

Characteristics of Survival: Longevity of Business Establishments in the Business Employment Dynamics Data

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Introduction

It seemed every sector of our society was growing apace in the 1990s whether through mergers, buy-outs, or new openings. Most of us noticed the changing signs on our hometown bank and the new construction going on in our neighborhoods. In addition to new homes going up, new businesses were moving in to take advantage of the growing wealth in the U.S. In an age where it seemed that everyone was succeeding, did some nevertheless, fail?

Our understanding of new businesses has been largely limited to the manufacturing sector and to the scale of the firm and not the establishment (For example, Dunne, Roberts, and Samuelson, 1988; Baldwin and Gorecki, 1991; Mata and Portugal, 1994; Audretsch, 1991; Audretsch and Mahmood, 1995). The main reason was limitations of the data available for such study. In many countries, including the U.S. until recently, manufacturing was the only sector for which data was compiled on a regular basis and provided the ability to link firms across time, in order to create a history of firm behavior. These studies have been mainly concerned with firm behavior even when the unit of collection is the establishment.

This study characterizes business survival by looking at all establishments that started in the U.S. in the late nineties, when the boom was not yet showing signs of weakness. This study builds on and extends a report from the Minnesota Department of Economic Security (MDES) on business churning from 1993-1995 (May 1997), which profiled births, their survival rates, and deaths during the early nineties, when the boom years were just starting. These businesses are followed into the recession of 2001 to see how they fared once the economy turned sour. The analysis follows a birth cohort from second quarter of 1998 through the following 16 quarters, differing from previous studies in both focus and time frame. This study focuses only on those entrants that are completely new, that is, only new firms that open a single establishment, and expands the analysis to all sectors in the economy. Survival rates of establishments along with several measures of employment are reported and compared across sectors.

Data

This study uses data from the BLS Quarterly Census of Employment and Wages (QCEW) that has been compiled into a longitudinal database containing about 8.2 million establishments in both the public and private sectors. These monthly data are compiled on a quarterly basis for state unemployment insurance tax purposes and edited and submitted to BLS for compilation as the QCEW. The QCEW is a Federal/State cooperative between the BLS and the State Workforce Agencies that collects information from approximately 98% of non-farm payroll businesses in the U.S. The QCEW longitudinal database is used as the sampling frame for BLS establishment surveys and to generate the gross job flows in the Business Employment Dynamics (BED) data series. In addition, outside researchers use the database to investigate topics in the field of labor economics.

In order to construct a longitudinal database, these data are linked across quarters using unique identifiers to track establishments even when ownership changes. The QCEW longitudinal database contains data from the first quarter of 1990 through the most current quarter, usually available six months after the end of the reference quarter. The coverage and frequency of the data are unique in the federal statistical system and allow tracking of the start-up, growth, and failure of a particular establishment concurrent with the timing of those events. Because the QCEW longitudinal database contains establishment level data, that is data that corresponds to a specific location, one can observe the characteristics of each establishment, such as industry, age, and number of employees.

The BED data series takes advantage of this longitudinal data by calculating gross job flows. The BED data reveal the high level of employment changes each quarter due to openings, closings, expansions and contractions. These categories illustrate the vast number of business and employment changes that contribute to the overall net change in employment. The openings data from the BED is a broad category of new businesses that consists of both birth establishments and establishments that are re-opening, such as establishments that open on a seasonal basis. The BED data portray quarter to quarter comparisons of establishments that are changing, but not how a consistent set of businesses change over the quarter. This study is different in that it follows a carefully selected cohort of birth establishments through four years of their lifetime. For a discussion of the BED data series see Spletzer, Faberman, Sadeghi, Talan, and Clayton (2004).

Births are defined as those establishments that are new to the QCEW longitudinal database in the relevant quarter. Births had not reported positive employment for the previous four quarters. The data was tested for four quarters prior to the relevant quarter to eliminate seasonal establishments and establishments re-opening after a temporary shutdown from showing up in the birth cohort. Furthermore, these new establishments have no ties to any establishment(s) that existed prior to the relevant quarter. This eliminates changes in ownership from the cohort as well as new locations of existing firms that might be expected to behave differently from independent establishments. Another reason for not including new locations of existing firms is that often these are administrative changes in the data, rather than actual new locations. To include them would risk skewing the data in both the rates of survival and average employment. The resulting cohort contained 212,182 new establishments across the nation for the second quarter of 1998.

