions are, the lower the quality of an average start-up is. Therefore, entrepreneurial policies during that time should not support the transition of unemployed people into self-employment but rather target employed individuals with potential to establish a growing company and focus on entrepreneurial education.

The final remarks consider the effects that are recorded in this study and the specificity of the Swedish socio-economic system in the context of results interpretation. When discussing the results of this study, it should be acknowledged that the question, not fully addressed in this paper, is the nature of the long-term relationship between employment levels and entrepreneurial activities. This paper tested the assumption, based on the job search theory predictions, that the long-term labour market conditions are

taken into account by individuals when taking a decision about whether to start a company or not. Understandably, alternative interpretations are also possible. Firstly, long-term labour market trends might be positively influenced by local entrepreneurial activity. This study does not fully eliminate the reversed causality, but deals with this problem by using regional fixed-effects to account for unobserved regional differences. Also, only certain cohorts are analysed in this study while the labour markets trends represent the activities of the whole population and all existing firms. Another interpretation problem relates to the possible confounding effect of other factors that are influencing entrepreneurial activity and labour market trends. For this reason, alongside the fixed effect, an alternative measure of regional development was also introduced: average salary growth at regional level. This variable aimed to control the aspects of regional growth which are not directly related to the labour market situation, but turned out to be insignificant in all model specifications.

Concerning the specificity of the Swedish context, despite a decrease in social protection, Sweden remains a country with a highly developed welfare system aiming to protect vulnerable members of society, and the levels of unemployment in the country remain relatively low. Specifically in the entrepreneurial context, Sweden has one of the lowest shares of necessity-driven entrepreneurs among OECD countries (Kelley et al., 2016; Singer et al., 2015). Despite this, the analysis based on data for Sweden showed the significance of being unemployed in entrepreneurial decisions. Therefore, one can expect that these effects are even more important in the context of other countries with lower levels of social protection.

References:

Acs Z, 2006, "How Is Entrepreneurship Good for Economic Growth?" *Innovations: Technology, Governance, Globalization* **1**(1) 97–107

Acs Z, Storey D, 2004, "Introduction: Entrepreneurship and economic development", http://www.tandfonline.com/doi/pdf/10.1080/0034340042000280901

Arenius P, Minniti M, 2005, "Perceptual Variables and Nascent Entrepreneurship" *Small Business Economics* **24**(3) 233–247

Armington C, Acs Z J, 2002, "The determinants of regional variation in new firm formation" *Regional studies* **36**(1) 33–45

Audretsch D B, Fritsch M, 2002, "Growth Regimes over Time and Space" *Regional Studies* **36**(2) 113–124

Beutell N J, 2007, "Self-Employment, Work-Family Conflict and Work-Family Synergy: Antecedents and Consequences" *Journal of Small Business & Entrepreneurship* **20**(4) 325–334

Blanchflower D G, 2000, "Self-employment in OECD countries" *Labour Economics* **7**(5) 471–505

Blanchflower D G, 2004, "Self-Employment: More may not be better", National Bureau of Economic Research, http://www.nber.org/papers/w10286

Block J H, Hoogerheide L, Thurik R, 2011, "Education and entrepreneurial choice: An instrumental variables analysis" *International Small Business Journal* 266242611400470

Boschma R, Eriksson R H, Lindgren U, 2014, "Labour Market Externalities and Regional Growth in Sweden: The Importance of Labour Mobility between Skill-Related Industries" *Regional Studies* **48**(10) 1669–1690

Burdett K, 1978, "A Theory of Employee Job Search and Quit Rates" *The American Economic Review* **68**(1) 212–220

Carrasco R, 1999, "Transitions to and From Self-employment in Spain: An Empirical Analysis" *Oxford Bulletin of Economics and Statistics* **61**(3) 315–341

Evans D S, Leighton L S, 1990, "Small business formation by unemployed and employed workers" *Small Business Economics* **2**(4) 319–330

Fritsch M, Noseleit F, 2013, "Start-ups, long- and short-term survivors, and their contribution to employment growth" *Journal of Evolutionary Economics* **23**(4) 719–733

