Business Location Decisions and Employment Dynamics in California

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Summary

Over the past 15 years, it has been argued that California's hostile business environment has caused businesses to leave the state, taking valuable jobs with them. Critics of various policies affecting the state's businesses have pointed to these claims in their arguments for more business-friendly policies and legislation. In the economic downturn that followed the dotcom bust early in this decade, these claims about California's poor business climate flared again and did so also during the 2003 gubernatorial recall election. After his election, Governor Arnold Schwarzenegger aggressively—if symbolically—tried to lure businesses to California through a campaign that included placing billboards in other states touting California as a place to do business. He also showed up at events with a truck whose signage read "Arnold's Moving Company" that was available to help out-of-state businesses move to California.[1]

Until recently, however, little was known about trends in interstate business relocation, the effect of this relocation on employment change in California, or the usefulness of relocation as an indicator of economic performance. Neumark, Zhang, and Wall (2005) found that, contrary to popular claims, job losses from interstate business relocation are negligible. Although California lost more jobs from relocation out of the state than it gained from relocation of businesses into the state, the average annual job loss equaled only 0.06 percent of employment, or 11,000 jobs out of today's economy of 18 million.[2] Compared with other sources of job creation and destruction, job relocation is very small: Out-migration accounts for 1.6 percent of overall job destruction, and in-migration accounts for 1 percent of overall job creation.[3] These findings do not resolve the question of

[1]See California Commission for Jobs and Economic Growth (2006). For additional details on efforts to attract businesses and on the business climate debate overall, see Neumark, Zhang, and Wall (2005, 2006).

[2]The California economy has grown over time. The actual annual net migration between 1992 and 2004 was a loss of 10,000 jobs from an economy that averaged 17 million jobs over the period.

[3]The numbers referenced here are updated from Neumark, Zhang, and Wall (2005) but have scarcely changed.

whether California's business climate is hostile or favorable, but they do establish that migration is too small to be a reliable basis for claims about the business climate or overall economic performance. The key implication is that any policy responses to concerns about the state's business climate should emphasize sources of job creation and destruction other than business relocation.

These findings about business relocation provided a clear answer regarding whether California was losing a significant number of jobs to other states. However, they were also the beginning, not the end, of the story about California's business location decisions and employment dynamics. Important as these findings were, state-level migration is by itself a blunt and narrow metric: State-level results are averages across all industries and across all regions in California, some of which might be more affected by migration. Thus it is possible that particular industries—notably those in which relocation to another state is more feasible in the first place—are suffering more from relocation. It is also possible that even if relocation on net is negligible, the state is losing high-paying jobs—for example, in manufacturing—because of relocation, and these are being replaced with low-paying jobs. And, finally, relocation—whether interstate or intrastate—may be more important in particular regions of the state.

In addition, the focus on interstate relocation captures only one dimension of business location decisions. Other business location decisions—such as businesses headquartered in California choosing to expand their operations outside the state—are not relocation in the strict sense of the definition but nonetheless may be important determinants of changes in employment and so might be useful indicators of economic performance and of California's business climate.

In this report, we analyze measures of business location decisions and their implications for employment dynamics that are finer—that is, more disaggregated—to illuminate the nature of interstate relocation. We also analyze broader measures, looking at important dimensions of location decisions other than the physical relocation of existing businesses. These yield potentially richer conclusions about California's economic performance and the business climate. They also point to important questions about whether firms are organizing themselves differently than they did in the past and why businesses move. We ask a number

of questions throughout the analysis, which are organized around three broader questions or themes:

1. Despite the modest effect of job migration on the state economy overall, does it have economic significance for particular industries or regions within the state?
2. Is such migration a useful indicator of the economic performance of an industry or a region?
3. What can dynamics other than interstate migration—such as business expansions into other states and migration within the state—reveal about the California economy and the economies of regions within the state?

As with previous research on relocation in California (Neumark, Zhang, and Wall, 2005), this report relies on the National Establishment Time-Series (NETS), a longitudinal file of the universe of business establishments. In particular, we rely on a subset of the NETS that includes establishments in California at any time between 1992 and 2004 and establishments elsewhere in the United States that belong to firms that had an establishment in California during that time period.

Interstate Migration by Industry

We first look at interstate relocation by industry. The statewide average effect of relocation on employment combines industries whose establishments exhibit little mobility (such as retail and health care) with "footloose" industries where relocation is a more viable strategy (such as information services). Industries also differ in their average pay. Although relocation has a small effect on employment in the aggregate, we consider whether relocation has a different effect on high-paying industries and whether, as some have claimed, California's job losses are more concentrated in high-paying industries. Finally, we consider whether relocation, although negligible in terms of net jobs lost, is nonetheless a useful indicator of the economic health of an industry—the "tip-of-the-iceberg" hypothesis. This line of analysis posits that migration, being more visible and better publicized than other sources of job creation and destruction, could be useful to policymakers as a proxy for the larger changes in establishment births, deaths, expansions, and contractions that account for

nearly all employment change. We ask whether the employment change from relocation at the industry level is correlated with industry employment growth—both in absolute terms and relative to industry growth in the rest of the United States.

The evidence indicates that job loss from interstate relocation is small across virtually all industries although more prevalent in finance and insurance. Some industries, such as manufacturing and information, are more footloose in the sense that relocation occurs more frequently. However, relocation in these footloose industries is often more common not only out of California but also into California, resulting in a small net effect.

Job loss from interstate relocation tends to occur in better-paying industries. Although this indicates that California is losing high-paying jobs to other states, this tendency does not translate into a substantial effect on the overall composition of jobs because the total number of jobs affected by relocation is still small.

Finally, relocations in a particular industry do not appear to support the tip-of-the-iceberg hypothesis. At the industry-sector level, industries losing relatively more jobs from relocation are not also losing more jobs for other reasons. This lack of correlation holds for the absolute level of industry employment growth in California as well as for industry employment growth in California relative to that in the rest of the United States.

The main findings about interstate migration by industry are reported in detail in Chapter 3:

1. Even in footloose industries, net job loss from relocation is very small, and in-migration largely offsets out-migration.
2. Job loss from relocation has tended to occur in high-paying industries, although such relocation has a negligible effect on the state's economy.
3. Interstate relocation does not appear to be an indicator of more substantial problems of job creation or destruction.

A Broader Perspective on Business Location Decisions

Next, we broaden our analysis to include other business location decisions and their implications for employment. The political and

popular debate over physical business relocation is overly narrow: The relocation of business activity and jobs can also occur through decisions about which establishments to expand or contract and where to create new establishments or close down existing ones. We examine trends in businesses headquartered in California that expand outside the state and, consistent with our theme of looking at job flows in both directions, at trends in businesses outside California expanding into the state. We describe evidence on changes in the location of businesses and jobs that are part of companies headquartered in California. Then we delve into some of the dynamics underlying these changes, looking explicitly at births and their contribution to employment growth. We contrast the behavior of firms headquartered inside and outside California and draw implications for overall employment in the state. Finally, we report some results for key industrial sectors and note how—and suggest why—trends differ across them.

The data reveal some trend toward more dispersion of firms' activities across states, with California firms employing more workers and opening more establishments out of state. However, this is offset by non-California firms doing the same within the state. Thus, the changes in firm behavior seem more likely to be a subnational reflection of some of the same forces spurring increased globalization—such as reductions in communications costs from improvements in information technology—than a reflection of the lack of attraction of California as a place to do business. This conclusion is reinforced by the timing of the changes in the geographic dispersion of the operations of California-headquartered companies. In particular, the large outward shift was concentrated during the height of the boom of the late 1990s, a period for which it would be simply implausible to argue that California was suffering from a bad business climate.

The main findings about company expansions are reported in detail in Chapter 4:

1. The share of employment in the state in establishments owned by California-headquartered firms has declined, with the decline concentrated during the economic boom of the late 1990s and some reversal since then.

2. The share of births of establishments of California-headquartered firms that took place outside California has increased, and the share in California has correspondingly declined. The peak of the share of births outside California occurred at the height of the economic boom of the late 1990s.
3. The shift of employment of California-headquartered companies to other states (via births and other processes) has been offset by increased employment in California by firms headquartered elsewhere. The consequence is that the outward employment shift of California-headquartered companies has not resulted in any long-term decline in California's share of national employment; in fact, this share dipped in the early to mid-1990s and has risen since then.
4. Looking at key industry sectors at both the high and low ends of the earnings distribution, there is no evidence of more adverse developments in high-paying industries. If anything, the trend is the opposite, with California's share of national employment rising in high-paying industries.

Local and Regional Migration

Finally, we turn to the analysis of areas within California, looking at 11 regions and at all 58 counties. We do so because there can be wide variation in the cost of real estate, the availability and cost of different types of labor, and local policies. As with individual industries, there could be regional differences in the contribution of relocation to employment growth. Moreover, despite the popular attention to interstate relocation, the overwhelming majority of businesses that do relocate do so within the state. These intrastate moves are a source of job creation and job destruction at the regional level, even though they do not affect aggregate employment at the state level.

We also look at the migration flows between pairs of regions and between pairs of counties. Of particular interest is whether moves between counties tend to be between adjacent counties or between more distant pairs; this question provides suggestive evidence on why businesses move. Also of interest are the types of counties that are net gainers and net losers of jobs, which could provide additional insight into business migration. We consider whether migration flows at the county level are correlated with

overall county employment changes, which could provide insight into the relationship between relocation and the business climate at the regional level.

The conclusions we reach on the regional questions parallel the industry-level conclusions in many ways. Some regions lost more jobs from interstate relocation than others; for example, the Bay Area—San Francisco and Marin Counties in particular—lost many more net jobs to other states than any other region. Still, interstate migration remains small in magnitude relative to births, deaths, expansions, and contractions, and most regions and counties have experienced almost no net job loss from interstate migration. Some counties have even gained.

Just as some industries are more footloose, some parts of the state experience more interstate relocation than others, in both directions. Interstate migration is primarily a phenomenon of the most urbanized, coastal regions. In the rest of the state, intrastate migration accounts for the majority of job flows into and out of regions, although these intrastate job flows are still small relative to the other employment dynamics. Moreover, among intrastate moves, short-distance moves are more common than long-distance moves, suggesting that businesses are moving more in search of cheaper real estate than in search of differently skilled or cheaper labor.

Overall, the findings from the regional analyses appear to reinforce earlier conclusions that a focus on relocation ignores far more important sources of job creation and destruction. However, one important difference is that relocation at the regional level *is* more indicative of broader trends in net job creation; although interstate and intrastate migration at the regional level is small in magnitude, it *is* a useful indicator of the overall health of a local economy. In contrast to what we find at the industry level, migration at the regional level may be informative about the local business climate—regions with substantial net out-migration should consider whether local policies are inimical to business or whether, perhaps, statewide policies are having adverse effects on the local business climate. It is critical to emphasize, however, that this conclusion does *not* imply that curbing out-migration or encouraging in-migration should be a priority for regional policy. Migration at the regional level still contributes relatively little to overall employment change, and a healthy local economy depends

much more on the creation of new businesses and the economic health and expansion of existing businesses.

The main findings about local and regional migration are reported in detail in Chapter 5:

1. Every region lost jobs as a result of interstate migration and this job loss was highest in the San Francisco Bay Area.
2. Intrastate migration contributes most to employment change in inland and less urbanized regions, and the Inland Empire (San Bernardino and Riverside Counties) is the largest beneficiary of moves within the state.
3. Intrastate migration is most common over short distances. The most common cross-county moves are between adjacent counties, from a more urban county to a less urban one.
4. At the county level, job migration—and especially intrastate job migration—is a useful measure of overall economic conditions.

The findings overall give no cause for concern about California's business climate. Although some businesses move or expand out of the state, others move or expand into the state. And although some industries and some regions in the state are not growing as fast as others, California's job growth has kept pace with that in the nation.

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Acronyms

BLS: Bureau of Labor Statistics

CES: Current Employment Statistics

CM: Census of Manufactures

CPS: Current Population Survey

D&B: Dun & Bradstreet

DMI: DUNS Marketing Information

DUNS: Data Universal Numbering System

ESP: Economic Strategy Panel

FIPS: Federal Information Processing Standard

GNP: gross national product

IPO: initial public offering

LBD: Longitudinal Business Database

LEHD: Longitudinal Employer-Household Dynamics

LRD: Longitudinal Research Database

NAICS: North American Industry Classification System

NETS: National Establishment Time-Series

QCEW: Quarterly Census of Employment and Wages

SCAG: Southern California Association of Governments

SIC: Standard Industrial Classification

UI: Unemployment Insurance

USEEM: U.S. Establishment and Enterprise Microdata

1. Introduction

For over a decade and a half, there has been a debate over whether California's business climate is deteriorating. It is often argued that businesses are leaving California and taking jobs with them because of the state's hostile business environment; business relocation has become the "poster child" for critics of policies affecting the state's businesses. Concerns about California's business climate accompanied both of the state's recent economic downturns. In response to the first, in the early 1990s, which was related to defense cutbacks, other states launched campaigns to attract California businesses, aggravating fears among the state's politicians and business leaders that jobs were fleeing California. In 1992, the Council on California Competitiveness, created by Governor Pete Wilson, issued a long report with recommendations for improving the business climate, focusing on reforms in workers' compensation, environmental regulations, and education. Then, in the post-dotcom downturn a decade later, concerns about the business climate were heard again from candidates in the 2003 recall election. After winning that election, Governor Arnold Schwarzenegger offered moving trucks to out-of-state business owners willing to move their operations to California. He was also featured on billboards in other states with the message "Arnold Says: 'California wants your business.'" A billboard battle ensued, with other states, such as Massachusetts and Nevada, buying their own billboard space and newspaper ads in California in an attempt to lure California businesses to cross the state line.[1]

A business lost to another state is often portrayed as a defeat for California, a victory for the business's new home, and an indicator of California's economic health. Because employment growth is a major goal of state economic policy, policymakers are rightly eager to have good indicators of California's economic performance, both in absolute terms and relative to that of other states. Until recently, however, little was known about trends in interstate business relocation, the real effect of this

[1] For additional details on efforts to attract businesses and on the business climate debate overall, see Neumark, Zhang, and Wall (2005, 2006).

relocation on employment change in California, and the usefulness of relocation as an indicator of economic performance.[2]

Contrary to popular claims, job losses from interstate business relocation are negligible. Although California lost more jobs from relocation out of the state than it gained from relocation of businesses into the state, the average annual job loss over the period 1992–2004 equaled only 0.06 percent of employment, or about 11,000 jobs out of nearly 18 million jobs in today's economy.[3] Compared with other sources of job creation and destruction, interstate relocation is very small: Out-migration accounts for 1.6 percent of overall job destruction, and in-migration accounts for 1.0 percent of overall job creation.[4] The vast majority of job creation is due to the expansion of existing establishments and the births of new ones, and the vast majority of job destruction is due to the contraction or deaths of existing establishments, as shown in Figure 1.1.

These findings establish that migration is too small in magnitude to account for noticeable changes in California's overall economic performance. The key implication is that policy responses to concerns over the business climate should emphasize sources of job creation and destruction other than those associated with business relocation.

Before the research of Neumark, Zhang, and Wall (2005) on business location decisions and employment dynamics in California, studies of intended and actual relocation focused on relocation in isolation, rather than in the context of other sources of job creation and destruction. Furthermore, other studies looked only at businesses leaving the state, not

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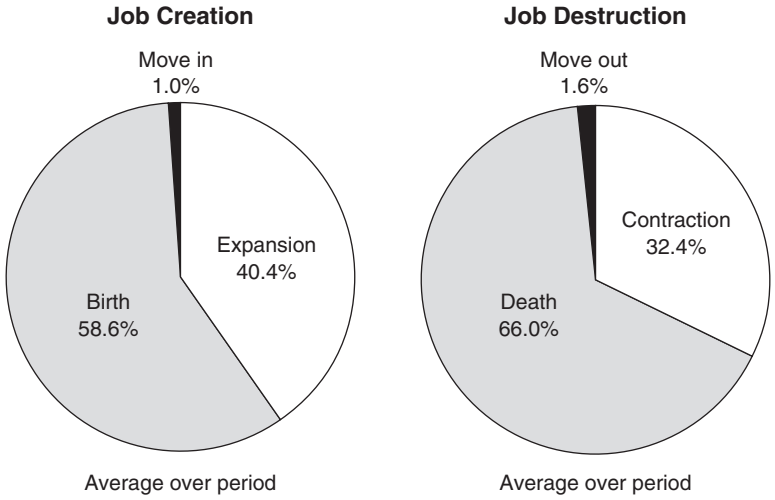
[2]There is very little existing research on the quantitative importance of business relocation in employment growth. The only research of which we are aware is by Allaman and Birch (1975), Allaman (1978), and Birch (1979). This research, which is based on early Dun & Bradstreet data, looks at the four Census regions and concludes that business relocation plays a minor role in employment change. However, in- and out-migration would be expected to play a larger role for more disaggregated regions (such as states). Regardless, given changes both in the economy and in data collection, there is clearly a need for updated evidence on this question, especially because recent policy debates (at least in California) place great emphasis on business relocation.

[3]The California economy has grown over time. The actual annual net migration between 1992 and 2004 was a loss of 10,000 jobs from an economy that averaged 17 million jobs over the period.

[4]These findings were first presented in Neumark, Zhang, and Wall (2005) and are updated here with two additional years of data.

Figure 1.1—Magnitudes of Sources of Job Creation and Destruction, 1992–2004



those arriving.[5] And considerable attention was focused on relocations of particular businesses. As a result, these past studies gave no indication of the consequences of relocation for the state's economy. Were they simply isolated—if high-profile—incidents that were part of the continual ebb and flow of businesses in a dynamic economy, or were they indicators of broader economic problems in the state?

Our approach to studying business relocation and its implications for California's economic health rectifies these significant shortcomings. The first contribution of our approach is the consideration of business relocation in both directions. Businesses do leave California, but other businesses enter, and the effect of migration on California's employment—and any implications for its business climate—depend on the net effect of both kinds of migration. The second is to consider business relocation as only one aspect of the continuing processes of job creation and job destruction. Job creation also includes job growth from expansions at existing establishments and from newly formed establishments (births). Job destruction includes not only jobs lost from business out-migration but also job loss from contractions at existing establishments and from

[5]See Bules & Associates (1992) and California Business Roundtable and Bain & Company (2004).

establishments that closed (deaths). The third contribution is the explicit consideration of how useful relocation is as an indicator of California's absolute or relative economic performance. If, for instance, a state or region offers productivity advantages for new businesses, then business formation could drive employment growth; this would hold true even if businesses, when they mature, move to locations with a lower cost of doing business. An area could have robust job growth that exceeds growth in other regions yet lose jobs to other regions because of the relocation of mature businesses.

The fact that California does not lose a significant number of jobs to other states is the beginning, not the end, of the story about California's business location decisions and employment dynamics. Important as these findings are, state-level migration figures are a blunt and narrow metric. They are blunt because state-level results are averages across all industries and across all regions in California, some of which might be more affected by migration. They are narrow because other location decisions—such as businesses headquartered in California choosing to expand their operations outside the state—are not relocation in the strict sense but nonetheless may be important determinants of changes in employment and might be useful indicators of economic performance and of California's business climate.

This report, therefore, looks at both finer and broader measures of business location decisions and their implications for employment dynamics. This approach yields richer conclusions about California's economic performance and the business climate. It also points to important questions about whether firms are organizing themselves differently than they did in the past and about why businesses move. Throughout this report, we look at business location decisions from several perspectives, but we return repeatedly to several themes:

1. Despite the modest effect of interstate migration on the overall state economy, does migration have economic significance for particular industries or regions within the state?
2. Is interstate migration a useful indicator of the economic performance of an industry or a region?
3. What can dynamics other than interstate migration—such as expansions into other states and migration within the state—reveal

about the California economy, and the economies of regions within the state?

This report relies on the National Establishment Time-Series (NETS), which is the best data source for studying business location decisions in the context of the broader processes of job creation and destruction. The NETS is a national, longitudinal file of the universe of business establishments created by Walls & Associates using establishment-level data from Dun & Bradstreet, a leading provider of business credit information and credit reports.[6] For this research, we use a subset that includes all establishments in California at any time between 1992 and 2004, as well as establishments elsewhere in the United States that belong to firms that had an establishment in California during that time period. With this database, we can track interstate and intrastate relocations, and we can also track the expansions of firms into and out of California. The NETS lacks information about establishments outside the United States, so it is not possible to track international relocations. In Chapter 2, we describe the NETS database and the measurement issues that are most pertinent to this report.[7] We also update some of the earlier findings on interstate business relocation.

