

Where the Jobs Are:

Business Dynamics and Employment Growth

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Executive Overview

Jobs are created by births of new businesses, expansions of existing ones, and relocations of businesses into an economy. Conversely, jobs are destroyed by deaths and contractions of existing businesses, and outward relocations. To the extent that state and local policymakers directly address job creation and job destruction, they focus to a large extent on relocation – engaging in efforts to attract new businesses to a state or locality, and attempting to encourage existing businesses contemplating leaving to stay. However, the empirical evidence underlying this focus on relocation is virtually non-existent, as there has been no systematic evidence on the role of business relocation in job creation and destruction.

This paper presents new evidence on the importance of each of these processes – births and deaths, expansions and contractions, and in- and out-migration – to employment growth (and decline). We use data from the National Establishment Time Series for California. The evidence indicates that births of new business establishments and especially new firms, and expansions of existing ones, coupled with their counterparts of deaths and contractions of existing establishments, are the prime determinants of employment growth. In contrast to the high profile accorded it by policymakers, business relocation plays a negligible role. The gross job flows (both positive and negative) from births, deaths, expansions, and contractions far outweigh those due to relocation. Moreover, in most years the net difference between expansions and contractions of existing businesses contribute by far the most to job growth.

Employment growth is a major goal of public policy at both the national and regional levels. Yet there are important gaps in our knowledge about what drives employment growth, as well as how public policy can affect it. Employment change and growth is a dynamic process resulting from job creation and job destruction, which in turn are driven by the birth, death, growth, contraction, and relocation of business establishments (see Figure 1).¹ Using a newly constructed longitudinal database – the National Establishment Time Series (NETS) – we are able to calculate a full decomposition of the sources of employment change from 1992-2002 for the state of California. The key advantage of these data is the ability to

track business relocations – in addition to the births, deaths, expansions, and contractions that have been studied using other data.

Despite the fact that a considerable amount of policy efforts of state and local governments are focused on encouraging businesses to move to their locations, or discouraging outward moves, we find that business establishment births and expansions of existing establishments are responsible for nearly all job creation, and conversely that deaths and contractions are responsible for most job destruction. Overall, business expansion always outweighs business contraction, so that in most years expansions minus contractions are the primary source of job growth. Births and deaths create and destroy more jobs in each year than expansions and contractions, but in most years they are more in balance, so that they typically

¹ An “establishment” is a business or industrial unit at a single physical location that produces or distributes goods or performs services – for example, a single store or factory.

contribute much less to net job creation, and often result in net job destruction. However, during the dot-com boom in California – not surprisingly, perhaps – job creation from births far outweighed job destruction from deaths. Finally, of the jobs created by births of new business establishments, births of new firms account for more job creation than the creation of new branches of existing firms, and deaths of new businesses are not a major contributor to job destruction. Together, then, these findings emphasize the importance of the health of existing businesses and the creation of new businesses in creating job growth.

The results we report are limited to California, which may be distinct from other regions in a number of ways. Thus it remains a question to what extent these findings can be generalized to the rest of the nation. But California is of great interest in its own right for a few reasons: its high-tech orientation suggests that it may be a harbinger of the economic future of other regions; its overall large size makes it a significant component of the U.S. economy (accounting for 13 percent of U.S. gross state product); and the high-profile, raging debate within the state about the relationship between the business climate and job growth – with an emphasis on relocating businesses – has arisen in other states as well.

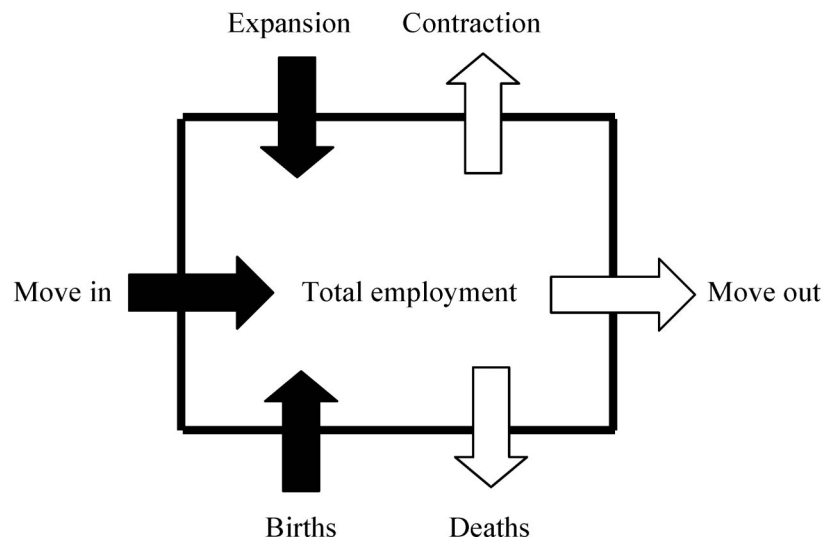
Previous Research on Business Establishment Dynamics and Employment Growth

Small Businesses and Job Creation

There is considerable controversy over which of the processes depicted in Figure 1, and for which types of businesses, are most important in driving employment growth. Some of the fundamental research on job creation and destruction was done by Birch (1979, 1981, and 1987) and Allaman and Birch (1975), who claimed that small firms were the central engine of job creation in the U.S. economy.² Because new businesses are typically small, by extension this view suggested that entrepreneurship and new business formation were the most important factors in employment growth. As an example, Birch (1987) argued that during the period 1981-1985, firms with fewer than 20 employees accounted for 82 percent of employment growth via expansion and contraction of existing firms (Figure 1-3, p. 14), and 88.1 percent of overall employment growth (Figure 1-5, p. 16). Birch's argument about the role of small firms in job creation caught the attention of the popular press and had a lasting influence on policy. For example, the U.S. Small Business Administration has an Office of Advocacy (for small

² The subtitle of Birch's 1987 book is "How Our Smallest Companies Put the Most People to Work."

