

# Who creates the jobs?

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## 1 the job creation debate

In 1979 David Birch, a Harvard-trained engineer who was directing a programme of research at MIT on urban problems, produced a report on job creation. This report (albeit unintentionally) initiated what has turned out to be a long lasting, and at times acrimonious debate, a debate which continues to this day. Birch sought to answer the question: what size firms create the most jobs?

“On the average about 60 percent of all jobs are generated by firms with 20 or fewer employees, about 50 percent of all jobs are created by independent, small entrepreneurs. Large firms (those with over 500 employees generate less than 15 percent of all net new jobs.” Birch [1979, p29]

This appears a simple enough empirical proposition, so it seems difficult to imagine how it could have become, and remained, so controversial.

One of the factors that has played an important role in sustaining this debate was (according to a recent contributor),

“Birch’s argument about the role of small business in job creation fit perfectly with the U.S. government’s long tradition of supporting small businesses” Neumark et al. [2008, p.1].

For exactly the same reason Birch’s answer would not have been welcomed by those more sceptical about government intervention in general,

and the desirability of assisting small business more particularly. Another significant factor was that Birch's conclusions were based on a very large database of individual firm-level records, purpose-built by Birch and his team. The appropriateness of the underlying records, the construction of the database, the statistical techniques used to draw the conclusions from it: all were criticised. On occasions quite strong language was used both by Birch's critics and his stout defenders.<sup>1</sup> In the 30 years since Birch's publication there have been a number of further studies of the US (by Birch amongst others), and of other countries looking at different dimensions of job creation (not just by size, also by sector and location): but as yet no consensus has emerged on the answer to Birch's question.

Although there have been some contributions to this literature using UK data, here (as elsewhere) research has been constrained by the limited availability of suitably comprehensive firm-level data. This has now changed. In 2008 the Office of National Statistics launched a new firm-level database, the Business Structure Database with records of (amongst other things) employment from 1997 onwards for virtually all businesses with employees (see Evans and Welpton [2009] for a description) and this is the source for the data we use to tackle Birch's question.<sup>2</sup>

Our strategy is a little different from most job creation studies. Instead of looking at the record of all firms over a particular period, we focus instead on those born in a particular year – in our case 1998 (the first birth year we can confidently identify from data starting in 1997) – and track the evolution of this birth cohort of firms up to 2008, over their first decade of life.<sup>3</sup> The advantage of this approach is it enables us to distinguish firms which were born small (or large) from others which became so at some later stage in their life. And, as we have seen, whether, and/or to what extent, size matters is the key issue.

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<sup>1</sup>The titles alone of some of the contributions are sufficient to convey the strength of feeling engendered : *Small Business and Job Creation: Dissecting the Myth and Reassessing the Facts*; and, *Response to Renewed Attacks on the Small Business Job Creation Hypothesis*

<sup>2</sup>We use statistical data from the ONS which is Crown copyright and reproduced with the permission of the controller of HMSO and Queen's Printer for Scotland. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data.

<sup>3</sup>A more detailed treatment of sources and methods is available from the authors upon request.

## 2 Cohort98 at birth and 2008

Cohort98 was born with 219 thousand firms and 1.1m employees; a decade later 81% were dead and the 41 thousand survivors had just 480 thousand employees.<sup>4</sup> We have divided the cohort's firms into seven size-bands using the number of employees as the criterion. Seven was chosen because it yields a classification in which the number of categories is small enough to be tractable, yet large enough to capture the key features of the data. The first four size-bands are single-sized: size1, one employee; size2, two employees; and so on. The other three, larger size-bands are cover a range: size59, five to nine employees; size1019, ten to nineteen employees; and size20+, twenty or more employees.

From Figure 1 we can see that at birth the distribution of firms by size-band and the distribution of employees by size-band look very, very different: firms are concentrated at the small end – more than half of firms have just one employee, almost 90% less than 5; employees are concentrated at the large end – more than half employees are in 20+ sized firms, with just over 70% of employees in firms with 5 or more employees.

Figure 2 displays the data for the 20% of the birth cohort who survived the decade ('survivors'). Although the contrast in skewness remains, the picture looks rather different. In fact the shape of both the firm and employment distributions have twisted in a similar way – shrinking at the 'small' end (just 30% of firms and less than 5% of employees in the smallest size-band); and expanding at the 'large' end (almost 10% of firms and 70% of employees in the largest size-band).

