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Are More Start-Ups Really Better?

Quantity and Quality of New Businesses and Their Effect on Regional Development *

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August 2009

Abstract

Empirical analyses suggest that the employment creating effect of start-ups is highest in regions with a low level of new business formation and that an increase in the regional start-up rate beyond a certain level may lead to negative employment effect. In explaining these results, we assume that the average quality of regional start-ups decreases with the number of start-ups, while the costs of the induced resource reallocation increase. Our model implies that it is not the number of start-ups but their quality that is decisive for their effect on economic development. Therefore, a policy aiming at stimulating economic growth through entrepreneurship should focus on high-quality start-ups.

JEL classification: L26, M13, O1, O18, R11

Keywords: Entrepreneurship, new business formation, regional development, entrepreneurship policy

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1. Aims and scope

It is widely believed that new businesses lead to economic growth and to an increase in employment (for an overview see Carree and Thurik, 2004). Consequently, a main focus of entrepreneurship policy in nearly all countries is to increase the number of start-ups (e.g., Audretsch, Keilbach, and Lehmann 2006; Lundstöm and Stevenson, 2005). But are more start-ups really better for economic development than fewer start-ups?

Recent research has shown that in most regions new business formation does, indeed, have a positive long-term effect on economic development, but there are also regions which simultaneously have relatively high levels of new business formation and below average growth rates or where the effect of start-ups on employment is even negative (Audretsch and Fritsch, 2002; Mueller, van Stel, and Storey, 2008). Some recent analyses (Fritsch and Schroeter, 2010; Bosma, Stam, and Schutjens, 2010) find that the marginal employment effect of a rising regional start-up rate is decreasing and may even become negative at a certain level of new business formation.

In this paper, we propose a model that is able to explain these observations. Based on an overview of empirical findings about the effect of new business formation on regional employment (section 2), we first review the available theories that might explain why the growth enhancing effect of start-ups decreases with their increasing number (section 3). Our assessment shows that these theories are not well suited to explain this empirical result. In particular, we argue that the market-‘overcrowding’ approach, which dominates the respective literature, is not appropriate in the case of innovative start-ups. The model that we develop in section 4 is based on the assumption that start-ups may considerably differ with regard to their quality and that new businesses of different quality can have diverging effects on regional growth. Moreover, we introduce the costs of creative destruction, which is caused by the entry of new competitors and the resulting turbulence. Our model can explain why the marginal effect of a rising number of new businesses on regional employment growth is decreasing and how this effect

may even become negative. In particular, our model implies that a higher number of start-ups is not necessarily better for regional growth, but rather that the quality of the new businesses is of crucial importance for their effect on economic development. Based on our model, we deal with possible reasons for differences in the effect of new businesses formation on economic development (section 5) and discuss a number of policy implications (section 6).

2. Recent empirical evidence on the effect of new business formation on employment

Recent empirical studies on the effect of new business formation on employment (see Fritsch, 2008, for an overview)¹ are at a regional level because an analysis at the level of industries leads to serious difficulties in the interpretation of the results. The reason is that if industries follow a life cycle, then the number of entries and the start-up rate will be relatively high in the early stages of the life cycle when the industry is growing and it will be relatively low in latter stages when the industry is stagnant or declining (Klepper, 1996). Obviously, the resulting positive correlation between the start-up rate and the development of industry employment in subsequent periods may be considerably shaped by the industry life cycle and cannot be unequivocally regarded as an effect of entry on development. Indeed, entirely different results are found if, for example, the relationship between the level of start-ups and subsequent employment change is analyzed on the level of regions and on the level of industries (see Fritsch, 1996). Therefore, geographical units of observation are much better suited for such an analysis than industries.

It has been shown in recent research that the effect of new business formation on economic development is rather long-term and evolves over a

¹ Acs and Mueller (2008); Arauzo-Carod, Liviano-Solis, and Martin-Bofarull (2008); Audretsch and Fritsch (2002); Baptista, Escária, and Madruga (2008); Carree and Thurik (2008), Fritsch and Mueller (2004, 2006, 2008); van Stel and Storey (2004); Mueller, van Stel, and Storey (2008); van Stel and Suddle (2008)

period of at least ten years. The way in which the entry of new competitors shapes the development of a region can be interpreted as a challenge-response interaction that leads to a process of creative destruction as described by Joseph A. Schumpeter (1942). Several effects of new business formation on employment may be distinguished:²

- *First*, the setting up of new businesses leads to an employment increase obviously because extra personnel are needed to operate the additional capacities (“direct employment effect”).
- *Second*, competition between the new and the incumbent businesses on input as well as on output markets spurs market selection. As far as this market selection process works according to a ‘survival of the fittest’ scenario, the least productive firms have to reduce their level of economic activity or must exit the market (“displacement effect”). Because such a scenario leads to an increase in average productivity, employment should decrease if output remains at a constant level. Hence, although starting a new business means creating additional capacities that require personnel to operate them, the effect of new business formation on the number of jobs in the economy does not necessarily need to be positive but could just as well be negative.
- *Third*, the competition between the new businesses and the incumbents may lead to improvements in the supply-side of the economy that result in higher competitiveness.³ The main *supply-side effects* of entry could be

² The effects of entry on regional development are exemplified here with employment change as indicator of economic development. Because information on regional employment is more easily available than information on regional GDP, this variable has been used in nearly all of the recent empirical analyses of the issue. Carree and Thurik (2008) have shown that the same pattern of effects results for GDP change as an indicator for development.

³ These improvements may occur on the side of the start-ups as well as on the side of the incumbents. The emergence of these improvements, therefore, does not necessarily require that the newcomers are successful and that they survive. As long as entry induces improvements on the side of the incumbents, it will generate positive supply-side effects even if most of the new businesses fail and have to exit the market shortly after entry.

- *securing efficiency* and stimulating an increase in productivity by contesting established market positions;
- *acceleration of structural change*, e.g. incumbents are substituted by newcomers;
- *amplified innovation*, particularly, the creation of new markets; and
- *greater variety* of products and problem solutions⁴.

These third-phase supply-side improvements may induce employment growth and increase welfare. They are the reason why new business formation may lead to a positive employment effect. For the emergence of these supply-side effects, it is of critical importance that market selection works in accordance with a 'survival of the fittest' scenario. If the market mechanism forced the relatively efficient firms to exit and allowed the inefficient firms to survive, the result would be a decrease in the economy's competitiveness.⁵

Empirical analyses of the employment effect of new business formation have shown that the relationship between new business formation and

Therefore, even the failed start-ups may also make a significant contribution to the improvement of supply and competitiveness.

These supply-side effects are rather indirect in character and are not necessarily limited to the industry to which a start-up belongs, but rather may also occur in completely different industries that use the improved supply as input. For a regional analysis, it is important to note that a considerable part of the supply-side effects may occur in the industry's establishments that are located in other regions. Therefore, the size of the supply-side effect is probably underestimated, and it only focuses on development in the region where the start-ups occurred. If empirical analyses find considerable supply-side effects in the same region, this can be regarded as an indication of the importance of space in competitive processes.

⁴ Such an increased variety implies a higher probability of finding a supply that better suits the customers' preferences. Increased variety due to new supplies may stimulate an intensified division of labor as well as follow-up innovation and can, therefore, generate significant impulses for economic development. For more information on the relationship between variety and economic development, see Saviotti and Pyka (2004).

⁵ Empirical analyses have shown that these three effects occur during different phases. The generation of additional employment due to the creation of new businesses occurs at about the time of the establishment of the new entities. This phase is followed by a second phase in which inefficient suppliers have to exit, leading to an employment decline. The third phase, when the supply-side effects begin to occur, starts to dominate the development about five to six years after market entry (Fritsch, 2008; Fritsch and Noseleit, 2009).

development is, to a considerable degree, shaped by the regional conditions. In particular, it was found that while many regions are able to draw substantial employment growth out of the process of new business formation, the effect may be insignificant or even negative in other regions (Fritsch and Mueller, 2008; Mueller, van Stel, and Storey, 2008; Stel and Suddle, 2008). According to Fritsch and Schroeter (2010), the regional variation of the effect is closely related to population density which can be regarded as a catch-all indicator for a multiplicity of regional conditions such as availability of resources, quality of the workforce, regional knowledge spillovers, etc. Fritsch and Schroeter (2010) identify an inversely u-shaped relationship between the regional level of new business formation and its effect on regional development. At low levels of new business formation, the effect on employment change is positive. Increasing levels of new start-up rates are then related to a positive but decreasing marginal effect. After the maximum amount of the positive effect of new business formation on employment is attained, any further increase in the start-up rate leads to a reduction of this employment increasing effect; thus, the marginal effect even becomes negative. This suggests that there are decreasing marginal returns for a policy that attempts to boost the regional level of start-up activity in order to stimulate employment. Estimating for West German regions, Fritsch and Schroeter (2010) find that the marginal effect of an increasing level of new business formation on regional employment becomes significantly negative with a start-up rate of above seventeen new businesses per 1,000 employees in a year (figure 1). Similar results have been found for the Netherlands (Bosma, Stam, and Schutjens, 2010).