Figure 1
Effects of Business Employment Dynamics on Employment Changes – A Schematic Representation



businesses) that still trumpets Birch's findings in trying to help small businesses with regard to regulatory constraints, taxation, etc.³

This research also attracted criticism, most notably Davis et al. (1996), who criticized Birch's approach of dividing firms into size classes and then measuring job growth in each class. They argued that such calculations are subject to a "regression fallacy" that leads to upward bias in the estimated contribution of small firms to job growth. The bias arises because either measurement error that is uncorrelated over time or transitory fluctuations will lead to some firms being classified as small in whatever base year one chooses (following erroneous or transitory employment declines), and then growing more sharply over the next year because of regression to the mean. They argued that this regression fallacy can fully explain the relationship between firm size and job growth. Studying data from the Longitudinal Research Database that covers the U.S. manufacturing sector only, when they used an average instead of a base-year firm size measure the data showed that job growth has "no systematic relationship to average plant size" (1996: 68).⁴ There has been ensuing debate about the strength of the regression fallacy in data for other countries (e.g., Davidsson et al. 1998). However, there has been no refutation of the Davis et al. results for the United States. Nonetheless, Davidsson et al. raise doubts about the generality of conclusions for the United States that can be drawn from the manufacturing sector, which has far fewer small establishments than other sectors of the economy and was in rather sharp decline during the period studied by Davis et al.⁵

³ See <http://www.sba.gov/advo/25ann.html> and <http://www.sba.gov/advo/mission.html> (accessed on September 27, 2005).

⁴ Davis et al. (1996) also extend their criticism to similar calculations included in the Small Business Administration Annual Reports to the President (in the mid- to late-1980s).

⁵ Davis et al. also criticize political discourse about job creation that "rarely distinguishes between the small business share of gross job creation . . . and its 'share' of net job creation" (1996, pp. 64-5).

Business Establishment Dynamics, Employment Change, and Job Flows

With the availability of establishment-level U.S. Census data for the manufacturing sector, several studies moved beyond the data studied by Birch and his associates and broadened the inquiry to a more general understanding of employment dynamics. Using data from five Censuses of Manufactures (CM) – for the years 1963, 1967, 1972, 1977, and 1982 – Dunne et al. (1989a) examined gross and net job flows caused by the opening, closing, expansion, and contraction of manufacturing plants.⁶ They find that gross job flows are much larger than net flows, implying that the relatively smooth employment changes in manufacturing at the aggregate level reflect far more tumultuous changes at the establishment level.⁷ For example, they calculate that net employment fell by 3.8 percent from 1977 to 1982, a change made up of a 17.6 percent increase in jobs from plant openings, an 11.7 percent increase from expansion of existing plants, a 17.7 percent decline due to plant closings, and a 15.4 percent decline due to contraction of continuing plants. Over the four periods they study – connecting the five Censuses – they find that gross job changes due to births and deaths are often quite close and net employment changes are driven more by differences between expansion and contraction of continuing plants. As it turns out, this conclusion foreshadows our results for the broader economy.⁸

Davis and Haltiwanger (1992) also studied job creation, destruction, and reallocation across manufacturing plants, but using the Longitudinal

⁶ In related work using the same data, Dunne et al. (1989b) study the post-entry growth and failure patterns of manufacturing plants.

⁷ Research by Leonard (1987), using Unemployment Insurance (UI) records for establishments in the state of Wisconsin from 1977 to 1982 (not restricted to the manufacturing sector), found similar results, with relatively small changes in employment masking substantial "reallocation" among establishments.

⁸ There are some limitations of these data that are germane to the potential value of the NETS data. First, they exclude plants with fewer than five employees. Second, they are of course limited to manufacturing, which may not be representative of the entire economy (see, for example, Foote 1998). Third, because the data generally come at five-year intervals, the dynamics that occur at higher frequency cannot be studied. Fourth, these data cannot be used to track plant relocations.

Research Database (LRD) for the period between 1972 and 1986. And Davis et al. (1996) used a later version of the LRD to paint a statistical portrait of job creation and destruction in the U.S. manufacturing sector from 1972 to 1988. The LRD is built by combining data from the Census of Manufactures and the Annual Survey of Manufactures (a survey of a probability sample of manufacturing establishments). Combining these yields a panel data set on establishments (which may enter or leave depending on inclusion in the sample) with which it is possible to carry out analyses similar to those described above at a higher frequency.⁹ The findings from the LRD echoed those of Dunne et al. (1989a) in pointing to the quite high gross job flows that underlie net employment changes in manufacturing. Also, they found that plant openings account for 20 percent of job creation and the closure of existing plants accounts for 25 percent of job destruction (Davis and Haltiwanger 1992). Given that they did not consider business relocation, this means that job creation and destruction in the manufacturing sector are mainly driven by the expansion and contraction of existing plants.

More recently, Spletzer (2000) used Unemployment Insurance (UI) data to examine the contribution of business establishment births and deaths to employment growth in West Virginia, covering 1990-1995, and extending the analysis to all sectors of the economy. Spletzer devoted considerable attention to measurement issues, including both the measurement of births and deaths and the sensitivity to the time horizon used of the contributions of births and deaths to employment change. It is easy to see why the latter issue is significant. First, as the interval gets shorter (for example, one year versus two, or a quarter versus a year), we might expect the gross flows to become larger because more employment changes due to temporary fluctuations are captured, although the

opposite could occur (for example, as the interval length approaches zero). Second, the longer the interval chosen, the greater the contribution of births and deaths to gross flows. To see this most simply, note that all establishments in existence during a period are born and die during that period as the period gets infinitely long (in both directions).

Spletzer decomposed employment change into the components due to births and deaths, and expansion and contraction of existing establishments, using data at different frequencies. Reflecting the expected sensitivity to the window used, he found that about 20 percent of job creation is due to births using a quarterly frequency, rising to 40 percent using an annual frequency and 56 percent using a triennial frequency. The figures for the contribution of establishment deaths behave similarly, with corresponding numbers of 19, 41, and 60 percent.

Business Relocation

Business Relocation and Job Creation and Destruction

The studies summarized in the previous section have greatly added to our understanding of job creation and destruction. However, because of data limitations, they are unable to address the contribution of business relocation to job creation and destruction. Given the importance placed on business relocation by policymakers at the state and local level, it would appear that relocation is an important source of job growth, and hence that these studies miss an important part of the picture. As it turns out, however, there is virtually no existing, systematic evidence on the importance of relocation, a lacuna we seek to rectify with the present research.