## 3 where did the firms go to?

We can use an origin/destination matrix to track the movement between size-bands of the 40793 survivors. Here the matrix is a cross-tabulation of the frequency distribution of firms by size-band at birth (down the rows) against their 2008 size-band (across the columns) scaled by the total number of survivors and expressed as a percentage, see Table 1

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<sup>4</sup>Our analysis covers the private sector only, public sector firms are likely to evolve quite differently.

Table 1: Cohort98: firms, 2008 survivors, origin/destination matrix by employee size-band, ratio to total firms in 2008 (%)

		destination (2008)size-band							all
		1	2	3	4	5-9	10-19	20+	
origin (1998) size -band	1	22.2	11.5	4.3	3.4	6.0	2.5	1.2	51
	2	4.9	6.6	2.2	1.8	3.3	1.4	0.7	20.9
	3	1.2	1.7	1.2	1.0	2.0	0.9	0.5	8.4
	4	0.7	0.8	0.6	0.8	2.4	1.6	1.2	8.2
	5-9	1.2	0.9	0.6	0.7	2.1	1.2	0.8	7.5
	10-19	0.2	0.2	0.2	0.2	0.7	1.0	1.1	3.6
	20+	0.1	0.1	0.0	0.1	0.1	0.3	1.9	2.7
	all	30	21.7	9	7.9	15.8	8.5	7.0	100

The last column is the size distribution of survivors at birth, so survivors are recorded in the size-bands in which they were born; the last row is the size-band distribution in 2008, and the body of the table summarises the movement over the decade.

Starting with row 1 of the matrix – firms born with just one employee – we see that almost half of them (22.2/51.0) still had only one employee at the end of the decade; and almost half of those who grew added just one more employee (11.5/(51.0-22.2)). And notice, movement from the one employee size-band into the 20+ size-band was quite a rare event, with just a 2.4% chance (1.2/51.0). For most of the smaller size-bands the pattern is similar to that for size1: a relatively large chance of staying in the size-band of birth, with the chance of a move (in either direction) decaying with distance (though grouping 5 to 9 employee firms into a single size-band does cause some distortion), and relatively little chance of becoming large.

We already know (from the comparison between Figure 1 and Figure 2) that the 20+ size-band is of particular interest. Looking along the 20+ row, we see that just over two thirds of the 2.7% born in the size-band stayed in the size-band. So almost one third (30% = ((2.7-1.9)/2.7)) shrank, and dropped into a lower size-band. Looking down the column, we can see that the 20+ category was larger by a factor of 2.59 (7.0/2.7) in 2008 than it was at birth, swelled by new entrants from smaller size-bands. Finally,

and perhaps most significantly, over half the new additions were from firms born with less than 5 employees (3.6/7.0). Over the decade 1149 firms made the transition from less than 5 employees to 20+, of those 475 had just one employee at birth.

## 4 where did the jobs come from?

Another origin/destination matrix by size-band, now for employees, can help bring precision to answering questions about changes in the distribution of jobs as firms move between between size-bands over the decade. Again, as with the firms matrix, origins (size-band at birth) are rows, and destinations (size-band in 2008) columns, with all the entries scaled by the survivors 2008 employee total 480227 and expressed in percent, see Table 2.

Table 2: Cohort98: employees, 2008 survivors, origin/destination matrix by employee size-band, ratio to total employees in 2008 (%)

		destination (2008)size-band							all
		1	2	3	4	5-9	10-19	20+	
origin	1	1.9	2.0	1.1	1.1	3.3	2.8	11.2	23.4
(1998)	2	0.4	1.1	0.6	0.6	1.8	1.5	3.2	9.2
size	3	0.1	0.3	0.3	0.3	1.1	1.0	2.2	5.3
-band	4	0.1	0.1	0.1	0.2	0.8	0.9	2.5	4.7
	5-9	0.1	0.1	0.2	0.3	1.4	1.9	5.6	9.5
	10-19	0.0	0.0	0.0	0.1	0.4	1.2	10.9	12.7
	20+	0.0	0.0	0.0	0.0	0.1	0.4	34.6	35.1
	all	2.5	3.7	2.3	2.7	8.9	9.7	70.2	100