We present our main findings in the chapters that follow. In Chapter 3, we look at interstate relocation at the industry level. The statewide average effect of relocation on employment includes industries whose establishments exhibit little mobility, such as retail and health care, and also industries where relocation is a more viable strategy, such as information services. Industries also differ in their average pay. Although relocation has a negligible effect on employment in aggregate, we consider whether

[6]An establishment is a location where a company does business, and the NETS gives the street address of each establishment, the number of employees in that location, and the firm to which the establishment belongs.

[7]The NETS is a new and—as yet—little-used data source, and an important component of our research has been extensive assessment of the quality of the NETS data. In particular, although no single data source has the same information as the NETS, we have tried to compare various subsets of information available in the NETS with other data sources, including comparing information in the NETS to other measures of employment levels and changes and establishment-level dynamics, linkages between establishments and parent firms, and newspaper accounts of relocation. The results of this assessment are presented in Appendix A.

relocation has a different effect on high-paying industries and whether, as some have claimed, California's job losses are more concentrated in high-paying industries. Finally, we consider whether relocation, although negligible in terms of net jobs lost, is nonetheless a useful indicator of the economic health of an industry—which we label the "tip-of-the-iceberg" hypothesis. This hypothesis is that migration, being more visible and better publicized than other sources of job creation and destruction, could be useful to policymakers as a proxy for the changes in establishment births, deaths, expansions, and contractions that are less visible to casual observers. We ask whether the employment change resulting from relocation at the industry level is correlated with industry employment growth—both in absolute terms and relative to industry growth in the rest of the United States.

Next, in Chapter 4, we broaden our analysis to include other business location decisions and their implications for employment. The political and popular debate over physical business relocation was overly narrow: Changes in the location of business activity and jobs can also occur through decisions made by firms about which of their establishments to expand or contract and where to create new establishments or close down existing ones. Chapter 4 looks at trends in businesses headquartered in California expanding outside the state and those outside California expanding into the state. We describe evidence on changes in the location of businesses and jobs owned by companies headquartered in California. We then delve more deeply into some of the dynamics underlying these changes, looking explicitly at births and their contribution to employment growth. Our strategy in Chapter 4 is to consider the timing of when firms headquartered in California expanded most outside the state, when firms headquartered outside California expanded most into the state, and when California's share of national employment rose and fell. We compare the timing of these trends to what would be implied by claims that a hostile business climate costs California jobs. Finally, as in Chapter 3, we report some results for key industrial sectors and note how and suggest why trends differ across them.

In Chapter 5, we turn to the analysis of regions within California. As in Chapter 3, where we disaggregated our state-level findings and focused on individual industries, here we disaggregate by looking at 11

regions within California as well as individual counties. Because there can be wide variation in the cost of real estate, the availability and cost of different types of labor, and local policies, we consider the possibility that there are regional differences in the contributions of relocation to employment growth. A second motivation for studying employment dynamics at the regional level is that—despite the political attention to interstate relocation—the overwhelming majority of businesses that relocate move within the state.[8] These intrastate moves are a source of job creation and job destruction at the regional level, even though they do not affect aggregate employment from the state's perspective. Thus, we assess the contributions of both interstate and intrastate migration to employment changes at the regional level. We then look at the migration flows between pairs of regions and between pairs of counties. Of particular interest is whether moves between counties tend to be between adjacent counties or more distant pairs. This can suggest why businesses move. Also of interest are the types of counties that are net gainers and net losers of jobs, which provide additional insight into business migration.

In Chapter 5, we revisit several themes mentioned earlier in the report. We consider the tip-of-the-iceberg hypothesis in the regional context by assessing whether migration flows at the county level are correlated with overall county employment changes. We also return to the original motivation: What, if anything, can relocation tell us about the business climate? Previous work (Neumark, Zhang, and Wall, 2005) found that interstate migration at the aggregate state level cannot support any claims about the California business climate, but here we raise the possibility that some regional migration patterns could reflect a challenging local business climate.

We view our results as informative about California's business climate and the business climates of particular regions in the state. The term "business climate" is vague and has been defined in many ways, as

[8]Out of 255,838 cases of establishment relocation originating in California during 1993–2002, 246,283 (96.3%) were moves within California. In fact, 35.4 percent of all the moves originating in California occurred within a city and 78.5 percent of the moves did not go beyond the county boundary. This analysis was first presented in a previous report and used an earlier version of the NETS that included data through 2002 (Neumark, Zhang, and Wall, 2005).

described in the "Defining the Business Climate" text box. Many current business climate indicators or rankings focus on external conditions that may affect economic growth, such as crime rates, taxes and regulations, worker skills, and so on. Our view, however, is that it is more meaningful to consider key outcomes—such as employment growth—as indicators of the business climate. A couple of the existing indicators also combine information on economic outputs. But even then, their focus is limited, such as tallying the openings of new manufacturing plants. Our approach is broader because we study all the determinants of employment growth, including those that contribute to job creation (births, expansions, and in-migration) as well as those that contribute to job destruction (deaths, contractions, and out-migration).

We do not claim that the evidence on these job creation and destruction processes tells us everything we need to know about the business climate. Clearly, for example, policymakers care about the wage levels and other characteristics of the jobs being created and destroyed. We address these issues to some extent, but our ability to document changes and trends in job characteristics and outcomes other than employment change is more limited. In future work, we plan to study some of the key factors identified as contributing to the business climate and how they affect economic performance along a variety of dimensions at both the state and regional levels.

Defining the Business Climate

The term "business climate" describes how conducive a country, state, region, or city is to economic growth. Assessments of the business climate typically rank multiple areas using a combination of measures. The methods usually fall into one of three categories. The first type takes a narrower view, focusing on such policy measures as taxes and regulation that are predicted to affect business location decisions and economic growth. For example, the Tax Foundation and the Cato Institute both publish state rankings that focus strictly on fiscal policy measures.[1] The second category takes a broader view of the business climate to include factors that are predicted to affect economic growth, even if they are not policy-determined—such as worker skill levels, real estate prices, and the availability of infrastructure. The Beacon Hill Institute, for instance, includes such indicators as crime rates, academic research and development spending, and air quality, along with tax indicators.[2] The third type focuses on outcomes, such as new business location or recent economic growth, rather than on predictors of economic growth. *Site Selection* magazine, for example, ranks states annually based in part on where new plants open, supplemented by a survey of corporate site-selection professionals.[3] Some assessments combine predictors of both economic growth and outcomes: "The 2007 State New Economy Index," published by the Information Technology and Innovation Foundation, includes such predictors as workforce skills and telecom infrastructure with such outcomes as initial public offerings (IPOs) and the presence of fast-growing firms.[4]

This report does not attempt to assess what factors help predict economic growth and would constitute the best definition of "business climate"; it therefore does not claim to assess how California's business climate ranks. Instead, it examines outcomes—including job relocation, company expansions, and overall economic growth—that are frequently cited in the public debate about the business climate. Assessing what factors contribute to the business climate and therefore predict economic growth is central to PPIC's future research agenda.

[1] See Dubay and Atkins (2006) and Slivinski (2006).

[2] See Beacon Hill Institute (2006).

[3] See Arend (2006).

[4] See Atkinson and Correa (2007).

2. The National Establishment Time-Series Database

Our study relies on data from the National Establishment Time-Series (NETS), covering all business establishments that were in California at any time between 1992 and 2004. A "business establishment" or simply "establishment" is defined as 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.[1] The NETS is a long-term project of Walls & Associates, in conjunction with Dun & Bradstreet (D&B), a leading provider of business credit information and credit reports.

We currently have access to a version of this dataset that covers all business establishments in California at any time between 1989 and 2004; it also covers their respective parent headquarters (regardless of location), as well as establishments elsewhere in the United States that belong to firms that had an establishment in California during that time period. The D&B data on which the NETS is based are intended to cover the universe of business establishments. However, D&B's coverage increased sharply when it started to use telephone book Yellow Pages to identify business units in 1992, and we therefore decided to exclude the 1989–1991 data.

In this chapter, we briefly describe the construction of the NETS and some of its strengths relative to other datasets. We then discuss in some detail how the NETS measures the key phenomena we study in this report. Appendix A presents detailed findings from our assessments of the quality of the NETS data.

Construction of the NETS

The construction of the NETS database used in this report begins with D&B's annual cross-sectional files of the full Data Universal Numbering

[1]Many companies own or control more than one establishment, and those establishments may be in different geographic areas and may be engaged in different industries. We sometimes refer to an establishment as a "business," reserving the word "firm" to refer to what may be collections of many establishments.

System (DUNS) Marketing Information (DMI) file for each year. The primary purpose of D&B's data collection effort is to provide information on businesses to the business community to enhance their decisionmaking by constructing a set of indicators of creditworthiness.[2] The DMI file for each year is constructed from an ongoing effort to capture each business establishment in the United States in each year (including nonprofits and the public sector). The DMI file is based on a multilayered process incorporating many data sources.

D&B strives to identify all business establishments and to assemble information on them by contacting them each year, through a massive data collection effort, including making over 100 million telephone calls from four calling centers. In addition, it collects information from court filings, newspapers and electronic news services, public utilities, the secretaries of state of each of the 50 states, government registries and licensing data, payment and collections information, company filings and news reports, and the U.S. Postal Service.[3] For every establishment identified, D&B assigns a DUNS number as a way to track the establishment. Since around 1990, the DUNS number has become the standard way to track businesses and has been adopted by many government agencies in the United States and internationally.[4]

Although the goal of D&B is not to collect and organize data for scholarly research, it does have an incentive to ensure the accuracy of its current data files because inaccuracies would hurt its business. D&B has established a sophisticated quality control system and engages in extensive quality and consistency checks.[5] Thus, the data in each cross-section should provide high-quality "snapshots" of business establishments (Birch, 1987; Audretsch, 1995).

Walls & Associates' collaboration with D&B has a very different purpose—namely, to provide a dynamic view of the U.S. economy using

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[2]However, we have also learned through interactions with members of the business community that the D&B data are very useful in sales marketing, as they identify concentrations of workers in particular industries.

[3]See mddi.dnb.com/mddi/story.aspx (viewed April 28, 2005).

[4]See, for example, www.dnb.co.in/whoduns.htm (viewed May 11, 2005).

[5]See www.dnb.com/us/about/db_database/dnbinfoquality.html (viewed April 28, 2005).

data from the D&B archives (Walls & Associates, 2003). Essentially, this requires linking the D&B cross-sections into a longitudinal file that tracks every establishment from its birth, through any physical moves it may make, capturing any changes of ownership, and recording the establishment's death if it occurs. This is a multistage process, the most important step of which includes merging the data files, imputing data when data are not reported, eliminating duplicate records, identifying establishment relocations, and merging records on establishments for which the DUNS number changes yet which appears to cover the same establishment (which happens occasionally).

One highly desirable feature of the NETS database is that it covers essentially all establishments. This reflects the fact that it is designed to capture the universe rather than a sample of establishments. Over the sample period, the database includes information each year on an average of 1.6 million establishments in California that provide on average about 17 million jobs.[6]

The NETS database includes the following variables that are of particular importance to this research:

- current business name,
- industry (we use North American Industry Classification System (NAICS) industry codes),[7]
- establishment location (zip codes, including the four-digit extension, as well as street address),

[6]Technically speaking, the NETS measures the number of jobs rather than the number of employed people, because an individual working at two establishments would be counted twice. For those who have at least one wage or salary job (that is, they are not solely self-employed), data from the Bureau of Labor Statistics (BLS) indicate that in California in 2002, toward the end of the period covered by our data, the share of employees with multiple jobs (whether or not self-employed) was 4.5 percent (Campbell, 2003). This share is very stable across the different years.

[7]D&B has always used the Standard Industrial Classification (SIC) codes to classify industries and, thus, for every establishment, the NETS database includes a SIC code (up to the eight-digit level) in each year. Given that the NAICS has increasingly been adopted to replace the SIC codes and that the NAICS codes reflect more precisely the contemporary nature of the U.S. economy, Walls & Associates provides a NAICS-SIC "crosswalk" that allows researchers to classify industries using the NAICS codes. Our analysis in this study uses the NAICS codes.

- Federal Information Processing Standard (FIPS) county codes in each year,
- type of location (single location, headquarters, branch) in each year,
- employment in each year, and
- if the establishment has ever moved, the year of movement, origin zip code, origin city, origin state, destination zip code, destination city, and destination state.

The NETS does not, however, include any employee data, such as pay or occupation, other than the number of employees.

Advantages of the NETS

The NETS is not the first dataset researchers have used to study business establishment and employment dynamics, nor is ours the first project to attempt to study this topic using data from D&B. However, other data sources have important limitations when it comes to studying employment dynamics.[8] In particular, the NETS has two key features that make it the most useful for this research. First, it allows us to capture all sources of employment change. For any economy—whether national, statewide, or regional—employment change comes from one of six possible sources, based on the following decomposition of employment change:

$$\begin{aligned} &\textit{Employment change} = \\ &\textit{(job creation at expanding establishments} - \textit{job destruction at contracting establishments)} \\ &+ \textit{(jobs created at new establishments} - \textit{jobs destroyed at establishments that closed)} \\ &+ \textit{(jobs at establishments that moved in} - \textit{jobs at establishments that moved out)} \end{aligned} \tag{2.1}$$

Other data sources that have been used to study employment dynamics typically do not capture business relocation or do so in a problematic and probably incomplete fashion (Neumark, Zhang, and Wall, 2007). Thus, in general, a data source such as the NETS is needed to fully decompose the

[8]Alternative data sources used to study business establishment and employment dynamics include the U.S. Establishment and Enterprise Microdata (USEEM), created

sources of employment change. And since a central focus of our research is business relocation, the NETS data are particularly useful.

Moreover, access to alternative data sources collected by federal and state government agencies that can be used to study some features of business establishment and employment dynamics is highly restricted because of confidentiality reasons and requires a long and complex process of application and approval. As a practical matter, this has deterred many researchers from using these alternative datasets and has clearly made it difficult to do research in a timely manner. Moreover, because of confidentiality, researchers working with these data sources are restricted in the geographic detail to which they can disaggregate when describing results. Typically, they cannot do any analysis at the substate level, nor can they do any research that involves identifying particular companies. With the NETS data, none of these problems arise. The data are accessible, and no confidentiality restrictions are imposed on users. This is particularly useful for the present research. As explained in the Introduction, part of our analysis in this report focuses on regions and counties within California. In addition, part of our analysis focuses on the behavior of firms with respect to opening or closing establishments in California and other states. In such an analysis, it is sometimes useful to be able to identify specific companies, most notably with respect to our assessment of the data quality on links between establishments of the same firms, described below.

Measurement Issues

As indicated by the decomposition in Eq. (2.1), aside from measuring employment at each existing establishment, using the NETS to understand business establishment and employment dynamics requires accurate measurement of births and deaths of establishments and of relocations of businesses. A central question, therefore, is how D&B distinguishes

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by the U.S. Small Business Administration; the Census of Manufactures (CM), the Longitudinal Research Database (LRD), the Longitudinal Business Database (LBD), and the Longitudinal Employer-Household Dynamics (LEHD) data, all based at the Census Bureau; and Unemployment Insurance (UI) data, which are collected and administered by each state. Neumark, Zhang, and Wall (2007) discuss some of the research using these data and their disadvantages with respect to research on these dynamics.

whether an establishment at a new location previously existed elsewhere—and hence will be identified as a relocation in the longitudinal file—or instead is a new establishment. Similarly, it is critical to distinguish between relocation of an establishment from an area and the death of an establishment.

The DUNS number is critical to this system, because it lets D&B attach information on credit histories, which is what its clients value. DUNS numbers are unique and are never recycled. If an establishment closes, its DUNS number goes into an "out of business or inactive" file, where it remains permanently unless that establishment reopens. When D&B updates establishment information, it attempts to contact the establishment using the previous location information. Those that move frequently leave a forwarding address or telephone number or have an email contact that allows D&B to identify the new location. (In addition, business establishments sometimes notify D&B of their move.) Any establishment that cannot be contacted at the previous year's address or telephone number goes into the out-of-business or inactive file, and before any new establishment can be given a DUNS number, it must be checked against this file; if there are indications of a match, a follow-up investigation is undertaken. For example, if an establishment belonging to a multiunit firm cannot be found, D&B contacts the headquarters to determine whether a relocation has occurred. Whenever 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 such procedures, the longitudinal file should, in principle, correctly identify relocations of establishments and distinguish them from births of new establishments (and deaths of others). However, one cannot rule out the possibility of occasional errors, for example of a move being classified as a death in one location and a birth in another, which would lead to an undercount of relocating establishments.

An establishment relocation in the NETS data is identified by street address and zip code changes from one year to another. Establishments that moved out of California and establishments that moved into California are both included in the database, so we are able to track cross-state

relocation. Of course, we can also track intrastate relocation. However, this form of relocation—which might best be thought of as "physical relocation"—is only one possible dimension of changes in the location of economic activity. For example, a firm can also change the location of economic activity by expanding employment at one establishment and reducing it at another or by opening establishments in some locations and perhaps closing them in others; still other combinations of these activities are possible. Whereas Neumark, Zhang, and Wall (2005) focused on physical relocation, in this report we expand the nature of location decisions that we consider to include all these possibilities.

Finally, it is important to emphasize that firms also decide which countries to do business in and can relocate internationally, but because the NETS database covers U.S. establishments only, our perspective is limited to domestic location decisions only. Our data and research do not address the relocation of economic activity from California or the rest of the United States to other countries (which appear in the NETS as deaths) or movements in the opposite direction (which appear in the NETS as births). To the extent that arguments about California's business climate pertain to differences between California and other states, the NETS captures the right kinds of relocation of economic activity. On the other hand, many of the concerns raised about California's business climate and the migration of firms out of California have their national parallels. For example, McKinsey Global Institute (2005) finds that the United States is at a disadvantage for firms seeking to reduce wage costs but is more appealing for firms looking for a better "business environment."

The second central measurement issue is the linking together of establishments that are part of multiunit firms. This is accomplished in the NETS via the inclusion on each establishment record of the DUNS number of the headquarters to which an establishment reports (which is the establishment's own DUNS number in the case of single-establishment firms).

Improvements and Updates

One important issue that arises in using the NETS data is that the longitudinal data on businesses can be revised over time. The NETS is constructed from cross-section "snapshots" of the U.S. economy. Although

D&B focuses only on the accuracy of the latest cross-sectional data, the goal of the NETS is longitudinal accuracy. Therefore, when the newest cross-sectional snapshot is added, the NETS does not simply add one more year to the database; the new cross-sectional data are also used to update some of the imputations in previous years—for example, backfilling missing information or changing data now reported differently.[9] For example, an establishment might be specified as dead in 2002 because D&B could not find it in that year but be found later and included in the D&B data in 2003. In this case, Walls & Associates, in constructing the NETS, have to adjust the 2002 data when the 2003 data are provided. As another example, an establishment might be founded in 2002 but not be captured by the D&B data until 2003. If the 2003 D&B data clearly indicate the self-reported start date of this new establishment as 2002, Walls & Associates would impute the missing information for the establishment for 2002.

In addition, D&B sometimes changes measurement methods to enhance data quality, creating additional complications. One change pertinent to the earlier research in Neumark, Zhang, and Wall (2005) is D&B's recent switch to a new vendor and a different algorithm for detecting address changes. As a result, the D&B data for 2003 and 2004 indicate a significantly higher number of relocations both inside California and between California and other states. However, these newly detected relocations did not in fact all occur in this period. Rather, some moves occurred in previous years but were not identified until the new algorithm was used in 2003. D&B is not so much concerned with accurately dating relocations as with getting the current location right. To improve the accuracy of the longitudinal data, Walls & Associates checked the data for the previous four years (1999–2002) and, where possible, reassigned the date of relocation, smoothing the artificial spike of relocations in 2003 over five years, according to their best estimate of the actual date of move. However, it is still likely that some moves that occurred before 1999 are

[9]This process of data revision is common to almost all economic measurement, including, for example, gross national product (GNP) growth, productivity, employment, and price inflation.

mistakenly assigned to 2003 or 2004 only because those were the years they were detected.[10]

Because of this important development, it is useful to update some of the previous analysis (in Neumark, Zhang, and Wall, 2005) using the most recent data, as a prelude to the new material we present in this report. In Table 2.1, we calculate the net loss of establishments and jobs from interstate business relocation for each year during 1992–2004. In Table 2.2, we decompose annual employment change in California into its six sources, three of which contribute to job creation and the other three to job destruction. In both cases, we present the results using both the previous and the current versions of the NETS data (labeled as "2003 Data" and "2005 Data," respectively), highlighting the changes in the results that stem from the updating of the database.

In every year during the 1992–2004 sample period, as shown in Table 2.1, some establishments left California, taking jobs away. At the same time, others moved into California, bringing jobs to the state. Measured by either the number of business establishments or the number of jobs, California experienced a net loss owing to business relocation in every year. The latest version of the NETS data still supports the two conclusions from the earlier research on relocation (Neumark, Zhang, and Wall, 2005), which used the old data. First, California never experienced a net gain through business relocation in any of the years covered by the NETS data. Second, relative to the size of its overall economy, California's net loss from relocation is negligible.

