

Business Employment Dynamics data: survival and longevity, II

A study that extends previous research on the longevity of businesses shows that survival decreases at a decreasing rate; establishments that manage to survive the crucial 4-year period after their birth have a better chance of surviving longer and experiencing employment growth

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This study is an extension of a research summary published in the *Review* in 2005.¹ That piece examined survival rates from a cohort of establishments from the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) program over a 4-year period. The study presented here extends the previous cohort an additional 3 years to create a 7-year survival analysis.

Data sources

The QCEW program contains information on 8.9 million U.S. business establishments in both the public and private sector. These monthly business establishment data are compiled on a quarterly basis for State unemployment insurance tax purposes and are edited and submitted to the BLS. A Federal-State cooperative venture between the BLS and the State Workforce Agencies, the QCEW program collects information covering approximately 98 percent of nonfarm payroll employment in the United States. Data generated by the program serve as the sampling frame for a range of BLS establishment surveys and as a benchmark for the Current Employment Statistics survey. Outside researchers use QCEW microdata to investigate topics in the field of labor economics, and such data are the largest single input to the Bureau of Economic Anal-

ysis personal income accounting program. QCEW program data also are used to generate gross job flows in the Business Employment Dynamics (BED) data series.

To construct the BLS longitudinal database, analysts link the data across quarters, using unique identifiers to track establishments, even when their ownership changes. The QCEW program has linked data from the first quarter of 1990 through the most current quarter; the data usually are available 7 months after the end of the reference quarter. The coverage and frequency of the data are unique in the Federal statistical system in that they allow tracking of the startup, growth, and failure of a particular establishment concurrently with the timing of those events. The program contains establishment-level data (that is, data relating to a specific location). Therefore, one can observe various characteristics of each establishment, such as the State, county, and industry in which it operates; its age, predecessors, and successors; its total quarterly wages; and its monthly employment.

The BED data series takes advantage of the QCEW microdata by calculating gross job flows. BED data reveal the level of employment changes each quarter due to openings, closings, expansions, and contractions of businesses. These four categories illustrate the vast number of business and em-

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ployment changes that contribute to the overall net change in employment. The BED data on establishment openings constitute a broad category of new businesses consisting of both establishments that are born and establishments that are reopening, including establishments that open on a seasonal basis. The BED data allow for quarter-to-quarter comparisons of establishments that are changing, but do not indicate how a consistent set of businesses changes over the quarter. The analysis presented in this research summary is different in that it follows a carefully selected cohort of establishments from birth through 7 years of their lifetime.²

Preparing a birth cohort

Births are defined as those establishments which are new in the reference quarter and show no positive employment for the previous four quarters. Each microdata record is tested for four quarters prior to the reference quarter, to prevent seasonal establishments from appearing in the birth cohort. Furthermore, these new establishments have no ties to any establishments that existed prior to the reference quarter. Thus, this approach eliminates changes in ownership from the cohort, as well as new locations of existing firms, which might be expected to behave differently from independent establishments. Another reason for not including new locations of existing firms is that they often represent administrative changes in the data rather than actual new locations. To include them would risk skewing the data in terms of both survival analysis and average employment.

The study presented here tracked the original 212,182 new establishments across the Nation for the second quarter of 1998 (beginning in March of that year³). This cohort accounts for approximately all births during that quarter, a typical quarter from 1992 to the end of the series.⁴

In the original study, births were tracked across 16 quarters from March 1998 to March 2002 by a unique identifier. The current study tracks these establishments an additional 12 quarters, from March 2002 to March 2005, creating a 7-year survival study. In the birth quarter, establishments are equivalent to firms. In subsequent quarters, establishments may be acquired by or merged with another firm, spin off a subsidiary, or open additional locations. Establishments that were involved in such succession relationships also were tracked across time, by following the successor establishments. The data on these successor establishments were aggregated and assigned a unique identifier that was linked to the original birth establishment.

Two-digit NAICS codes were used to group the establishments into 10 sectors: natural resources (NAICS codes 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 percent) of establishments did not have a NAICS industry classification over their lifetime and were excluded from the sectoral analysis. The 10-sector grouping facilitates comparisons of survival between industry sectors, as well as comparisons between employment contributions in the initial quarter and over the subsequent 7 years. In the latter regard, average employment in the initial quarter is compared with average employment in subsequent quarters, as well as with the highest employment attained by an establishment, on average, during the 7 years under study. That is, for each industry sector, peak employment, which can be attained by an establishment in any quarter of the given period, is compared with average initial employment.