As Figure 1 illustrates, fully characterizing employment change requires information on relocating businesses. In contrast to the other data sources used in most of the research described above, the NETS database used in this study tracks business address changes and identifies business moves over time within the entire country, enabling us to measure the contribution of in- and out-migration to employment change. The

⁹ A newer data effort at the U.S. Census Bureau is the Longitudinal Business Database (LBD), which creates an LRD-like database covering all industries (Jarmin & Miranda 2002). The LBD is based on the Standard Statistical Establishment List (SSEL), a register of all U.S. businesses and establishments. The LBD covers all in-scope establishments with employees; most of the public sector and some small parts of the private sector are considered "out-of-scope" for the Census Bureau, and for these sectors data in the LBD are not broken out by establishment.

only exception, it turns out, is the Dun & Bradstreet (D&B) data used by Birch (the same data that underlie the NETS, as explained in the next section). Based on these data, Birch concluded that business relocation was largely irrelevant to employment change in the 1970s. Specifically, Birch claimed that “however highly publicized they may be, relocated firms are insignificant from a job creation or loss standpoint. Many firms move each year, but the vast majority do so [over] comparatively short distances, and virtually all . . . within the same metropolitan area” (1987: 136). Looking at the four Census regions, Allaman (1978) reported that in-migration of firms contributed only about 1.5 percent of employment growth over a three-year period (1970-1972), while out-migration contributed about 1 percent of employment decline. However, this evidence is outdated, and therefore may not accurately describe the role of business relocation in today’s economy. Moreover, there has been much criticism of the D&B data from the time period Birch studied (e.g., Davis et al. 1996). For both of these reasons, plus the importance placed on relocation by policymakers, the NETS data we use in this research are extraordinarily valuable.

Business Relocation Policy

Although state and local laws and regulations are rarely found to be directly aimed at business attraction and retention, state and local policymakers have paid a great deal of attention to the issue of business relocation. State tax incentives for certain industries (such as those for manufacturing and biotech industries) or special initiatives (such as those to improve quality of life) are often motivated by the intention to attract businesses and create jobs (NGA Center for Best Practices 2005; 2006). More importantly, state and local policies on business attraction and retention are reflected in ad hoc incentive packages tailored to one business or a narrowly defined industry, and usually include not only tax incentives but also training subsidies, waived fees, reduced land prices, or even cash payments. These “policies” are often decided on a case-by-case basis, frequently in response to what other states or regions do or in anticipation of what they will do. Chicago’s package of incen-

tives to attract Boeing is a typical example. In 2001, when Boeing announced that its headquarters (with 500 jobs) would leave Seattle, cities such as Chicago, Dallas, and Denver engaged in a fierce bidding war to recruit the company. Chicago eventually won the competition by offering Boeing \$63 million dollars in incentives (see Lyne 2001, for the details of the deal).¹⁰

While the practice of luring businesses with economic incentives has a long tradition, it was in the 1970s that this practice became common and developed into a bitter battle among states (Farrell 1996). By the early 1990s, the bidding war among states became so widespread and so much state revenue was spent on business attraction and retention that two economists at the Federal Reserve Bank of Minneapolis even suggested that Congress should stop the competition among state governments (Burstein & Rolnick 1995).¹¹ Yet nothing was done and the practice continues today.¹² Many scholars generally believe that from the perspective of the whole country, local economic incentives for business attraction and retention are ineffective and largely wasteful (e.g., Bartik 2005; Peters & Fisher 2004).¹³ On the other hand, Glaeser (2001) points out that although such competition may have distributional effects that some do not like, it may increase the efficiency of locational decisions.

¹⁰ See many other examples in Site Selection’s archive of top incentives deals at <http://www.siteselection.com/ssinsider/incentive/archive.htm> (accessed on June 7, 2006). And see Klier and Testa (2002) for additional evidence on headquarter moves.

¹¹ An example of local government efforts cited by Burstein and Rolnick (1995) shows how far this competition had gone by the 1990s. In 1994, Amarillo, Texas, sent out an \$8 million check to about 1,300 companies around the country, which could be cashed if the company committed to creating 700 new jobs in the city.

¹² See the publications by the National Governors Association (e.g., NGA Center for Best Practices 2005, 2006) for some states’ marketing campaigns, many of which, such as Texas’ “moving to Texas” campaign and Vermont’s business recruitment campaign, have an explicit goal of luring businesses from other states.

¹³ Some have characterized this kind of competition as a prisoners’ dilemma, arguing that although the competition for businesses and jobs hurts all locations, nobody has an incentive to give in unilaterally (Ellis & Rogers 1997). Moreover, there has been a whole industry built around business relocation, including site selection consulting, legal services, and related publications. People in this industry all benefit from the bidding war among states and localities for businesses and have every incentive to see it continue. See LeRoy (2005, Chapter 3: 68-91) for discussion of the pioneering site selection consulting firm Fantus, and his claim that Fantus helped escalate the competition for businesses among states.

Calculations for 2003 reported in Bartik et al. (2003) indicate that in that year the state of Michigan alone offered \$531 million in cash or “near cash” incentives to attract or retain business operations owned by large companies. These are all decided on a discretionary basis, which amount to three-fourths of Michigan’s annual economic development resources. For the whole country, this kind of spending on business attraction and retention and related consulting, legal, and informational services is estimated to be on the order of \$50 billion (LeRoy 2005: 185).¹⁴ Because so many resources are involved in influencing the locational choices of businesses and because many states continuously engage in marketing campaigns to lure businesses, this issue also draws a great deal of attention from the media and the public.

The high profile nature of policymakers’ focus on relocation has been highlighted recently in California – the state the authors know best. In California, policy debate has sharply focused on the role of business relocation in regional employment growth, with a particular emphasis on stopping an alleged exodus of businesses from the state, along with the jobs of the workers they employ.¹⁵ After Arnold Schwarzenegger won the recall election and became Governor, he adopted an aggressive public relations strategy focusing specifically on business relocation. In August 2004, billboards were erected in cities such as Atlanta, Boston, Dallas, Las Vegas, Phoenix, Portland, and Seattle, featuring an arms-folded Schwarzenegger with a California state flag T-shirt reading: “Arnold Says: ‘California wants your business.’” (Actually, he says, ‘Kah-li-fornia.’) He dubbed a big moving truck “Arnold’s Moving Co.” and promised to lend it to any business owner who wants to move to California. It is unclear whether

this kind of campaign influences business decisions, but it certainly provoked a response. Only two months later, large signs appeared in Los Angeles, San Francisco, and San Diego featuring a picture of Massachusetts Governor Mitt Romney. Its message apparently responds to Schwarzenegger’s challenge: “Smaller muscles, but lower taxes! Massachusetts means business.” At the same time, a Nevada Economic Development coalition put up “wallscapes” on buildings in Los Angeles, Sacramento, and San Francisco, with images of a beaten and bruised worker below the question “Will your business be terminated?” (Tamaki 2004), and the same picture also appeared in major California newspapers.¹⁶

The National Establishment Time Series Database

Description

The National Establishment Time Series (NETS) is a new longitudinal file, based on Dun & Bradstreet (D&B) data, which is a long-term project of Walls & Associates in conjunction with D&B (Walls & Associates 2003). We currently have access to an extract of this data set that covers all business establishments that were ever located in California between 1989 and 2002, and their respective parent headquarters (regardless of location). The unit of observation in the NETS is a business establishment. Of course many firms own or control more than one establishment, and those establishments may be located in different geographic areas and may be engaged in different industries. The NETS data indicate whether an establishment is a stand-alone firm or a branch of a multi-establishment firm, and in the latter case establishments of the same firm can be linked. We sometimes refer to an establishment as a “business,” reserving the word “firm” to refer to what may be collections of many establishments with a common owner.