A number of empirical studies suggest that start-ups in manufacturing generate a stronger employment effect than new businesses in other economic sectors (Fritsch and Schroeter, 2010; van Stel and Suddle, 2008). This is particularly remarkable because entries into manufacturing are relatively few due to high entry barriers in terms of minimum efficient size and capital intensity. However, these high entry barriers in manufacturing may

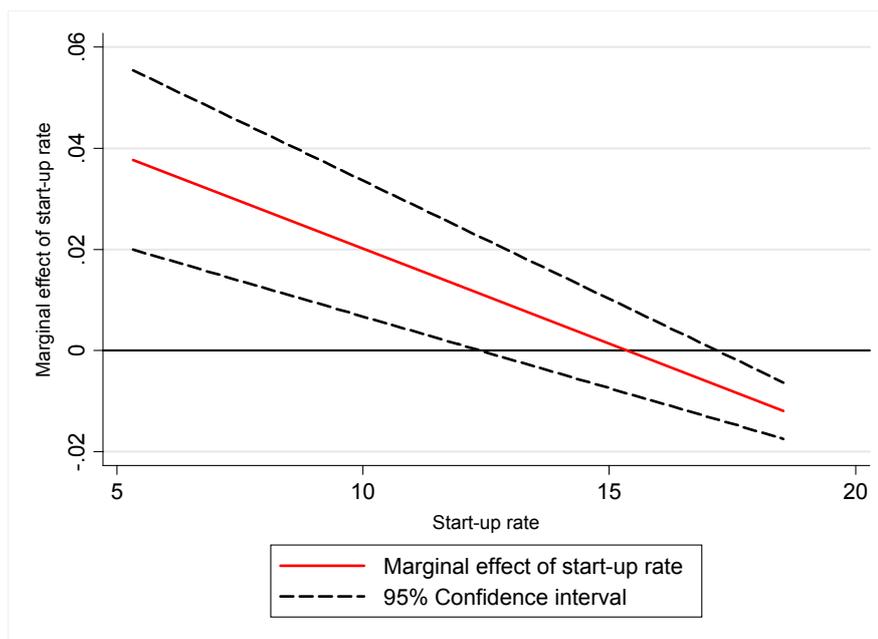


Figure 1: The marginal effect of the start-up rate on employment change in West German regions according to Fritsch and Schroeter (2010)

induce a higher quality of entries due to a self-selection of potential entrepreneurs.⁶ The quality of a start-up means the intensity of the challenge in terms of competitive pressure that the newcomers exert on the incumbents, which is the driving force of the effect that new businesses have on economic development. The quality of a new business may be indicated by factors such as the qualification of the entrepreneur, the amount and quality of resources that are mobilized for the new business, the marketing strategy that is pursued, their productivity as well as the innovativeness of the supplied goods and services. The quality of start-ups is an important element in our model that we present in section 4.

⁶ Relatively strong effects of start-ups on economic development have also been found for new businesses in knowledge-intensive sectors (Baptista and Preto, 2010).

3. Why should the effect of new business formation on regional employment be negative? A review of the literature

Reviewing the literature on the effect of market-entry, one can find two explanations for a declining marginal effect or an overall negative effect of new business formation on employment. One possible reason for a negative employment effect of entry could be that competition does not work according to a 'survival of the fittest' scenario. This means that firms with relatively low productivity will remain in the market while those with higher productivity have to reduce their output or exit. As a result, overall economic performance will decline. A possible source of such a malfunction of the market mechanism could be public interventions such as subsidies for start-ups which give them a non-performance based competitive advantage over the non-subsidized incumbents (Fritsch and Mueller, 2004). If such subsidies should, indeed, lead to an increased level of start-up activity, this could explain why the marginal effect of new business formation decreases with an increase in the start-up rate.

A second line of argument for a negative employment effect of entry is based on the notion that start-ups may lead to overcrowding in the market and that such overcrowding leads to reduced welfare and growth. The overcrowding argument implies that there exists an optimum number of employees or of firms that can persist in a particular market for a longer period of time. This is also referred to as a market's 'carrying capacity' in the organization ecology literature (Hannan and Freeman, 1977; Carre and Thurik, 1999). Hence, if the number of competitors in a market has reached a certain threshold, long-term total employment will remain more or less constant if more firms enter.⁷ A related line of reasoning presumes that there

⁷ A number of theoretical models (e.g., Chamberlin, 1933; Spence, 1976a,b; Dixit and Stiglitz, 1977; Mankiew and Whinston, 1986; Sutton, 1991; Anderson et al., 1995) can be found in the literature in which market entry may lead to a deadweight loss of social welfare or to an efficiency decline. This negative effect may especially occur if entry is related to high fixed or sunk costs and if market size is constant. Empirical evidence for this argument has been found in studies of the US movie theaters (Davis, 2006) and the radio broadcasting industry (Berry and Waldvogel, 1999). Like the concept of carrying capacity, these models are rather static in character and are based on the assumption that entry is entirely imitative

exists an equilibrium rate of business ownership and that self-employment rates that exceed this equilibrium rate⁸ will be unstable and cause lower growth rates (Audretsch et al., 2002). The common explanation for entrepreneurs entering markets which are already rather crowded states that entrepreneurs may be overconfident with regard to their chances and risks (Arabsheibani, 2000; Koellinger, Minniti, and Schade, 2007). Such overconfidence seems to be, indeed, quite common among firm founders, and one may even argue that it constitutes a necessary ingredient of new ventures given the high risk of failure that would otherwise be deterrent to entry (ibid). Excessive entry can occur in markets with low barriers to entry (e.g., certain service industries) or if public subsidies are available that lead to reduced costs of venture creation. Founders of such businesses might be especially those individuals who face relatively low opportunity costs, e.g. due to being unemployed.

Excessive entry and market overcrowding may cause different kinds of costs which are to a large extent external to the newcomers. Such costs of creative destruction can, for example, arise from excessive production, which drives output prices below their equilibrium level (Parker, 2007, 59). Moreover, the relatively high factor demand may bid up input prices (Manove and Padilla, 1999). If supply in the market requires high sunk costs, firms will tend to stay in the market even if the costs of production cannot be fully covered. Hence, competition may become ruinous and lead to reduced welfare. A negative welfare effect of overcrowding may also occur because many ventures stay relatively small; thus, scale economies remain unexploited and resources could have been allocated more productively (Carree et al., 2002, 2007). In general, excessive entry and subsequent exit

or that new products are complete substitutes for the old products, resulting in the newcomers having to “steal business” from the incumbents in order to survive. Davis (2006) in his study on the effects of market entry in the US cinema market found evidence that high-quality entry leads to market expansion, suggesting that the net effect of entry is positive.

⁸ Carree et al. (2002) introduce a model that derives an equilibrium relation between the business ownership rate and the level of economic development in a country. The equilibrium rate of business ownership is defined as a function of GDP per capita and is found to be u-shaped.

lead to relatively high costs of creative destruction in terms of transaction costs, costs of adjustment on financial and labor markets as well in terms of sunk costs in the event of an exit (see section 4 for a detailed exposition of these costs).⁹

The market-‘overcrowding’ approach has a number of shortcomings in explaining a negative marginal effect of new businesses on regional economic growth. First, it does not explain a decreasing marginal effect in a constellation where the number of firms is below the optimal level. If the number of firms in a market is below the optimum, additional entries should more likely lead to an increase in regional welfare (e.g., due to the benefits of more intense competition) than to a decrease. Hence, the curve of the marginal growth effect of entry can be expected to first rise and then fall as the number of regional start-ups rate increases. Second, many markets are geographically much larger than a region or a country; therefore, it may appear doubtful to define an optimal number of firms for a certain region. Third, the assumption that a market has a given carrying capacity that underlies the market overcrowding argument holds, however, mainly for non-innovative entry and is not or only to a much lesser degree valid for innovative new businesses. The reason is that the volume of market demand depends on the characteristics of a good and on its price, which is mainly determined by the respective costs. Assuming a given carrying capacity implies unvarying product characteristics as well as constant costs, i.e. non-innovative entry. For innovative entry, a market’s carrying capacity is not well defined and can hardly be predicted with any certainty. Therefore, the notion of excessive entry and overcrowding makes only limited sense, particularly if the new venture is based on product innovation.¹⁰ The argument is even

⁹ In case of a business-ownership rate below the equilibrium level, the ‘growth penalty’ results from a relatively low level of competition that leads to losses of static and dynamic efficiency of the economy (Audretsch et al., 2002; Carree et al., 2002).

¹⁰ For a process innovation, the variation of the market volume may be predicted on the basis of the variation of the product price and the respective price elasticity. Such a prediction of the market volume is much more difficult in case of product innovation, especially if the new product creates a completely new market. Theoretical arguments

questionable for non-innovative entry in case that the response of the incumbents to the newcomers' challenge includes an innovation.