The 'big picture' is, as we saw earlier, shrinkage at the 'small' end and expansion at the 'big' end. The column of greatest interest here is, of course, that for the 20+ size-band, which by 2008 accounted for almost three quarters of all employees. Only half of 20+ employment (34.6/70.8) is accounted for by firms which were 20+ at birth, and notice the relative importance of the contribution of the very small sizes: size1 alone contributes 11 percentage points, and size2 to size4 another 8 percentage

points between them. So firms with less than 5 employees at birth contributed more than a quarter (19.1/70.2) of the jobs in the 20+ category. Overall firms born with less than 5 employees accounted for 44% of all Cohort98 jobs in 2008.

Their importance in generating jobs notwithstanding, it is worth re-emphasising the rarity of these upwardly mobile small firms: in 1998, there were 122 thousand firms born size 1, just 21 thousand of them survived the decade and only 475 added 20 or more employees, 0.4% of those born size 1. Although the chances of making transition from small to large do increase with size, the chance for any firm born with less than 5 employees making it to 20 or more employees is still less than 2%.

## **5 growth trajectories of 20+ survivors**

Firms which started small and grew clearly played a big role in generating jobs and Figure 3 shows (on a log scale) how, for survivors in the 20+ size-band, the average number of employees in each size-band grew between 1998 and 2008. The bottom line on the plot is, of course, the average for firms born size1: by 2001 (i.e. by age 3) this group had on average 50 employees, an annual growth rate of over 250%. After the initial spurt, growth slowed and over the next seven years this group of firms averaged about 10% year, and reached 100 employees by 2008.

None of the other groups recorded such a striking surge in growth as those born size1. However, although all of those starting life at less than size 10 had around 20 employees by 2001, and by 2008 had between 50 and 75. Remarkably the firms born in each of the size2 to size59 categories are very similar in both their growth trajectories and their size in 2008. Certainly there is no evidence of any systematic association over time between size at birth and growth. And, at the top of the plot, we can see that firms born 20+ (average size at birth about 130 employees) grew very little over the decade: on average about 3.3% per year, and by 2008 they had grown to just 179 employees.

## 6 job creation by size-band

We are now in a position to deal with the job creation question and, as we shall see, approaching from the cohort viewpoint does indeed aid clarity. First of all, whilst it is necessarily the case that any measure of job creation will involve counting the employees of 'survivors' at a point in time, what the cohort approach provides is a natural like-for-like starting point for the comparison: employment at birth in those same 'survivors'. Table 3 records employee numbers for 2008 survivors, at birth and 2008, in both cases classified into size-bands at birth. The last two columns are comparisons: the change, 2008 less birth; and the ratio of 2008 to birth.

Table 3: Cohort98 employees: 2008 survivors, by employee size-band at birth, birth & 2008

	birth	2008	change	
	'000	'000	'000	ratio
all	233.1	480.2	247.2	2.06
size-band				
1	20.8	112.3	91.5	5.39
2	17.0	44.3	27.3	2.60
3	10.3	25.6	15.3	2.48
4	8.5	22.5	14.0	2.66
5-9	21.4	45.8	24.5	2.15
10-19	18.9	61.0	42.1	3.22
20+	136.1	168.7	32.5	1.24

Employment in 2008 survivors has doubled over the decade but, as we might have anticipated the smallest size-bands grew much more, size1 firms expanded their employment by a factor of 5. Only the largest (20+) size-band expanded at less than the cohort average rate. Of the 247 thousand jobs *added* during the decade, more than one third (91.5/247.2) were contributed by firms born with a single employee, and almost two thirds by firms with less than 5 employees at birth. By contrast, the largest firms (in the 20+ size-band) who started life with 136.1 thousand employees added just 32.5 thousand (13% of the overall increase) over ten years.

## 7 summing up

In the job creation debate, as in other long-lived controversies, much turns on the interpretation of terms. When we ask "who creates the jobs?" do we mean: in which firm size-band are most employees to be found? Or, do we mean: which firm size-band contributed most to the growth of jobs over time?

For the 200 thousand UK private sector firms born in 1998 the answer to the first question is: relatively large firms (20+ employees); whilst the answer to the second is: firms which were born very small (less than 5 employees), but grew over the decade. Evidently *'the'* answer depends crucially on whether being born counts as 'creation', or not.