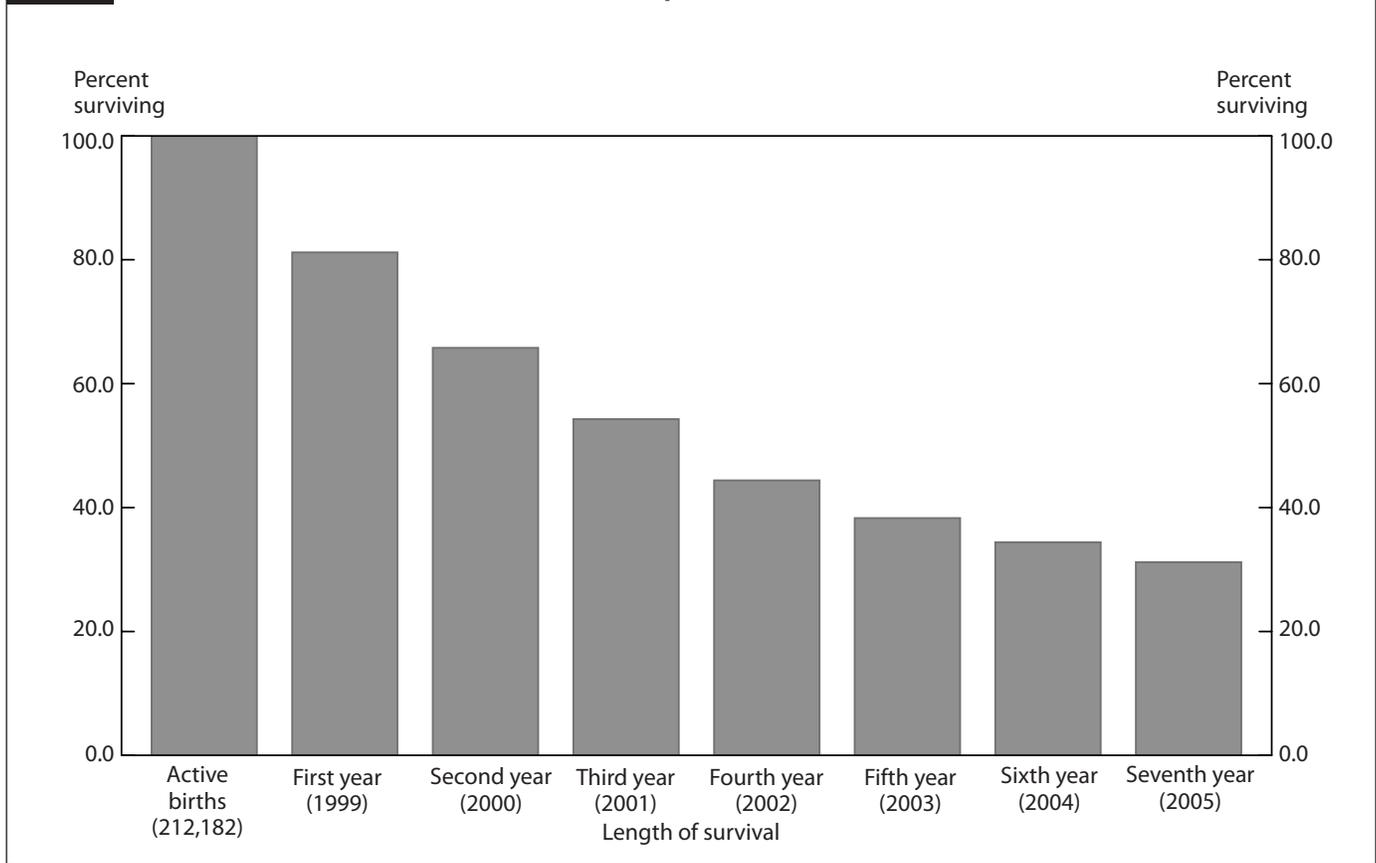
Profile of survival

Across all sectors, 44 percent of the cohort survived through the fourth year (the end of the previous study) and 31 percent to the seventh year. (See chart 1.) This finding is consistent with the previous study in that the largest exit of establishments occurred during the first and second years and, after the fourth year, the percentage of establishments that exited slowed considerably. In essence, after 4 years the number of establishments exiting the cohort was decreasing, albeit at a slower rate, and after 7 years almost a third of all establishments were still in business. One can see a smoothing of the survival curve and a dramatic decrease in surviving establishments in the first 4 years, while survival in years 5 through 7 increases in relation to survival during the previous 4 years.