Fritsch M, Storey D J, 2014, "Entrepreneurship in a Regional Context: Historical Roots, Recent Developments and Future Challenges" *Regional Studies* **48**(6) 939–954

Furdas M, Kohn K, 2011 *Why is startup survival lower among necessity entrepreneurs? A decomposition approach*, http://www.iza.org/conference_files/EntreRes2011/kohn_k2086.pdf

Gimenez-Nadal J I, Molina J A, Ortega R, 2012, "Self-employed mothers and the work-family conflict" *Applied Economics* **44**(17) 2133–2147

Grek J, Karlsson C, Klaesson J, 2011, "Determinants of Entry and Exit: The Significance of Demand and Supply Conditions at the Regional Level", in *Drivers of Innovation, Entrepreneurship and Regional Dynamics* Eds K Kourtit, P Nijkamp, and R R Stough Advances in Spatial Science (Springer Berlin Heidelberg), pp 121–141, http://link.springer.com/chapter/10.1007/978-3-642-17940-2_7

Hammarstedt M, 2006, "The predicted earnings differential and immigrant self-employment in Sweden" *Applied Economics* **38**(6) 619–630

Kelley D, Singer S, Herrington M, 2016, "Global Entrepreneurship Monitor 2015/16. Global report."

Manjón-Antolín M C, Arauzo-Carod J-M, 2008, "Firm survival: methods and evidence" *Empirica* **35**(1) 1–24

McCall J J, 1970, "Economics of Information and Job Search" *The Quarterly Journal of Economics* **84**(1) 113–126

Mortensen D T, Pissarides C A, 1999, "New developments in models of search in the labor market" *Handbook of labor economics* **3** 2567–2627

Niittykangas H, Tervo H, 2005, "Spatial variations in intergenerational transmission of self-employment" *Regional Studies* **39**(3) 319–332

Pissarides C A, 1994, "Search Unemployment with On-the-job Search" *The Review of Economic Studies* **61**(3) 457–475

Reimer D, Noelke C, Kucel A, 2008, "Labor Market Effects of Field of Study in Comparative Perspective An Analysis of 22 European Countries" *International Journal of Comparative Sociology* **49**(4–5) 233–256

Reynolds P D, Camp S M, Bygrave W D, Autio E, Hay M, 2001, "Global Entrepreneurship Monitor. Executive Report"

Ritsilä J, Tervo H, 2002, "Effects of Unemployment on New Firm Formation: Micro-Level Panel Data Evidence from Finland" *Small Business Economics* **19**(1) 31–40

Rogerson R, Shimer R, Wright R, 2005, "Search-theoretic models of the labor market: A survey" *Journal of Economic Literature* **4** 959–988

SCB, 2014, "Registerbaserad arbetsmarknadsstatistik (RAMS) 2013", http://www.scb.se/Statistik/AM/AM0207/_dokument/AM0207_BS_2012.pdf

Schmidt P, Witte A D, 1989, "Predicting criminal recidivism using 'split population' survival time models" *Journal of Econometrics* **40**(1) 141–159

Singer S, Amoros J E, Arreola D M, 2015, "Global entrepreneurship monitor 2014. Global report."

Storey D J, 1991, "The birth of new firms—Does unemployment matter? A review of the evidence" *Small Business Economics* **3**(3) 167–178

Svaleryd H, 2015, "Self-employment and the local business cycle" *Small Business Economics* **44**(1) 55–70

Taylor M P, 1999, "Survival of the Fittest? An Analysis of Self-Employment Duration in Britain" *The Economic Journal* **109**(454) 140–155

Tervo H, 2006, "Regional unemployment, self-employment and family background" *Applied Economics* **38**(9) 1055–1062

Thurik A R, Carree M A, van Stel A, Audretsch D B, 2008, "Does self-employment reduce unemployment?" *Journal of Business Venturing* **23**(6) 673–686

Tillvaxtanalys, 2013, "Regional tillväxt 2013– en rapport om regional tillväxt och utveckling"