We describe the dataset briefly here; a more

¹⁴ Of course, not all the subsidies go to the businesses that actually relocate; those that simply threaten to leave may be able to cut a deal with state and local governments. For example, according to LeRoy (2005: 10-16), in 1995 the defense contractor Raytheon pushed a tax cut in Massachusetts to “save” defense jobs by threatening to move operations out of the state, and during 1997-1999 the hotel chain Marriott International threatened to move its headquarters from Maryland to Virginia, inducing the state of Maryland to offer an incentive package worth \$49-74 million.

¹⁵ This issue arises on a national level with respect to outsourcing, which the NETS data do not allow us to address.

¹⁶ The politicization of business relocation has arisen elsewhere. For example, when Kimberly-Clark moved its headquarters from Wisconsin to Texas in 1985, it sparked heavy criticism of Wisconsin’s business climate, apparently contributing to the governor losing his job in the following election (Dresang 2002).

detailed discussion including assessment of the data is given in a lengthier paper (Neumark et al. 2005). The NETS database we use includes the following variables that are of particular importance to this research: current business name; establishment location (street addresses and phone numbers) in each year; county identifiers in each year; type of location (single location, headquarters, branch) in each year; employment in each year; and four-digit Standard Industrial Classification (SIC) codes that are also disaggregated to an eight-digit level by D&B. Because the NETS covers essentially all establishments for every year and includes location information, it is possible to infer moves through changes of address. The ability of the NETS to capture business relocation is an important advantage over other data sources that researchers have used to study business establishment and employment dynamics.

Over the sample period of 1989-2002, the database includes information each year on between 1.2 and 1.8 million establishments in California providing about 15 million to 18 million jobs per year. An establishment is included in our version of the NETS data if it was ever located in California during 1989-2002 or is the parent headquarters of such an establishment. However, because D&B's coverage increased sharply when they started to use the Yellow Pages telephone book to identify business units in 1992, we exclude the 1989-1991 data from our analysis.

Tracking Businesses

Given the goal of our research, it is important to clarify how the NETS database tracks relocation and other types of business establishment dynamics. Remember that the NETS is constructed using the raw data collected by D&B. D&B uses a unique establishment identification number – the DUNS (Data Universal Numbering System) number – to track business establishments. The DUNS number is the foundation of D&B's data system because it allows D&B to attach information on credit histories and marketing databases, which is what its clients value. Consequently, DUNS numbers are unique, and D&B never recycles numbers.

Each time D&B updates establishment information, it attempts to contact the establishment

based on the previous location information on the establishment. Moves can therefore be indicated in a number of ways. Frequently there is a forwarding address or telephone number, or a continuing email contact that allows D&B to identify a new location. (In addition, business establishments sometimes notify D&B of their move.) Most important, any establishment that cannot be contacted at the previous year's address or telephone number goes into the "out of business or inactive" file. Before any "new" establishment can be given a DUNS number, it must be checked against this file, and if there are indications of a match, follow-up investigation is undertaken. For example, if an establishment belonging to a multi-unit firm cannot be found, D&B contacts the headquarters to determine whether a relocation has occurred. In any case where D&B finds that the establishment previously existed elsewhere, it assigns its existing DUNS number. Finally, if a new establishment is identified whose characteristics do not match those of an existing establishment, D&B contacts the establishment to verify its start date, and assigns a new DUNS number. With these procedures, the longitudinal file should correctly identify relocations of establishments and distinguish them from births of new establishments (and deaths of others). Note, though, that what is classified as a relocation is a physical move of establishment. Although this is the natural definition of relocation, there are other types of relocation of economic activity – such as changes in the number of jobs at different establishments belonging to one firm – that will instead be captured as expansion and contraction.

Assessment

As the preceding discussion indicates, the data construction effort – including both the cross-sectional files and the longitudinal linking that tracks establishments over time – is a massive and complicated one. In addition, as noted earlier, the D&B data that were used in Birch's earlier work came under considerable criticism. For these reasons, we have undertaken a good deal of investigation to document and examine the quality of the NETS data in order to assess their reliability, their potential limitations, and how these limitations might affect results of

various analyses. Here, we summarize the findings; again, a more complete description of our assessment is provided in Neumark et al. (forthcoming).

We have compared NETS data with several alternative employment data sources, including the Quarterly Census of Employment and Wages (QCEW), the Current Employment Statistics (CES), and the Size of Business (SOB) data. Although we cannot compare data at the level of the establishment, we can do so at the level of the industry, county, size category, and combinations of these. The comparisons indicate that employment levels calculated from the NETS are highly correlated with those calculated from alternative data sources, but the NETS tends to give higher employment levels, primarily as a result of better coverage of small-size establishments and the counting of proprietors of small establishments. Also, because of rounding and imputation, year-to-year employment changes at disaggregated levels of analysis may not be as reliable as we would like, whereas three-year changes are quite reliable; even though in this paper we use aggregated data, in the empirical analysis that follows in the next section we focus on three-year changes.

Checks against newspaper stories about business relocation, culled from Lexis-Nexis searches, suggest that the NETS does a good job of capturing business relocations, especially cross-state relocations. The NETS also does a good job of capturing new business establishments and accurately measuring the dates when businesses were founded. In Neumark et al. (forthcoming), we show that start dates of businesses identified from a small sample of establishments we contacted directly and from a sample of biotech establishments whose starting dates can be found on their websites match those in the NETS very well.

Sources of Employment Growth and Change in California

Decompositions of Sources of Employment Growth

Table 1 presents decompositions of employment growth over three-year periods during 1992-2002. For each period, in the top panel we show California employment in the starting year

and the ending year, and the overall net change. The next panel shows the number of jobs created or eliminated by each dynamic process determining employment change, or gross flows. And the bottom panel shows the decomposition of employment change into the underlying net flows. We can decompose annual employment changes (or employment changes over any interval) in the same way.

