

High-growth Firms in Sweden 1997–2007

Characteristics and development patterns

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1 Introduction and background

This paper is a short summary of a recently published report on high-growth firms in Sweden.¹ The report is part of an assignment from the Swedish government to the Swedish Agency for Growth Policy Analysis (Growth Analysis) to analyse the relationship between entrepreneurship and innovation. Innovative entrepreneurship and fast growing firms are important drivers of growth, and especially important for the competitiveness of the Swedish economy with its dependence on global markets.

The report has studied rapidly growing firms in Sweden during the period 1997 - 2007. The main aim has been to analyse whether there are any characteristics that distinguish gazelles, apart from the contribution they make to growth. Earlier studies show that gazelles are very important in creating jobs and economic growth.² The fact that they grow more rapidly than other firms indicates that in some way they differ from other firms. It is thus of interest to follow gazelles over a longer period and further develop the analysis of rapidly growing firms, their characteristics and what the implications are for thinking on growth policy. One principal focus has been to study the growth of gazelles throughout the period in relation to firms that were not classified as gazelles. What does the development pattern look like? Is it a question of continuous growth, or do these firms have a period of rapid growth which is preceded by and then succeeded by periods of weak or stagnating growth?

The analysis is quantitative and based on the IFDB database at Growth Analysis which contains data on both firms and individuals. The 10 per cent of firms with the highest index values during the period were classified as gazelles. This means that the overall proportion of gazelles within any part of the time period can vary as a consequence of differences in the economy. A Birch index is used, since this measure takes into account both absolute as well as relative changes in employment. This measure is thus relatively neutral with respect to company size. The Birch index (BI) was calculated based on the difference between the number of employees during the first year in the time period (s_0), and the number of employees after three years of growth (s_3).

Birch index

$$BI = (s_3 - s_0) \left(\frac{s_3}{s_0} \right)$$

The analysis covers all firms, except for those with fewer than three employees or an annual turnover of less than SEK 1 million. In addition, enterprise groups were excluded. Concerning groups, there is a lack of knowledge about their real size and the scope of their operations abroad. It is also misleading to analyse firms that are members of a group in this context, since their expansion may be a consequences of transferring operations from other parts of the group.

Gazelles have been studied on the basis of a number of variables such as regional location, industry, size, age and capital intensity. In addition, their importance for economic growth and job creation has been analysed. Their development patterns have been studied over

¹ The full report is available in English and Swedish and can be downloaded from www.growthanalysis.se

² See, for instance, Henrekson & Johansson (2008)

time to determine if there is any kind of growth path dependence. Based on theory and earlier empirical studies we have tested the following seven hypotheses or propositions:

- Gazelles are younger compared to other firms.
- Gazelles exist in all size categories even though the number of growth firms is higher among small and medium-sized firms.
- Gazelles exist in all industries, but are somewhat overrepresented in growth industries such as business services.
- Gazelles exist in all counties although they exist in greater numbers in metropolitan regions.
- Gazelle are more capital and human capital intensive compared to other firms.
- Gazelles account for a disproportionately large part of increases in employment and value added.
- It is not possible to forecast which firms will become gazelles during a subsequent period, but the probability is somewhat higher that a gazelle compared to other firms remains a gazelle, or at least a company with a certain growth, also during the next period.

2 Main findings

Gazelles are clearly overrepresented among young firms and only firms that are five years or younger have a higher proportion of gazelles than the average. This result is in line with findings from earlier studies. The proportion of gazelles increases with company size, whilst the largest number are to be found among smaller firms. The construction of the Birch index, however, does mean that only a small percentage increase in the number of employees is all that is required for a large company to be classified as a gazelle, and this it could be argued disadvantages smaller firms. Gazelles are also somewhat overrepresented in construction, and growth industries such as business services, but not in knowledge or R&D intensive industries. They are also distributed relatively evenly geographically, even though the largest numbers are to be found in metropolitan regions. Gazelles on the other hand are not clearly more capital intensive than other firms. However, employees in the first mentioned firms have a significantly higher level of education compared to those in other firms. These results are relatively robust irrespective of whether the Birch index is based on changes in employment or changes in value added. The only exception is that gazelles are more capital intensive and that their proportion is somewhat higher in capital intensive industries in the last mentioned case.