In a nutshell, the existing economic literature suggests that a negative effect of new business formation on economic development may result from market overcrowding caused by over-optimism of founders and excessive entry. This market-'overcrowding' approach could especially explain why the marginal effect of new business formation decreases with a rising level of start-up activity. However, the argument is mainly relevant for non-innovative, low-quality start-ups that exert no or only slight pressure on the incumbents. In case of innovative entry or of an innovative reaction of incumbents, the carrying capacity of the respective market can only hardly or not at all be defined so that the overcrowding argument does not apply. Hence, a negative employment effect of new business formation may be especially expected if there is a high level of non-innovative entry. Distortions caused by public subsidies may be relevant, but they cannot explain why the marginal employment effect of new business decreases with an increase in the start-up rate.

4. A model of regional new business formation and creative destruction

Our model aims at explaining differences in the effect of new business formation on regional development. It compares the benefits and the costs of creative destruction caused by market entry. The basic argument of this model is that the marginal effect of new business formation will decline with the number of start-ups because the costs of creative destruction increase more than the respective benefits.

We begin with the *regional benefits of creative destruction*, which are initiated by the entry of new businesses into the market. In reviewing recent empirical evidence about the effect of new business formation on regional

(Cohen and Klepper, 1996) as well as empirical evidence suggest that the great majority of innovative new businesses are based on product innovation, not on process innovation.

employment growth (section 2), we have argued that the decisive positive economic outcome is the improvement of regional competitiveness (section 2). We assume that this effect depends critically on the *quality of the new businesses*. By quality, we mean the magnitude of the challenge that the new businesses exert on the incumbents. The greater this challenge is, the more intensive the pressure on the incumbents to implement improvements in order to stay competitive must be. The quality of a new business may be given by such factors as the qualification of the entrepreneur, the effort of preparing the start-up in terms of planning, the amount and the quality of resources that are mobilized for the new business, the marketing strategy that is pursued as well as the quality and especially the innovativeness of the supplied goods and services. Obviously, start-ups may greatly differ with regard to these aspects of quality and, hence, may constitute a different challenge to the incumbents.

According to the model of entrepreneurial choice (Knight, 1921; Lucas, 1978; Holmes and Schmidt, 1990; Kihlstrom and Laffont, 1979), potential entrepreneurs compare the income that they anticipate to earn through employment (W^*) with the profits (P^*) they expect to accrue from starting a business. The probability of setting up a new firm, $\text{Pr}(su)$, can then be represented as

$$(1) \text{Pr}(su) = f(P^* - W^*).$$

A positive value of $(P^* - W^*)$ is only a necessary but not a sufficient condition for a business idea to be realized. There are at least two reasons why not every concept with a positive value will lead to the set up of a new business. First, the decision to start a new business is associated with a rather high level of uncertainty. Therefore, a positive value of $(P^* - W^*)$ needs to exceed a certain threshold to initiate a start-up. This threshold should depend on the degree of risk aversion of the potential entrepreneur. Second, a promising concept may not be implemented because certain resources necessary for the venture (e.g., capital) are not available. We assume that high-quality business concepts have a greater expected profitability than start-ups of a relatively low-quality (e.g., badly prepared or

purely imitative new businesses) which are no serious challenge for the incumbents¹¹. Because the expected return from high-quality concepts clearly exceeds the uncertainty threshold their probability of being realized should be relatively high. . Moreover, the likelihood that they will be able to implement high-quality projects should be relatively high because their expected profitability facilitates the acquisition of necessary resources.

Start-ups with high expected profitability are a rather rare event. It was already Schumpeter (1934) who stated that only a tiny share of new businesses is innovative while their majority is imitative. In Germany, for example, only less than 400 start-ups appeared to be sufficiently promising to Venture Capital investors to receive first-round financing in the year 2007 (BVK, 2008, 9). Estimating the total number of start-ups in Germany in the year 2007 to be about 400,000, this is only one out of a thousand new businesses. In the USA this share is even smaller.¹² Because these high-quality start-ups tend to be concentrated in certain locations, particularly large agglomerations, there are many regions in which such a highly promising new business emerges only once every couple of years or even less frequently.

Since new businesses are generally set up close to the founders' residence (Stam, 2007), the regional population is the dominant source of business concepts. These concepts may include ideas which have been generated somewhere else, but the potential entrepreneurs tend to be rooted in their region. Arranging business concepts of the potential entrepreneurs in a region according to their expected profitability starting with the most

¹¹ The notion of low-quality start-ups resembles Baumols' "replicative entrepreneurs", i.e. those founders who start a firm similar to already existing businesses (Baumol, 2005). However, low-quality start-ups make-up a much larger group as they also include badly prepared entrepreneurs.

¹² Shane (2009) reports that since the year 1970 Venture Capital firms in the US have invested on average into about 820 new firms per year. According to the 2009 Yearbook of the US National Venture Capital Association, this number amounted to 1,179 in the year 2008 (National Venture Capital Association, 2009, 11, 31). Compared to more than two million new companies set up in the United States per year, this makes less than one out of two thousand.

promising concept results in a curve that converges to very low positive values of expected profitability (figure 2). If actors behave as rational profit-seekers, business concepts with a negative expected return will not be implemented. We assume that the probability for a business concept to be realized is higher the greater the expected profits are. This implies that policy measures that aim to increase the number of regional start-ups by lowering administrative hurdles or by subsidizing new businesses will particularly stimulate low-quality start-ups that are not or rarely competitive and, thus, will fail relatively soon after entry. Hence, within such a 'revolving door-regime' high entry and exit rates will not yield improvements of employment or productivity; rather, they represent a largely unproductive churning at the fringe of the market (Audretsch and Fritsch, 2002). Assuming the regional supply of business concepts as given, every increase in the number of

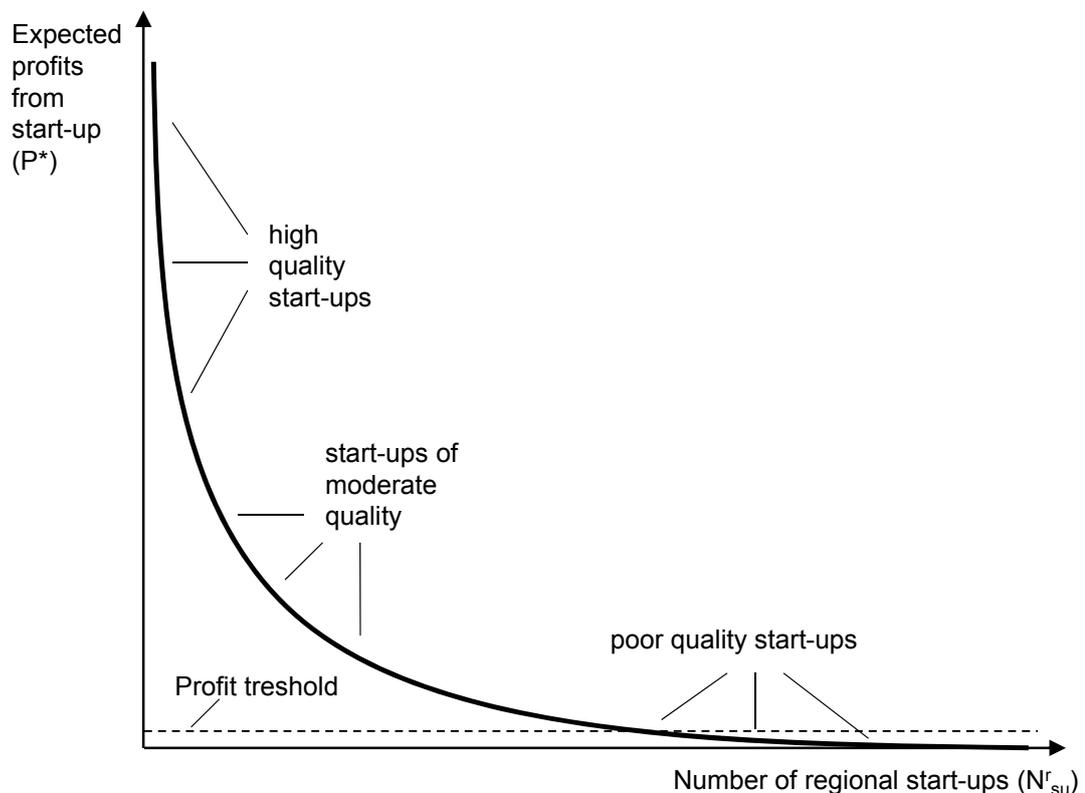


Figure 2: Expected profits from a start-up and the number of start-ups

regional start-ups (N_{su}^r) leads to a decline in the average expected profitability \bar{P}^{r*} of the start-ups, which are realized in a region (r), i.e.

$$(2) \quad d\bar{P}^{r*} / dN_{su}^r < 0.$$

We further assume that the *gross benefit* (GB^r) that a region draws from new business formation in terms of growth depends on the quality of the realized business concepts. High-quality start-ups will induce strong gross benefits by challenging established market positions (cf. also section 2). In contrast, for low-quality start-ups supplying similar products and using about the same technology, the gross benefits should be close to or equal to zero. According to recent empirical studies the gross benefits created by the start-ups emerge over a period of several years (cf. section 2). Since the quality of business concepts is closely related to their expected profitability, this implies that an increase in the number of start-ups leads to higher gross benefits with regard to economic development but that the marginal gross benefits will be decreasing, i.e.

$$(3) \quad dGB^r / dN_{su}^r < 0.$$

Hence, given the limited number of high-quality start-ups, the regional gross benefit of new business formation in a region converges towards an upper limit (UL^r) as the number of start-ups increases (figure 3), i.e.

$$(4) \quad \lim_{N_{su}^r \rightarrow \infty} GB^r = UL^r.$$

This does not imply that the gross benefit of a purely imitative entry is always zero because contesting an established market position may induce an efficiency increase or even product innovation on the side of the incumbents. Convergence of the gross benefit towards zero means, however, that this effect becomes weaker with the number of imitative entries. Hence, increasing the number of start-ups beyond a certain limit will not lead to any additional gross benefit for regional development.