Table 1 shows that in every three-year period, the expansion of existing establishments always creates more jobs than are lost through the contraction of existing establishments. This is perhaps not surprising, because at any time we expect that surviving business establishments tend to be those that are growing rather than shrinking. The net effects of births and deaths of establishments on overall employment change are positive in some years and negative in others.¹⁷ This tends to reflect the business cycle. In boom years many new establishments are created, and at the same time existing establishments are less likely to go out of business. As a result, jobs created by new establishments outnumber jobs eliminated by establishments that close in such years. Conversely, during slower economic times business formation is lower and more businesses tend to close, resulting in a net loss of jobs from these two processes because new businesses do not suffice to cover the loss of those that die. For example, during 1995-1998, establishment deaths in California cut 454,000 jobs more than the number of jobs created through establishment births. But during the next three years, from 1998-2001, business establishment births and deaths resulted in a net gain of 848,000 new jobs.

The table also shows the relative contribution of relocation to employment change. It is clear that relocation contributes minimally to both job creation and job destruction. For example, in-migration of establishments typically produces only about 2 or 3 percent of the number of jobs created by expansion of existing establishments, and an even smaller percentage

¹⁷ Given that we look at three-year intervals, a "birth" means the creation of an establishment that did not exist at the beginning of the three-year interval and which exists at the end of the interval.

relative to the number of jobs created by births. The relative role of out-migration in job destruction is a bit higher, but not much. And the bottom rows of Table 1 indicate how small the role of net business relocation (in-migration minus out-migration) is relative to the net expansion-contraction or birth-death effects. As the last row shows, the employment loss from relocation ranges from about 6,000 to 44,000, averaging around 20,000 per year. But the employment changes from the expansion-contraction processes and the birth-death processes are much greater, often by a factor of 20 or more. In other words, employment changes in California have overwhelmingly been driven by expansion-contraction and birth-death processes, rather than by relocation.

The relative importance of different sources of employment change is illustrated more clearly in Figure 2. The two panels display the sources of job creation and destruction, respectively, in each three-year period during 1992-

2002. The top panel shows that in each period the birth of new business establishments is the major source of job creation, while the expansion of existing establishments is also important. The number of jobs created by business establishments that moved to California is trivial compared to the number of jobs created by the other two processes. In particular, as indicated in the right-hand pie chart, establishment births contributed 62.4 percent of job creation, followed by 36.7 percent contributed by establishment expansion, and less than one percent due to in-migration.

Likewise, the bottom panel shows that the death of establishments is the major factor in job destruction. Contraction at existing establishments is also substantial but less important. Finally, business relocation out of California again contributes only minimally. In particular, deaths lead to 71.4 percent of job destruction, contractions contribute 26.9 percent, and out-migration only 1.6 percent.

Table 1
Decomposition of Employment Growth in California

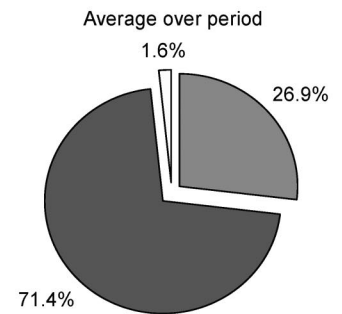
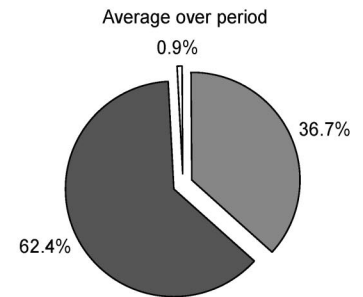
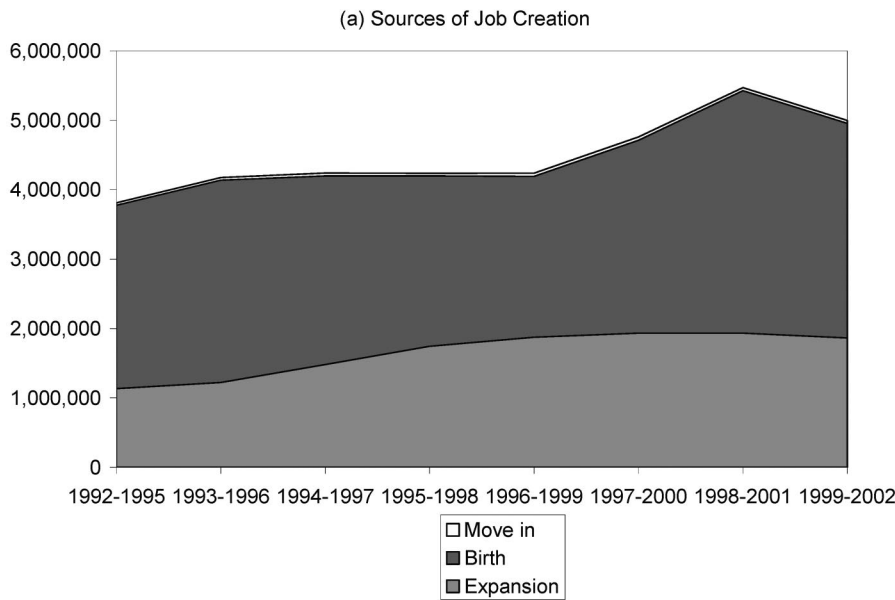
	1992-1995	1993-1996	1994-1997	1995-1998	1996-1999	1997-2000	1998-2001	1999-2002
<i>A. Employment change</i>								
Starting employment	16,394,151	16,266,713	16,371,012	16,241,156	16,314,659	16,546,553	16,512,479	16,864,781
Ending employment	16,241,156	16,314,659	16,546,553	16,512,479	16,864,781	17,666,262	18,149,748	17,527,918
Change	-152,995	47,946	175,541	271,323	550,122	1,119,709	1,637,269	663,137
<i>B. Gross flows</i>								
Job creation:								
Expansion	1,134,603	1,220,681	1,480,284	1,742,557	1,874,193	1,933,519	1,934,525	1,862,952
Birth	2,641,169	2,915,369	2,716,969	2,456,024	2,317,230	2,776,719	3,488,940	3,092,281
Move in	34,327	37,993	41,994	37,355	46,076	49,515	45,268	42,277
Job destruction:								
Contraction	1,102,839	965,717	1,030,221	994,987	973,018	901,333	1,134,032	1,410,608
Death	2,781,915	3,086,093	2,965,193	2,909,694	2,648,325	2,682,980	2,640,929	2,870,695
Move out	78,340	74,287	68,292	59,932	66,034	55,731	56,503	53,070
<i>C. Net flows</i>								
Employment change =	-152,995	47,946	175,541	271,323	550,122	1,119,709	1,637,269	663,137
(expansion-contraction)	31,764	254,964	450,063	747,570	901,175	1,032,186	800,493	452,344
+ (birth-death)	-140,746	-170,724	-248,224	-453,670	-331,095	93,739	848,011	221,586
+ (move in-move out)	-44,013	-36,294	-26,298	-22,577	-19,958	-6,216	-11,235	-10,793