In addition, the analysis shows that gazelles account for a disproportionately large proportion of increases in employment and growth of value added. The distribution is highly skewed and this 10 per cent of firms account in total for all of the increase in employment (Table 1). It can also be seen from Table 1 that new firms are very important in creating employment. Firms which are five years or younger account for approximately two thirds of growth in employment in the group of gazelles.

Gazelles also account for between 65 and 100 per cent of growth in value added depending on the period. Independent gazelles accounted for slightly more than 10 per cent of the growth in GDP in Sweden during the last period of 2004- 2007. Among gazelles the smallest firms account for the majority of the growth in employment and the proportion is essentially the same as for the youngest firms. Young firms, however, are particularly important in adding new jobs since the overall reduction in employment among the group of "Other firms" is much smaller for young firms compared with smaller firms. The relationships are similar when changes in value added are studied, and newness is a distinguishing characteristic of firms undergoing rapid growth.

Table 1 Change in number of employees by each age category in different periods grouped by gazelles, other firms and firms with worst development (Bottom 10)

Firm Grouping	Age	1997-2000	1998-2001	1999-2002	2000-2003	2001-2004	2002-2005	2003-2006	2004-2007
Gazelles	5 years or younger	28 449	31 812	29 773	26 425	23 833	24 369	29 206	35 926
	6-10 years	6 315	6 008	6 649	5 088	4 447	4 229	5 800	6 841
	11 years or older	6 392	6 358	6 521	6 134	6 730	6 262	8 435	10 125
	Data un-available	1 160	241	93	175	197	162	216	303
	Total	42 316	44 419	43 036	37 822	35 207	35 022	43 657	53 195
Others	5 years or younger	-4 063	-4 446	-4 124	-6 466	-7 986	-6 044	-4 503	-3 716
	6-10 years	-953	-1 274	-940	-1 502	-1 236	-1 218	-995	-259
	11 years or older	-1 281	-2 436	-1 576	-1 960	-1 923	-1 939	-1 822	-1 096
	Data un-available	-310	-499	-606	-606	-478	-431	-486	-458
	Total	-6 607	-8 655	-7 246	-10 534	-11 623	-9 632	-7 806	-5 529
Bottom 10	5 years or younger	-14 030	-16 663	-15 500	-18 134	-19 524	-19 676	-17 377	-16 164
	6-10 years	-3 953	-4 935	-3 686	-3 930	-4 687	-4 778	-4 084	-4 086
	11 years or older	-7 238	-15 233	-7 745	-8 308	-8 658	-9 482	-7 993	-8 500
	Data un-available	-608	-1 067	-1 081	-1 263	-1 095	-1 459	-1 656	-1 068
	Total	-25 829	-37 898	-28 012	-31 635	-33 964	-35 395	-31 110	-29 818
All Groups	Total	9 880	-2 134	7 778	-4 347	-10 380	-10 005	4 741	17 848

When firms belonging to a group are analysed, we have found major differences compared to independent firms, which serves to confirm that it is necessary to draw a distinction between them in the analysis. It turns out that the proportion of gazelles is significantly higher among the former, and particularly among firms that are part of international groups. The proportion of gazelles among firms which belong to wholly-owned Swedish groups is 19 per cent, and as high as 31 per cent for international groups. This can be compared with a figure of 10 per cent for independent firms according to the definition. There may be a number of reasons for this. One explanation may be the transfer of physical resources to a company from other parts of the group which means that it grows rapidly. Another is transfer of technology and other knowledge such as marketing and

production know-how. In particular, firms that are part of international groups enjoy as a result competitive advantages providing scope for rapid growth. In addition, international firms have access to a wider range of capital, and groups also have greater financial resources, two factors which are of particular importance for rapid growth over a longer period.

2.1 Path dependence

An interesting question that has only received relatively little attention is the development of gazelles over time. We have chosen to study this by dividing the period studied into three separate periods, 1998 – 2001, 2001 – 2004, and 2004 – 2007. Table 2 shows the development of firms which were gazelles during the middle period i.e. 2001 – 2004. The table shows the distribution of firms identified as gazelles in period (2001 – 2004), both before this period (1998 – 2001) and after the gazelle period (2004 - 2007). Lack of data on a company means that it was probably started, split up, merged or closed down during the period.