Births were tracked across 16 quarters from March 1998 to March 2002 by a unique identifier. Establishments are the same as firms in the birth quarter. In subsequent quarters, establishments are allowed to be acquired or merged with another firm, or to spin off a subsidiary or open additional locations. Those establishments that were involved in such succession relationships (0.16% of the cohort or 341 establishments) were also tracked across time by following the succeeding establishments. The data of these succeeding establishments was aggregated and assigned a unique identifier that was linked to the original birth establishment. In this way data was not lost for those establishments that were presumably the most successful.

Two-digit NAICS codes are used to group the establishments into ten sectors: Natural Resources (NAICS 11 and 21), Construction (23), Manufacturing (31-33), Trade Transportation and Utilities (22, 42, 44-45, 48-49), Information (51), Financial Activities (52-53), Professional and Business Services (54-56), Education and Health Services (61-62), Leisure and Hospitality (71-72), and Other Services (81). A small percentage (0.02%) of establishments that do not have a NAICS industry classification over their lifetime is excluded from the sector analysis. This grouping facilitates comparison of survival rates between industry sectors along with the employment contributions in the initial quarter and over the subsequent four years. Average employment in the initial quarter is compared to average employment in subsequent quarters as well as the highest employment attained by an

establishment, on average, during the four years. That is, peak employment, which can be attained by an establishment during any quarter of the time period, is compared to average initial employment for each industry sector.

Results

The data show that across sectors, 66% of new establishments were still in existence two years later, and 44% were in existence four years later (Figure 1). It is not surprising that most of the establishments disappeared within the first two years, and then only a smaller percentage disappeared in the subsequent two years. These survival rates do not vary much by industry (Figure 2). Despite the amazing success stories of the '90s dot-coms, Information had the lowest two and four year survival rates, 63% and 38% respectively. Education and Health Services had the highest two and four year survival rates, 73% and 55%. As the conventional wisdom goes, restaurants should bring down the averages for the sector that includes them, because they are constantly starting and failing. However, Leisure and Hospitality' two and four year survival rates at 65% and 44% are only slightly below average, despite including restaurants.

Converting these survival rates into exit rates used by previous studies, we can see that the results are similar. In particular, comparing the manufacturing sector to previous results, we get a four year exit rate of 52%¹, while Dunne, Robertson, and Samuelson found a five year exit rate of 62% on average for the three cohorts that they followed. Baldwin and Gorecki have slightly lower four and five year exit rates, at 35% and 41% respectively. And Audretsch's four year survival rate (77.4%) converts to an exit rate closer to that of Baldwin and Gorecki than to the numbers found here.

One can also look at survival rates by asking how many establishments were in operation in the second, third, and fourth years, conditional on being operational in the previous year. In other words, how many of the establishments which survived the first year were still in business at the end of the second year, how many that made it to the third still existed in the fourth year, and so forth. One might expect that survival to the previous year might be a good indicator as to the odds of surviving to the next, but at the national level these conditional survival rates are fairly

stable, increasing somewhat in the third year, but declining again in the fourth (Table 1). Only three sectors show a slight tendency toward increasing survival, Natural Resources and Mining, Education and Health Services, and Other Services. Information shows a somewhat stronger trend in the opposite direction, but most of the sectors show no tendencies at all.

The largest contributor to opening employment for the cohort as a whole was the Leisure and Hospitality sector. The smallest was the Information sector. This result is not surprising when looking at average initial employment in the sectors. Leisure and Hospitality also had the largest average initial employment, with 9 employees per establishment, but its establishments grew by one of the smallest amounts (67%), attaining a high of 15 employees on average at their peak during the time period. Information began with an average initial employment of 5, but grew by 211%, to almost match average peak employment of Leisure and Hospitality. While this growth is phenomenal, it must be measured against the number of establishments in each sector. Leisure and Hospitality has approximately 5 establishments for every one establishment in Information in each quarter (Table 2). Thus, the employment in the Leisure sector is at least 5 times that of the Information sector (Table 4).

Looking closer at the growth of the birth cohort, we see a wide variation in the growth of employment in each sector in contrast to the fairly stable measures of establishment survival across sectors. Information, Professional and Business Services, Education and Health Services, and Manufacturing stay at or above their opening employment for the four years of this study. All other sectors experience continual decreases in employment in successive years. Thus, looking at employment patterns slightly changes the picture of what a thriving industry sector is. While from the number of establishments and average employment Leisure and Hospitality appears to be the thriving sector, employment patterns show that the surviving establishments are not as successful overall as some other sectors (Figure 3).