Van Der Sluis J, Van Praag M, Vijverberg W, 2008, "Education and Entrepreneurship Selection and Performance: A Review of the Empirical Literature" *Journal of Economic Surveys* **22**(5) 795–841

Verheul I, Thurik R, Hessels J, van der Zwan P, 2010, "Factors influencing the entrepreneurial engagement of opportunity and necessity entrepreneurs" *EIM Research Reports H* **201011** 1–24

Wooldridge J M, 2010 *Econometric Analysis of Cross Section and Panel Data* (MIT Press)

Table I – Model Results

Transition into Entrepreneurship	Model 1 No interactions		Model 2 Interactions		Model 3 Interactions		Model 4 Interactions		Model 5 Split population	
	b	se	b	se	b	se	b	se	b	se
Working	-0.60***	(0.01)	-0.59***	(0.01)	-0.60***	(0.01)	-0.59***	(0.01)	-0.58***	(0.01)
Average employment rate	1.22***	(0.13)	1.20***	(0.13)	1.21***	(0.13)	1.21***	(0.13)	1.20***	(0.13)
Labour market dynamics	-0.69***	(0.32)	-1.35***	(0.32)	-0.59***	(0.21)	-1.34***	(0.32)	-1.33***	(0.32)
Population density	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Working* Labour market dynamics			1.06***	(0.35)			1.05***	(0.35)	1.05***	(0.35)
Working* Population density					-0.00**	(0.00)	-0.00*	(0.00)	-0.00*	(0.00)
Age 25-29	0.88***	(0.01)	0.88***	(0.01)	0.87***	(0.01)	0.88***	(0.01)	0.86***	(0.01)
Age 30-34	1.19***	(0.01)	1.19***	(0.01)	1.19***	(0.01)	1.19***	(0.01)	1.18***	(0.01)
Age 35-39	1.37***	(0.01)	1.37***	(0.01)	1.37***	(0.01)	1.37***	(0.01)	1.36***	(0.01)
Age 40-max	1.27***	(0.02)	1.27***	(0.02)	1.27***	(0.02)	1.27***	(0.02)	1.26***	(0.02)
Secondary Education	0.34***	(0.01)	0.34***	(0.01)	0.34***	(0.01)	0.34***	(0.01)	0.34***	(0.01)
Tertiary Education	-0.00	(0.02)	-0.00	(0.02)	-0.00	(0.02)	-0.00	(0.02)	-0.00	(0.02)
Female	-0.64***	(0.01)	-0.64***	(0.01)	-0.64***	(0.01)	-0.64***	(0.01)	-0.64***	(0.01)
Foreign Born	0.28***	(0.02)	0.28***	(0.02)	0.28***	(0.02)	0.28***	(0.02)	0.28***	(0.02)
One Parent Entrepreneur	0.53***	(0.01)	0.53***	(0.01)	0.53***	(0.01)	0.53***	(0.01)	0.52***	(0.01)
Both Parents Entrepreneurs	0.96***	(0.01)	0.96***	(0.01)	0.96***	(0.01)	0.96***	(0.01)	0.95***	(0.01)
Fathers Education Secondary	-0.03***	(0.01)	-0.03***	(0.01)	-0.03***	(0.01)	-0.03***	(0.01)	-0.02***	(0.01)
Fathers Education Tertiary	0.10***	(0.01)	0.10***	(0.01)	0.10***	(0.01)	0.10***	(0.01)	0.10***	(0.01)
Average salary growth	-0.10	(0.24)	-0.10	(0.24)	-0.13	(0.24)	-0.10	(0.24)	-0.10	(0.24)
_cons	-7.36***	(0.13)	-7.34***	(0.13)	-7.40***	(0.13)	-7.35***	(0.13)	-7.35***	(0.13)
ll	-574844.9		-574844.9		-574847.6		-574843		-574843	
N	1.32e+07		1.32e+07		1.32e+07		1.32e+07		1.32e+07	

* p<0.10, ** p<0.05, *** p<0.01