As noted above, a recent switch of D&B to a new algorithm for detecting moves resulted in a spike of moves at the end of the sample period, and Walls & Associates were able to date some of these moves to preceding years. This change explains why the latest version of the data shows a noticeable jump in job loss from relocation (in terms of both establishments and jobs) in later years of the sample period. It is important to emphasize that a good share of the recent measured increase in relocation does not reflect an actual change in behavior but instead simply a change in measurement; future data will better clarify the relative roles of changes in behavior and changes in measurement. Even so, despite the higher

[10]Personal communication with Donald Walls (January–February, 2006).

Table 2.1

Business Relocation and Its Effect on Employment in California, 1992–2004

	Net Change from Relocation		Total Number in California		Net Change as a Percentage of Total	
Year	2003 Data	2005 Data	2003 Data	2005 Data	2003 Data	2005 Data
			Number of Establishments			
1992–1993	–752	–734	1,503,787	1,404,050	–0.050	–0.052
1993–1994	–751	–752	1,532,256	1,436,658	–0.049	–0.052
1994–1995	–585	–586	1,515,142	1,449,573	–0.039	–0.040
1995–1996	–346	–355	1,497,623	1,465,425	–0.023	–0.024
1996–1997	–259	–263	1,521,247	1,530,400	–0.017	–0.017
1997–1998	–131	–145	1,518,940	1,544,088	–0.009	–0.009
1998–1999	–87	–108	1,492,105	1,530,797	–0.006	–0.007
1999–2000	–26	–58	1,461,135	1,507,495	–0.002	–0.004
2000–2001	–280	–484	1,519,325	1,576,675	–0.018	–0.031
2001–2002	–268	–441	1,644,230	1,722,596	–0.016	–0.026
2002–2003	—	–564	—	1,874,504	—	–0.030
2003–2004	—	–1,373	—	1,898,288	—	–0.072

Table 2.1—Cont'd

Year	Net Change from Relocation		Total Number in California		Net Change as a Percentage of Total	
	2003 Data	2005 Data	2003 Data	2005 Data	2003 Data	2005 Data
			Number of Jobs			
1992–1993	–13,241	–13,170	16,394,151	15,860,148	–0.081	–0.083
1993–1994	–16,475	–16,453	16,266,713	15,758,506	–0.101	–0.104
1994–1995	–14,088	–13,861	16,371,012	15,991,397	–0.086	–0.087
1995–1996	–5,194	–5,274	16,241,156	15,991,769	–0.032	–0.033
1996–1997	–17,136	–17,119	16,314,659	16,199,629	–0.105	–0.106
1997–1998	–1,611	–1,676	16,546,553	16,499,657	–0.010	–0.010
1998–1999	–4,544	–4,637	16,512,479	16,595,180	–0.028	–0.028
1999–2000	–1,405	–1,323	16,864,781	16,999,560	–0.008	–0.008
2000–2001	–5,330	–5,936	17,666,262	17,876,073	–0.030	–0.033
2001–2002	–3,895	–5,702	18,149,748	18,458,906	–0.021	–0.031
2002–2003	—	–10,448	—	17,728,987	—	–0.059
2003–2004	—	–23,194	—	17,333,179	—	–0.134

Table 2.2

Decomposition of Employment Growth in California, 1992–2004

	Data Year	1992–1993	1993–1994	1994–1995	1995–1996	1996–1997	1997–1998
				Employment			
Starting	2003	16,394,151	16,266,713	16,371,012	16,241,156	16,314,659	16,546,553
	2005	15,860,148	15,758,506	15,991,397	15,991,769	16,199,629	16,499,657
Ending	2003	16,266,713	16,371,012	16,241,156	16,314,659	16,546,553	16,512,479
	2005	15,758,506	15,991,397	15,991,769	16,199,629	16,499,657	16,595,180
				Job Creation			
Expansion	2003	552,169	409,869	490,154	615,115	727,776	765,594
	2005	549,585	408,827	481,192	610,120	725,871	770,557
Birth	2003	758,129	1,177,830	879,613	1,130,026	910,897	722,829
	2005	757,902	1,168,361	884,688	1,141,606	914,775	755,451
In-Migration	2003	13,853	8,977	14,136	13,158	11,073	15,098
	2005	13,759	8,888	14,124	13,143	11,118	15,174
				Job Destruction			
Contraction	2003	549,183	392,837	459,987	427,049	445,563	432,373
	2005	546,217	392,185	454,337	429,748	448,746	435,223
Death	2003	875,312	1,074,088	1,025,548	1,239,395	944,080	1,088,513
	2005	849,742	935,659	897,310	1,108,844	874,753	993,586
Out-Migration	2003	27,094	25,452	28,224	18,352	28,209	16,709
	2005	26,929	25,341	27,985	18,417	28,237	16,850

Table 2.2—Cont'd

	Data Year	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004
				Employment			
Starting	2003	16,512,479	16,864,781	17,666,262	18,149,748	—	—
	2005	16,595,180	16,999,560	17,876,073	18,458,906	17,728,987	17,333,179
Ending	2003	16,864,781	17,666,262	18,149,748	17,527,918	—	—
	2005	16,999,560	17,876,073	18,458,906	17,728,987	17,333,179	16,441,979
				Job Creation			
Expansion	2003	791,062	791,737	860,131	722,563	—	—
	2005	790,120	781,874	846,327	662,790	668,453	691,066
Birth	2003	900,418	1,310,054	1,598,235	840,498	—	—
	2005	928,813	1,363,153	1,616,818	954,737	742,276	641,500
In-Migration	2003	18,893	15,589	18,586	12,656	—	—
	2005	19,064	16,625	21,204	16,630	21,355	16,432
				Job Destruction			
Contraction	2003	421,381	366,855	729,255	907,453	—	—
	2005	424,656	372,210	721,893	904,721	533,787	708,785
Death	2003	913,253	932,050	1,240,295	1,273,543	—	—
	2005	885,260	894,981	1,152,483	1,437,023	1,262,302	1,491,787
Out-Migration	2003	23,437	16,994	23,916	16,551	—	—
	2005	23,701	17,948	27,140	22,332	31,803	39,626

relocation numbers in the last years in the new data, the losses in these years are only marginally higher, on a percentage basis, than the worst years earlier in the sample period. For example, in 1993–1994, California lost 0.052 percent of establishments to other states, compared with 0.072 in 2003–2004. In terms of job loss, the corresponding numbers are 0.104 in 1993–1994 and 0.134 in 2003–2004. To put this in perspective, given that California employment can grow as much as 10 percent in three years (e.g., the expansion from December 1997 to December 2000), or decline by 4 percent in three years (e.g., from July 1990 to May 1993), these losses from relocation do not play much of a role in overall state employment change.[11] At the same time, the uptick in job loss from relocation in the last two years covered by the NETS data merits continuing attention in the near future to try to determine whether, in fact, it indicates a rising trend or is instead an artificial blip driven by the change in D&B's methods for detecting establishment moves.

Table 2.2 presents decompositions of annual employment changes during 1992–2004. The results based on the latest version of the NETS data are qualitatively similar to those based on the previous version of the data. Consistent with the results in Table 2.1, out-migration always outweighed in-migration and thus establishment relocation always had a negative effect on employment change in California. The important information provided by Table 2.2 is the comparison of the contribution of relocation to employment change with the contributions of other sources. Table 2.2 shows, for example, that in the most recent year for which data are available, job creation from expansion of existing establishments was 42 times larger than job creation from in-migration, and job creation from births was 39 times larger than in-migration. In a similar vein, job destruction from contractions was 18 times larger than job destruction from out-migration, whereas job destruction from deaths of establishments was 38 times larger. The same qualitative conclusion holds for other years. In other words, employment changes in California are primarily driven by the processes of establishment expansion, contraction, birth, and death, rather than by relocation.

[11] California's historical employment data by month are available at www.calmis.ca.gov/file/lfhist/cal$shlf.xls (viewed May 23, 2006).

In sum, the latest version of the NETS data, with two more years of data added to the panel, still shows that interstate business relocation has only a negligible effect on California's total employment. Although the update of the data leads to higher estimates of the net loss from relocation, and even if one (erroneously) treats all this measured increase as real relative to the earlier period, the qualitative conclusions about the overall importance of interstate business relocation do not change. Given that the California economy entered a recession in 2001 and that the debate over the state's business climate intensified during the two following years, there has been a considerable amount of interest in the trend of relocation in this period. The latest, updated data do show an increase in job loss as a result of interstate relocation during 2002–2003 and 2003–2004. However, D&B's changes in measurement of relocation have unfortunately made it impossible to identify exactly how much of this increase reflects reality. Regardless, even in this most recent period, measured relocation does not loom large.

3. Interstate Business Relocation by Industry

In this chapter, we look at interstate relocation at the industry level, for several reasons. First, it is generally expected that business establishments in some industries are more mobile than in others industries. Businesses that produce or sell goods or services that can be transported, such as computers or financial information, may find it much easier to relocate than businesses that produce or sell goods or services that are consumed in-person, such as hamburgers or biopsies. Indeed, based on a survey of corporate executives, a recent study by the California Business Roundtable and Bain & Company (2004) emphasized that California's high-value mobile jobs are most likely to move to other states. If this is the case, then the negligible importance of business relocation at the aggregate level might understate the significance of relocation for certain industries because we are averaging over industries where relocation is a viable strategy—that is, industries that are footloose—and industries where it is not. Thus, it is important to explore how common interstate relocation is in the more mobile industries.

Second, a finding that relocation is negligible says nothing about the quality of the jobs affected by that relocation. Looking simply at the amount of relocation is potentially inadequate because if the jobs created by in-migration differ from the jobs lost from out-migration, relocation could change the mix of jobs; if, on net, relocation costs more high-quality jobs, then a simple focus on the number of jobs affected by relocation may understate the problem. We focus on one particular dimension of job quality—variation in pay—asking whether relocation tends to cost California high-paying jobs. Pay is not the only dimension of job quality. Others include employment security, benefits, job safety, satisfaction, status, and working conditions. However, pay has the advantage that it is measurable, is clearly important to workers, and is also of great interest to state policymakers because it directly influences the tax base

as well as the average economic well-being of workers.[1] Pay differs across occupations, skills, industries, and many other dimensions. Here, we focus on differences by industry, because the NETS data offer detailed industry classifications of business establishments. Average earnings in industries in California differ considerably. In 2004, average annual pay was about $80,000 in finance and insurance and $57,000 in manufacturing. In retail, average pay was only $29,000.[2] Thus, if a manufacturing job leaves the state and a retail job comes to the state, we might not want to view these as offsetting because, on average, a high-paying job has been "replaced" by a low-paying job.

Third, we motivated the analysis of relocation in part based on attention to the issue by the media, business leaders, and policymakers. Although we have shown that relocation is a minor contributor to job change, it is possible that relocation is important and receives a good deal of attention not because it constitutes a large flow of jobs but because it can reveal the tip of an iceberg. That is, there could be a problem with the general health of a particular industry in California, but business relocation in the industry gets the most attention because it is most easily observed by the media and others or is a salient indicator that an industry faces economic difficulties. To assess this hypothesis, we study whether changes in each of the sources of net job growth by industry—expansions minus contractions, births minus deaths, and relocations—move in the same direction, so that the changes in relocation reflect what is happening with the other sources.

Our main findings in this chapter are:

1. Even among footloose industries, net job loss from relocation is very small, and in-migration largely offsets out-migration.

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[1]We have to be a little cautious in assuming that a greater share of high-paying jobs is "better" for workers. A greater share of high-paying jobs implies higher average earnings for workers. But it may imply less demand for low-skilled workers, resulting in a combination of lower wages and lower employment opportunities for those with low skills.

[2]Annual pay data come from the Quarterly Census of Employment and Wages (QCEW). This difference in annual pay is driven in part by wage differences across industries for workers of similar skills and in part by differences in the skill composition of each industry's workforce (see, for example, Krueger and Summers, 1988). Given that the earnings figures do not adjust for hours, it may also reflect differences between full-time and part-time work.

2. Job loss from relocation has tended to occur in high-paying industries, although such relocation has a negligible effect on the state's economy.
3. Interstate relocation does not appear to be an indicator of more substantial problems of job creation and destruction.

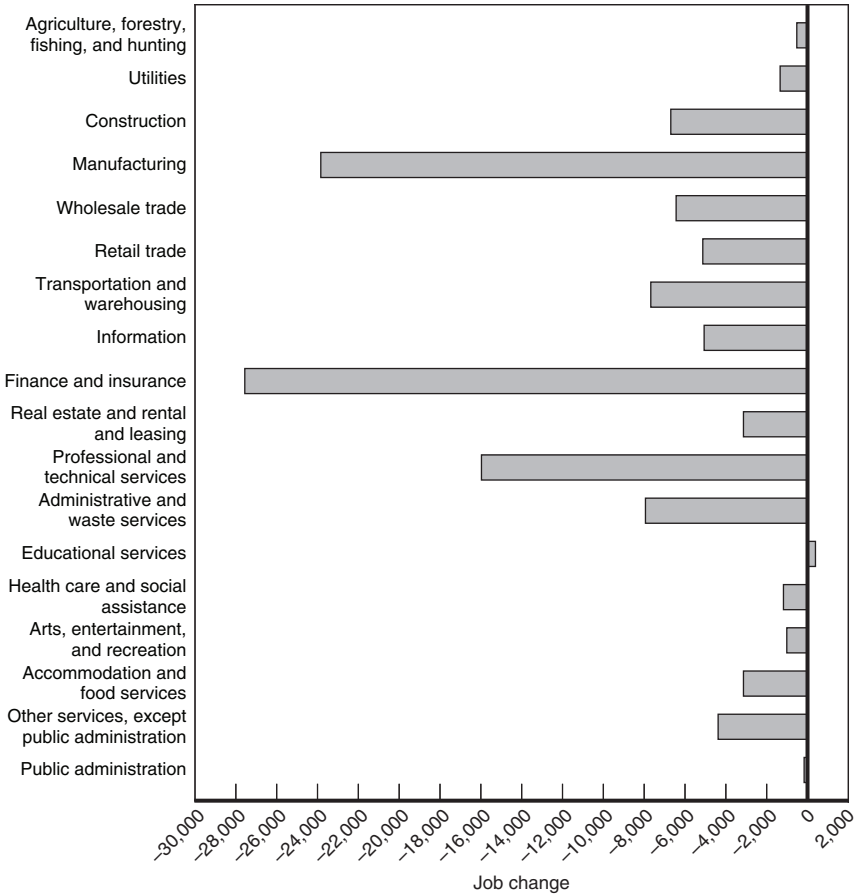
Is There Considerable Job Loss from Interstate Relocation in Footloose Industries?

We first look at differences in job loss from relocation by industry, asking whether it is more significant in industries for which it is easier (less costly) to move operations. The small overall job loss from interstate relocation results from averaging the employment dynamics of many large industries in which businesses are unlikely to relocate, particularly in such industries as education, retail, or health care where businesses need to be where their customers are. Looking at industries individually reveals whether the economy-wide average is masking larger job losses from interstate relocation in industries in which businesses can more easily move operations.

Our analysis indicates that the net job loss from interstate relocation is very small, even in footloose industries. Figures 3.1 and 3.2 (and Table 3.1, which includes the data in the figures) report the first set of results on business establishment dynamics and employment change by industry. We focus on broad industry sectors in this table, although we report results from analysis at the industry subsector level below. For each industry, Figure 3.1 shows the net job loss from out-migration from California. Figure 3.2 reports the same figures on a percentage basis, relative to 1992 employment.[3] We measure employment changes based on one-year intervals.[4] Overall, California lost 118,802 jobs during 1992–2004 from

[3]We convert the cumulative changes to annualized measures by applying the formula for annual compound growth. Thus, the annualized employment growth rate for all industries of 0.30 percent (Table 3.1, column 6, first row) corresponds to a cumulative growth rate of 3.7 percent over the 12-year period 1992–2004 (= 580,193/15,853,136). This cumulative growth rate is slightly larger than one gets by multiplying 0.30 percent by 12, although that multiplication does yield a close approximation.

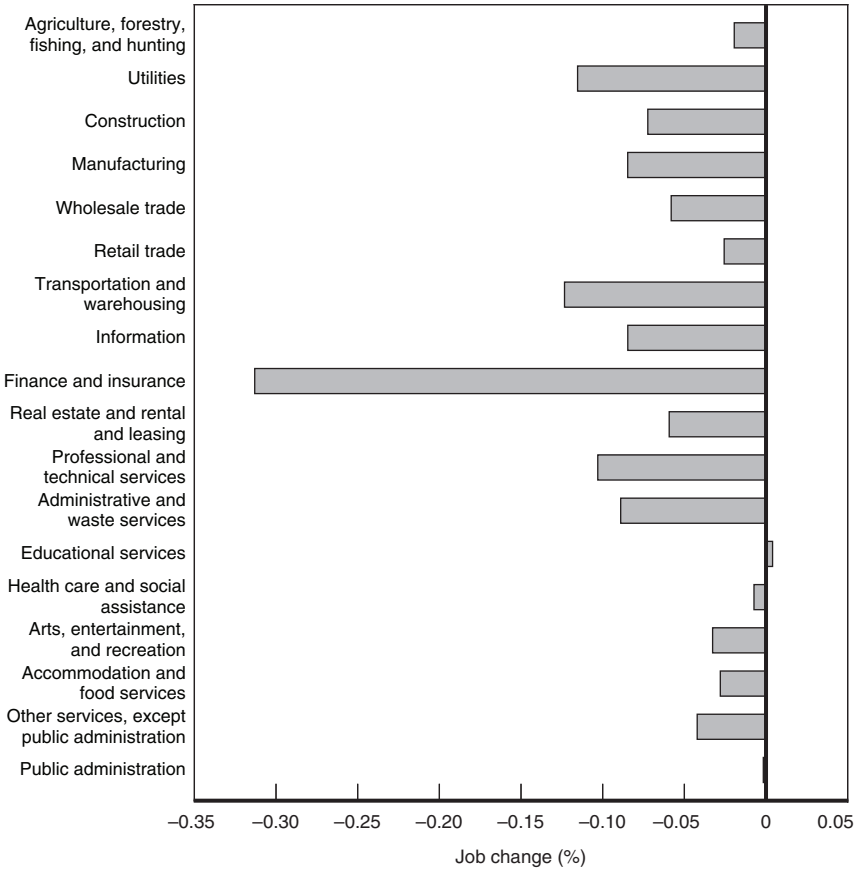
[4]See, for instance, Table 1 of Neumark, Zhang, and Wall (2005). Other tables in that article were based on three-year intervals, and results for even longer intervals were briefly reported. For simplicity, going forward we will focus on one-year intervals, and to create



NOTES: Underlying data are in Table 3.1, column 5. The figure excludes mining (NAICS 21) and management (NAICS 55).

Figure 3.1—Job Change from Net Migration, by Industry, 1992–2004

summary measures, we construct annualized one-year changes. Using longer intervals, such as three years, results in disproportionate weight being put on the middle years of the sample period. It also makes it difficult to continually update the estimates when the NETS database is extended by a year. Finally, the one-year changes seem to us to provide an appropriate distinction between "new" (that is, less than one year old) businesses and existing businesses, which is relevant, for example, to attributing job growth to births versus expansions.



NOTES: Underlying data are in Table 3.1, column 9. The figure excludes mining (NAICS 21) and management (NAICS 55).

Figure 3.2—Job Change from Net Migration as a Percentage of 1992 Employment, Annualized, by Industry, 1992–2004

net relocation, an annualized rate of 0.06 percent of employment; in other words, job loss from net relocation in California was six out of every 10,000 jobs annually.