One of the surprises of the data is that Manufacturing, thought to be a beleaguered sector, is still thriving. Its survival rates are above average and its employment stays above initial employment until the fourth year, when it falls back to its 1998 level (Figure 3). This shows that despite closing plants, employment has increased in the

¹Forty-eight percent of Manufacturing establishments were still in existence after four years, thus 52% had exited

surviving establishments keeping employment levels stable for the birth cohort of this sector. Another sector of interest is the Professional and Business Services, with average two and four year survival rates, but one of the best four year employment patterns (Figures 2 and 3). While the strong employment pattern of the Information sector is attenuated by its small employment size (17,794), the Professional and Business Services sector was one of the largest contributors to opening employment (137,908) (Tables 3 and 5).

Most sectors see a greater decline in employment in the fourth year, during which the recession occurred (Figure 3). The lead up to the recession may also be the cause behind the shift from increasing employment in the second year to decreasing employment in the third year. This is in contrast to the increase in the average size of surviving establishments (Table 4).

Conclusion

What emerges from this characterization of the 1998/2 birth cohort is that for most sectors of the economy, those businesses that manage to survive do grow. While establishment survival rates are fairly consistent across sectors, the contributions to employment of those surviving establishments varies widely. Some sectors experience consistent decreases in overall employment from year to year, while others are increasing their employment levels in the more prosperous sectors.

One must be cautious in judging the success of an industry sector only by its survival rates. In comparing the sectors with the lowest and highest survival rates, one can see that despite having the lowest survival rates, Information had stronger employment growth than Education and Health Services (Figure 3 and Table 4). However, overall employment in Education and Health Services was more stable (Table 5) and approximately three times the employment in Information in any given year.

Still, the employment contributions of these sectors were no where near that of those sectors which had only average growth, namely Professional and Business Services and Leisure and Hospitality. In fact, the negative impact of

the market.

average survival rates in Professional and Business Services is reduced by having one of the best employment patterns over the four years.

Disclaimer

All empirical work in this paper is based on the author's calculations. Any views expressed in this paper are those of the author and do not necessarily reflect the policies of the BLS or the views of other BLS staff members.

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Figure 1. Survival rates of new establishments from second quarter of 1998

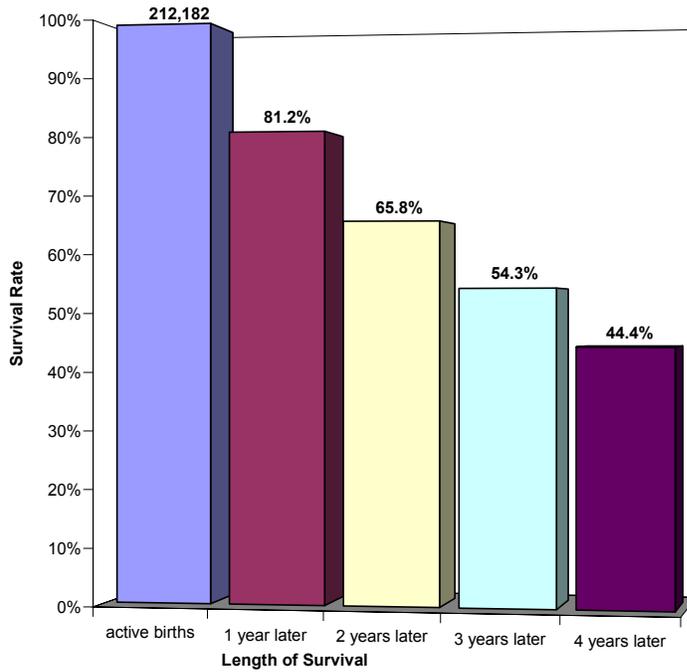


Figure 2. Survival rates of new establishments from second quarter of 1998 by sector