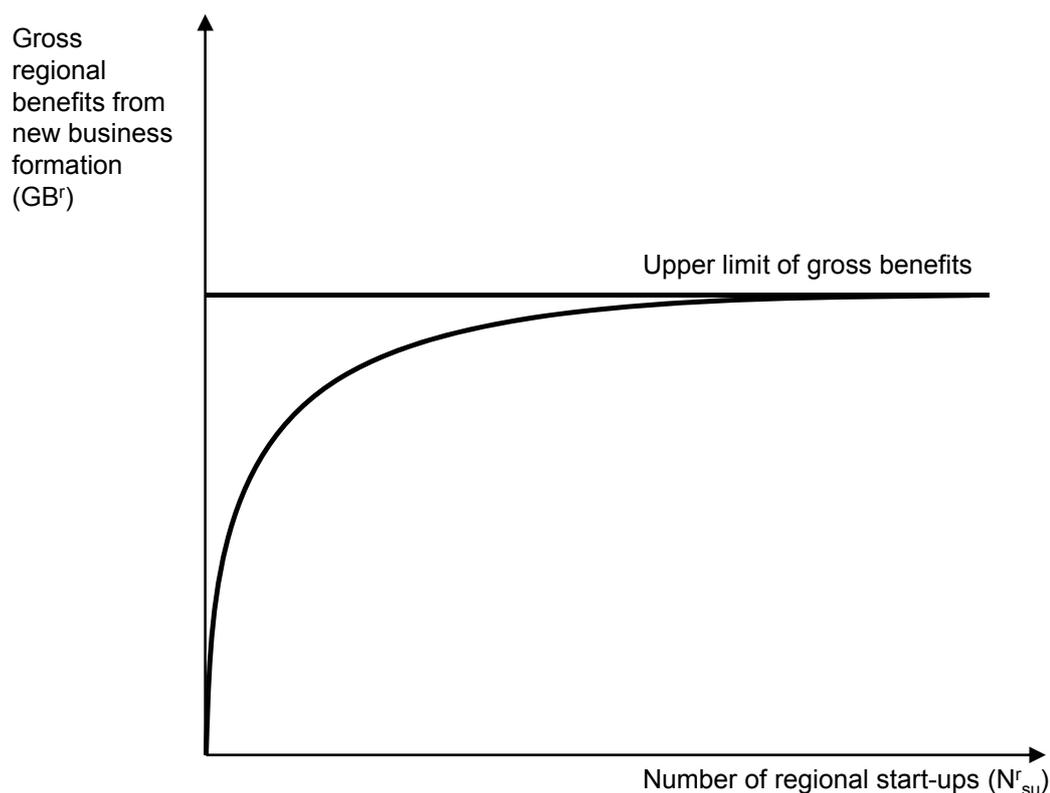


Figure 3: Number of start-ups and gross benefits from new business formation

The *regional costs of the creative destruction* (C_{CD}^r) comprise two main sub-categories, costs for temporary excess capacities built up by the newcomers in order to contest the markets of incumbents as well as the costs for reallocating resources. Costs of excess capacities comprise not only the resources spent for not fully utilized capacities but also unrealized economies of size in production. The costs for reallocating resources occur because real markets do not function as efficiently and costless as the textbook model asserts. Rather, market turbulence is always disruptive with regard to, among others, customer relations, supply chains, social networks, and the labor market and leads to revaluations of resources. Hence, creative destruction causes substantial costs for individuals and firms as well as for the economy as a whole (Caballero and Hammour, 1998; Robinson, O'Leary and Rincon, 2006). The reallocation costs of creative destruction particularly involve:

- a) The transaction costs of starting a venture. These include all kinds of effort caused, e.g. by establishing relationship with suppliers and customers, by hiring personnel and acquiring necessary financial resources, by contract negotiations and obtaining legal advice as well as by entry regulation such as effort for business registration and for obtaining permits (Djankov et al., 2002).
- b) Sunk costs of firm-specific investments on the side of the incumbent and/or the start-up, such as market-specific knowledge, R&D investment, specific machinery, firm-specific qualification of the personnel as well as investments in the relationships to suppliers, to customers, and to other partners in a firm's network that are no longer useful. This also includes the transaction costs that other actors have invested into the relationship of the exiting firm. Moreover, in the event of bankruptcy, closure may involve unpaid debt.
- c) Transaction costs that emerge in form of expenses for business deregistration and as contract penalties owing to non-compliance of stipulations.
- d) Welfare losses for the economy as a whole that may result from under-utilization of resources such as frictional unemployment and the respective lower income of laid-off personnel as well of losses that may result from cutthroat competition.¹³

Due to these different kinds of costs, creative destruction not only has positive but also negative effects on regional output and employment. Since large parts of these costs are external to the newcomers¹⁴, entrepreneurs do not account for these externalities in their decision to enter a market so that

¹³ Non-utilized capacities and unrealized size economies lead to reduced productivity and may cause less pronounced supply-side effects of new business formation (Section 2).

¹⁴ For a successful entry, the costs summarized under a) are completely internal while the costs mentioned under c) are completely external and the costs under b) and d) are to the largest part also external. For an unsuccessful newcomer, the costs under a) and c) are completely internal, the costs under b) will be basically internal and the costs under d) will be for the most part external.

no internal mechanism exists which prevents a negative net-effect of new business formation that occurs if the regional costs of creative destruction (C_{CD}^r) exceed the respective gross benefits (GB^r).

Like the regional gross benefits (GB^r) of new business formation, the regional costs of creative destruction also relate to a longer time period. It is plausible to assume that the costs of creative destruction increase with the number of regional start-ups, i.e.

$$(5) \quad dC_{CD}^r / dN_{su}^r > 0.$$

There is no upper limit to these costs as the number of start-ups increases because every additional entry, regardless of its quality, will generate at least some extra effort. The costs of creative destruction may considerably differ between start-ups according to the size of a venture and the displacement effects that it causes. They should be higher for high-quality and innovative start-ups as compared to low-quality and purely imitative new businesses for several reasons. First, intensive preparation of a venture requires resources and probably market-specific investment that will be sunk if the start-up fails. Second, if entry is innovative, it may require intensive marketing and R&D effort, a considerable part of which will be sunk in case of failure. Third, high-quality and innovative start-ups that intensely challenge the incumbents will probably induce stronger displacement effects than entries of lower quality. If, as we have assumed, the average quality of entries in a region decreases with the number of entries, the marginal costs of creative destruction should also be decreasing, i.e., $(dC_{CD}^r / dN_{su}^r)' < 0$ as is shown in figure 4.