Individual industries behaved in a similar manner: the concentration of exiting establishments occurred during the first 4 years and slowed after that. (See chart 2.) In relation to the overall survival average, survival forms a pattern across industries: those industries which started the study with survival below the national average continue below average, those which began with average survival continue that way through the entire period, and those which were above average survival in the beginning stay above average throughout the period.

Analyzing the data by industry sector yields a result consistent with that found in the previous study. Then, the information sector had the lowest 2- and 4-year survival: 63 percent and 38 percent, respectively; the trend contin-

Chart 1. Survival of new establishments from second quarter of 1998



ued in the current study, with the information sector having the lowest 6-year survival (28 percent) and the lowest 7-year survival (24 percent). (See chart 2.) Education and health services continued to have the highest survival: the sector's 6- and 7-year survival figures were 46 percent and 44 percent, respectively. Because restaurants are classified under the leisure and hospitality sector, one might assume that they would have lower survival figures than the average in the cohort, but over the 7-year study, the restaurant sector maintained survival shares that were close to the national average.

Growth of survivors

The employment data on surviving establishments in the cohort reveal that, as establishments stay in business, their employment grows. In the first 4 years of existence, about 82 percent of establishments survive from year to year, but in the fifth year the percentage increases to more than 86 percent. By the seventh year, the survival of surviving establishments increases to more than 90 percent. The trend in chart 3 (see also

table 1) demonstrates that the longer an establishment survives, the more likely it will continue to survive.

Examining the employment patterns of this cohort reveals that even though 69 percent of its establishments did not survive to the seventh year, nationwide employment of the remaining establishments (605,975) was more than 75 percent of the cohort's original employment (798,066). (See tables 3 and 4.) Even with the large exit of establishments, the relatively small decrease in employment by the seventh year reveals that survivors' employment tends to grow.⁵

The employment growth of survivors can be seen in the relationship between initial employment and average peak employment at 4 years and at 7 years. In the cohort studied, all sectors exhibit an increase in average peak employment from year 4 to year 7. The increase in average employment at 4 years (7.9 employees), compared with 13.1 employees at 7 years, shows the ongoing growth in employment even as establishments exit. (See table 4.) This trend reinforces the fact that, on average, surviving establishments' employment grows as those establishments age.