If the development of all firms is studied (the bottom part of Table 2), the distribution was basically similar with respect to the growth that firms had in the previous period. Gazelles during the middle period come from all groups with virtually the same proportions since these are around 25 per cent. Based on this data, there does not appear to be a higher probability that a gazelle during one period was also a gazelle during a previous period. Continuing gazelles i.e. firms that are gazelles over a number of periods, are overrepresented in the category of firms belonging to international groups, and 40 per cent were also gazelles during the previous period (the table section, second lowest from the bottom in table 1).

When the development of gazelles during *the next* period 2004 – 2007 is examined, the pattern is similar but not equally clear (the bottom part of Table 2). What can be stated is that firms which have been gazelles have a lower probability of reducing their employment or closing down operations, but they have just as high a probability of being defined as a gazelle as belonging to the category of "Other firms".

One way of determining whether there is any systematic pattern with regard to a company defined as a gazelle in two periods is to test whether firms defined as gazelles in one period are a random sample of firms. It is not possible to reject the hypothesis that the outcome is consistent with firms that were defined as gazelles in 2001-2004 are a random sample of firms. This serves to confirm the view presented in Table 2, i.e. there is no form of "growth path dependence" backwards in time.

There is on the other hand a slightly higher probability of remaining a gazelle during the next period 2004-2007, given that the company was a gazelle during the previous period. However, it should be pointed out that the probability is not lower than the threshold value of 0.01 at the highest level of significance (99 per cent). Macroeconomic factors may lie behind this relationship, since the middle period covered a short downturn in the economy whilst the last period was characterised by four years of uninterrupted high growth.

Table 2 Gazelles' development over time for firms classified as gazelles during 2001 – 2004 by independent firms, firms that are part of Swedish and international groups, and all firms, per cent

Independent	1998-2001	2001-2004	2004-2007
Gazelle	18	100	28
Others	33		44
Bottom 10	23		20
Data unavailable	27		7
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Swedish groups	1998-2001	2001-2004	2004-2007
Gazelle	30	100	36
Others	29		31
Bottom 10	24		25
Data unavailable	17		8
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International groups	1998-2001	2001-2004	2004-2007
Gazelle	40	100	41
Others	17		18
Bottom 10	25		33
Data unavailable	18		9
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All firms	1998-2001	2001-2004	2004-2007
Gazelle	27	100	34
Others	28		34
Bottom 10	24		25
Data unavailable	21		8

Finally we have analysed a subset of gazelles which succeeded in maintaining continuous growth and qualifying as gazelles during all three periods 1997 – 2000, 2000 – 2003 and 2003 – 2006 (Table 3). It should be observed that about 25 per cent of firms went from being an independent company into becoming a member of a group during the period. In addition, about 12 per cent of the firms belonging to a Swedish group became part of an international group. To conclude, close to 40 per cent moved from being an independent company into part of a group, or from belonging to a Swedish group and becoming part of an international group. This serves to illustrate that gazelles which succeeded in following a growth path were often acquired and became part of a larger constellation. Gazelles are particularly interesting as acquisition targets since they were selected as winners and their technology and business model passed the market test. This is a logical development, but

at the same time it does mean that newly started independent gazelles cannot be expected to grow into large firms, and that a more normal development pattern is that they are acquired by an established company.

Table 3 Firms classified as gazelles in all three periods 1997 – 2000, 2000 – 2003 and 2003 - 2006 by ownership category, number and relative proportions (per cent)

Ownership category	Number	Proportion (%)
Independent company all years	213	18.0
From independent company to Swedish group	182	15.4
From independent company to international group	113	9.5
Swedish group all years	213	18.0
From Swedish group to international group	144	12.2
International group all years	190	16.0
Others	130	11.0
Total	1 185	100.0

N.B. The category "Other firms" contains firms which changed their status at some point during the period, and at the same time went from being part of a group to an independent company, or from an international group to a Swedish group, i.e. they descended the hierarchy.