As shown in Figure 3.1, the net effect of interstate relocation differs across industries. Nearly all industries—18 out of 20—lost jobs as a result of relocation. Three industries—manufacturing, finance and insurance,

Table 3.1

Business Establishment Dynamics and Annualized Employment Change, by Industry, 1992–2004

NAICS Code	Major Industry Title	Starting Employment	Cumulative Net Annual Employment Change, 1992–2004				Change as Percentage of 1992 Employment, Annualized			
			Total	Expansion–Contraction	Birth–Death	Net Migration	Total	Expansion–Contraction	Birth–Death	Net Migration
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
11–92	All industries[a]	15,853,136	580,193	1,614,335	–915,340	–118,802	0.30	0.81	–0.49	–0.06
11	Agriculture, forestry, fishing, and hunting	234,561	–11,536	28,377	–39,357	–556	–0.42	0.96	–1.52	–0.02
21	Mining	48,046	–18,298	–7,870	–13,755	3,327	–3.92	–1.48	–2.77	0.56
22	Utilities	100,467	–16,324	–2,361	–12,584	–1,379	–1.47	–0.20	–1.11	–0.12
23	Construction	780,288	66,316	193,895	–120,826	–6,753	0.68	1.87	–1.39	–0.07
31–33	Manufacturing	2,371,820	–295,180	293,753	–564,988	–23,945	–1.10	0.98	–2.24	–0.08
42	Wholesale trade	926,152	3,265	201,988	–192,282	–6,441	0.03	1.66	–1.92	–0.06
44–45	Retail trade	1,662,629	98,794	110,887	–6,948	–5,145	0.48	0.54	–0.03	–0.03
48–49	Transportation and warehousing	525,341	7,078	20,112	–5,301	–7,733	0.11	0.31	–0.08	–0.12
51	Information	498,520	144,094	125,993	23,173	–5,072	2.14	1.90	0.38	–0.09
52	Finance and insurance	748,897	52,133	122,250	–42,437	–27,680	0.56	1.27	–0.48	–0.31
53	Real estate and rental and leasing	451,631	50,563	39,686	14,091	–3,214	0.89	0.70	0.26	–0.06

Table 3.1—Cont'd

NAICS Code	Major Industry Title	Starting Employment (1)	Cumulative Net Annual Employment Change, 1992–2004: Total (2)	Expansion–Contraction (3)	Birth–Death (4)	Net Migration (5)	Change as Percentage of 1992 Employment, Annualized: Total (6)	Expansion–Contraction (7)	Birth–Death (8)	Net Migration (9)
54	Professional and technical services	1,299,600	168,584	206,171	–21,546	–16,041	1.02	1.23	–0.14	–0.10
55	Management of companies and enterprises	8,443	9,259	4,463	5,342	–546	6.36	3.60	4.17	–0.56
56	Administrative and waste services	750,150	133,435	118,787	22,598	–7,950	1.37	1.23	0.25	–0.09
61	Educational services	957,879	57,003	82,654	–26,055	404	0.48	0.69	–0.23	0.00
62	Health care and social assistance	1,443,518	173,293	151,641	22,854	–1,202	0.95	0.84	0.13	–0.01
71	Arts, entertainment, and recreation	260,717	75,278	46,099	30,209	–1,030	2.14	1.37	0.92	–0.03
72	Accommodation and food services	966,673	73,843	38,481	38,573	–3,211	0.62	0.33	0.33	–0.03
81	Other services, except public administration	880,846	–18,514	–45,165	31,093	–4,442	–0.18	–0.44	0.29	–0.04
92	Public administration	936,958	–172,893	–115,506	–57,194	–193	–1.69	–1.09	–0.52	0.00

[a]Excludes unclassified establishments (NAICS 99).

and professional and technical services—lost more than 15,000 jobs.[5] However, as in the aggregate, the contribution of relocation to total employment change within industries is relatively small. As shown in Figure 3.2, only finance and insurance had an annualized rate of job loss from business relocation as high as 0.25 percent.[6]

To identify which industries are more footloose, we decompose the gross number of jobs created during 1992–2004 in each industry into its three different sources, including expansion, birth, and in-migration; similarly, gross job destruction in each industry is decomposed into contraction, death, and out-migration. We then calculate gross migration (the sum of in-migration and out-migration) as a percentage of initial (1992) employment for each industry, which is used as a measure of how footloose an industry is; we consider an industry with a high percentage of gross migration to be more footloose.

These gross migration figures by industry, again expressed as annualized rates of change relative to initial employment, are shown in Figure 3.3 (the underlying numbers are in Table 3.2, including the other components of job creation and destruction).[7] The four most footloose industries are information, finance and insurance, manufacturing, and professional and technical services.[8] All these industries produce goods or provide services that can be delivered over long distance or they have

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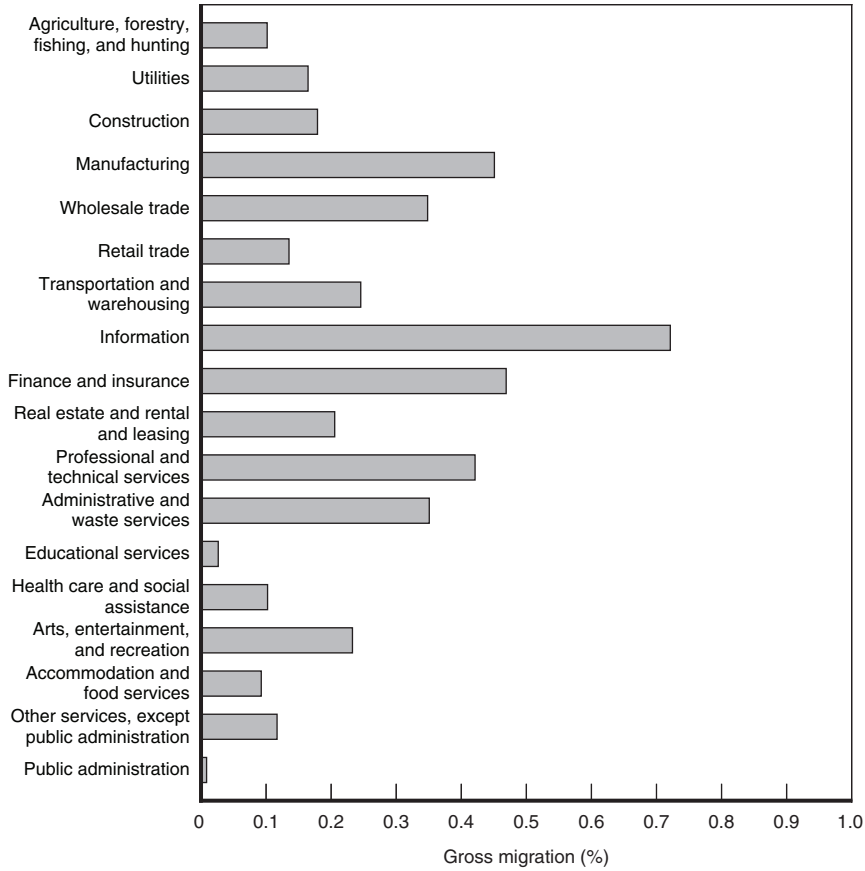
[5]We exclude two industries from the figures: mining (which includes oil and gas extraction) and management of companies and enterprises. These industries account for only 0.3 percent and 0.1 percent of state employment in 1992, respectively, but exhibit some large percentage changes that make it difficult to see other variation in some of the figures. However, the tables with the data underlying the figures provide the complete information, including these industries. Table 3.1 shows that mining gained more than 1,000 jobs from net migration. Scrutiny of the list of large relocators in the mining industry revealed that the job gain in this industry is primarily driven by Chevron's acquisition of Texaco in 2001, followed by the move of Texaco's headquarters from White Plains, New York, to San Ramon, California.

[6]As shown in Table 3.1, this is also true in management of companies and enterprises, which is a very small industry.

[7]The gross migration figures are conceptually the sum of gross in-migration from column 3 and gross out-migration from column 6 (from Table 3.2). Because we annualize the data using the formula for compound growth, the numbers shown in Figure 3.3 (column 7 of Table 3.2) do not exactly equal the sums of columns 3 and 6.

[8]These are followed closely by administrative and waste services and wholesale trade. Conclusions with regard to these industries do not differ from those for the more footloose



NOTES: Underlying data are in Table 3.2, column 7. The figure excludes mining (NAICS 21) and management (NAICS 55).

Figure 3.3—Annualized Gross Migration as a Share of 1992 Employment, by Industry

back-office functions that can be located at a distance from other parts of the company. In contrast, public administration, educational services, accommodation and food services, health care and social assistance, and retail trade all need to be close to their customers and thus are among the least footloose industries.

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industries discussed in the text. Two very small industries, management and mining, are excluded from the list of "most footloose" industries.

Table 3.2

Gross Employment Changes as Annualized Shares of 1992 Employment, by Industry, 1992–2004

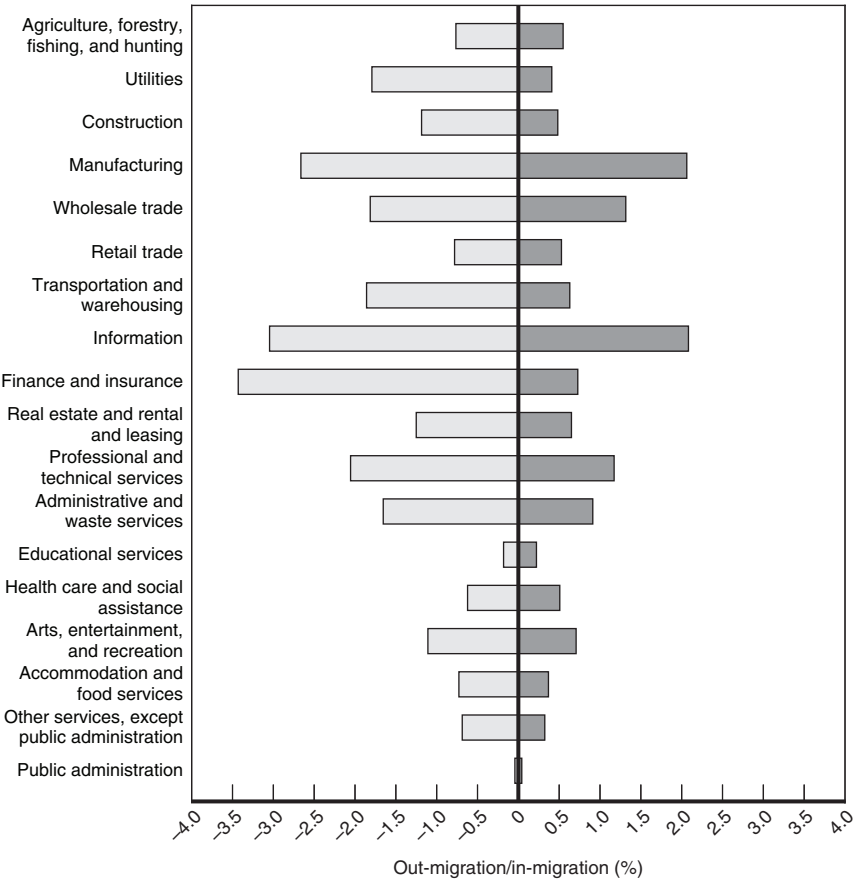
NAICS Code	Major Industry Title	Gross Job Creation			Gross Job Destruction			Gross Migration
		Expansion	Birth	Move in	Contraction	Death	Move out	Move in + Move out
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
11–92	All industries[a]	3.46	4.76	0.10	2.86	5.04	0.16	0.26
11	Agriculture, forestry, fishing, and hunting	3.38	2.82	0.04	2.66	3.80	0.06	0.10
21	Mining	2.18	2.77	1.01	3.20	4.39	0.48	1.44
22	Utilities	2.69	2.80	0.03	2.83	3.54	0.14	0.16
23	Construction	4.20	4.49	0.05	2.78	5.26	0.12	0.18
31–33	Manufacturing	3.94	3.36	0.19	3.24	4.65	0.27	0.45
42	Wholesale trade	3.98	4.72	0.15	2.71	5.71	0.20	0.35
44–45	Retail trade	2.55	5.54	0.05	2.12	5.56	0.08	0.13
48–49	Transportation and warehousing	3.05	4.83	0.06	2.82	4.88	0.18	0.24
51	Information	4.44	6.76	0.33	3.04	6.57	0.41	0.72
52	Finance and insurance	3.80	5.32	0.08	2.85	5.59	0.38	0.47
53	Real estate and rental and leasing	3.56	5.30	0.07	3.05	5.15	0.13	0.20

Table 3.2—Cont'd

NAICS Code	Major Industry Title	Gross Job Creation: Expansion (1)	Gross Job Creation: Birth (2)	Gross Job Creation: Move in (3)	Gross Job Destruction: Contraction (4)	Gross Job Destruction: Death (5)	Gross Job Destruction: Move out (6)	Gross Migration: Move in + Move out (7)
54	Professional and technical services	4.13	6.03	0.16	3.25	6.10	0.26	0.42
55	Management of companies and enterprises	10.70	9.45	0.66	9.15	7.28	1.15	1.73
56	Administrative and waste services	4.55	6.22	0.13	3.70	6.09	0.22	0.35
61	Educational services	3.09	2.36	0.01	2.56	2.53	0.01	0.02
62	Health care and social assistance	3.13	4.44	0.05	2.48	4.36	0.05	0.10
71	Arts, entertainment, and recreation	3.92	6.46	0.10	2.91	5.96	0.13	0.23
72	Accommodation and food services	2.22	4.63	0.03	1.95	4.43	0.06	0.09
81	Other services, except public administration	3.04	5.57	0.04	3.34	5.40	0.08	0.11
92	Public administration	2.34	3.88	0.00	3.11	4.21	0.00	0.01

[a]Excludes unclassified establishments (NAICS 99).

In Figure 3.4, we assess how important moves are relative to other employment dynamics for each industry; the underlying numbers are in Table 3.3. For the economy as a whole—not shown in the figure—in-migration accounts for 1 percent of gross job creation, expansions of existing establishments account for 40 percent, and births of new establishments account for 59 percent. Out-migration accounts for a larger share of gross job destruction—1.6 percent—with contractions of existing



NOTES: Underlying data are in Table 3.3, columns 3 and 6. The figure excludes mining (NAICS 21) and management (NAICS 55).

Figure 3.4—Shares of Gross Job Destruction and Creation from Out-Migration from and In-Migration into California, 1992–2004

establishments accounting for 33 percent and deaths of establishments accounting for 66 percent. For the most footloose industry in Figure 3.4—information—in-migration and out-migration account for 2 percent and 3 percent, respectively, of gross job creation and destruction. Although these figures are twice as high as the rates for the overall economy, they are still very small relative to the other employment dynamics. Similarly, for finance and insurance—the industry with the largest net loss of jobs from relocation—move-outs account for only 3.5 percent of gross job destruction.

Despite the higher incidences of interstate moves in footloose industries, these industries do not appear to perform particularly worse than other industries in terms of net job loss from relocation. In fact, the information sector is the most footloose (excluding very small industries), as shown by an annualized gross migration rate of about 0.7 percent (Figure 3.3), but the annualized net migration rate, as shown in Table 3.1, is only –0.09 percent, far smaller than that of finance and insurance. And, of course, during 1992–2004, the information sector was one of the state's fastest-growing industries, increasing at an annualized rate of more than 2 percent.

Manufacturing, another footloose industry, experienced a net loss of jobs as a result of relocation, but as shown in Figure 3.2, the net effect of relocation in this sector is still negligible, accounting for an annualized loss of only 0.08 percent of jobs. This is particularly interesting because the manufacturing sector attracted a great deal of attention in the debate over the supposed business exodus from California. Manufacturing plants are often targeted by states or localities offering incentives for businesses to locate in their areas.[9] Manufacturing is often perceived as the most mobile of sectors, and as transportation and communications costs have generally fallen over time, manufacturing plants have probably become even less constrained in their location decisions.

As with other states, California experienced a significant loss of manufacturing jobs between 1992 and 2004. Total manufacturing employment fell more than 1 percent a year during this 12-year period,

[9]Of course, it is possible for them to move not only to other U.S. states but also to foreign countries; we are unable to track the latter moves in our data.

Table 3.3

Components of Gross Job Creation and Destruction, by Industry, 1992–2004

NAICS Code	Major Industry Title	Percentage of Job Creation			Percentage of Job Destruction		
		Expansion (1)	Birth (2)	Move in (3)	Contraction (4)	Death (5)	Move out (6)
11–92	All industries[a]	39.9	59.2	0.9	32.8	65.6	1.6
11	Agriculture, forestry, fishing, and hunting	55.0	44.4	0.6	39.3	59.9	0.8
21	Mining	36.4	47.8	15.8	38.5	56.6	5.0
22	Utilities	48.6	51.0	0.4	42.7	55.5	1.8
23	Construction	47.7	51.9	0.5	31.1	67.7	1.2
31–33	Manufacturing	53.6	44.3	2.1	38.1	59.3	2.7
42	Wholesale trade	44.1	54.6	1.3	28.0	70.1	1.8
44–45	Retail trade	27.8	71.7	0.5	23.7	75.5	0.8
48–49	Transportation and warehousing	36.1	63.2	0.6	33.3	64.8	1.9
51	Information	35.7	62.2	2.1	26.6	70.4	3.1
52	Finance and insurance	39.2	60.1	0.7	29.3	67.3	3.5
53	Real estate and rental and leasing	37.6	61.8	0.6	34.0	64.8	1.3
54	Professional and technical services	37.6	61.2	1.2	30.5	67.5	2.1

Table 3.3—Cont'd

NAICS Code	Major Industry Title	Percentage of Job Creation			Percentage of Job Destruction		
		Expansion (1)	Birth (2)	Move in (3)	Contraction (4)	Death (5)	Move out (6)
55	Management of companies and enterprises	53.9	44.2	1.9	55.8	39.8	4.4
56	Administrative and waste services	39.5	59.6	0.9	34.0	64.3	1.7
61	Educational services	57.6	42.2	0.2	50.2	49.6	0.2
62	Health care and social assistance	39.3	60.2	0.5	33.6	65.7	0.6
71	Arts, entertainment, and recreation	34.2	65.1	0.7	28.7	70.2	1.1
72	Accommodation and food services	29.3	70.3	0.4	27.5	71.8	0.7
81	Other services, except public administration	32.0	67.7	0.3	35.2	64.1	0.7
92	Public administration	35.6	64.4	0.0	40.9	59.0	0.1

[a]Excludes unclassified establishments (NAICS 99).

for a decline of 295,180 manufacturing jobs.[10] However, the net loss of 24,000 manufacturing jobs from relocation is dwarfed by the net loss of 565,000 manufacturing jobs from establishment deaths in excess of births (Table 3.1). That is, many manufacturing jobs disappeared not because a large number of plants moved to other states but because many plants shut down.[11]

One industry that deserves highlighting is the finance and insurance sector, where job loss from net out-migration was higher than in manufacturing, despite the sector's being about a third smaller; job loss from relocation in this sector occurred at a rate five times higher than that of the economy overall and in-migration was low. We examined the data on relocation in this industry year by year, and these show that in all but two years during 1992–2004, the finance and insurance industry lost jobs from relocation. Many services in the finance and insurance industry are not mobile because they need to be near customers; examples are bank branches and insurance agents' offices. However, many financial activities, including such back-office functions as credit card and insurance claim processing, may have become more footloose as a result of the rapid advancement of information technology. Indeed, data at the industry subsector level show that most of the job loss from relocation in this sector occurred in credit intermediation and related activities (NAICS 522, with 18,714 jobs lost to relocation) and insurance carriers and related activities (NAICS 524, with 5,485 jobs lost from relocation).[12] We should

[10]The annualized rate of employment loss of 1.10 percent in manufacturing is equal to a cumulative decline in employment of 12.4 percent for the period 1992–2004.

[11]Given that international relocations are not identified as such in the database, some of the manufacturing establishment deaths identified in the NETS may actually be establishments relocating out of the United States. From the perspective of simply accounting for job loss in the state, whether jobs are moving to other states or to other countries may be irrelevant. But from the perspective of policy, it is quite important, since a loss of manufacturing jobs overseas is likely to be less the result of state or local policy factors and more the result of labor costs, macroeconomic conditions, and other factors that contribute to international productivity and cost differences. To the extent that concerns about California's business climate are framed relative to that in other states, job loss to other countries (whether via relocation or other channels) is less relevant to the debate than is job loss to other states.

[12]Looking at the data by company, the NETS database identifies the relocation of Bank of America headquarters from San Francisco to Charlotte, North Carolina, in 1999, when Bank of America merged with NationsBank, as a significant contributor to

emphasize, however, that although the finance and insurance industry suffered the most serious job loss through relocation, employment overall grew at an annualized rate of 0.56 percent, which exceeded the 0.30 percent growth of overall state employment over the same period (Table 3.1). Nonetheless, the out-migration in finance and insurance is out of proportion to that in the other industries.

Is There More Job Loss from Interstate Relocation in Higher-Paying Industries?

Next, we consider the relationship between relocation and annual average pay in the industry. We find that job loss from interstate relocation has tended to occur in high-paying industries, but the economic effect of interstate relocation accounting for average industry pay remains very small.

This analysis focuses on Figures 3.1 and 3.2, and annual average pay by industry, shown in Figure 3.5.[13] Evidence indicates that relocation costs more jobs in high-paying than in low-paying industries.[14] In particular, the three industries losing the most jobs to interstate relocation—finance and insurance, manufacturing, and professional and technical services—all pay well above the state average salary. However, the industries represented in Figures 3.1 and 3.2 are broad sectors, many of which contain high-paying and low-paying subsectors.

