

Editorial introduction

Demography of the firm and spatial dynamics

A look at the last volumes of the Annals reveals that there are very few contributions that deal with the micro level of firm, with the notable exception of the special issue on *Entrepreneurship and Regional Economic Development*, in 2002. Is this macro level fixation because regional science is devoted exclusively to the study of regional characteristics? This restriction would be very much in contrast with the eclectic spirit of the field. The reason is rather that, although regional science is a multi- and interdisciplinary field, it has inherited from economics a predominant macro level focus. In most of our research we deal with regional growth, unemployment, or interregional trade. We estimate regional production functions that include regional indicators of innovativeness. In all of this, the individual entrepreneur is only implicitly present. But since regional science mirrors in many respects the research tradition of economists, we may anticipate a growing trend towards the micro level, which can already for some time be observed in a number of sub-branches of economic science, such as evolutionary economics, industrial organization, and labour economics. In these new approaches the micro level often refers to the individual, or to the firm. These developments are further reinforced by existing research disciplines as diverse as small business economics, entrepreneurship studies, and organization ecology. They all share a focus on the behaviour of the individual firm. This is not only for its own sake, but also in order to understand and explain processes at the macro level. Demography as a discipline has always been good at exactly this: explaining macro population trends by means of aggregating individual events of birth, death, migration, and other changes in the individual life course.

For regional science there are probably also other advantages to join this trend towards a more microscopic focus on regional growth. We can mention at least five; some of a more theoretical nature, and some more empirical. The first is probably the oldest reason for looking at birth and death of firms from a regional perspective. Regional growth is not an abstract event out of the blue. It is the sum of many individual decisions of enterprises, to start, to grow, to survive, or to relocate. By decomposing regional growth in these components, and by studying the mechanisms behind each of these components, we gain understanding of the process of regional growth from a micro perspective. In the past, this mechanism was used for looking at regional employment change, more recently the role of start-ups and young firms *vis-à-vis* incumbent firms has become an important indicator of regional innovation and vitality. By focusing on the micro level of these events, we are able to take a firm demographic look in the black box of regional growth. In a similar spirit, we may gain some understanding behind the mechanisms of

agglomeration economies by looking at it from a micro perspective. Regional clustering is the result of co-location decisions of new firm formation and firm relocation, as well as the existence of spatial patterns of firm growth and survival differentials.

Secondly, in recent years a number of influential papers and books have been produced that explain the development of regional industrial clusters as a result of demographic processes of start-ups and spin-offs, which is cast in a evolutionary economics theoretical framework. This applies particularly to the work of Klepper and Arthur. Spin-offs are an important mechanism to generate knowledge transfers, spread innovations, and to build industry networks. Here, both the characteristics of the mother and of the child are important factors that have an impact on the nature of these processes. Since spin-offs typically locate close to the parent firm, these demographic processes may generate regional clusters, such as the Detroit automobile industry, or Silicon Valley.

A third reason why a shift to more micro oriented approaches is beneficial to regional science is that increasingly non-economic variables, such as entrepreneurial attitude and culture are taken into account in studying regional economic growth. These variables should ideally be measured and modelled at the individual level. Related to this issue of modelling micro level variables, it is also recognized that micro and macro level factors should be taken into account simultaneously, for instance when dealing with individual entrepreneurial attitude in relation to market circumstances and regional culture.

Finally, the main obstacle that prevented empirical analysis at the micro level of the firm in the past is becoming less of a problem today. Many countries now have a longitudinal business register, and although data quality and comparability is often still a problem, we now have a data infrastructure that allows various types of analysis to be carried out. Entrepreneurship studies, small business economics, and organizational studies have found their way to these resources already. Since by tradition these types of data and analysis techniques are not common in regional science, the diffusion of this innovation in this field is likely to take some time.

The title of this special issue refers to the special links between firm dynamics and spatial dynamics, and the papers included show different aspects of this relationship. At the same time, the papers show the multi- and interdisciplinary nature of the topic of firm demography. The range of topics covered includes entrepreneurship studies (Beugelsdijk and Noorderhaven, Wagner and Sternberg), firm start-ups (all papers except Beugelsdijk and Noorderhaven, and Brouwer et al.), exits (Huisman and van Wissen, and Dejardin), and relocations (Brouwer et al.). Although all papers in this issue deal with spatial variation in the sense of differences between regions or countries, two papers deal explicitly with the spatial dimension of firm demography in the sense of distance sensitivity: Van Oort and Atzema, and Huisman and van Wissen. Regional growth and agglomeration economies figure importantly in most papers as well, as the outcome of firm dynamics at the micro level. The relatively large number of papers dealing with new firm formation reflects the focus on this demographic component in the field of firm demography in general, which is not surprising given its connotations with economic growth and innovation.

The field of firm demography is too broad to be covered in one single issue. For instance, firm survival analysis (the analysis of firm survival as a function of age, and other relevant variables) is not included in any of the papers.