Births and Deaths, Expansions and Contractions, and Cyclical Employment Change

Figure 3 provides a graphical depiction of the net flows. The figure shows that over the time period covered by the data the net effect of expansions minus contractions is always positive, and for the most part quite large. In contrast, the net effect of births minus deaths changes sign over time, dipping into negative territory through the 1996-1999 period, but then rising and becoming positive before falling

again. In addition, the changes generated by births minus deaths most closely track the overall employment changes, which are indicated by the vertical bars, in contrast to the rather steady job growth created by the expansion and contraction of existing establishments. This suggests that cyclical employment change may be most strongly influenced by births and deaths. Of course the latter part of the sample period is the dot-com boom and bust, and the dramatic peak in jobs created by births minus deaths may

Figure 2
Job Creation and Destruction



reflect the proliferation of small companies that subsequently died, so this period may be unique.

From the point of view of those who emphasize the important role of new (and small) businesses in job creation, this figure indicates that new businesses, which of course include start-ups, are crucial to cyclical job creation. On the other hand, failures are also crucial to job destruction. If new and small businesses are most likely to fail, then there is not necessarily much benefit from start-ups and new branches in terms of employment growth. But if failures come more from existing businesses, then the important role of new businesses appears particularly important to job creation. We return to this question later.

As Figure 3 emphasizes, the largest share of employment growth is expansion minus contraction of existing businesses. Births and deaths contribute large gross flows into and out of employment, although generally smaller net flows (see Table 1). Nonetheless, modest change in the balance between births and deaths could lead to large shifts in net employment growth, as reflected in the sharp changes in the net effect of births minus deaths in Figure 3. In contrast, the very low gross job flows associated with relocation imply that even if the rate of mobility out of the state dou-

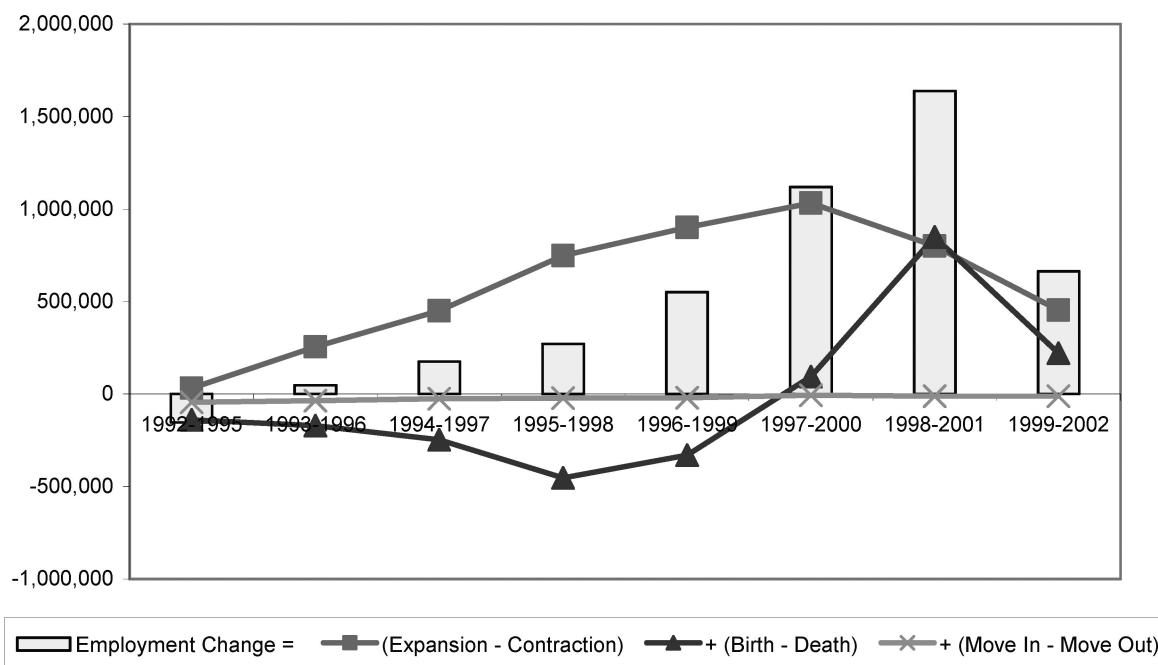
bled, and establishments completely ceased to move into the state, there would be little impact on net employment change.

The magnitude of gross job creation and destruction, as well as its decomposition, are dependent on the interval length over which the changes are measured, as noted earlier. However, we examined interval lengths ranging from one to ten years, and, as reported in Table 2, the relative rankings (and approximate relative magnitudes) of the contributions of each process of employment change to either job creation or job destruction are unaffected.

New Firms vs. New Establishments

To this point, we have focused on business establishment dynamics and their contribution to employment change and growth. We have noted the important role of births, especially in some periods (like the dot-com boom), but we have not considered the specific role of the entrepreneurship that leads to the creation of new firms, as opposed to new establishments or branches of existing firms. Figure 4 sheds some light on this by further disaggregating the sources of job creation to distinguish between births of new establishments or branches of existing firms and births of new firms.

Figure 3
Net Employment Changes due to Different Business Dynamics



Looking at job creation, the top panel reveals two features. First, new firms contribute more to job creation than do new branches of existing firms, with the former contribution sometimes as much as twice as large. Second, job creation attributable to new firms appears somewhat more volatile and perhaps more cyclical than job creation attributable to new branches, which occurs at a steadier pace over the sample period. The bottom panel of the figure provides a more transparent comparison of levels and changes over time in each source of job creation, plotting employment growth due to births of branches and firms, and due to expansions, as well as the overall employment change, over the sample period. The panel shows that job creation due to births of new firms is often the highest of the three sources, and is always higher than job creation due to new branches. It also shows the higher volatility of job creation from births of new firms, and suggests that the sharp run-up in employment growth in California beginning in 1996 is most strongly paralleled in job creation from births of new firms.