Chart 2. Survival of new establishments from second quarter of 1998, by industry

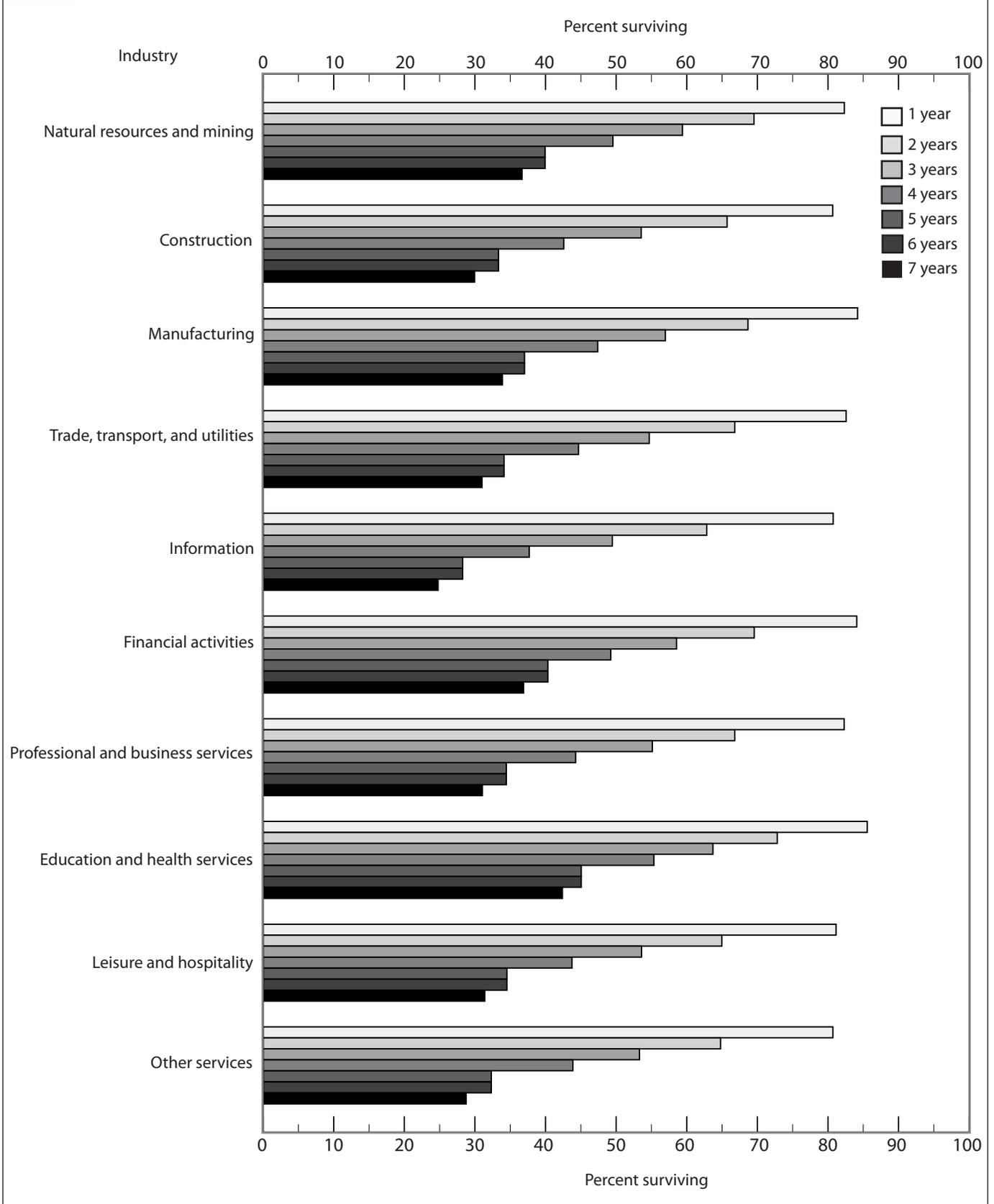
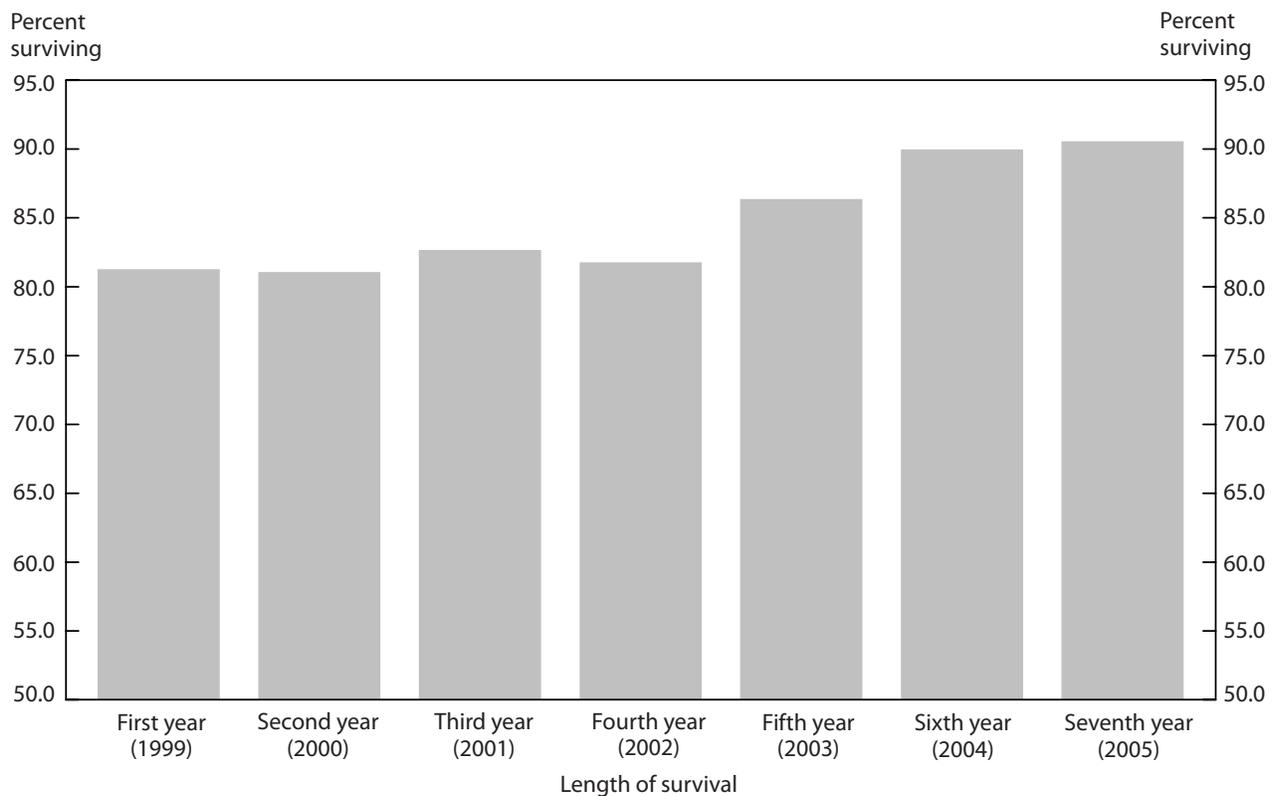