We therefore carry out our analysis at the subsector level, looking at 100 three-digit NAICS subsectors grouped by average pay. In particular, we divide NAICS industry subsectors into three groups, with each containing approximately one-third of the workforce: low-paying industries

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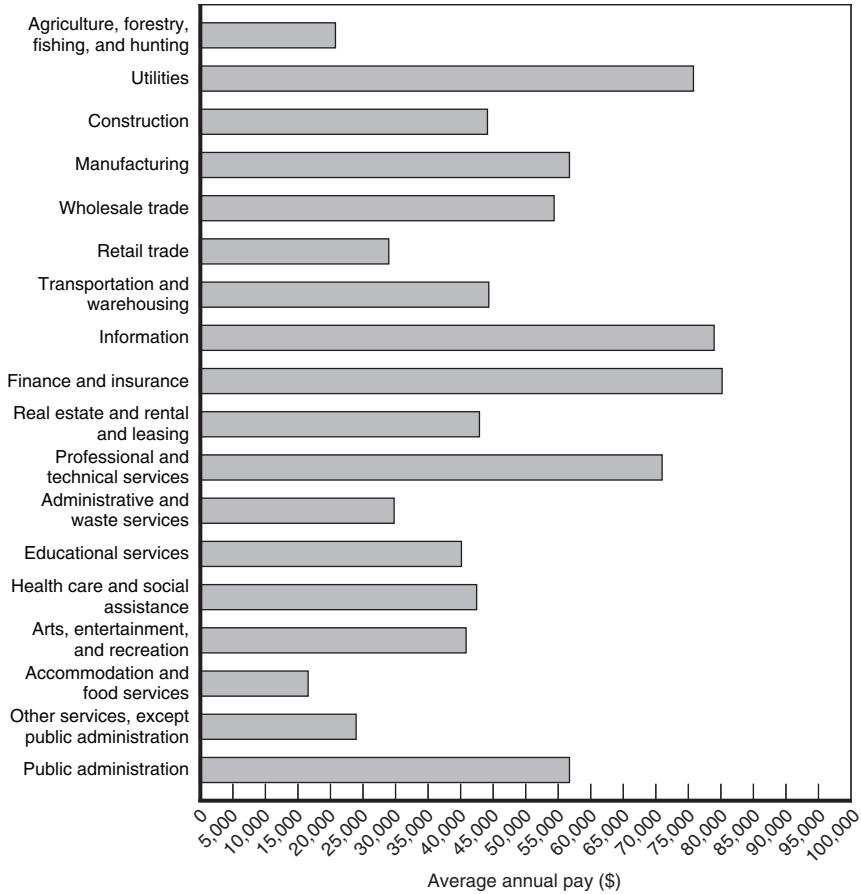
the employment loss in this industry from relocation. However, even for Bank of America and NationsBank, employment changes resulting from births, deaths, expansions, and contractions are far larger than those from relocation.

[13]Although our choice of reporting annual pay for the last year is rather arbitrary, this does not drive any of our results below because annual pay at the industry sector and subsector levels is very highly correlated across the 12-year period.

[14]In assigning NETS establishments to an industry, we regard the 2 percent of the establishments whose NAICS code changed over time as belonging to the industry in which they are classified for the most number of years. In the event that an establishment is classified in two industries for an equally long period of time, the more recent industry classification is chosen.



SOURCE: Quarterly Census of Employment and Wages.
NOTE: The figure excludes mining (NAICS 21) and management (NAICS 55).

Figure 3.5—Average Annual Pay, by Industry, 2004

(with the lowest average annual pay), medium-paying industries, and high-paying industries. Table 3.4 shows the decomposition results in these three industry groups. Column 5 shows that interstate relocation during 1992–2004 cost low-paying industries about 31,000 jobs and medium-paying industries about 15,000 jobs. The industries with the highest pay accounted for 73,000 jobs lost from net relocation—more than half the total for the state. Column 9, which reports the annualized rate of employment change from net migration, tells the same story. The high-

Table 3.4

Business Establishment Dynamics and Annualized Employment Change, by Average Pay, 1992–2004

		Cumulative Net Annual Employment Change, 1992–2004			
	Starting Employment	Total	Expansion–Contraction	Birth–Death	Net Migration
Pay Level	(1)	(2)	(3)	(4)	(5)
All industries[b]	15,853,136	580,193	1,614,335	–915,340	–118,802
Low pay[c]	5,345,807	357,343	373,480	15,191	–31,328
Medium pay[c]	5,223,281	191,832	605,948	–399,538	–14,578
High pay[c]	5,284,048	31,018	634,907	–530,993	–72,896

	Change as a Percentage of 1992 Employment. Annualized				Average Annual Pay ($), 2004[a]
	Total	Expansion–Contraction	Birth–Death	Net Migration	
Pay Level	(6)	(7)	(8)	(9)	(10)
All industries[b]	0.30	0.81	–0.49	–0.06	44,634
Low pay[c]	0.54	0.56	0.02	–0.05	25,682
Medium pay[c]	0.30	0.92	–0.66	–0.02	45,127
High pay[c]	0.05	0.95	–0.88	–0.12	72,819

[a]Data are from the Quarterly Census of Employment and Wages.

[b]Excludes unclassified establishments (NAICS 99).

[c]Based on 3-digit NAICS subsectors.

paying industries lost jobs from net migration at an annualized rate of 0.12 percent, more than twice the rate of the low-paying and medium-paying industries. These results clearly show that California has tended to lose high-paying jobs to other states through business relocation.

An even more precise measure is the correlation, at the NAICS industry subsector level, between average pay and net migration. The correlation between (1) employment change from net interstate relocation and (2) annual pay is –0.12. This correlation is computed using all NAICS three-digit subsectors and is weighted by 1992 industry employment, so

large subsectors count more than small subsectors do. This correlation is strongly influenced by two industries that experienced extreme rates of net migration over the period. Excluding these industries yields a moderately strong correlation of –0.26.[15]

Much stronger, however, is the link between average industry wages and *gross* migration. High-paying industries are much more footloose than low-paying industries. The correlation between wages and gross migration at the three-digit NAICS level (again, weighting by 1992 employment levels) is 0.56—far stronger than the correlation between wages and net migration. Accordingly, the correlations between wages and in-migration and out-migration are also high (0.50 and 0.49, respectively).[16] This strong correlation between footloose industries and wages may lead to an exaggerated perception that California is losing good jobs. Although it is indeed true that jobs in high-paying industries are much more likely to leave the state than are those in low-paying industries, jobs in those same high-paying industries are also much more likely to move into the state, which explains why the correlation between wages and *gross* migration is stronger than the correlation between wages and *net* migration.[17]

Overall, our analysis shows that job loss from relocation is more likely to occur in industries with higher average earnings, which is consistent with the claims of some of the critics of California's business climate. These results suggest that relocation may have had a negative—although modest—effect on the composition of jobs in California.

Table 3.1 shows that California lost 0.06 percent of jobs annually from interstate business relocation. This number counts all jobs as equal. For

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[15]These two industries are NAICS 211 (oil and gas extraction), a high-paying industry with considerable net in-migration, and NAICS 482 (rail transportation), a low-paying industry with considerable net out-migration. We also report the correlation without these outliers to acknowledge the fact that extreme values in the NETS, as in any dataset, could be due to errors, and it is always good practice to check the sensitivity of key results to the exclusion of such outliers.

[16]These results are not sensitive to the exclusion of the outlier industries discussed above.

[17]One hypothesis beyond the scope of this research is that high-paying industries are more footloose in part because they rely more on information technology. Another hypothesis is that higher-paid workers are more mobile, so the industries hiring these expensive workers face lower costs of relocation because a higher share of their workers might move with them.

example, if California lost 2,000 high-paying jobs in the financial services industry but at the same time gained 2,000 low-paying retail jobs, we treated these two developments as offsetting each other. But given that job losses from relocation tended to occur in high-paying industries, simple calculations of total employment changes resulting from business relocation may understate the economic effect of relocation.

One way to summarize the effect of relocation on the composition of jobs across all industries is to calculate an earnings-adjusted job loss figure. In particular, we chose the relative average annual pay as the multiplier with which to weight jobs in each industry. For example, if a job in the finance and insurance industry pays 50 percent more than average earnings, this method counts one job lost in this industry as a loss of 1.5 jobs. Similarly, if a retail job pays only half of average earnings, this method counts a job gain in the retail industry as adding only 0.5 jobs to the state economy. Thus, by converting employment changes in different industries into "average-pay-equivalent" units, we can calculate job loss figures that reflect changes in the composition of jobs by pay.

More specifically, we define the earnings-adjusted job loss from relocation as the following:

$$\sum_i \frac{w_i}{w}(N_i - O_i)$$

where w is overall average annual earnings, w_i is average annual earnings in industry i, N_i is the job gain through in-migration, and O_i is the job loss from out-migration. Applying this formula at the industry subsector level (that is, three-digit NAICS) gives an earnings-adjusted job loss of 127,885 over the period 1992–2004, versus the 118,802 figure reported in Table 3.1, treating all jobs equally. Taking out the two small industries (mining and management) noted above, the earnings-adjusted job loss rises to 138,843 jobs over the period. In terms of the annualized rate, this represents a loss of 0.071 percent of earnings-adjusted jobs (0.077% taking out the outliers), compared with the annualized loss of 0.063 percent reported in Table 3.1.[18]

[18]Table 3.1 reports the annualized job loss for the economy as 0.06 percent, and in the text above we report the figure to three decimal places (0.063%) to show the

This exercise confirms that the simple sum of job losses and gains over different industries underestimates the economic effect of the loss from interstate relocation because California has tended to lose high-paying jobs to relocation. However, even if we take into account this pay difference by scaling the job numbers using industry-level annual pay, we still find that interstate relocation has a small effect on state employment—an annualized rate of 0.071 percent instead of 0.063 percent.

Is Interstate Relocation an Indicator of an Industry's Economic Health?

Finally, we ask whether industries experiencing job loss from relocation were also experiencing job loss from either the excess of deaths over births or the excess of contractions over expansions. If so, then job loss from relocation, even if small, may be a useful indicator of the economic health of particular industries in the state.

We have shown thus far that job loss from interstate relocation, in itself, does not contribute importantly to economic performance because relocation is negligible relative to job change from expansions, contractions, births, and deaths—the four major sources—even in high-paying and more footloose industries. But if the patterns of net job change from these four major sources of job creation and destruction are similar to the patterns of relocations, then job losses from relocation, even if small, could represent much more serious problems. For example, the disproportionate loss of high-paying jobs resulting from relocation could then indicate larger-scale substitution of jobs in low-paying industries for jobs in high-paying industries.

As already noted, some of the numbers in Tables 3.1 and 3.2 suggest that overall employment changes did not result in the substitution of low-paying for high-paying jobs. For example, job loss from relocation is most pronounced in finance and insurance, but this industry had robust net job

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comparison with the earnings-adjusted figure more clearly. Letting L be total employment in the state, we can write the proportion of earnings-adjusted job loss as $\sum_i \frac{w_i}{wL}(N_i - O_i)$, where wL is the total wage bill and $w_i(N_i - O_i)$ is the net loss/gain of earnings from relocation in industry i. Thus, this 0.071 percent annualized job loss can also be interpreted as the proportion of total wage bill that was lost from interstate relocation.

creation from expansions minus contractions. As a result, although this industry experienced the most extreme job loss from relocation, it added a total of 52,133 jobs during 1992–2004, for an annualized growth rate of 0.56 percent. The same conclusion is true for professional and technical services, which lost a disproportionate share of employment from relocation but registered even stronger job growth overall. These examples give the general impression that we learn very little about the overall health of an industry by focusing attention on relocation.

This general impression is confirmed by correlations across industries between the percentage changes in jobs from each of the three net processes, which gauge whether trends in employment from expansions minus contractions, births minus deaths, and relocations are similar. Using data at the NAICS industry subsector level, weighted by 1992 industry employment as above, we find the correlation between net migration (in-migration minus out-migration) and net growth from expansions and contractions to be –0.15; between net migration and net growth from births and deaths, the correlation is –0.022; and between net migration and net growth from all four of the other dynamics (expansions, contractions, births, and deaths), it is –0.1. In other words, migration is actually a contraindicator of other kinds of employment change: Industries that lose more jobs as a result of net migration, on average, gain more jobs from births, deaths, expansions, and contractions. In fact, because net migration is such a small component of employment change, the correlation between net migration and overall employment change is effectively zero (–0.038).[19] Thus, job loss from relocation in particular industries is generally not indicative of larger problems in those industries.

Finally, these correlations refer to the relationship between net migration and net job growth from other sources or overall employment change at the industry level. Although these correlations are all negligible, it is possible that job loss from relocation is an indicator of a decline in employment in an industry in California *relative to* that in the rest of the country, rather than an absolute decline in employment in the state. For

[19]Estimating a correlation between one variable (overall employment growth) and one of its components (net migration) likely creates an upward bias. But in this case it reinforces how little information net migration trends yield about the overall growth of an industry, because, even with some potential upward bias, this estimate is still below zero.

example, we noted that job loss from relocation of finance and insurance establishments out of California was relatively high but that overall employment growth in the industry in California was also relatively high, suggesting that relocation is not an indicator of broader changes in the industry. However, if employment growth in finance and insurance was even faster in other states than in California, then the share of this industry's employment in California would have declined, and perhaps relocation out of California is indicative of this sort of relative decline. To check this, we estimated the correlations at the NAICS industry subsector level between percentage changes in jobs from relocation and percentage changes in California's share of national employment in the industry.[20] The correlation, weighted by 1992 industry employment in California, is –0.002, or 0.068 excluding the two outlier industries mentioned above. These near-zero values suggest that there is no evidence that net employment migration in California's industries is indicative of changes in employment in the industry in California relative to that in the nation as a whole.

[20] We were able to do this using data that Walls & Associates provided on national employment by industry, based on NETS data.

4. Company Expansion into and out of California

The public debate over the business climate focused on interstate relocation—in particular, physical relocation of existing businesses—which we have shown to be very small relative to other causes of employment dynamics. However, the focus on physical relocation of existing establishments is overly narrow. Changes in the location of jobs can also occur through decisions made by firms about which establishments to expand or contract and where to create new establishments or to close down existing ones. For at least two reasons, expansions, contractions, births, and deaths—and the changes in the locations of economic activity that accompany them—could be more important indicators of California's economic conditions than is physical relocation.

First, births, deaths, expansions, and contractions account for the vast majority of job creation and job destruction, so these are far more likely to be informative about the business climate. Second, even if relocation were significant, changes in the physical relocation of existing business establishments might not reflect important components of the business climate. Moving a business, after all, is an expensive proposition, and relocation may be a disproportionate response to small changes affecting the profitability a business might expect in California relative to that in another state. However, an existing firm wishing to create a new establishment faces no moving costs per se, and hence the site location decision may be highly responsive to differences in expected profitability across states (although there may well be advantages—such as customer relations—to remaining in a particular market). Similarly, decisions by a business that has multiple establishments about expanding or contracting any of them may be quite sensitive to marginal differences in profitability across states.

We focus, in particular, on changes in the behavior of California-headquartered firms. Specifically, we report information on whether California-based firms have shifted their operations out of state via expansion of out-of-state establishments, creation of more new

establishments outside the state, closures of more establishments in the state, or contractions at establishments in the state. Business groups responding to the earlier research on relocation (Neumark, Zhang, and Wall, 2005) suggested that this was occurring, based in part on anecdotal or limited survey evidence,[1] and we wanted to explore more systematic evidence on this hypothesis.

Of course, a shift in the locus of employment of California-based firms to other states could be offset by a shift in the locus of employment into the state from firms headquartered in other states, reflecting an increased tendency for firms in all states to diversify the locations of their operations, with no implications for overall employment in the state or its industrial composition. That is, shifts in the employment and establishment location decisions of firms occur along a two-way street, and it is inappropriate to focus on California-headquartered firms shifting their operations *out of* state without also looking at whether there are offsetting movements of firms headquartered outside California *into* the state, although we have somewhat less information on this offsetting behavior. In this chapter, we shed what light we can on whether there are shifts in the economic activity of California-headquartered firms to destinations in other states and, if so, whether this reflects weakness in California's economic performance.

Our detailed empirical analysis has four main findings:

1. The share of employment in the state in establishments owned by California-headquartered firms has declined, with the decline concentrated during the economic boom of the late 1990s and some reversal since then.
2. The share of births of establishments of California-headquartered firms in other states has increased, and the share in California has correspondingly declined. The peak of the share of births outside California occurred at the height of the economic boom of the late 1990s.
3. The shift of employment of California-headquartered companies to other states (via births and other processes) has been offset by increased employment in the state by firms headquartered elsewhere, with

[1]For the latter, see California Business Roundtable and Bain & Company (2004).

the consequence that the outward employment shift of California-headquartered companies has not resulted in any long-term decline in California's share of national employment; in fact this share dipped in the early to mid-1990s and has risen since then.

4. Looking at key industry sectors at both the high and low ends of the earnings distribution, there is no evidence of more adverse developments in high-paying industries and, if anything the opposite, as California's share of national employment has risen relatively more in high-paying industries.

How Has the Share of Establishments and Employment in Establishments Owned by California-Headquartered Firms Changed?

We first examine changes in the share of establishments in the state owned by California-headquartered firms. We find that this share has declined, but the decline occurred during the economic boom of the late 1990s.

Table 4.1's four columns describe business establishments in California as well as establishments outside the state owned by firms headquartered in California. The first column shows the number of single-establishment firms in California in each year. The second and third columns show establishments in California that belong to multiestablishment firms—those belonging to firms headquartered in California and those headquartered outside California. The fourth column shows establishments outside the state owned by firms headquartered in the state.[2]

Table 4.1 shows that the count of all three types of establishments belonging to multiestablishment firms peaked in 2001 and then declined

[2]For a very small number of establishments (typically around 500 per year), the headquarters identifier is missing, and for a larger number (averaging around 12,000 each year), the headquarters is identified but does not appear in the NETS data. We suspect that most of the latter cases are foreign-owned establishments. We therefore repeated the analysis described here, treating the latter establishments as headquartered outside California; our conclusions remained the same.

Table 4.1

California Business Establishments, by Type of Establishment, 1992–2004

Year	Single-Establishment Firms in California	Establishments in California of Multiestablishment Firms		Establishments Outside California of Multi-establishment Firms
		Headquartered in California	Headquartered Outside California	Headquartered in California
	(1)	(2)	(3)	(4)
1992	1,252,921	96,050	45,676	34,689
1993	1,284,725	94,941	46,651	33,967
1994	1,278,412	109,085	50,963	38,128
1995	1,285,336	114,991	54,090	38,440
1996	1,343,082	117,669	57,563	41,535
1997	1,347,530	122,965	60,648	45,579
1998	1,331,558	123,255	64,119	51,443
1999	1,293,894	128,968	71,820	58,208
2000	1,351,348	135,356	76,501	64,980
2001	1,492,332	138,178	78,263	66,251
2002	1,645,556	137,687	77,922	63,325
2003	1,675,754	132,052	77,637	60,711
2004	1,702,490	122,100	75,545	57,402

somewhat following the business cycle.[3] By computing the ratio of the sum of columns 1 and 2 in Table 4.1 to the sum of columns 1, 2, and 4, we obtain the share of establishments of California-headquartered firms that are in California. This series is graphed in Figure 4.1, which indicates that the share of establishments in the state owned by companies headquartered in California did fall somewhat, from about 97 or 98 percent through 1993

[3]On an annual basis, California employment grew strongly from 1993 through 2001 and then leveled off for the next two years. Correspondingly, the annual unemployment rate jumped up in 2002 and 2003.

to about 96 percent in 1999–2001, and then rose slightly.[4] The numbers in Table 4.1 are also informative about the share of establishments in the state owned by California companies or, conversely, the share of establishments in the state owned by companies headquartered outside the state. The time-series on this latter share, graphed in Figure 4.2, exhibits a relatively steady increase initially, which accelerated at the end of the decade, followed by a decline, although not to the levels before the boom of the late 1990s. Roughly speaking, the movements in the series graphed in Figures 4.1 and 4.2 are in offsetting directions.[5]

This evidence points to some decline in the number of California-owned business establishments in California as a share of all establishments. Note, however, that the change in this share occurred in a rather discrete fashion between roughly 1997 and 2001, meaning that it occurred during a high-tech boom that was probably one of the most successful eras in California's recent economic history.

Next, we report similar analyses for employment levels rather than establishment counts. We find that the share of employment in the state in establishments owned by California-headquartered companies fell slightly, again around the time of the economic boom of the late 1990s.