Again, these types of conclusions could be sensitive to the interval length used in the analysis. To address this, we examined the results with interval lengths ranging from one to ten years (results are reported in Table 3). As expected, the contribution of both types of births to job creation grows with the interval length. But the relative shares of births attributable to new firms and new branches are quite stable using different interval lengths, with the former declining by only a few

percentage points (from 66 to 63 percent of overall job creation due to births) as the interval length goes from one to ten years.

Job Destruction at New Firms and New Branches

The findings just discussed suggest a vital role for entrepreneurship in the creation of jobs and therefore in employment growth. Of course, it is conceivable that the new firms (and branches) that create many jobs also have relatively high rates of job destruction. This would occur if these firms tended to be very short-lived, in which case a higher rate of formation of new firms would not have much impact on employment growth.

To study this question, we calculate job destruction at “young” firms and branches and at “older” firms and branches. Any such definition is arbitrary, but we define young firms and branches as those that have existed for three years or fewer, and old ones as those that have existed for longer than three years. This corresponds to the definition of births in most of our analyses thus far, which are identified as establishments that do not exist in a given wave of the NETS but do exist three years later.¹⁸

Figure 5 reports the job destruction rates attributable to all sources – deaths of young and old branches, deaths of young and old firms,

¹⁸ In this case, we can compute job destruction at younger and older branches and firms beginning in 1995. Overall, for the period 1995-2002, 28.4 percent of all establishments are classified as young, and they account for 16.5 percent of total employment.

Table 2
Employment Change Decomposition (1992-2002), Various Interval Lengths of Observation

	1 year	2 years	3 years	5 years	10 years
Expansion	39.3%	37.9%	35.6%	33.5%	26.7%
Birth	59.8%	61.2%	63.5%	65.5%	72.2%
Move in	0.8%	0.9%	0.9%	1.0%	1.1%
Gross creation	17,096,718	15,847,399	13,514,768	13,000,185	10,160,780
Contraction	32.1%	29.7%	27.5%	25.3%	20.7%
Death	66.4%	68.8%	70.9%	73.1%	77.5%
Move out	1.4%	1.5%	1.7%	1.6%	1.9%
Gross destruction	15,962,951	14,713,632	11,759,171	11,866,418	9,027,013
Net change	1,133,767	1,133,767	1,755,597	1,133,767	1,133,767

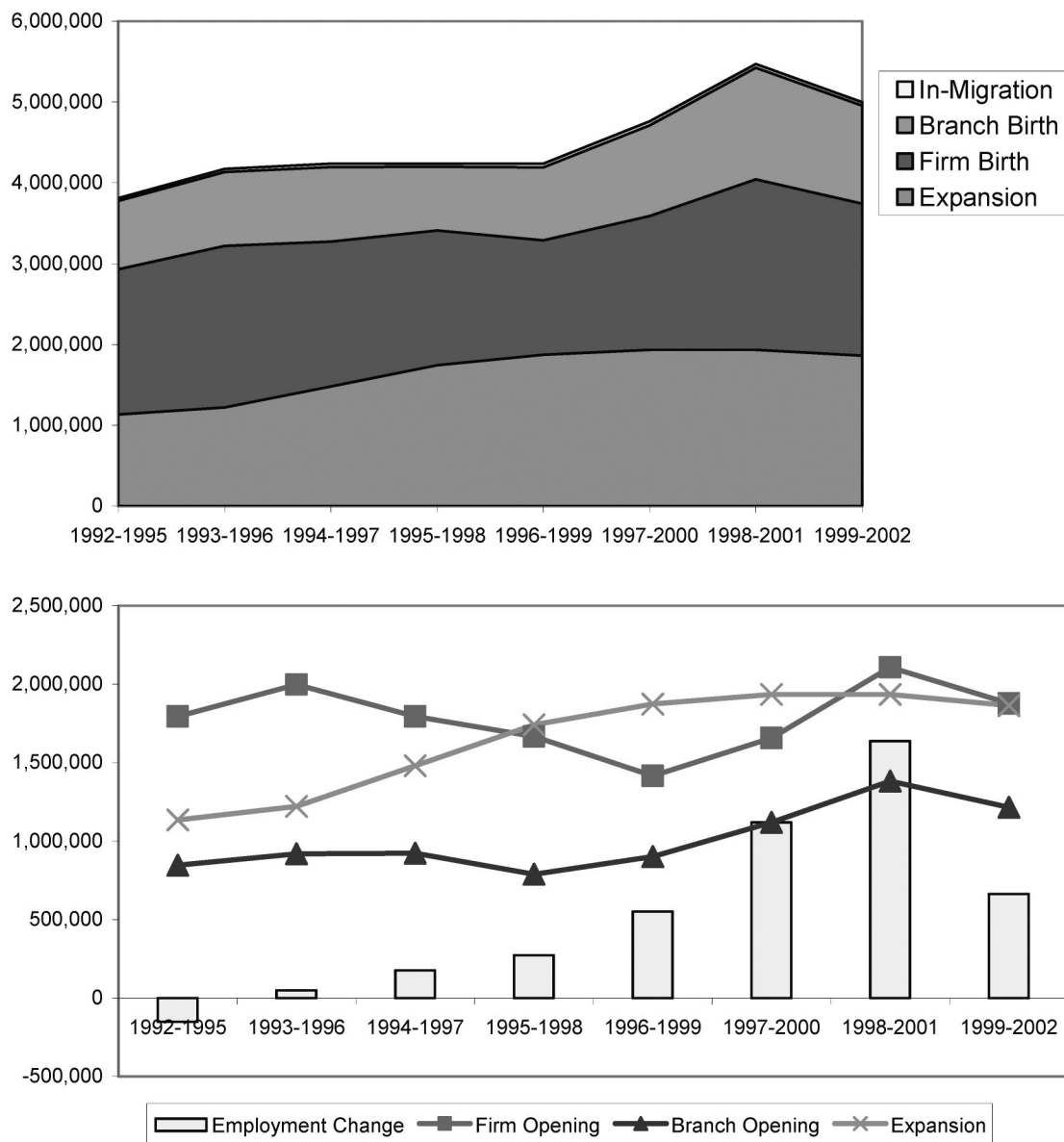
For three-year intervals the analysis is limited to 1992-2001, which can be divided into periods of three years length. The intervals used in these computations are non-overlapping.