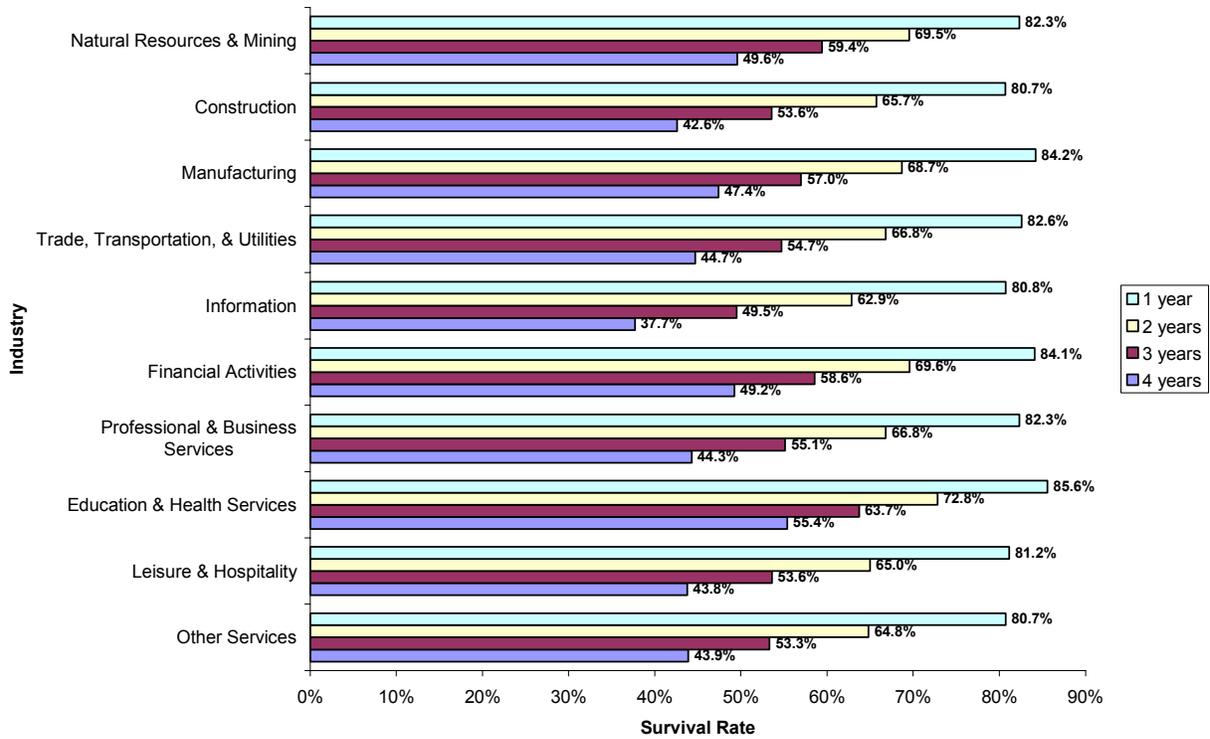
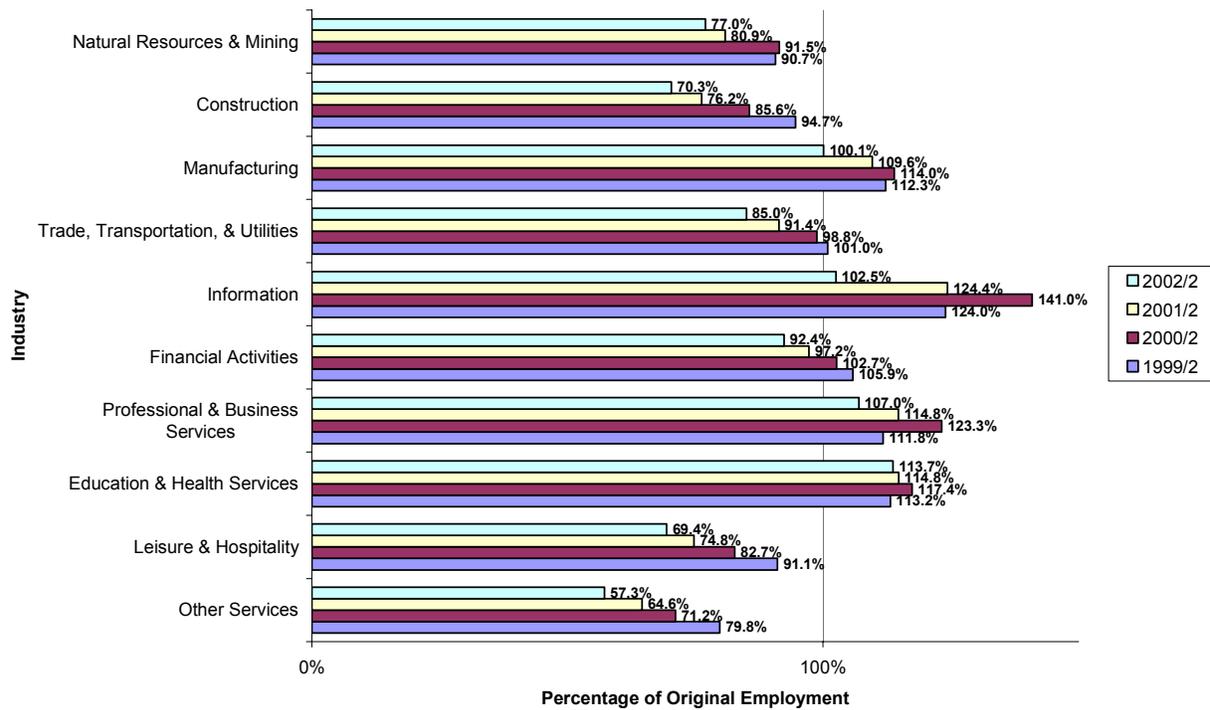