The four columns of Table 4.2 exactly parallel those in Table 4.1. In all four columns, employment peaks in 2001, paralleling the overall employment figures discussed above. Figure 4.3 combines columns 1, 2, and 4 to display—for California-headquartered firms—the share of employment in establishments in California. This series is similar to the

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[4]Figures 4.1 and 4.3 also show the trend in the share of establishments or employment in California-headquartered multiestablishment firms *only* for those that are located in California; the lower trend line is different from the one discussed in the text because it excludes single-establishment firms, which by definition are both located and headquartered in California. Looking only at multiestablishment firms shows how firms in a better position to respond to productivity or cost differentials across states behave. The main findings of Figures 4.1 and 4.3—that California-headquartered firms shifted activity out of state most during the late 1990s—are the same whether single-establishment firms are included or not. The trends in Figure 4.3 are more similar because single-establishment firms, although numerous, are smaller and therefore account for a considerably less-than-proportionate share of employment.

[5]This does not have to be the case. In Figure 4.1, the denominator is the number of establishments located anywhere that are part of California-headquartered firms; in Figure 4.2, the denominator is the number of establishments located in California that are part of firms headquartered anywhere.

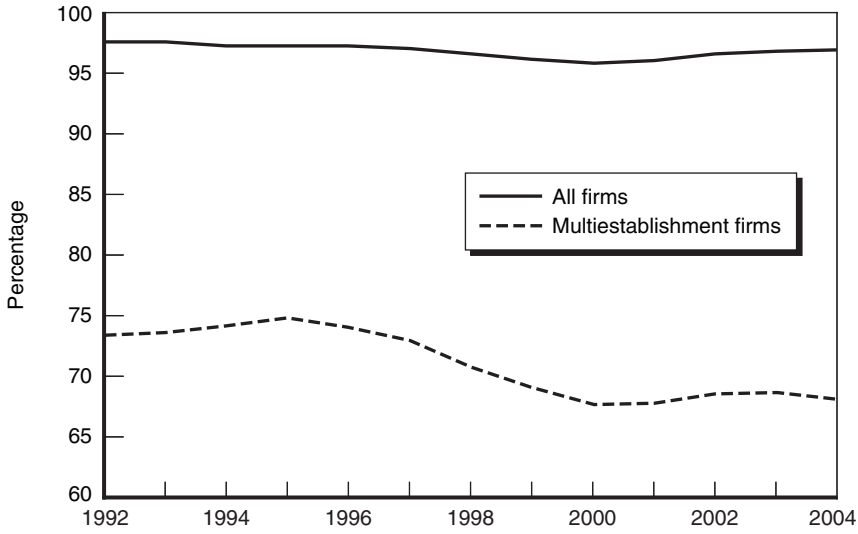

Figure 4.1—Share of California Establishments Owned by California-Headquartered Firms, 1992–2004

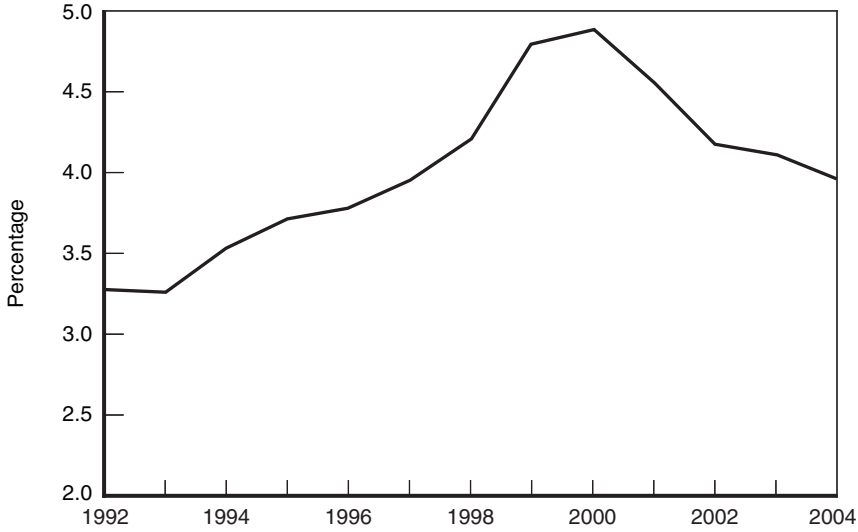

Figure 4.2—Share of California Establishments Owned by Firms Headquartered Outside California, 1992–2004

Table 4.2

California Employment, by Type of Establishment, 1992–2004

Year	Single-Establishment Firms in California	Establishments in California of Multiestablishment Firms		Establishments Outside California of Multi-establishment Firms
		Headquartered in California	Headquartered Outside California	Headquartered in California
	(1)	(2)	(3)	(4)
1992	8,326,313	4,422,660	2,709,076	1,807,115
1993	8,315,144	4,345,783	2,670,247	1,813,856
1994	8,294,078	4,544,673	2,697,122	1,830,896
1995	8,260,693	4,577,664	2,706,731	1,724,320
1996	8,456,406	4,525,638	2,743,317	1,702,748
1997	8,355,919	4,790,108	2,875,723	1,978,906
1998	8,358,995	4,822,640	2,998,596	2,262,400
1999	8,271,639	5,111,865	3,179,630	2,431,965
2000	8,677,479	5,378,634	3,341,432	2,607,431
2001	9,169,903	5,439,213	3,388,221	2,689,647
2002	8,755,460	5,280,971	3,262,342	2,384,705
2003	8,578,150	5,188,212	3,141,138	2,239,803
2004	8,220,795	4,899,345	2,920,428	2,088,005

series for establishment counts in Figure 4.1, with a decline setting in at about the beginning of the late 1990s economic boom and then some recovery. And, again, the change occurs mainly over the 1997–2001 period.

Figure 4.4 shows the share of state employment accounted for by establishments of firms headquartered outside California. As it was in the case of establishments themselves, this series increases over the late 1990s and then falls back a little. In this case, over the entire period, the share seems to offset quite directly the decline in employment among

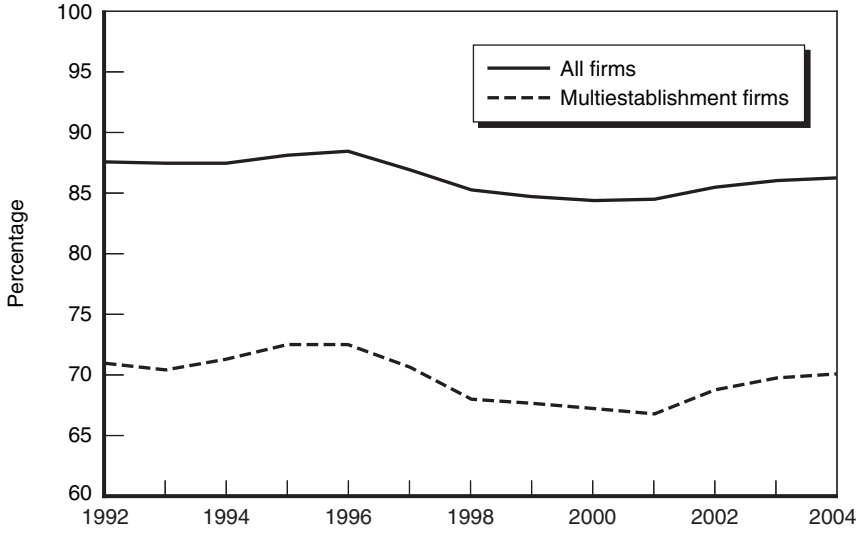

Figure 4.3—California Employment in California-Headquartered Firms, as a Share of Total Employment in California-Headquartered Firms, 1992–2004

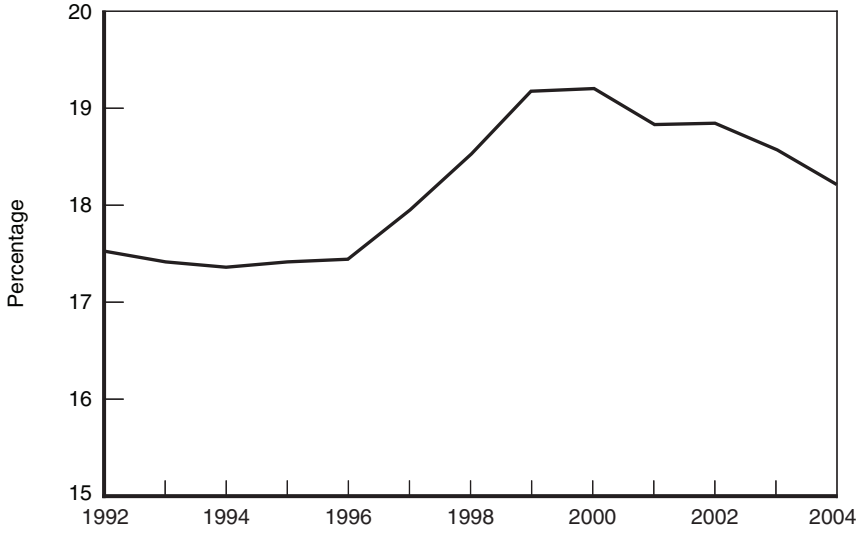

Figure 4.4—California Employment in Firms Headquartered Outside California, as a Share of Total California Employment, 1992–2004

establishments owned by California-headquartered multiestablishment firms.[6]

The broad analysis of the numbers of establishments and of employment levels suggests no major shift in the location of economic activity of California-headquartered businesses. There was some decline in the share of establishments in California owned by California-headquartered companies and a less-pronounced shift in the same direction in California employment. These shifts were at least partially offset by increases in the share of establishments and employment in firms headquartered out of state. This suggests that the changes are more attributable to an expanding geographic focus of multiestablishment firms both inside and outside the state. This conclusion, plus the timing of the downward shift in economic activity in the state by California-owned firms (specifically, the concentration of the shift during the economic boom of the late 1990s), makes it difficult to attribute the shift to a deterioration in the business climate.

For California Companies, How Has the Share of Out-of-State Establishment Births, and Job Creation from These Births, Changed?

The analysis to this point has focused on changes in the overall share of employment or establishments in California by location of ownership. We now turn to some evidence on the dynamic processes underlying employment change and ask how these processes have themselves changed over time for California-headquartered and out-of-state firms. We focus in particular on establishment births, asking whether California-headquartered companies have shifted job creation via births to outside the state. Births may be particularly salient as a barometer of the business climate because an expanding company has the option of creating a new establishment and new jobs anywhere. This analysis of births inside and outside California expands in an important way on the earlier analysis of physical relocation of businesses to address the more general question of changes in the location of economic activity. And it directly addresses

[6]Again, though, these shares have different denominators and hence do not sum to 1.

concerns that the earlier research (Neumark, Zhang, and Wall, 2005) missed an important avenue by which California companies were shifting economic activity to other states—not by the physical relocation of establishments but rather through decisions about where to create new establishments.

Our evidence shows that the share of out-of-state establishment births for California companies has increased, as has the share of out-of-state job creation from establishment births. As for overall employment, this increase was concentrated around the time of the economic boom of the late 1990s. Figure 4.5 plots the number of establishment births inside and outside the state for California-headquartered multiestablishment companies (using the left-hand scale and shown by the bars) and the percentage of births inside the state (using the right-hand scale and shown by the solid line).

Establishment births in California fell sharply from 1993 to 1998, whereas births outside California rose modestly. Then, all births rose sharply during the economic boom, followed by declines. As a percentage, births inside the state declined, from 60–70 percent in the early 1990s to around 50 percent at the height of the economic boom and then rose again afterward before falling slightly. Before the economic boom, the share of births in California declined because of fewer births in the state, and during the boom, it continued to decline, although *not* because establishment births in the state continued to diminish but because the increasing number of births in the state was less than the even sharper increase outside the state.

Figure 4.6 moves from establishment births to the jobs created by establishment births. The figure reveals that these job creation numbers are relatively volatile and that jobs created by births, both inside and outside California, of establishments belonging to California-headquartered companies rose sharply during the boom and then fell substantially. Overall, the share of jobs created by births that occurred inside the state fell to less than 50 percent of the total jobs these firms were creating via births during the boom of the late 1990s and subsequently rose, although perhaps to a level a bit lower than that in the early to mid-1990s. For the most part, these findings mirror those for overall employment, which suggested that

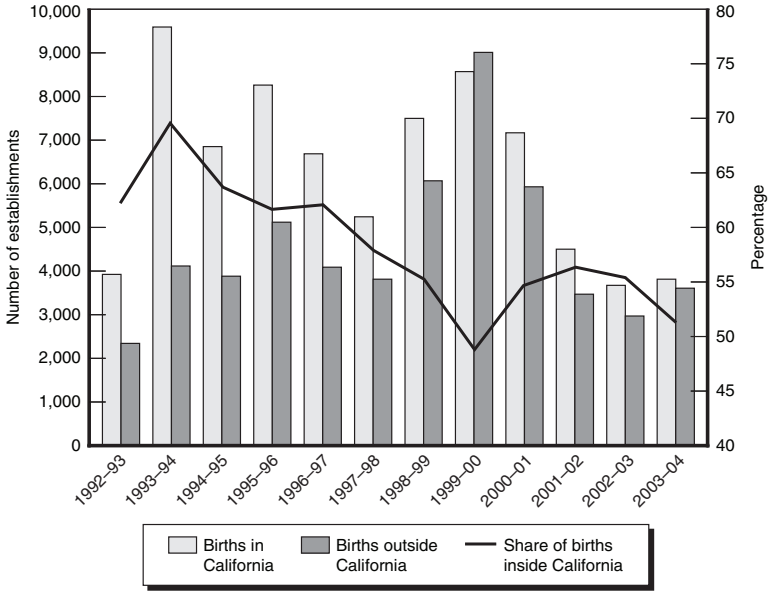

Figure 4.5—Establishment Births of Multiestablishment, California-Headquartered Firms Inside and Outside California, 1992–2004

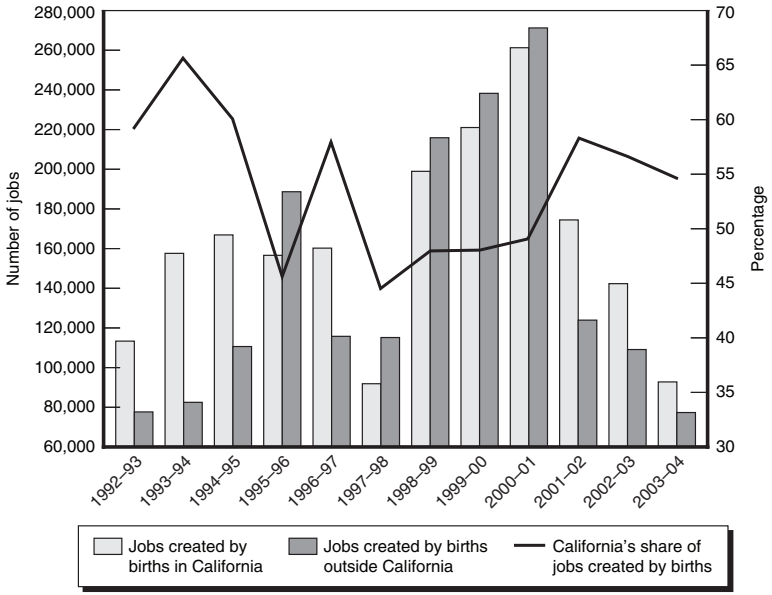

Figure 4.6—Employment Creation from Births of Multiestablishment, California-Headquartered Firms Inside and Outside California, 1992–2004

there was some shift of employment of California-headquartered firms to other states; not surprisingly, perhaps, some of this occurred via births.

Finally, a comparison of Figures 4.5 and 4.6 suggests little overall long-term change in the share of job creation from births inside versus outside the state for California-headquartered companies, although we see a steadier downward trend in the share of births of establishments belonging to these companies outside the state. The difference must be due to variation in the size of establishments created through births inside and outside the state. Presumably, though, the employment numbers are of greater significance.

At this point it is also useful to touch on a data issue. As mentioned in Chapter 2 and discussed in more detail in Appendix A, one potential problem with the NETS data is a lag in detecting some establishment births. However, as long as the shares of births detected with a lag in the NETS are proportionally distributed inside and outside the state, there is no reason to think that this lag in detecting births biases the shares displayed in Figures 4.5 or 4.6.[7] Of course, this condition may not hold exactly, so some caution has to be exercised in the interpretation of results based on the last couple of years of NETS data.

Are There Offsetting Shifts of Employment of Non-California Companies to Inside the State?

The evidence thus far indicates that, for California-headquartered firms, the overall number of establishments, total employment, and job creation via establishment births each exhibit slight shifts to locations outside California. Does this imply that something in California's business climate has worsened? We have already noted the fact that much of this shift was concentrated in the late 1990s (and in some cases diminished afterward), making this interpretation tenuous. Moreover, it is possible that the pre-boom to post-boom declines in activities of these companies in the state are not a negative indicator at all but instead simply reflect shifts in the locus of employment relative to headquarters, with business operations becoming more dispersed.

[7] Figures A.1 and A.3 show that the NETS reports similar drops in employment in recent years for both California and the United States overall.

A natural way to assess this is to study changes in the behavior of businesses headquartered outside California. The question is not whether the share of state employment accounted for by non-California-headquartered firms is growing, which must be true if the share attributable to California-headquartered firms is declining. Rather, the question is whether firms headquartered outside California are increasing their California employment as a share of their total employment, which would be consistent with an increasing dispersal of operations by those firms. Conversely, if these non-California firms were also reducing their share of employment in California, then this would point to decreasing attractiveness of the state as a place to do business.

Our analysis indicates that shifts in employment of California companies to outside the state have been offset by shifts of employment of non-California companies to inside the state. As a result, the share of California employment relative to that in the nation as a whole has been quite stable or perhaps has even risen recently.

To see this evidence—placing the question of the behavior of California-headquartered firms in the context of the two-way street that can characterize changes in the location of economic activity—Figure 4.7 displays the time-series of the share of employment in California as a share of total employment of firms headquartered outside California.[8] The figure gives some indication that, after a brief dip in the early to mid-1990s, this share has generally increased, especially during the same 1997–1999 period when the share of employment accounted for by California-headquartered firms fell. Thus, it seems that the shifting locus of employment of California-headquartered firms out of state was related more to increased employment away from headquarters in both directions rather than solely to businesses moving jobs out of California.[9]

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[8]We cannot do this analysis for births because we do not have the NETS micro-data on every establishment nationwide. But we can do the employment analysis because we have total national employment figures for each year. We can compute total employment in firms headquartered outside California by subtracting from this total the employment of firms headquartered in California.

[9]Over the period 1992–2004, employment in California as a share of total employment of firms headquartered outside California fluctuated within a range of 0.2 percentage point relative to a mean of approximately 2.15 percent. The base for this percentage is employment in all firms headquartered outside California, which ranged

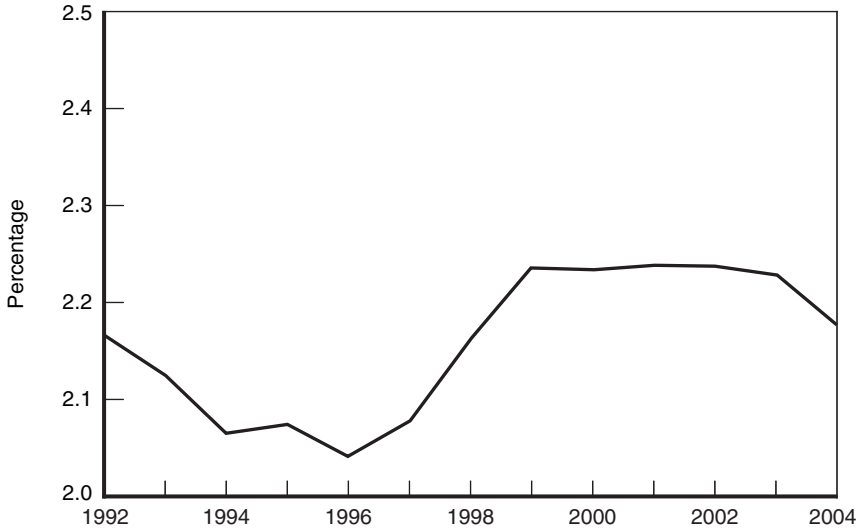

Figure 4.7—California Employment in Firms Headquartered Outside California, as a Share of Total Employment in Firms Headquartered Outside California, 1992–2004

The most straightforward and complete way to assess California's relative economic performance is to look at California's share of national employment, which takes into account all sources of job creation and destruction of all firms regardless of headquarters location. California's share of national employment fell during the early to mid-1990s but then rose steadily subsequent to the boom of the late 1990s. This is illustrated in the top panel of Figure 4.8 for NETS employment, as well as employment measured in both the Current Population Survey (CPS) and the Current Employment Statistics (CES) payroll survey.[10] Of course, the U.S. population share residing in California could have changed in ways that

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from 125 million to 150 million over the time period. Compare this with employment outside California as a share of firms headquartered within California, which fluctuated within a range of 4 percentage points relative to a mean of approximately 14 percent (the inverse of the top line in Figure 4.3). The base for this percentage is employment in all firms headquartered in California, which ranged from 14.5 million to 17 million over the time period.