Chart 3. Survival rates of previous year's survivors, 1999–2005**Table 1. Survival rates of previous year's survivors, by sector and year since birth, 1999–2005**

[In percent]

NAICS supersector	First year (1999)	Second year (2000)	Third year (2001)	Fourth year (2002)	Fifth year (2003)	Sixth year (2004)	Seventh year (2005)
National.....	81.2	81.0	82.6	81.7	86.3	89.9	90.5
Natural resources and mining	82.3	84.5	85.4	83.4	87.6	92.0	91.8
Construction	80.7	81.5	81.5	79.5	86.8	90.3	89.8
Manufacturing	84.2	81.6	83.0	83.2	86.2	90.6	91.6
Trade, transportation, and utilities	82.6	80.9	81.9	81.7	85.5	89.3	90.9
Information	80.8	77.8	78.7	76.2	82.9	90.5	87.6
Financial activities	84.1	82.7	84.2	84.1	89.2	91.8	91.5
Professional and business services	82.3	81.2	82.5	80.3	86.1	90.4	90.2
Education and health services	85.6	85.1	87.5	86.9	90.5	92.8	94.1
Leisure and hospitality	81.2	80.1	82.5	81.6	87.1	90.6	90.9
Other services	80.7	80.3	82.3	82.3	84.4	87.3	89.0

The variation in employment growth contrasts with fairly stable establishment survival. One can see the lifetime contributions of employment in relation to opening contributions, and employment drops sig-

nificantly after the fourth year, but remains stable at around the fifth-year level for most sectors. (See chart 4.) This information sheds some light on manufacturing industry survival rates: even though the manufacturing

Table 2. Surviving establishments, by sector and year since birth, 1999–2005

NAICS supersector	Second quarter, 1998	First year (1999)	Second year (2000)	Third year (2001)	Fourth year (2002)	Fifth year (2003)	Sixth year (2004)	Seventh year (2005)
National.....	212,182	172,379	139,543	115,194	94,116	81,253	73,074	66,166
Natural resources and mining ..	3,198	2,633	2,224	1,900	1,585	1,389	1,278	1,173
Construction	27,536	22,219	18,099	14,748	11,728	10,176	9,187	8,251
Manufacturing	7,326	6,168	5,031	4,174	3,473	2,995	2,713	2,484
Trade, transportation, and utilities	41,797	34,518	27,928	22,863	18,674	15,969	14,262	12,964
Information	3,793	3,063	2,384	1,877	1,430	1,185	1,073	940
Financial activities	14,853	12,490	10,333	8,698	7,314	6,525	5,991	5,481
Professional and business services	40,992	33,743	27,389	22,599	18,152	15,623	14,127	12,739
Education and health services	11,594	9,923	8,444	7,389	6,420	5,807	5,388	5,068
Leisure and hospitality	16,834	13,661	10,941	9,024	7,367	6,415	5,814	5,286
Other services	39,783	32,113	25,783	21,214	17,458	14,738	12,863	11,446