Figure 3. Employment patterns of survivors by sector as percentage of original employment



NAICS Supersector	1 st year	2 nd year	3 rd year	4 th year
Natural Resources and Mining	82.3	84.5	85.4	83.4
Construction	80.7	81.5	81.5	79.5
Manufacturing	84.2	81.6	83.0	83.2
Trade, Transportation, and Utilities	82.6	80.9	81.9	81.7
Information	80.8	77.8	78.7	76.2
Financial Activities	84.1	82.7	84.2	84.1
Professional and Business Services	82.3	81.2	82.5	80.3
Education and Health Services	85.6	85.1	87.5	86.9
Leisure and Hospitality	81.2	80.1	82.5	81.6
Other Services	80.7	80.3	82.3	82.3
National	81.2	81.0	82.6	81.7

NAICS Supersector	1998/2	1 st year	2 nd year	3 rd year	4 th year
Natural Resources and Mining	3,198	2,633	2,224	1,900	1,585
Construction	27,536	22,219	18,099	14,748	11,728
Manufacturing	7,326	6,168	5,031	4,174	3,473
Trade, Transportation, and Utilities	41,797	34,518	27,928	22,863	18,674
Information	3,793	3,063	2,384	1,877	1,430
Financial Activities	14,853	12,490	10,333	8,698	7,314
Professional and Business Services	40,992	33,743	27,389	22,599	18,152
Education and Health Services	11,594	9,923	8,444	7,389	6,420
Leisure and Hospitality	16,834	13,661	10,941	9,024	7,367
Other Services	39,783	32,113	25,783	21,214	17,458
National	212,182	172,379	139,543	115,194	94,116

Table 3. Contributions to initial employment, average initial employment, and average peak employment, by sector

NAICS Supersector	Employment in 1998/2	Average Initial Employment	Average Peak Employment
Natural Resources and Mining	21,809	6.8	14.8
Construction	98,750	3.6	8.1
Manufacturing	45,670	6.2	14.0
Trade, Transportation, and Utilities	139,125	3.3	6.7
Information	17,794	4.7	14.6
Financial Activities	45,098	3.0	6.4
Professional and Business Services	137,908	3.4	9.0
Education and Health Services	57,068	4.9	10.8
Leisure and Hospitality	152,668	9.1	15.2
Other Services	69,736	1.8	2.7
National	798,066	3.8	7.9

Table 4. Average employment of survivors, by sector and year from birth

NAICS Supersector	1st year (1999)	2nd year (2000)	3rd year (2001)	4th year (2002)
Natural Resources and Mining	7.5	9.0	9.3	10.6
Construction	4.2	4.7	5.1	5.9
Manufacturing	8.3	10.3	12.0	13.2
Trade, Transportation, and Utilities	4.1	4.9	5.6	6.3
Information	7.2	10.5	11.8	12.8
Financial Activities	3.8	4.5	5.0	5.7
Professional and Business Services	4.6	6.2	7.0	8.1
Education and Health Services	6.5	7.9	8.9	10.1
Leisure and Hospitality	10.2	11.5	12.7	14.4
Other Services	1.7	1.9	2.1	2.3
National	4.6	5.6	6.3	7.2

Table 5. Total employment of survivors, by sector and year from birth

NAICS Supersector	1st year (1999)	2nd year (2000)	3rd year (2001)	4th year (2002)
Natural Resources and Mining	19,781	19,945	17,636	16,789
Construction	93,468	84,550	75,256	69,426
Manufacturing	51,271	52,055	50,073	45,732
Trade, Transportation, and Utilities	140,462	137,448	127,135	118,266
Information	22,064	25,085	22,131	18,241
Financial Activities	47,745	46,314	43,855	41,665
Professional and Business Services	154,160	170,016	158,281	147,618
Education and Health Services	64,594	67,017	65,534	64,881
Leisure and Hospitality	139,041	126,323	114,154	105,941
Other Services	55,664	49,639	45,027	39,932
National	792,131	781,506	721,103	670,111