The net benefit (NB^r) of regional new business formation is the gross benefit minus the respective costs of creative destruction,

$$(6) \quad NB^r = GB^r - C_{CD}^r.$$

A net benefit from new business formation in terms of economic development occurs if the gross benefit is higher than the related costs. Since the costs of

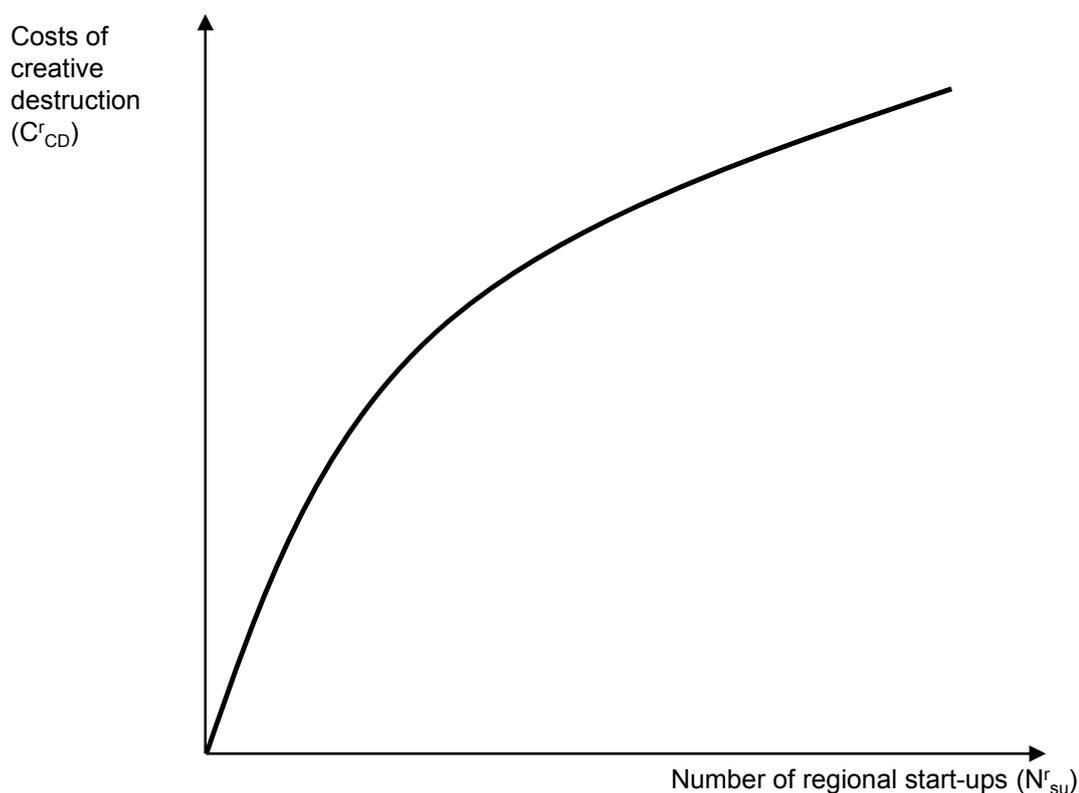


Figure 4: Number of start-ups and costs of creative destruction

creative destruction increase with the number of start-ups while the gross benefits converge towards an upper limit, both curves intersect at a certain number of start-ups (figure 5). Any further increase in this number would lead to a negative marginal net benefit of new business formation because the marginal costs of creative destruction exceed the marginal gross benefits.¹⁵ We conclude that, from the perspective of economic growth, there can clearly be too many start-ups in a region.¹⁶

¹⁵ As far as the costs of creative destruction lead to lower regional productivity, the decrease in the marginal effect of new business formation on regional development should be more pronounced for growth measured in terms of GDP than in terms of employment.

¹⁶ For an alternative model to explain excess entry by low-quality entrepreneurs, see Parker and Praag (2010).

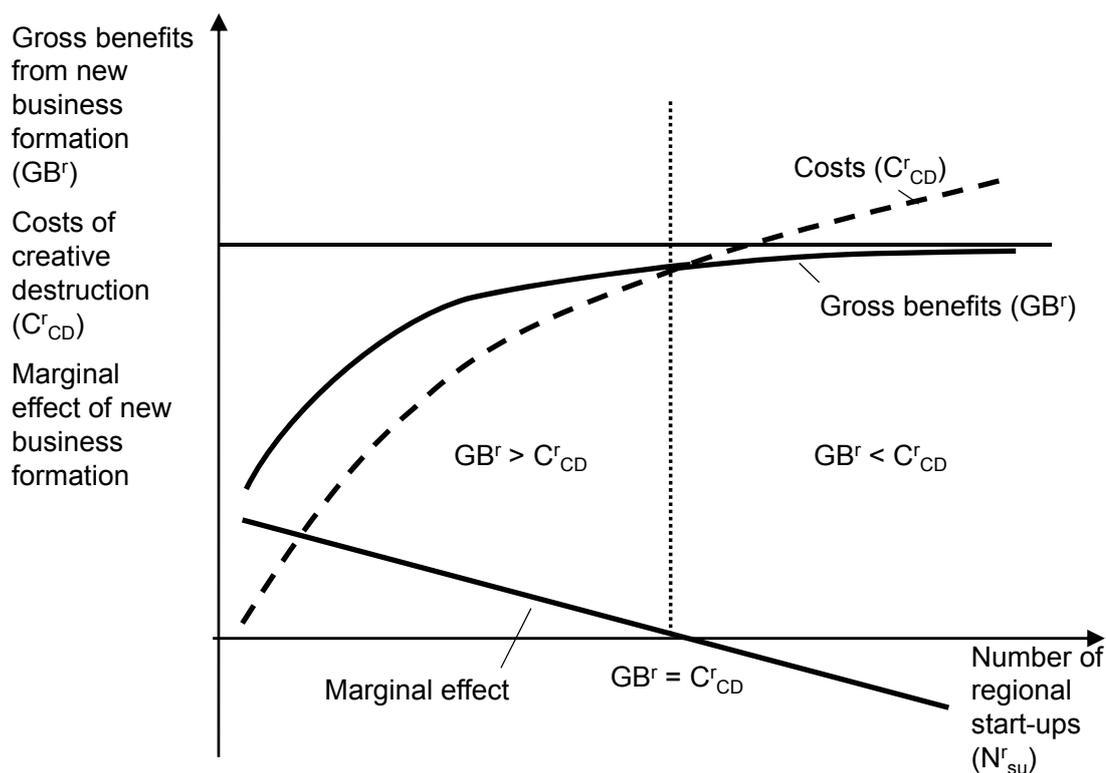


Figure 5: Gross benefit, cost of creative destruction, net benefit, marginal effect, and number of start-ups

Is it plausible that start-ups occur which lead to negative net benefits for economic development, e.g. a decline in GDP or of employment? According to our model, such start-ups with a negative marginal effect on regional growth may, indeed, occur because the motivation of starting a business is based on expected private returns while a large part of the gross benefits (GB^r) as well as of the costs of creative destruction (C^r_{CD}) are external to the founder. If, for example, a start-up challenges the incumbents and has to exit the market because the incumbent firm reacts by supplying a superior and economically more successful solution, the benefit for the founder may be negative while there is a pronounced positive effect in terms of improved competitiveness for the regional economy. Likewise, if an entry is successful and displaces an incumbent, the costs of creative destruction, e.g. exit of competitors, must not be borne by the founder of a new business. Since the largest part of the regional costs and benefits of new

business formation are external to the founder, there is no reason why the factual number of start-ups should equal the socially desirable number of entries. Moreover, as already mentioned in section 3, the number of entries may exceed the optimal level because many entrepreneurs tend to be over-optimistic with regard to the prospects of their venture. There is no mechanism in our model that steers the number of entries towards the optimal level.

Summarizing the results attained so far, we can state that our model can explain the observation that the marginal effect of new business formation on regional employment decreases with the number of start-ups (cf. section 2). The main policy implications are rather obvious:

- First, a policy that tries to increase the number of start-ups by lowering the administrative hurdles or by subsidizing new businesses will particularly stimulate low-quality start-ups that have only a small positive or even a negative marginal effect on economic development (Greene et al. 2004). Such a strategy may lead to a revolving door regime characterized by “early failures, and precarious and temporary job creation” (Santarelli and Vivarelli, 2007, 464) instead of innovation and, thus, substantial and sustainable economic growth.
- Second, since the effect of new business formation on regional development critically depends on the quality of start-ups, a growth-oriented policy should try to stimulate the quality of start-ups, not their mere number (Santarelli and Vivarelli, 2007; Piergiovanni and Santarelli, 2006; Shane, 2009). This suggests a focus on high-quality innovative business concepts. Such a strategy may particularly require major investments in human capital, which constitutes the essential precondition for high-quality entrepreneurship. Hence, improving the general knowledge and the skills of the regional workforce should lie at the heart of every growth-oriented entrepreneurship policy (Piergiovanni and Santarelli, 2006).

In a nutshell, our model provides a theoretical underpinning for a policy that fosters the quality instead of the quantity of new business formation in order to create economic value and growth.

5. Interregional differences in the effect of new business formation

Regions may differ considerably with respect to their economic potential such as the number entrepreneurs. In order to make meaningful interregional comparisons with regard to new business formation, it is common practice to relate the number of start-ups to this economic potential. According to the so-called labor market approach, the number of employees is taken as denominator of a start-up rate. The start-up rate according to the labor market approach can also be regarded as the probability of a member of the regional workforce setting up a firm in a given period. This view corresponds to the basic model of entrepreneurial choice, which we applied at the outset of our model in section 2. For the purpose of interregional comparisons, we now focus on start-up rates. The net effect of new business formation is measured as the rate of regional growth. Hence, we relate two variables that can be compared across regions regardless of differences in the economic potential of these regions.