3 Interpretation of results

What are the implications of these results? It can be stated that gazelles are clearly younger than other firms. They account for the whole of the increase in employment and young firms are particularly important in creating new jobs. Among firms belonging to a group, there is a significantly higher proportion of gazelles, especially in international groups. In addition, the proportion of gazelles increases with company size irrespective of type of ownership. In other respects such as industry, regional affiliation and capital intensity, the pattern is not nearly as clear even though some minor differences exist. The fact that it is difficult to predict winners is evident, as there does not appear to be any clear growth path dependence forwards in time. In other words, rapidly growing firms have not succeeded in following a growth path during subsequent periods, but have been replaced by other gazelles, which are then replaced by other firms. This situation can be compared to a large number of parallel relays where the leading contenders are constantly shifting.

It should be emphasised that the process or phenomena which have been studied despite the difficulties of unravelling the patterns is very important. In fact, this process is a part of ongoing structural transformation or creative destruction, a process where winners on the market are selected in accordance with the theory of competence blocks.³ Selection takes place in a number of phases or levels when new firms are started, and from which one third disappear after three years.⁴ Some become rapidly growing firms whilst the majority exhibit a more normal pattern of development. A large proportion of rapidly growing firms disappear as a result of being bought up. They are particularly interesting for established firms as acquisition targets since their technology and business model has already passed the first test on the market. A larger company can then go further in its development, at the same time as an acquired company can contribute know-how which assists the development of the acquiring company. This process gives rise to a transfer of knowledge.

Even though the explanatory factors or specific characteristics of gazelles are largely unknown, the fact that firms become winners and take market shares means that in some important respects they differ from other firms. We know that new firms are overrepresented among gazelles and that the education level of their employees is higher. Newness and knowledge are thus two keywords which are also fundamental to and related to the concept of innovation. It can also be stated that the most rapidly growing gazelles in particular, and those experiencing continuous growth *are* innovative in some respect. In understanding the relationship between innovation and entrepreneurship, rapidly growing firms are of particular and enduring interest, even though the underlying reasons for the phenomenon are multifaceted and difficult to explain.

3.1 Policy implications

New and rapidly growing firms in particular have aroused great interest on the part of politicians and policymakers in recent times, and in public debate the argument is put forward that growth policy initiatives should be directed to this target group. Based on the results of this and other studies, however, the conditions for intervention through selective measures are not particularly favourable. The reason being that company growth is

³ *The competence block defines the minimum set of actors with different but complementary competencies necessary to generate, identify, select, expand and leverage business ideas to large scale economic development, see for example Eliasson & Eliasson (1996)*

⁴ *The Swedish Institute for Growth Policy Studies (2008)*

difficult to forecast. This applies particularly to the growth of smaller firms which is significantly more irregular compared to that of larger firms, which display a much more even pattern of growth.⁵

This means that it is important that the general institutional conditions are well-designed. Rapidly growing firms and economic players that are necessary for generating and commercialising new knowledge appear to be particularly dependent on the incentives created by institutional settings.⁶ Recruitment of competent personnel is important, both for the transfer of knowledge and also the growth of gazelles, which have shown themselves to be more knowledge intensive. This presupposes mobility on the part of the labour force. Labour market legislation and the social insurance system should not be allowed to create unnecessary barriers to such mobility. Low barriers to entry and contestable markets are important for the development of growth firms. Finally, it is important that tax rules are neutral in the sense that they neither create disadvantages nor advantages for the sale of a gazelle company, or indeed a less successful company. Structural transformation involves the reallocation of resources from less efficient to more efficient firms.

3.2 Proposals for further studies

There is great need to deepen our knowledge of rapidly growing firms in different respects. Possible areas for further studies may be:

- Development of quantitative models for both explanatory variables and also growth path dependence, i.e. development of gazelles over time.
- Focused studies of the few companies that are continuous gazelles, or the most rapidly growing gazelles. Quantitative analyses of "super gazelles" could with advantage be combined with qualitative analyses, such as in-depth interviews to acquire greater knowledge of these unique and innovative companies.
- Research concerning institutions and the effects of rules on companies and their development.

⁵ *Coad (2007)*

⁶ *Henrekson & Johansson (2009)*

4 References

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