[10]In addition to looking at California's share of national employment, one can use the NETS to look at California's share of headquarters by measuring the percentage of employees nationally that work for companies headquartered in California. As

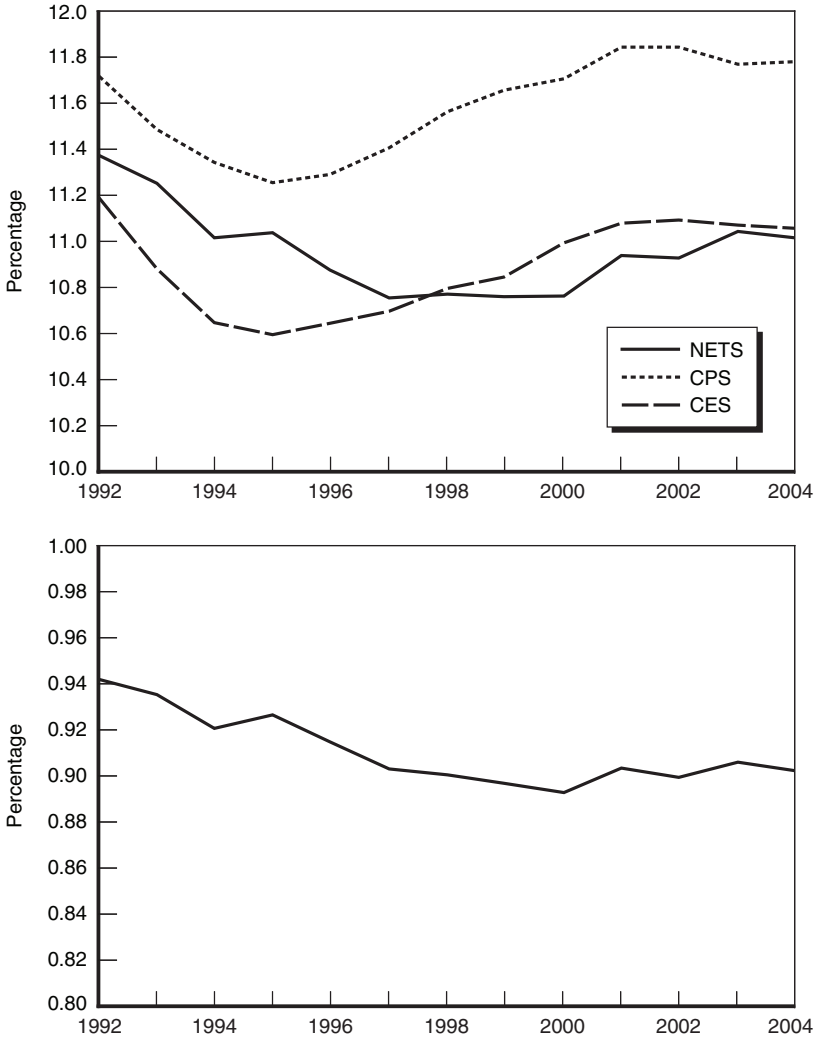

Figure 4.8—California's Share of Total U.S. Employment (top panel), and California's Employment Share Divided by California's Population Share (bottom panel, for NETS only), 1992–2004

with California's share of national employment, the share of national jobs reporting to California companies fell in the early 1990s and rose most years after.

help generate this employment pattern. Thus, in the bottom panel, we show the same series (for the NETS only) divided by California's share of the U.S. population, yielding the state's employment share relative to its population share. The qualitative pattern is similar. However, the fall and rise of this ratio is more muted than is the fall and rise of California's share of national employment, reflecting the fact that California's share of the U.S. population fell from the early to the mid-1990s and then rose modestly.

How Do Changes in the Location Decisions of Firms Headquartered Inside and Outside California Differ Across Key Industries?

All the analysis to this point has been in terms of aggregate behavior. It is possible, of course, that industry-level behavior in some cases has been quite different. And because earnings levels differ substantially by industry, it is possible that shifts of establishments or employment in establishments owned by California-headquartered companies to other states could be concentrated in high-paying industries, whereas the offsetting expansion into California might consist of low-paying jobs. In such a case, the shifting locus of ownership and employment might be worrisome.

We look at four industry groups that seem significant with respect to business climate issues and the changing job market: technology,[11] manufacturing, finance and insurance, and retail. The technology sector played a central role in the late 1990s boom and subsequent bust. Manufacturing is of interest because jobs in this sector are considered "good" because manufacturing, on average, pays high wages and generous benefits. We study finance and insurance because findings in Chapter 3 indicate that this industry experienced a non-negligible net relocation

[11] We define this sector as including the following NAICS codes: 334 (computer and electronic product manufacturing, which includes computers and computing equipment, communications products, semiconductors, and instrument manufacturing), 517 (telecommunications), and 518 (internet service providers, web search portals, and data processing services). We excluded 516 (internet publishing and broadcasting) because the NETS did not break out 516 separately from NAICS 511 (publishing). We excluded 5415 (computer systems design and related services) because national employment aggregates from the NETS were made available to us only at the three-digit level, and the remainder of NAICS 541 is not technology-related.

of jobs from California to other states. In addition, this industry has high average earnings. Finally, we examine retail because this sector is frequently viewed as the source of the proliferation of relatively low-wage, low-benefit jobs. Table 4.3 shows the average annual pay in these sectors.

The data show that the shift of economic activity of California-headquartered firms to out of state is largest for finance and insurance and retail. There is weaker evidence of such a shift for the technology sector, and no such shift for manufacturing. On the other hand, the shifts of economic activity of firms headquartered outside California to inside the state occurred for all these industry sectors, although most sharply for finance and insurance.

For the four industry groups, we present analyses similar to those presented for the economy overall in Figures 4.3 and 4.7. Figure 4.9 displays these shares for the technology sector. The share of employment in California-headquartered technology firms declined at first and then increased during the late 1990s before dropping again—perhaps to a somewhat lower share than before the late 1990s boom. The share of employment in California for technology firms headquartered outside California rose sharply from 1996 to 1997 and continued to drift fitfully upward after. Thus, there is perhaps some downward trend in employment of California-based companies in the state in this industry, but this is countered by a relatively strong increase in technology employment in the state attributable to companies headquartered elsewhere. In general, then, there is an increasing tendency for technology firms headquartered both inside and outside California to have employment in a different state from the headquarters.

Table 4.3

Average Annual Pay, by Industry Sector, 2004

Sector	Average Annual Pay, $
Technology	91,449
Manufacturing	56,520
Finance and insurance	80,103
Retail trade	28,905

SOURCE: Quarterly Census of Employment and Wages, 2004.

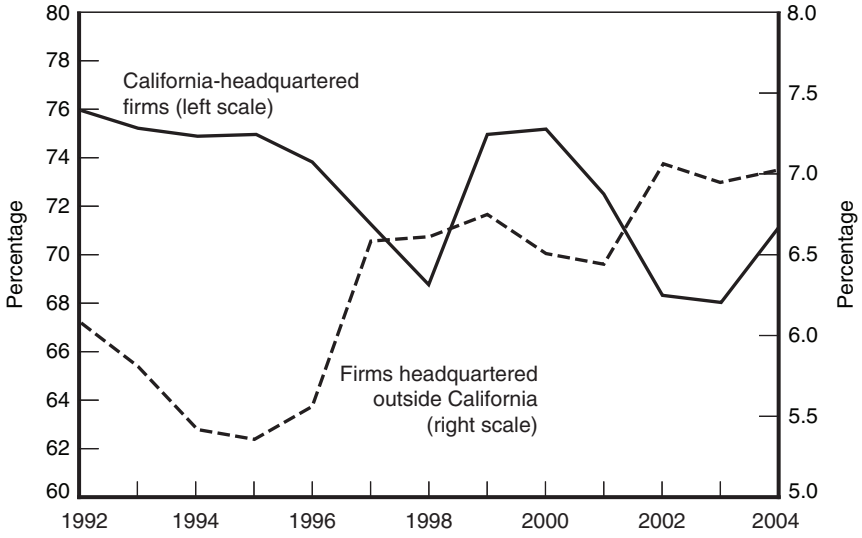

Figure 4.9—California's Employment Share in the Technology Sector, 1992–2004

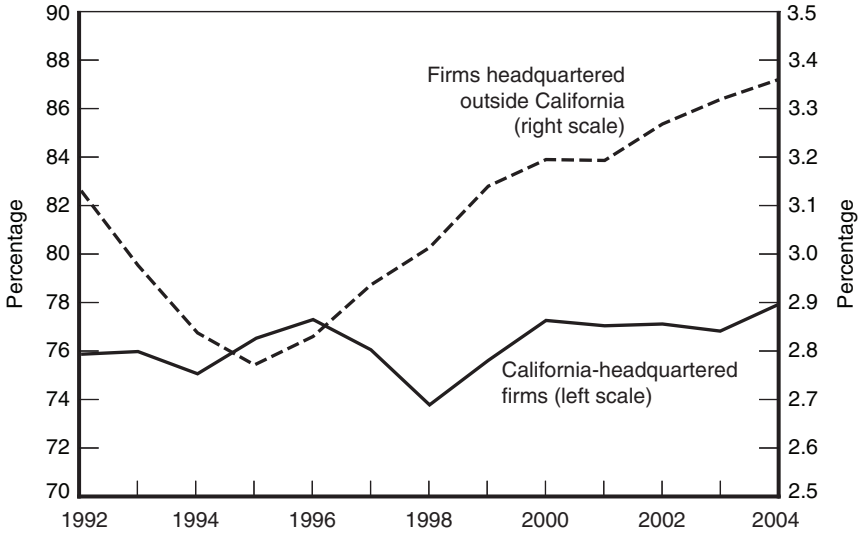

Figure 4.10—California's Employment Share in the Manufacturing Sector, 1992–2004

Figure 4.10 reports similar data for manufacturing. Here, there is little evidence of any trend in the share of employment in California-headquartered firms in California, which is quite stable throughout the sample period. Thus, in this sector, which is often a focus of policy debate, there does not appear to be any sign that California-headquartered companies are finding the state less hospitable economically. And among firms headquartered outside California, their employment share in California rose steadily after 1995, reversing a decline over the period 1992–1995, suggesting that California may have become more attractive to these firms. Of course, it must be remembered that this relative increase is against a backdrop of overall declining manufacturing employment throughout the United States.

The results for finance and insurance are displayed in Figure 4.11. For this industry, there is a marked drop in the share of employment in the state represented by California-headquartered companies between 1996 and 2000. Yet the share of employment in the state in firms headquartered outside California rose sharply over the same period, in a closely offsetting manner. Figure 4.12 shows a similar if somewhat less-marked pattern of geographic dispersion for retail trade—a drop in the California share

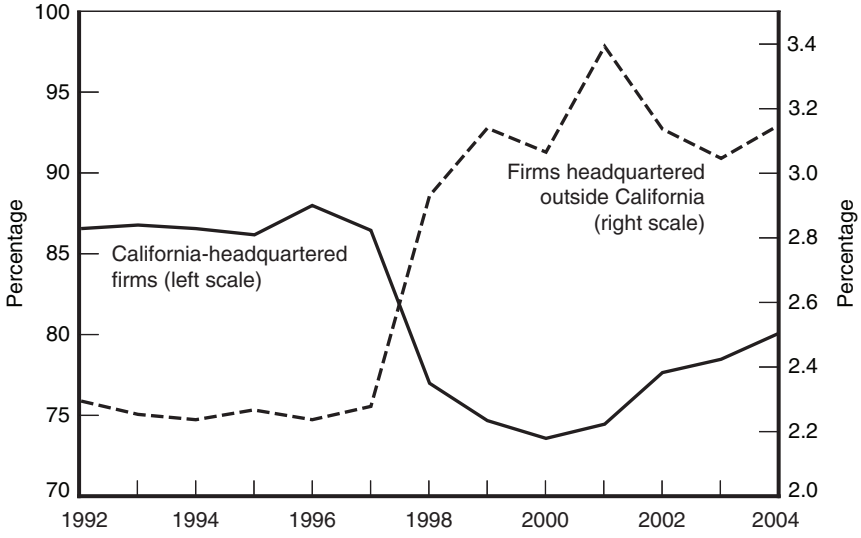

Figure 4.11—California's Employment Share in the Finance and Insurance Sector, 1992–2004

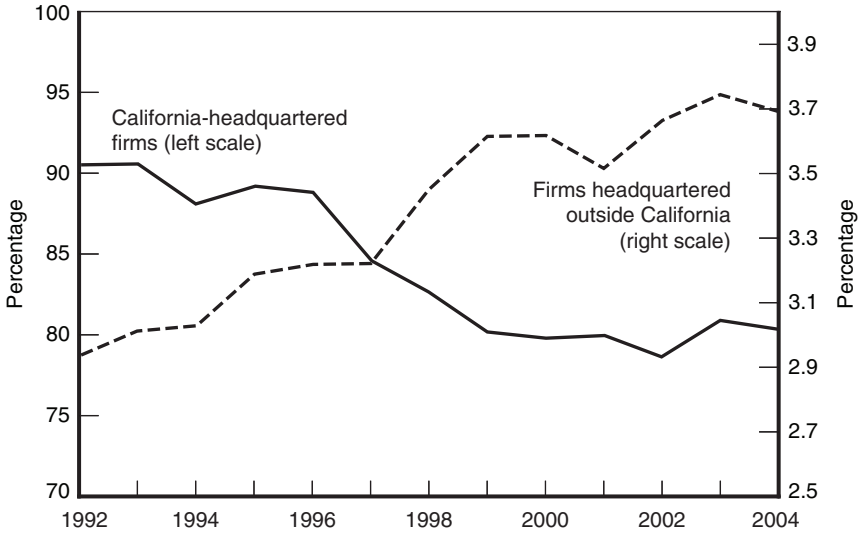

Figure 4.12—California's Employment Share in the Retail Sector, 1992–2004

of employment of firms headquartered in California offset by a rise in the California employment of firms headquartered outside California. These results underscore the importance of looking not only at changes in one direction (whether California-based firms are shifting employment elsewhere) but rather at changes in both directions.

To assess the combined effect of firms headquartered both in and outside California, the top panel of Figure 4.13 shows the share of national employment in California for each of the four highlighted industries (analogous to Figure 4.8 for the economy overall). For three of the four industries—technology, finance and insurance, and manufacturing—California's share of national employment was by and large steady or rose slightly over the period 1992–2004. The only industry to lose share was retail, because of an initial drop between 1993 and 1994 and slow growth subsequently.[12] Interestingly, the industry in which California has lost employment relative to the national average is not one with high-wage, high-benefit jobs but rather one that is most often flagged as providing poor-quality jobs. By contrast, California's relative position in terms of

[12]This does not mean that retail jobs are not proliferating but instead simply that retail has grown more in other states.

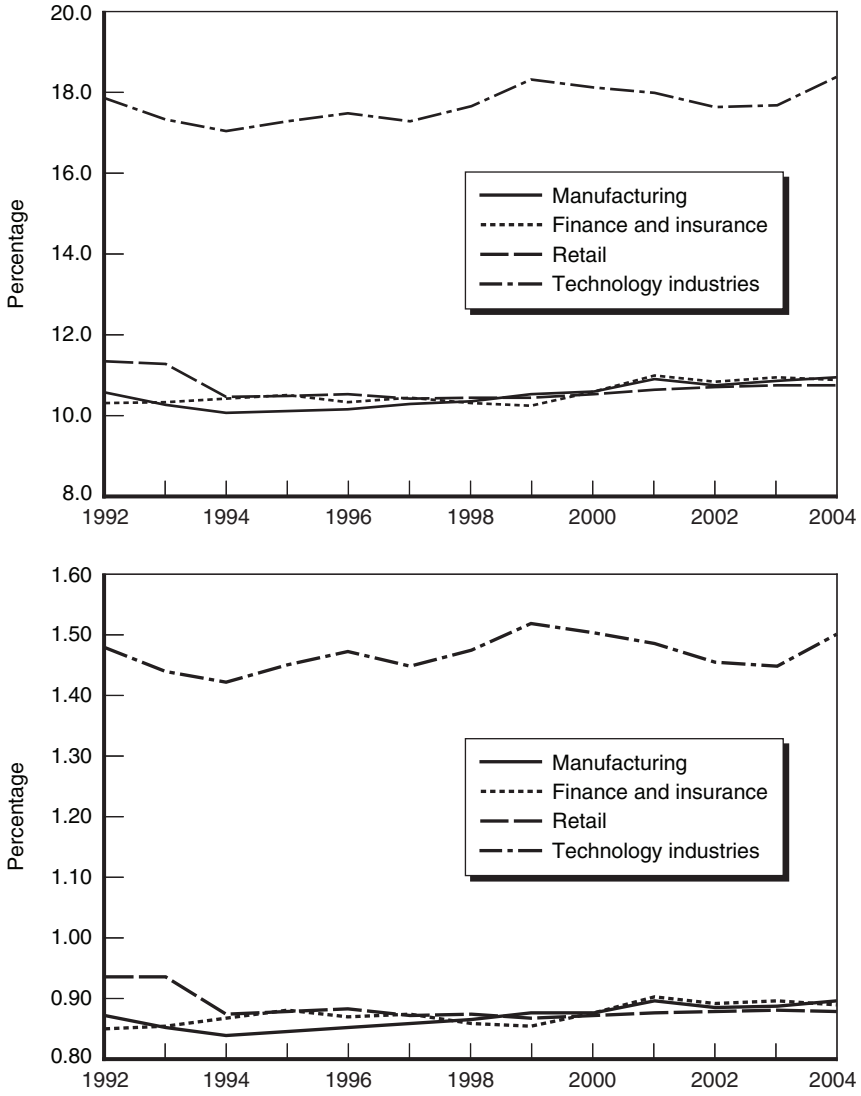

Figure 4.13—California's Share of U.S. Employment, by Industry (top panel), and California's Employment Share, by Industry, Divided by California's Population Share (bottom panel), 1992–2004

employment in industries with higher earnings shows slight but continual improvement. Adjusting for population movements, the bottom panel shows the same series relative to the state's population share. The patterns remain similar.

5. Regional Patterns of Interstate and Intrastate Relocation

To analyze employment dynamics at the regional level, we divide the state into 11 regions (see Table 5.1).[1] The regions themselves contain economic variation, since they span counties that differ in their level of urbanization, industry mix, and other factors. Therefore, we also examine employment dynamics at the county level.

Table 5.1

California's 11 Regions

Region	Counties
Northern California	Del Norte, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Plumas, Sierra, Siskiyou, Trinity
Northern Sacramento Valley	Butte, Colusa, Glenn, Shasta, Tehama
Greater Sacramento	El Dorado, Placer, Sacramento, Sutter, Yolo, Yuba
San Francisco Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma
Southern San Joaquin Valley	Fresno, Kern, Kings, Madera, Tulare
Northern San Joaquin Valley	Merced, San Joaquin, Stanislaus
Central Sierra	Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, Tuolumne
Central Coast	Monterey, San Benito, San Luis Obispo, Santa Barbara
Greater Los Angeles	Los Angeles, Orange, Ventura
Inland Empire	Riverside, San Bernardino
San Diego border region	Imperial, San Diego

[1] These regions are very similar to the Economic Strategy Panel's (ESP's) nine regions. We divided the ESP's San Joaquin Valley region into Northern and Southern, and we divided the ESP's Southern California region into Greater Los Angeles and Inland Empire. Last, whereas the ESP assigns San Benito County to the San Francisco Bay Area, we assign it to the Central Coast region.

Establishments are much more likely to move within California than to move into or out of the state. Many of the factors that enter into firms' location decisions differ widely within a state, especially one as large and diverse as California. Local governments use zoning and incentives to attract or—if congestion or rapid growth is perceived as a problem—to curtail employment, and neighboring jurisdictions can take different approaches. Localities also offer businesses different labor markets; it is easier to hire a screenwriter in Los Angeles and a political polling expert in Sacramento than the reverse. Cities, towns, and even neighborhoods have their own real estate markets, and firms can affect their cost of office space or land by moving even a short distance within a metropolitan area. Proximity to other businesses can influence location decisions within cities and towns; firms in some industries reap benefits from clustering together, but the benefits of proximity weaken when firms are more than a mile from each other.[2]

From the perspective of local policymakers, businesses' intrastate location decisions matter as much as interstate location decisions. Many localities try to create more favorable business climates through infrastructure, regulation, and other incentives. And localities compete with other localities within California as well as with those in other states. From the state's perspective, intrastate moves leave aggregate state employment unchanged.[3] Still, the distribution of employment within the state affects infrastructure demands and the environment. Shifts in employment could also result in localized labor shortages or surpluses or in increasing commute times if population shifts do not match employment shifts. On the other hand, some moves could be viewed as beneficial from the state's perspective if they bring jobs to areas where labor market

[2]Rosenthal and Strange (2003) find that the effect of industry employment on establishment births in the same industry is much stronger for employment within one mile than for employment in the one-to-five-mile range.