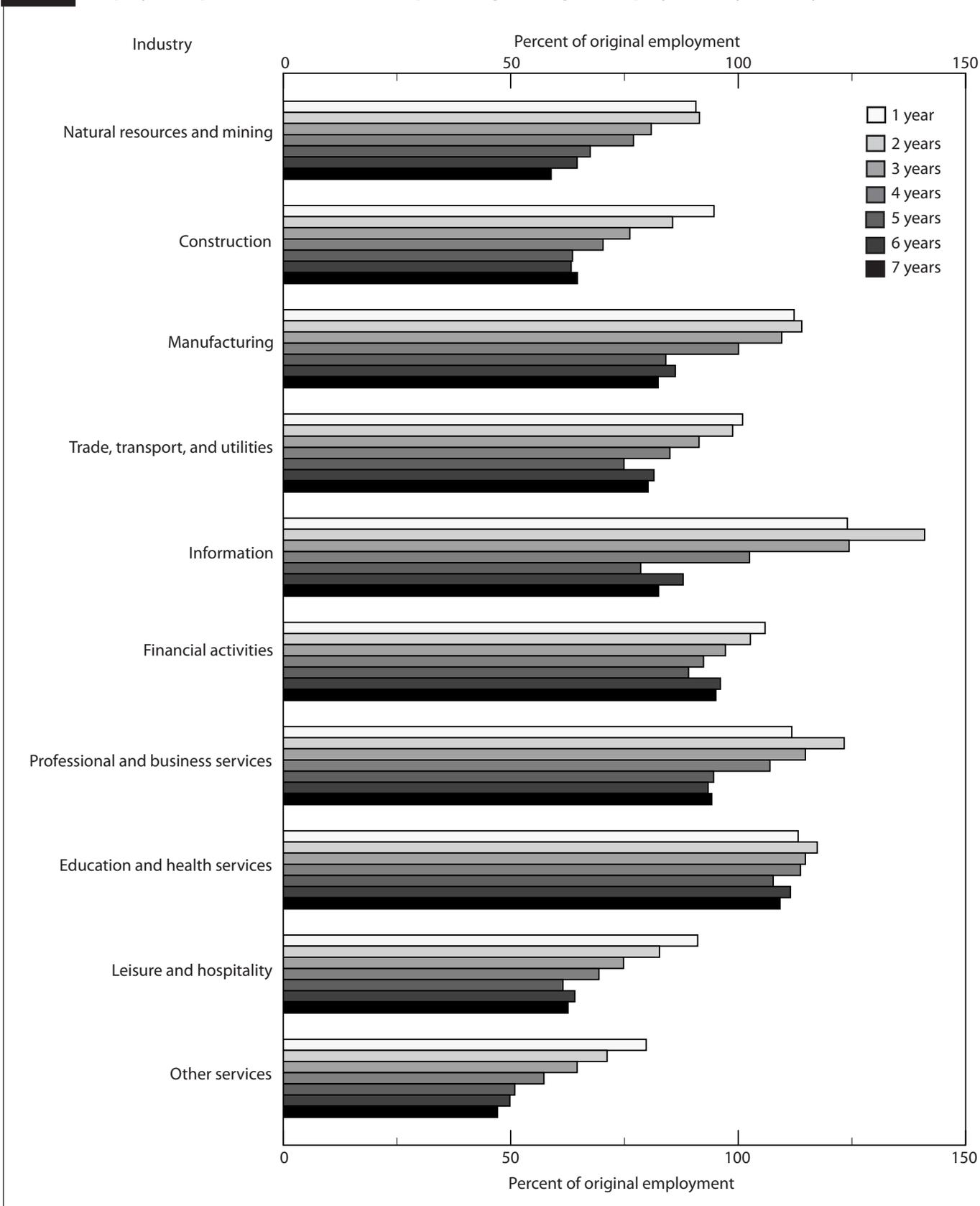
Table 3. Total employment of survivors, by sector and year since birth, 1999–2005