Figure 1: distribution of firms & employees by employee size-band at birth

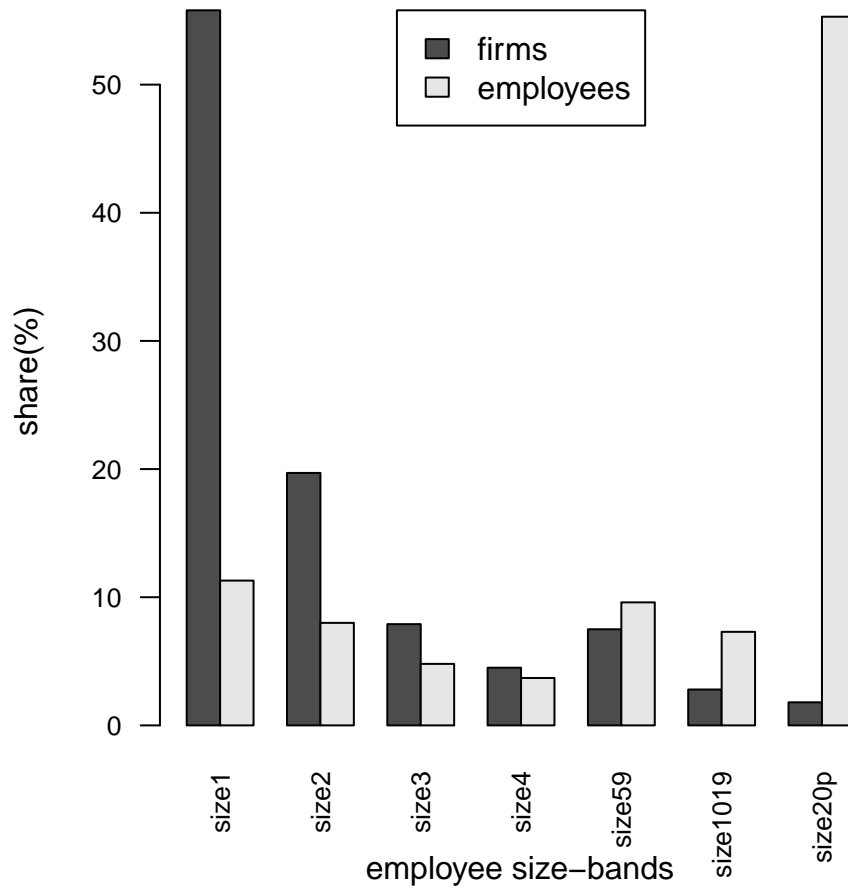


Figure 2: firms & employees by employee size-band at 2008

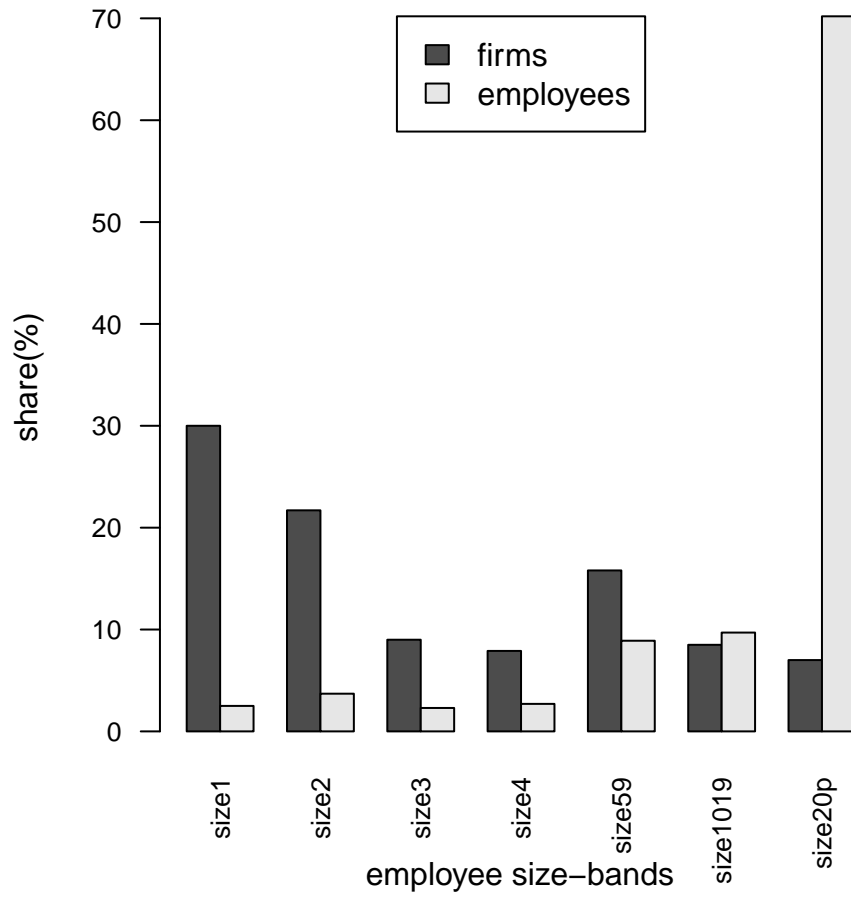