5.1 Differences in the quality of start-ups and different regional growth regimes

As we have argued above, the quality of the start-ups may be an important source of regional differences in their effect on employment growth. This is illustrated in figure 6. While high-quality start-ups are more or less completely missing in region I, there are some high-quality ventures in region II and several in region III. Accordingly, the growth effect of new business formation is much higher in region III as compared to the other two regions as shown in figure 7. The assumption of varying qualities of new businesses among regions is

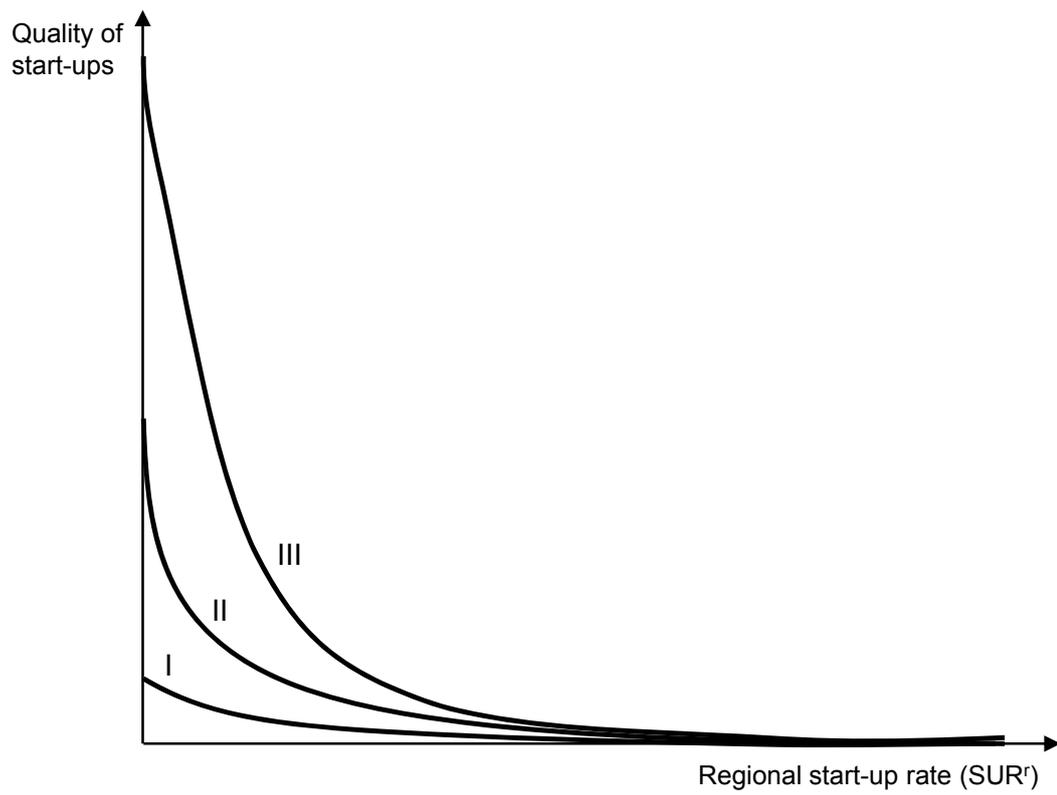


Figure 6: Regional differences in the quality of start-ups

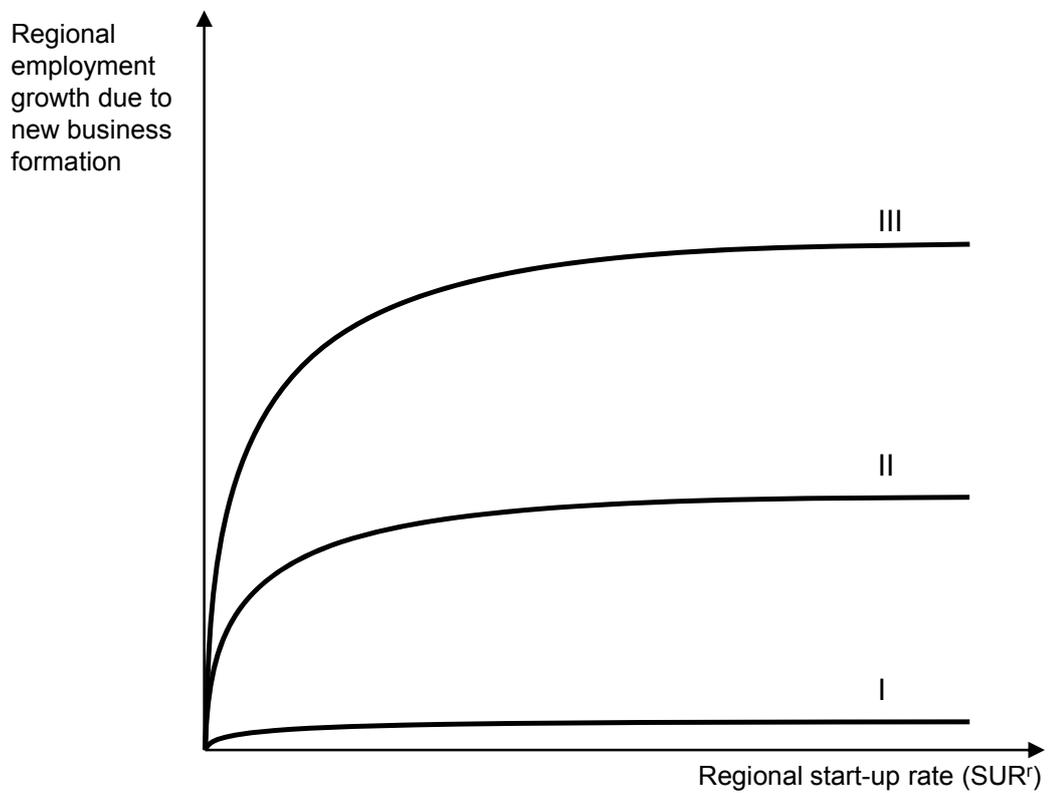


Figure 7: Regional differences in the effect of start-ups on growth

confirmed by empirical studies which have found a larger share of start-ups affiliated with knowledge-intensive and high-tech industries in agglomerated regions than in moderately congested and rural areas (Audretsch et al., 2006; Bade and Nerlinger, 2000; Schroeter, 2009).

Another possible reason for the varying scale of the effect of entry among regions is the differences in the characteristics of the regional growth regimes, particularly differences in the characteristics of the region-specific competitive process. The regional growth regime is the set of institutional and economic conditions which has an effect on regional development. One main element is the type and the intensity of competition of regional firms with firms within and outside the respective region. This can pertain to a number of issues such as the type of market selection ('survival of the fittest' versus 'survival of the less productive'), the most important parameters for competition (e.g., price versus product quality), a region's technological regime (entrepreneurial versus routinized) as well as the intensity of competition on input and on output markets. One may well expect that a relatively high level of competition will spur market selection and will ultimately lead to a relatively high economic competitiveness of the surviving entrants and the surviving incumbent businesses. Hence, a new business of a certain quality could lead to different employment effects in the framework of different regional growth regimes. The curves I, II, and III in figure 7 could also represent the employment effect of start-ups of a given quality under the conditions of different regional growth regimes. In this example, region III has the greatest effectiveness in transforming the challenges of entry into growth.

Empirical research has shown that the effect of new business formation may largely differ between regions and that region-specific factors play an important role in this respect (see for example Fritsch and Schroeter, 2010). However, we still know only rather little about the reasons for such regional differences. A factor that in empirical analyses turned out to have a rather dominating influence on the employment effect of start-ups is population density. Hence, curve III in figure 7 could represent the agglomerations, curve II the moderately congested areas, and curve I the

rural regions. In the next section, we discuss possible reasons why population density can have such a strong influence.

5.2 Why is the effect of new business formation on employment growth higher in agglomerations?

There is strong empirical evidence that the effect of new business formation on employment is much more positively pronounced in agglomerations than in moderately congested areas and in rural regions (Fritsch and Mueller, 2008; Fritsch and Schroeter, 2010; Mueller, van Stel, and Storey, 2008; Stel and Suddle, 2008). Schroeter (2009) argues that the greater employment effect of an entry in agglomerations mainly emanates from a relatively larger share of high-quality start-ups in those areas in addition to the relatively intense competition.

The relatively high share of innovative, high-quality start-ups that can be found in many agglomerations may be explained by the special resource endowment and other characteristics of high-density areas. Following the view that entrepreneurship is a process of perceiving opportunities and transforming these opportunities into ventures that create economic value and growth (Shane, 2000; Shane and Eckhardt, 2003), the quality of new businesses should vary across regions depending on the pool of innovative opportunities as well as on the quantity and quality of resources available to implement these opportunities (Shane, 1996; Acs and Armington, 2004). Compared to moderately congested areas and rural regions, agglomerations offer relatively favorable conditions for the creation, dissemination, and exploitation of innovative opportunities, which is reflected in a higher share of high-quality start-ups. These characteristics include a rich resource base, a high level of innovation activity, a great diversity of economic activities as well as close spatial proximity of actors that fosters knowledge spillovers and learning. A relatively high average quality of start-ups in agglomerations may also result from a higher education level (e.g., a higher share of persons with a tertiary degree) of the members of the regional workforce, which represent the potential entrepreneurs (Schroeter, 2009).