In the first paper, *Beugelsdijk and Noorderhaven* address two issues. First, they perform a statistical analysis to detect to what extent the self-employed differ from the general population and from wage and salary earners. Using data from the European Values Studies they find that self-employed differ significantly with issues associated to the need for achievement, risk-taking attitude, and locus of control. However, the self-employed do not differ in innovative attitude. In the next step the results of this analysis are used to construct a regional aggregate measure that captures the entrepreneurial attitude of a region. This variable is included in a standard regional economic “Barro-type” growth framework and the results show that entrepreneurial attitude has a significant positive effect on regional economic growth for all possible regression specifications. This may be seen as an empirical proof of the influence of regional culture on economic growth.

Entrepreneurship is also the focal point in the paper by *Wagner and Sternberg*, who present an explanatory model of entrepreneurship, that includes socio-demographic variables and attitudes of the individual, as well as regional characteristics. They use data from the German *Regional Entrepreneurship Monitor*, which is an extensive dataset at the individual level. Their analysis shows that personal variables like sex, age, and education are indeed related to becoming a nascent entrepreneur. However, variables that directly reflect the entrepreneurial attitude of an individual in terms of previous experience as self-employed, contacts with other entrepreneurs and risk aversion have a higher impact on the probability of becoming a nascent entrepreneur. When regional variables are added to the model these variables turn out to be also significant determinants of the probability of becoming an entrepreneur, but the coefficients of the individual characteristics are hardly influenced by adding the regional variables to the equation. The results of this study are not only useful for understanding the determinants of entrepreneurship; the authors also present a detailed discussion on the implications of the results for the design of regional policy measures with regard to new firm formation.

Sutaria and Hicks use pooled regression techniques to estimate regional determinants of new firm formation rates in Texas in the period 1976-1991. The coverage of this dataset is unique and this is a solid basis for finding a set of robust determinants of regional firm formation, in particular unemployment change (but not unemployment level), mean establishment size, prior firm entry and exit dynamics, and the availability of local financial capital. Interestingly, they do not find significant effects of population or income dynamics, and local government spending. The latter finding of course also has some obvious policy implications: the effectiveness of increasing local attractiveness for new firms through government spending is very small.

New firm formation is also the subject of the contribution by *van Oort and Atzema*. They study regional variation in new firm formation rates in the ICT sector in the Netherlands at various spatial scales, using spatial econometric techniques. They find that startup rates are higher in municipalities with already high levels of ICT activities. Their key argument is that in studying localized startup rates of ICT activities, both contiguous and structured spatial patterns need to be taken into account. This leads to the

conclusion that the incubation hypothesis should be formulated at the appropriate level of the agglomerated region. Moreover, they also show that firm life cycle aspects are important in assessing agglomeration effects at the regional level.

The spatial dimension of firm demography is the central theme in the contribution by *Huisman and van Wissen*. They look at the spatial clustering effects of firm formation and closure, using Dutch register data at the local unit level and detailed information about the exact spatial location of each firm. Plant openings and closures can either reinforce or weaken the existing spatial pattern, so the spatial effect of these demographic components should be measured relative to the existing spatial structure. It turns out that plant openings tend to reinforce spatial clustering for most sectors, whereas plant closures have a delocalising effect. In other words, new firms tend to locate close to incumbents, but firms in spatial clusters also have a higher probability of exit. The net effect of both is delocalisation, except for the manufacturing industry, where spatial localization occurs, except at the very local level.

Plant openings and closures are also studied by *Dejardin*. The starting point of his research is the observation that both are correlated. Following earlier studies by Johnson and Parker he hypothesizes three types of interrelationships, viz. Competition, Multiplier and Marshall effects. Dejardin studies these interrelationships by looking both at intra- and intersectoral linkages, and this turns out to be a relevant additional dimension. His major finding is that even between firms in the same industry multiplier effects (i.e., a negative correlation between exits and entries) are important.

Similar to human demography, relocation is also a demographic component in the population of firms. The article by *Brouwer, Mariotti and van Ommeren* looks at determinants of firm relocation of larger firms located in 21 different countries. They test four explicit hypotheses regarding firm relocation. Their results show that larger firms tend to be less mobile, as well as older firms. In addition, the size of the geographical market is positively related to firm mobility. In line with the relocation literature they find that internal firm dynamics (positive and negative growth) induce firm relocation. A new finding is that acquisitions, mergers and takeovers are also relocation triggers. Finally, due to the unique international character of the dataset, they are able to show that firm mobility in northern Europe is significantly higher than in southern Europe. This finding could not have been obtained easily using country-specific data registers, because of numerous definitional and measurement obstacles in international comparisons of relocation statistics.

The papers in this special issue offer numerous insights into geographical dimensions of firm demography. We would like to point out a few cross-cutting themes that seem especially relevant in this issue. First, the research design of studying the firm at the micro level within its regional (economic, institutional and cultural) setting proves useful. This multilevel framework enhances the understanding of individual firm behaviour, as well of regional growth. Second, including the cultural dimension into explanations of firm and regional dynamics is necessary and feasible. It appears that these 'soft' factors account for additional explanatory power in addition to the more traditional economic factors in models of firm behaviour. Thirdly, the spatial scale and structure of inter-firm linkages, networks, externalities and other

linkages, becomes of utmost importance when studying firm behaviour. In order to disentangle the complexities around this issue, the toolbox of spatial econometrics is indispensable when studying inter-firm and firm-regional environment interactions. Moreover, these linkages are important both within, and between different economic activities. To our opinion these issues will also dominate the future research agenda in the field of firm demography within regional science.

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