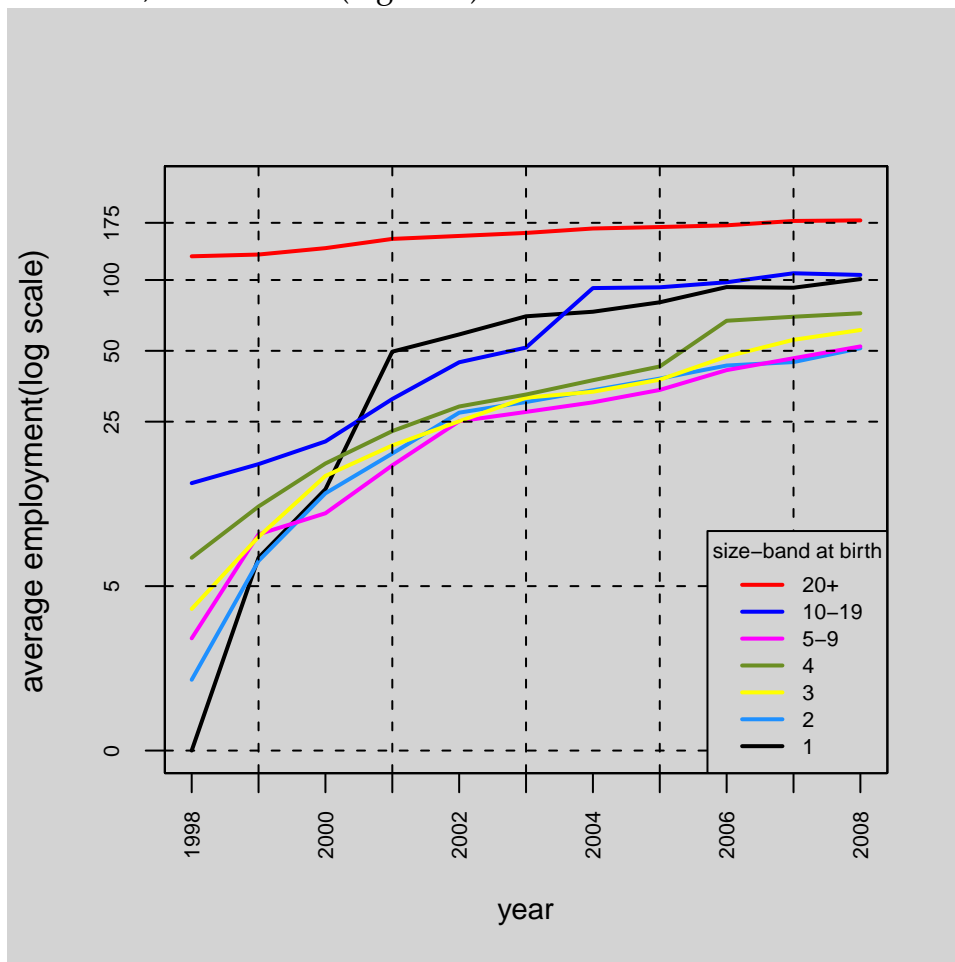


Figure 3: Cohort98 survivors employment 20+, average by birth employee size-band, 1998 to 2008 (log scale)



## References

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