Another important feature of agglomerations is the relatively high intensity of competition due to the greater number of firms demanding similar inputs or supplying goods and services to the same regional market. Therefore, market selection should be particularly intense in agglomerations, causing – if the market works according to a surviving of the fittest scenario – a relatively strong supply-side effect of entry that is likely to be reflected in a larger employment growth in these areas. This supposition is supported by empirical studies that have found a higher level of start-ups (Fritsch and Falck, 2007) but a lower probability of survival in agglomerations as compared to areas with a lower density of economic activity (Engel and Metzger, 2006; Weyh, 2006). A higher intensity of competition and higher resource costs in agglomerations may, however, also lead to higher costs of creative destruction in these areas. The empirical evidence of more pronounced net effects on new business formation in high-density areas does, however, suggest that in most of these regions these higher costs are overcompensated by a better ability to transform the impulses of entry into regional growth.

6. Summary and conclusions

Recent empirical research suggests that the marginal effect of new business formation on regional employment effect declines with an increasing level of start-up activity and that the marginal effect can become even negative for particularly high rates of entry. The main explanation of this phenomenon that can be found in the literature is based on the notion of market ‘overcrowding.’ This approach is, however, rather unsatisfactory for two reasons. First, it cannot explain a decreasing marginal effect of entry in constellations where the number of the suppliers on a market is below the optimum. Second, the approach holds only for non-innovative entries but not for innovative new businesses.

We proposed a model which is able to explain the decreasing marginal employment effect of start-ups by comparing the regional benefits and the regional costs of new business formation. Assuming that the regional

benefits of entry critically depend on the quality of the new firms, we argue that quality and, hence, the economic effect of new businesses decline with their number. Since the reallocation costs that are associated with entry and creative destruction increase more than the respective benefits, the marginal net benefit of new business formation declines as the number of start-ups increases, and it may even become negative if the costs of creative destruction outweigh the benefits. This implies that the level of new business formation in a region may be 'too high' from the perspective of economic growth.

Furthermore, our model suggests that there are two main sources of interregional differences in the effect of new business formation on employment. The first factor is different qualities of start-ups. The quality of start-ups pertains to the challenge that the newcomers represent for the incumbents such as their degree of innovativeness. The second possible cause of interregional differences in the employment effect of new business formation could be differences in the capability of the regional growth regime to transform the incentives which are generated by entry into growth. Both factors should be more pronounced in agglomerations, leading to a considerably higher impact of new business formation in these regions as compared to the other regions with lower levels of density.

There are at least three main policy conclusions that can be drawn from our model. First, policy efforts aiming at an increase in the mere number of start-ups will yield only a slightly positive or even a negative marginal economic effect on growth. Second, instead of stimulating the mere quantity of new businesses, policy measures should try to promote the quality of start-ups in order to create economic value and growth. This can pertain to issues such as improving the qualifications of entrepreneurs, securing the availability of important inputs, and particularly stimulating the innovativeness of regional entries. Third, policy could aim at strengthening the ability of the regional growth regime of transforming the impulses of new businesses into regional growth. However, little is known about the factors that determine this

type of quality of a regional growth regime so that there is considerable need for research.¹⁷

To answer the question “are more start-ups really better?” posed in the title of the paper: more start-ups are not at all necessarily better. It is the quality of the start-ups, especially the intensity by which they challenge the incumbent businesses, that counts.

¹⁷ See Schroeter (2009) for a discussion of possible reasons why new business formation has a considerably larger effect on economic development in agglomerations as compared to rural regions.

References

- Acs, Zoltan and Catherine Armington (2004): The Impact of Geographic Differences in Human Capital on Service Firm Formation Rates, *Journal of Urban Economics*, 56,244-278.
- Acs, Zoltan J. and Pamela Mueller (2008): Employment Effects of Business Dynamics: Mice, Gazelles and Elephants, *Small Business Economics*, 30, 85-100.
- Aghion, Philippe, Richard Blundell, Rachel Griffith, Peter Howitt and Susanne Prantl (2006): The Effects of Entry on Incumbent Innovation and Productivity, Working Paper 12027, Cambridge, MA: National Bureau of Economic Research.
- Anderson, Simon P., Andre DePalma and Yurii Nesterov (1995): Oligopolistic Competition and the Optimal Provision of Products, *Econometrica*, 63, 1281–1302.
- Arabsheibani, Gholamreza (2000): And a vision appeared unto them of a great profit: evidence of self-deception among the self-employed, *Economic Letters*, 67, 35-41.
- Arauzo-Carod, Josep-Maria, Daniel Liviano-Solis and Mònica Martin-Bofarull (2008): New business formation and employment growth: some evidence for the Spanish manufacturing industry, *Small Business Economics*, 30, 73-84.
- Audretsch, David B. and Michael Fritsch (2002): Growth Regimes over Time and Space, *Regional Studies*, 36, 113-124.
- Audretsch, David B., Martin Carree, Andre van Stel and Roy Thurik (2002): Impeded Industrial Restructuring: The Growth Penalty, *Kyklos*, 55, 81-98.
- Audretsch, David B., Max C. Keilbach and Erik E. Lehmann. (2006): *Entrepreneurship and Economic Growth*, New York: Oxford University Press.
- Bade, Franz-Josef and Eric A. Nerlinger (2000): The spatial distribution of new technology-based firms: empirical results for West Germany', *Papers in Regional Science*, 79, 155-176.
- Baptista, Rui, Vitor Escária and Paulo Madruga (2008): Entrepreneurship, regional development and job creation: the case of Portugal, *Small Business Economics*, 30, 49-58.
- Baptista, Rui and Miguel Torres Preto (2010): New Firm Formation and Employment Growth: Regional and business Dynamics, *Small Business Economics*, 32 (forthcoming).
- Baumol, William J. (2005): Entrepreneurship and Invention: Toward their Microeconomic Value Theory, AEI-Brookings Joint Center for Regulatory Studies, related publication No. 05-38, Washington: Joint Center.

- Berry, S and J. Waldfogel (1999): Free Entry and Social Inefficiency in Radio Broadcasting, *The RAND Journal of Economics*, 30, 3, 397-420.
- Blanchflower, David G. (2004): Self-employment: more may not be better, *Swedish Economic Policy Review*, 11, 15-73.
- Federal Office for Building and Regional Planning (Bundesamt für Bauwesen und Raumordnung), 2003, *Aktuelle Daten zur Entwicklung der Städte, Kreise und Gemeinden*, Vol. 17, Bonn: Federal Office for Building and Regional Planning.
- Bosma, Niels, Erik Stam and Veronique Schutjens (2010): Creative Destruction and Regional Productivity Growth: Evidence from the Dutch Manufacturing and Services Industries, *Small Business Economics* (forthcoming).
- Brixy, Udo and Michael Niese (2006): The determinants of regional differences in new firm formation in Western Germany, in: P. Nijkamp, R.L. Moomaw and I. Traistaru (eds.), *Entrepreneurship, investment, and spatial dynamics : lessons and implications for an enlarged EU*, Cheltenham: Elgar, 109-120.
- BVK: German Private Equity and Venture Capital Association (2008): *Early Stage-Venture Capital 2007*, http://www.bvkap.de/media/file/168.BVK_Teilstatistik_Early_Stage2007_310308.pdf.
- Caballero, Ricardo J, and Mohamad L. Hammour (1998): Improper Churn: Social Costs and Macroeconomic Consequences, Cambridge (MA): National Bureau of Economic Research, Working Paper 6717.
- Carree, Martin and Roy Thurik (1999): The carrying capacity and entry and exit flows in retailing, *International Journal of Industrial Organization*, 17, 985-1007.
- Carree, Martin, André van Stel, Roy Thurik and Sanders Wennekers (2002): Economic development and business ownership : an analysis using data of 23 OECD countries in the period 1976-1996 *Small Business Economics*, 19, 271-290.
- Carree, Martin A., and Roy Thurik (2003): The Impact of Entrepreneurship on Economic Growth, in Zoltan J. Acs and David B. Audretsch (eds.), *Handbook of Entrepreneurship Research*, Boston: Kluwer, 437-471
- Carree, Martin, André van Stel, Roy Thurik and Sanders Wennekers (2007): The relationship between economic development and business ownership revisited, *Entrepreneurship and Regional Development*, 19, 281-291.
- Carree, Martin and Roy Thurik (2008): The Lag Structure of the Impact of Business Ownership on Economic Performance in OECD Countries, *Small Business Economics*, 30, 101-110.
- Chamberlin, Edward (1933): *The Theory of Monopolistic Competition*, Harvard University Press, Cambridge.