contraction, and out-migration (the latter two of which are the same as in Figure 2). The figure reveals that deaths of older branches and firms contribute much more to job destruction than do deaths of young branches and firms. There are, of course, more of the former, but note that Figure 4 shows that new branches and firms contribute substantially to job creation. Finally, we again examined the sensitivity of this conclusion to the interval length used in the analysis. As reported in Table 4, the qualitative conclusions are not very sensitive to the inter-

val length. In particular, as we shorten the interval the share of job destruction attributed to deaths of young firms and branches falls.¹⁹ Because this narrows the definition of young branches or firms, of course, the corresponding share of job destruction must fall. By the same token, if we lengthen the interval, the share of

¹⁹ One might suspect that the NETS database fails to pick up very short-lived businesses, and thus understates the death rate of new businesses. But this should bias downward estimation of births as well as deaths. Regardless, these businesses would not contribute to job creation or job destruction over anything but a very short interval.

Figure 4
Job Creation and Employment Change from New Firms vs. New Branches



job destruction attributed to deaths of young firms and branches rises. But as the last column of Table 4 shows, even if we define young firms and branches as those no more than five years old, our qualitative results still hold. Thus, the combined results on job creation and job destruction are consistent with the notion that entrepreneurship and start-up firms contribute substantially to employment growth.²⁰ The evidence is consistent with a life-cycle view of businesses in which new businesses create jobs

as older businesses close and destroy jobs, much like the Schumpeterian notion of waves of creative destruction.

Conclusions and Discussion

Our analysis of the NETS data builds on earlier research on employment changes and growth. The most significant advantage of the NETS database is that it captures business relocation and hence permits a full decomposition of the sources of employment change.²¹ We find that the birth-death

²⁰ Note that this is different from the contention that small establishments have high rates of job destruction. Hence, our results speak to somewhat different issues than those addressed by Birch and others.

²¹ For the purposes of research on other topics, advantages of the NETS data include the ability to disaggregate to a fine geographic level, as well as ease of access and the absence of confidentiality restrictions.

Table 3
Job Creation Share Decomposition (1992-2002), New Firms vs. New Branches, Various Interval Lengths of Observation

	1 year	2 years	3 years	5 years	10 years
Expansion	39.3%	37.9%	35.6%	33.5%	26.7%
Birth	59.8%	61.2%	63.5%	65.5%	72.2%
Birth, firm	39.2%	39.7%	41.2%	41.5%	45.7%
Birth, branch	20.6%	21.4%	22.3%	24.0%	26.5%
Move in	0.8%	0.9%	0.9%	1.0%	1.1%
Gross creation	17,096,718	15,847,399	13,514,768	13,000,185	10,160,780

See notes to Table 2. Numbers that are new here, and not reported in Table 2, are highlighted.

Figure 5
Job Destruction from New Firms and Branches vs. "Old" Firms and Branches



and expansion-contraction processes of business establishments are responsible for nearly all gross job creation and destruction and net employment change, and that cross-state business relocation is virtually a negligible factor both gross and net. Moreover, in the sample period we study, job creation from business expansion steadily outpaces job destruction from business contraction, while the net effect of business establishment births and deaths is more volatile and more closely tracks overall employment change. Finally, when we disaggregate establishment births into births of new firms and births of new branches of existing firms, the data indicate that new firms play a greater role in job creation, yet play quite a small role in job destruction.

From a policy perspective, there are two central questions regarding employment growth. The first, which this paper addresses, is what drives employment growth. Is it births of new firms or new branches, or expansions of existing businesses? Or is it relocation? The second question is what, if anything, public policy can do about it. That is, even if we establish, for example, that births of new businesses are central to employment growth, can we

identify public policies that encourage this activity, or that reduce disincentives to create new businesses? The second question is in many ways a more difficult one to answer, and we do not take it up in this paper but leave it for future research.

Our more limited goal is to bring new – previously unavailable – data to bear on establishing the facts regarding job creation and job destruction, with the hope that doing so will at least focus the policy debate and future policy research on asking the right questions. With regard to this goal, the negligible role of business relocation suggests that a policy focus on such relocation is badly misdirected, and unlikely – even if successful at attracting new businesses and retaining old ones – to contribute visibly to job growth, unless for some reason business relocation is inordinately sensitive to public policy. In contrast, any policy leverage over business establishment births and expansions is likely to have a much greater impact, since the gross flows from these sources, as well as the net flows from births minus deaths, and from expansions minus contractions, are much larger. And the creation of new firms, in particular, plays a critical role in employment growth. Given that births are central to employment growth, it is essential to ask whether incentives posed by taxes, subsidies, regulations, institutions of credit, etc., deter business formation, or whether these can be changed to encourage more business formation, perhaps in particular among sectors of the population in which there are constraints on this activity. Drawing further conclusions regarding the impact of particular policies on employment growth requires evidence that we do not yet have on the responsiveness of the various dynamic processes of business establishments and employment change to specific policies. But it appears that policies that yield even marginal increases in births or expansion, or marginal decreases in deaths or contractions, can generate sharp net increases in employment.

Table 4
Job Destruction Share Decomposition (1995-2002), Young vs. Old Deaths, Various Interval Lengths of Observation

	1 year	2 years	3 years	5 years
Contraction	30.3%	28.8%	27.3%	26.8%
Death	68.3%	69.7%	71.2%	71.8%
Death, young firm	5.3%	7.7%	10.1%	13.4%
Death, old firm	38.2%	35.7%	34.0%	28.9%
Death, young branch	1.6%	2.7%	3.4%	6.4%
Death, old branch	23.3%	23.6%	23.8%	23.0%
Move out	1.4%	1.4%	1.5%	1.4%
Gross destruction	9,307,679	8,482,481	7,796,077	5,975,169
Net change	1,908,592	1,908,592	1,908,592	981,365

The cutoff between young and old deaths is equivalent to the interval length of observation. So, for example, for the three-year intervals we look back three years earlier to determine whether a business that died was three or fewer years old (young death) or more than three years old (old death). Because classifying deaths as young or old requires looking back as much as three years, the sample period begins in 1995 rather than 1992. And this sample is also used for calculations over shorter intervals (one year and two years). The calculations in the last column were based on data from 1997-2002 instead of 1995-2002 as for the first three columns, because in using the five-year cutoff, we have to discard the data from the first five years (1992-1996).

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