NAICS supersector	Second quarter, 1998	First year (1999)	Second year (2000)	Third year (2001)	Fourth year (2002)	Fifth year (2003)	Sixth year (2004)	Seventh year (2005)
National.....	798,066	792,131	781,506	721,103	670,111	597,177	615,090	605,975
Natural resources and mining	21,809	19,781	19,945	17,636	16,789	14,726	14,091	12,836
Construction	98,750	93,468	84,550	75,256	69,426	62,852	62,489	63,935
Manufacturing	45,670	51,271	52,055	50,073	45,732	38,404	39,355	37,636
Trade, transportation, and utilities	139,125	140,462	137,448	127,135	118,266	104,156	113,398	111,622
Information	17,794	22,064	25,085	22,131	18,241	13,987	15,640	14,674
Financial activities	45,098	47,745	46,314	43,855	41,665	40,200	43,360	42,892
Professional and business services	137,908	154,160	170,016	158,281	147,618	130,403	128,803	129,938
Education and health services	57,068	64,594	67,017	65,534	64,881	61,482	63,611	62,328
Leisure and hospitality	152,668	139,041	126,323	114,154	105,941	93,893	97,933	95,611
Other services	69,736	55,664	49,639	45,027	39,932	35,499	34,700	32,820

Table 4. Contributions to initial employment, average initial employment, and average peak employment, by sector

NAICS supersector	Employment in second quarter, 1998	Average initial employment	Average peak employment 4 years after birth (Knaup, 2005)	Average peak employment 7 years after birth (current study)
National.....	798,066	3.8	7.9	13.1
Natural resources and mining	21,809	6.8	14.8	21.3
Construction	98,750	3.6	8.1	12.4
Manufacturing	45,670	6.2	14.0	21.8
Trade, transportation, and utilities	139,125	3.3	6.7	11.5
Information	17,794	4.7	14.6	25.6
Financial activities	45,098	3.0	6.4	10.5
Professional and business services	137,908	3.4	9.0	16.6
Education and health services	57,068	4.9	10.8	16.2
Leisure and hospitality	152,668	9.1	15.2	24.2
Other services	69,736	1.8	2.7	3.9

Chart 4. Employment patterns of survivors as a percentage of original employment, by industry



industry has average survival rates, employment stayed above initial employment until the fourth year, when it returned to the level of the second quarter of 1998.

Caution is advised, therefore, in judging the success of an industry sector only by its survival. For example, in comparing the sectors with the lowest and highest survival figures, it becomes clear that, despite having the lowest survival, the information sector had stronger employment growth than the education and health services sector. (See chart 4 and tables 2 and 3.) However, overall employment in education and health services was more stable. (See table 3.)

EXTENDING THE COHORT OF KNAUP'S 2005 STUDY to 7 years yields results consistent with that study: the survival of establishments decreases at a decreasing rate. Industry sectors that had above-average survival after 4 years continue to have above-average survival, and after 7 years, those with below-average survival continue to have below-average survival. More importantly, establishments that manage to survive continue to exhibit employment growth. This movement demonstrates that even as establishments exit the cohort, the increase in hiring by surviving establishments produces job growth in the economy. □

Notes

¹ Amy E. Knaup, "Survival and longevity in the Business Employment Dynamics data," *Monthly Labor Review*, May 2005, pp. 50–56.

² For a discussion of the BED data series, see James R. Spletzer, R. Jason Faberman, Akbar Sadeghi, David M. Talan, and Richard L. Clayton, "Business Employment Dynamics: new data on gross job gains and losses," *Monthly Labor Review*, April 2004, pp. 29–42.

³ In the BED system, births are considered changes, and quarterly changes track over 4 months; that is, to calculate a first-quarter change (from January through March), one must include the previous December's figure, and to calculate a second-quarter change (from April to June), one must include the previous March's figure.

⁴ For more information and a discussion of birth and death methodology, see Akbar Sadeghi, Richard L. Clayton, Sheryl L. Konigsberg,

and David M. Talan, "Birth and Death of Business Establishments: Decomposition of Openings and Closings in the Business Employment Dynamics Data Series," paper presented at the Third International Conference on Establishment Surveys (ICES-III), Montreal, Quebec, Canada, June 18–21, 2007.

⁵ It might be argued that the small decrease in employment by the seventh year reveals, not that survivors' employment tends to grow, but that big establishments tend to survive (or perhaps that a combination of the two occurs). However, this possibility is precluded because establishments with large employment were excluded from the study. The reasoning behind their exclusion was that confining the cohort examined to smaller entities would ensure that the appearance of new establishments in the data were births and not reopenings or spinoffs.