- Cohen, Wesley and Steven Klepper (1996): Firm Size and the Nature of Innovation within Industries: The Case of Process and Product R&D, *Review of Economics and Statistics*, 78, 232-243.
- Davis, Peter (2006): Measuring the business stealing, cannibalization and market expansion effects of entry in the US motion picture exhibition market, *The journal of industrial economics*, 4, 293-321.
- Dixit, Avinash K. and Stiglitz, Joseph E. (1977): Monopolistic Competition and Optimum Product Diversity, *American Economic Review*, 67, 297-308.
- Djankov, Simeon, Rafale La Porta, Florencio Lopez-de-Silanes und Andrei Shleifer (2002): The Regulation of Entry, *Quarterly Journal of Economics*, 117, 1-37.
- Engel, Dirk and Georg Metzger (2006): Direct Employment Effects of New Firms, in: Michael Fritsch and Juergen Schmude (eds.), *Entrepreneurship in the Region*, New York: Springer, 75-93.
- Fritsch, Michael (1996): Turbulence and Growth in West-Germany: A Comparison of Evidence by Regions and Industries, *Review of Industrial Organization*, 11, 231-251.
- Fritsch, Michael (2004): Entrepreneurship, Entry and Performance of New Businesses Compared in two Growth Regimes: East and West Germany, *Journal of Evolutionary Economics*, 14, 525-542.
- Fritsch, Michael and Udo Brix (2004): The Establishment File of the German Social Insurance Statistics, *Schmollers Jahrbuch / Journal of Applied Social Science Studies*, 124, 183-190.
- Fritsch, Michael and Pamela Mueller (2004): The Effects of New Business Formation on Regional Development over Time, *Regional Studies*, 38, 961-975.
- Fritsch, Michael and Oliver Falck (2007): New Business Formation by Industry over Space and Time: A Multi-Dimensional Analysis, *Regional Studies*, 41, 157-172.
- Fritsch, Michael (2008): How Does New Business Formation Affect Regional Development? *Small Business Economics*, 30, 1-14.
- Fritsch, Michael and Pamela Mueller (2008): The Effect of New Business Formation in Regional Development over Time: The Case of Germany, *Small Business Economics*, 30, 15-29.
- Fritsch, Michael and Florian Noseleit (2009): Investigating the Anatomy of the Employment Effects of New Business Formation, Jena Economic Research Papers # 001 – 2009, Friedrich Schiller University and Max Planck Institute of Economics Jena.
- Fritsch, Michael and Alexandra Schroeter (2010): Why Does the Effect of New Business Formation Differ Across Regions ? *Small Business Economics*, 32 (forthcoming).

- Greene, Francis J., Kevin F. Mole and David J. Storey (2004): Does More Mean Worse? Three Decades of Enterprise Policy in the Tees Valley, *Urban Studies*, 41, 1207-1228.
- Greene, William (2003): *Econometric Analysis*, 5th ed., Upper Saddle River, NJ: Prentice Hall.
- Grupp, Hariolf and Harald Legler (2000): *Hochtechnologie 2000*, Karlsruhe: Fraunhofer Institute for Systems and Innovation Research (ISI).
- Hannan, Michael T. and John Freeman (1977): The population ecology of organizations. *American Journal of Sociology*, 82, 929-964.
- Kihlstrom, Richard E. and Jean-Jacques Laffont (1979): A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion, *Journal of Political Economy*, 87, 719-748.
- Klepper, Steven (1996): Entry, exit, growth, and innovation over the product life cycle, *American Economic Review*, 86, 562-583.
- Knight, Frank H. (1921): *Risk, Uncertainty and Profit*, New York: Houghton Mifflin.
- Koellinger, Philipp, Maria Minniti and Christian Schade (2007): "I Think I Can, I Think I Can": Overconfidence and Entrepreneurial Behavior, *Journal of Economic Psychology*, 28, 502-527.
- Kronthaler, Franz (2005): Economic capability of East German regions: results of a cluster analysis, *Regional Studies*, 39, 739-750.
- Lucas, Robert E., Jr. (1978): On the Size Distribution of Business Firms, *Bell Journal of Economics*, 9, 508-523.
- Lundström, Anders und Lois Stevenson (2005): *Entrepreneurship Policy: Theory and Practice*, New York: Springer.
- Mankiw, Nicholas G. and Michael D. Whinston (1986): Free Entry and Social Inefficiency, *The RAND Journal of Economics*, 17, 48-58.
- Manove, Michael and A. Jorge Padilla (1999): Banking (conservatively) with optimists, *RAND Journal of Economics*, 30, 324-350.
- Mueller, Pamela, André van Stel and David J. Storey (2008): The Effect of New Firm Formation on Regional Development over Time: The Case of Great Britain, *Small Business Economics*, 30, 59-71.
- National Venture Capital Association (2009): *Yearbook 2009*, Arlington (VA), NVCA, http://www.nvca.org/index.php?option=com_docman&task=doc_download&qid=446&Itemid=93. Accessed on July 6 2009.
- Olson, Mancur (1982): *The rise and decline of nations: Economic growth, stagflation, and social rigidities*. New Haven, CT: Yale University Press.
- Olson, Mancur (1983): Political economy of comparative growth rates. In D.C. Mueller (Ed.), *The political economy of growth*. New Haven, CT: Yale University Press.

- Parker, Simon (2007): Policymakers beware! in: David B. Audretsch, Isabel Grilo and Roy Thurik (eds.): *Handbook of Research on Entrepreneurship Policy*, Cheltenham, Edward Elgar, 54-63.
- Parker, Simon and Mirjam van Praag (2010), Status and Entrepreneurship, *Journal of Economics & Management Strategy* (forthcoming).
- Piergiovanni, Roberta and Enrico Santarelli (2006): What is the Best Policy for Innovative Entrepreneurship? in: Enrico Santarelli (ed.) *Entrepreneurship, Growth, and Innovation*, New York: Springer, 261-274.
- Robinson, Catherine, Brigid O'Leary and Ana Rincon (2006): Business Start-ups, Closures and Economic Churn – A Review of the Literature. Final Report, London: National Institute of Economic and Social Research.
- Santarelli, Enrico and Marco Vivarelli (2007): Entrepreneurship and the Process of Firms' Entry, Survival and Growth, *Industrial and Corporate Change*, 16, 455-488.
- Santarelli, Enrico and Marco Vivarelli (2007): Entrepreneurship and the process of firms' entry, survival and growth, *Industrial and Corporate Change*, 16, 455–488.
- Saviotti, Pier Paolo and Andreas Pyka (2004): Economic development, variety and employment, *Revue Économique*, 55, 1023-1049.
- Saxenian, Annalee (1994): *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Cambridge (Mass.): Harvard University Press.
- Schroeter, Alexandra (2009): The Effect of New Business Formation on Employment – The Dominance of Density, Jena Economic Research Papers # 019 – 2009, Friedrich Schiller University and Max Planck Institute of Economics Jena.
- Schumpeter, Joseph A. (1911/34): *The Theory of Economic Development*, Cambridge, MA: Harvard University Press: (first edition in German: *Theorie wirtschaftlicher Entwicklung*, Berlin 1911: Duncker & Humblot).
- Schumpeter, Joseph A. (1942): *Capitalism, Socialism and Democracy*, New York: Harper and Row.
- Shane, Scott (1996): Explaining Variation in Rates of Entrepreneurship in the United States 1899–1988, *Journal of Management*, 22, 747–781.
- Shane, Scott (2000): Prior Knowledge and the Discovery of Entrepreneurial Opportunities, *Organization Science*, 11, 448-469.
- Shane, Scott and Jonathan Eckhardt (2003): The Individual-Opportunity Nexus. In: Acs, Zoltan J. and David B. Audretsch (eds.), *Handbook of Entrepreneurship Research*, Kluwer Academic Publishers, Dordrecht, 161–194.
- Shane, Scott (2009): Why encouraging more people to become entrepreneurs is bad public policy, *Small Business Economics*, 33, 141-149.

- Spence, Michael (1976a): Product Differentiation and Welfare, *American Economic Review*, 66, 407–414.
- Spence, Michael (1976b): Product Selection, Fixed Costs and Monopolistic Competition, *Review of Economic Studies*, 43, 217–236.
- Stam, Erik (2007): Why Butterflies Don't Leave: Locational Behaviour of Entrepreneurial Firms, *Economic Geography*, 83, 27-50.
- Sutton, John (1991): *Sunk Costs and Market Structure*, MIT Press, Cambridge.
- van Stel, André and David J. Storey (2004): The Link Between Firm Births and Job Creation: Is there a Upas Tree Effect? *Regional Studies*, 38, 893-909.
- van Stel, André and Kashifa Suddle (2008): The Impact of New Firm Formation on Regional Development in the Netherlands, *Small Business Economics*, 30, 31-47.
- Wagner, Joachim and Rolf Sternberg (2004): Start-up activities, individual characteristics, and the regional milieu: lessons for entrepreneurship support policies from German micro data, *Annals of Regional Science*, 38, 219-240.
- Weyh, Antje (2006): What Characterizes Successful Start-Up Cohorts? in: Michael Fritsch and Juergen Schmude (eds.), *Entrepreneurship in the Region*, New York: Springer, 61-74.
- Winter, Sidney G. (1984): Schumpeterian Competition in Alternative Technological Regimes, *Journal of Economic Behavior and Organization*, 5, 287-320.