[3]At the least, there are no first-order effects on state employment. One could imagine, though, that a shift of jobs from one location to another could have asymmetric effects on the origin and destination locations, perhaps generating stronger positive spillover effects in the destination location than negative spillover effects in the origin location if the destination location is less saturated with other businesses. Intrastate moves could also affect aggregate state employment if an establishment expands or contracts when it relocates, although technically speaking this is distinct from relocation in and of itself.

conditions are weak, which could in turn reduce local unemployment or lower commuting times. Indeed, California's main economic development program—enterprise zones—is designed to affect businesses' intrastate location decisions and to encourage employment growth in designated neighborhoods; these designated areas may well gain at the expense of other areas in the state. Thus, even though intrastate location decisions generally do not affect aggregate state employment, they are still relevant to state-level policy.

In this chapter, we first extend our analysis to look at interstate migration from a regional perspective, exploring the extent to which particular areas of the state tend to lose jobs to other states or attract jobs from them via relocation.[4] We then look at intrastate migration more generally, tracking the patterns of intrastate migration between regions and between counties.

In principle, every analysis we have done in the previous chapters could be done for any region or county of the state. For example, we could ask about intrastate and interstate migration by industry for each region and county. Repeating all these analyses, however, would lead to such massive amounts of information as to render it uninterpretable.[5] Nonetheless, we do report two additional analyses of migration at the local level.

First, we compare the prevalence of more distant to more local moves within the state to provide some evidence on motivations for within-state migration. Second, we revisit the tip-of-the-iceberg question at the county level—a question we considered at the industry level in Chapter 3—to see whether relocation at the county level is a useful indicator of overall county economic performance.

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[4]Our analysis of interstate migration at the regional level parallels our industry-level analysis. We showed in Chapter 3 that the aggregate level of interstate migration at the state level is very small, but interstate migration is a bit more substantial in some industries. Similarly, in this analysis we explore whether interstate migration plays a more significant role in some regions or counties within the state, which is masked when looking at the statewide average.

[5]At the same time, this chapter illustrates the type of analysis we could do with the NETS data to study business establishment and employment dynamics for a particular locality.

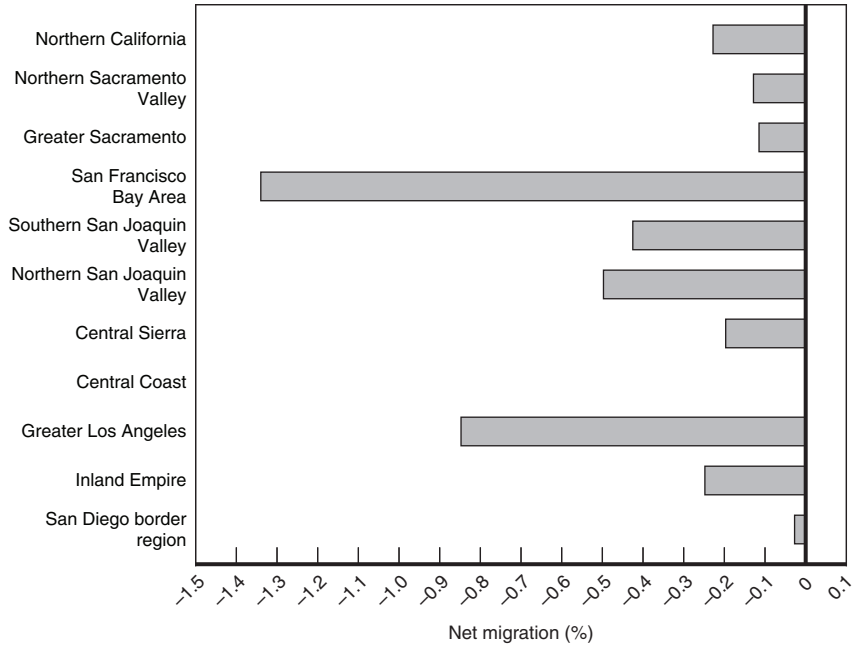
Our main findings are:

1. Every region lost jobs from interstate migration during the time period studied, and this job loss was highest in the San Francisco Bay Area.
2. Intrastate migration contributes most to employment change in inland and less-urbanized regions; the Inland Empire is the largest beneficiary of moves within the state.
3. Intrastate migration is most common over short distances. The most common cross-county moves are between adjacent counties, from more urbanized to less urbanized.
4. At the county level, migration—and especially intrastate migration—is a useful measure of overall economic conditions.

How Were Regions Affected by Interstate Relocation?

The NETS data indicate that nearly every region lost jobs from interstate migration over the period 1992–2004, and that this job loss was highest in the San Francisco Bay Area. At the state level, the loss of jobs from net interstate migration, relative to employment in 1992, was 0.7 percent, or about 0.06 percent annually. Across the 11 regions, the rate of job loss from net migration was highest in the Bay Area: Its rate of loss between 1992 and 2004 was 1.34 percent, almost twice the state average (Figure 5.1, and Table 5.2, column 1). Greater Los Angeles was second, losing 0.85 percent of its jobs from net interstate migration.

Figure 5.2 shows how much interstate migration contributes to gross job creation and gross job destruction at the regional level. Interstate out-migration accounted for 2.3 percent of all job destruction in the Bay Area, the highest among the regions, followed by 1.6 percent in Greater Los Angeles and 1.2 percent in the San Diego border region. However, the regions where interstate out-migration accounts for a larger share of job destruction are the same regions where interstate in-migration accounts for a larger share of job creation. In the Bay Area, Greater Los Angeles, and the San Diego border region, along with the Central Coast (Monterey, San Benito, San Luis Obispo, and Santa Barbara Counties), in-migration from other states accounted for larger shares of job creation than in the rest of the state. Therefore, interstate migration in both directions accounts for a larger share of employment changes along California's densely populated



NOTE: The underlying data are in Table 5.2, column 1.

Figure 5.1—Net Interstate Migration Relative to 1992 Employment, by Region, 1992–2004

coast than it does inland. This is despite the fact that the less-populated north and the inland Sierra regions are geographically closer to the borders of other states.

The Bay Area stands out from other regions for its job loss from interstate migration, but this phenomenon is heavily concentrated in a handful of Bay Area counties. In Marin and San Francisco Counties, the percentage of jobs lost from net interstate migration was more than 4 percent, compared with the Bay Area average of 1.34 percent and the state average of 0.7 percent over the period 1992–2004.[6] No other counties in the state came close: The third-highest was San Mateo, also in the Bay Area, with a job loss from net interstate migration of 1.8 percent. Other Bay Area counties' losses were less than the state average, and Contra

[6]These county-level numbers are not reported in the tables.

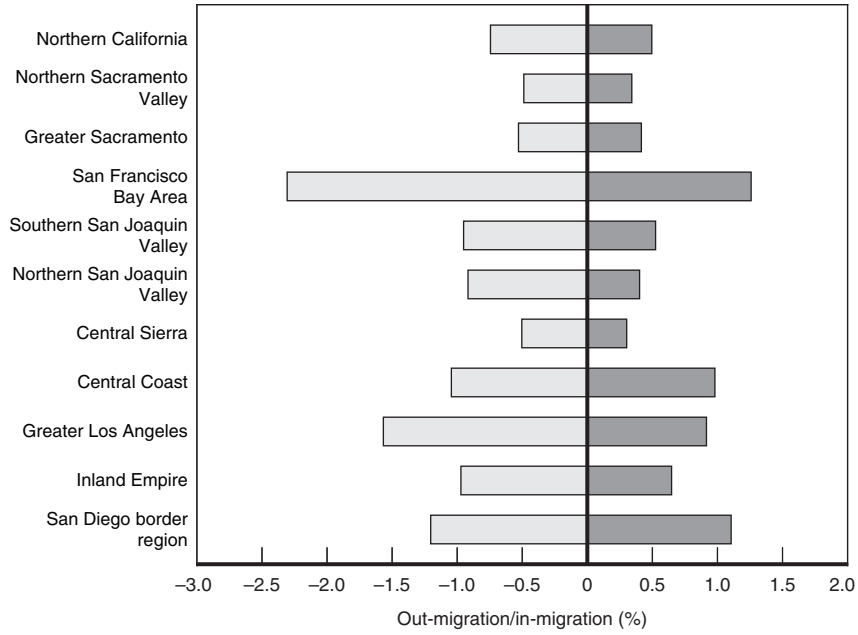
Table 5.2

Interstate Migration, by Region, 1992–2004

Region	Net Migration Relative to 1992 Employment (1)	Gross Migration Relative to 1992 Employment (2)	In-Migration as a Percentage of Job Creation (3)	Out-Migration as a Percentage of Job Destruction (4)
Northern California	–0.23	1.37	0.49	0.74
Northern Sacramento Valley	–0.13	0.91	0.34	0.50
Greater Sacramento	–0.12	1.33	0.41	0.53
San Francisco Bay Area	–1.34	4.60	1.26	2.31
Southern San Joaquin Valley	–0.43	1.65	0.52	0.96
Northern San Joaquin Valley	–0.50	1.42	0.40	0.92
Central Sierra	–0.20	0.91	0.30	0.51
Central Coast	–0.001	2.46	0.97	1.04
Greater Los Angeles	–0.85	3.08	0.91	1.58
Inland Empire	–0.25	2.16	0.65	0.97
San Diego border region	–0.03	3.09	1.11	1.21

Costa even gained jobs from net interstate migration. The loss of jobs from interstate migration, therefore, is not a Bay Area–wide phenomenon; it affected primarily San Francisco and Marin Counties.

What do these patterns imply for claims about California's business climate? The concentration of net out-migration in a couple of counties is more consistent with such localized factors as high costs or less business-friendly policies than with statewide factors. San Francisco and Marin Counties are expensive places to do business in part because of high and



NOTE: The underlying data are in Table 5.2, columns 3 and 4.

Figure 5.2—Interstate Out-Migration and In-Migration as Shares of Job Destruction and Job Creation, by Region, 1992–2004

rising costs of real estate. It is unclear why state-level policies would lead to concentrated job losses in these two counties and net gains from other states in numerous other counties such as Contra Costa, Imperial, and Merced, although we cannot rule out the possibility that state-level policies have effects that differ across regions.

How Were Regions Affected by Intrastate Relocation?

Unlike interstate migration, which contributed to net job losses in all regions of California—but not all counties—intrastate migration is effectively a zero-sum game; when some regions lose jobs to intrastate migration, other regions gain. California as a whole cannot, by definition,

gain or lose jobs solely from intrastate migration.[7] However, there may be gains or losses with respect to the geographic distribution of jobs within the state. Examining intrastate migration, furthermore, reveals strengths and weaknesses about California's regions, and it also helps assess the fundamental reasons why businesses move and locate where they do.

To study this, we expand our decomposition of employment dynamics to include migration of establishments between regions. Net intrastate migration is defined as jobs gained from migration from other regions minus jobs lost from migration to other regions. Our analysis shows that intrastate migration contributes most to employment change in inland and less-urbanized regions and that the Inland Empire is the largest beneficiary of moves within the state.

Figure 5.3 shows the gains and losses from intrastate migration for the regions; the underlying data are in Table 5.3. In absolute numbers, the largest gainer by far was the Inland Empire, into which more than 54,000 net jobs moved from elsewhere in the state between 1992 and 2004. Greater Sacramento was second, gaining 15,000 net jobs over the period. The largest loser of jobs, again by a considerable margin, was Greater Los Angeles, with more than 50,000 net jobs lost to elsewhere in the state, followed by the Bay Area, with 17,000 net jobs lost.[8]

For the Inland Empire, intrastate migration was considerable, relative to the size of this region. The addition of 54,000 net jobs increased regional employment by 5.5 percent relative to 1992 employment, as shown in Figure 5.4; in no other region did either intrastate migration or

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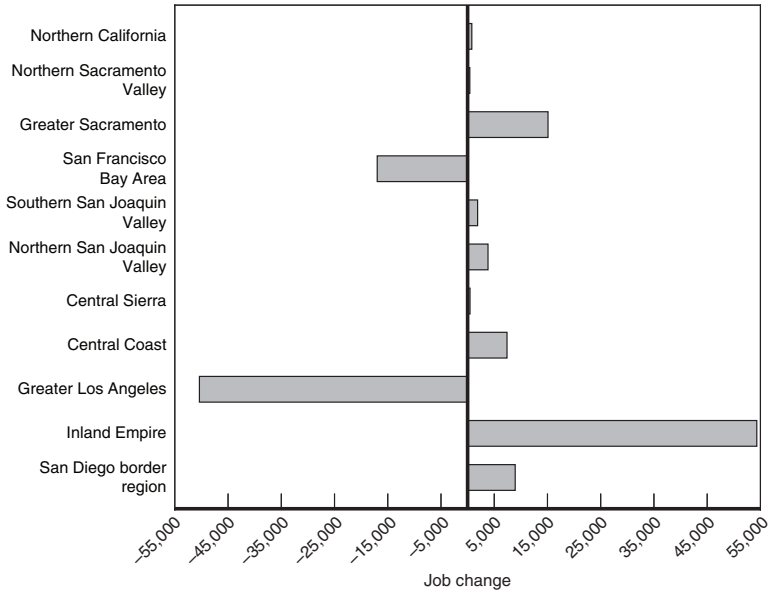
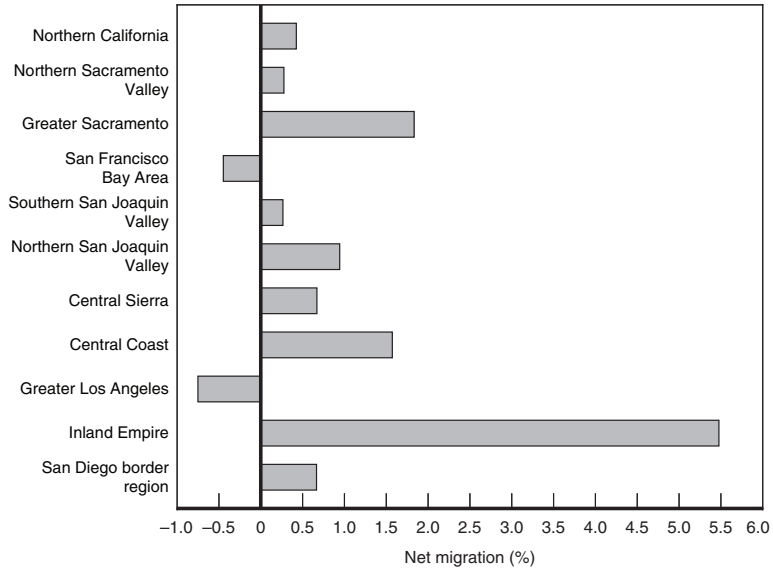
[7]The net intrastate migration flows, summed across regions, do not add to zero, however. Establishments can expand or contract in the same year that they move, so the sum of net flows also reflects employment changes in establishments in the year that they migrated. For instance, an establishment that has 100 employees and is in Los Angeles in 1993 and then has 120 employees and is in Orange County in 1994 would be counted as an intrastate migration between 1993 and 1994 that resulted in a loss of 100 jobs for Los Angeles and a gain of 120 jobs for Orange County.

[8]The picture of gains and losses from intrastate migration depends on how regions are defined. The Economic Strategy Panel and the Southern California Association of Governments (SCAG) define the "Southern California" region as including the Greater Los Angeles and Inland Empire regions (SCAG includes Imperial County, too). If Greater Los Angeles and the Inland Empire are combined into "Southern California," this larger region is a net gainer from intrastate migration of around 4,000 jobs, which would put it near the middle of regions ranked by net intrastate migration.



NOTE: The underlying data are in Table 5.3, column 1.

Figure 5.3—Net Job Change from Intrastate Migration, 1992–2004



NOTE: The underlying data are in Table 5.3, column 2.

Figure 5.4—Net Intrastate Migration Relative to 1992 Employment, 1992–2004

Table 5.3

Intrastate Migration, by Region, 1992–2004

Region	Net Job Change from Intrastate Migration, 1992–2004 (1)	Net Migration Relative to 1992 Employment, % (2)	Gross Migration Relative to 1992 Employment, % (3)	In-Migration as a Percentage of Job Creation (4)	Out-Migration as a Percentage of Job Destruction (5)	Gross Interstate Migration as a Percentage of All Migration (6)
Northern California	767	0.42	6.05	2.80	2.62	18
Northern Sacramento Valley	498	0.28	3.73	1.75	1.63	20
Greater Sacramento	15,192	1.83	4.62	2.16	1.02	22
San Francisco Bay Area	–17,080	–0.45	2.66	0.85	1.21	63
Southern San Joaquin Valley	1,810	0.26	3.38	1.57	1.44	33
Northern San Joaquin Valley	3,867	0.95	5.45	2.78	2.15	21
Central Sierra	446	0.67	5.45	2.63	2.21	14
Central Coast	7,539	1.57	6.24	3.08	1.98	28
Greater Los Angeles	–50,645	–0.74	2.97	0.91	1.49	51
Inland Empire	54,549	5.46	11.81	5.86	2.54	15
San Diego border region	8,989	0.66	4.12	1.73	1.34	43

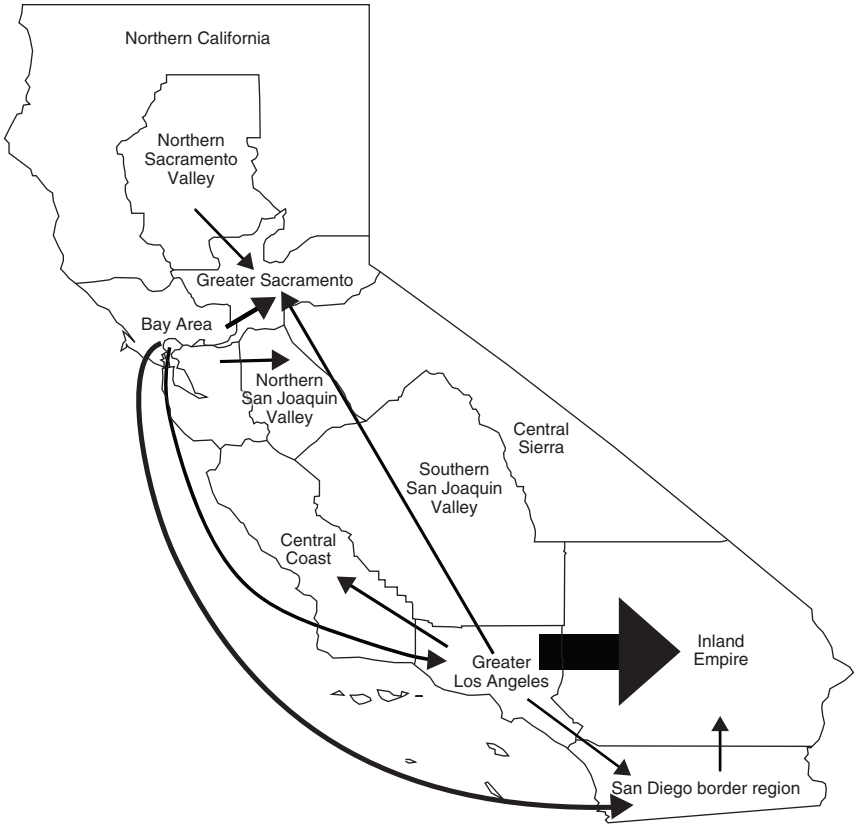
interstate migration change regional employment by more than 2 percent in either direction. In Greater Los Angeles, where the number of jobs lost from intrastate migration was similar to the number gained in the Inland Empire, but where the employment base is much larger, intrastate job loss decreased regional employment by only 0.74 percent. In the Bay Area, intrastate job loss decreased regional employment by only 0.45 percent—far less than the loss of 1.34 percent of jobs in the Bay Area from interstate migration.

The largest net flow of jobs *between* regions was from Greater Los Angeles to the Inland Empire: The net flow was 52,000 jobs. Figure 5.5 shows the top ten net flows between regions; the arrow thicknesses are proportional to the net migration flow; the underlying data are in Table 5.4. The other top flows between regions were much smaller, with the Bay Area losing between 5,000 and 7,000 net jobs each to the San Diego border region, to Greater Los Angeles, and to Greater Sacramento. The top eight flows are all from the Bay Area or Greater Los Angeles. However, these two regions are by far the largest economies in the state, together accounting for nearly two-thirds of California employment.

Table 5.4, column 2, presents a measure of job flows that adjusts for the sizes of each regional economy.[9] This adjustment reduces the implied flows between regions for which we could expect large flows based solely on their size, and vice versa. Instead, it yields what the flows would be if the factors *other than* size continued to matter but all regions of the state were the same size, holding total flows fixed. Thus, although the adjusted flow numbers are only hypothetical, they give a better sense of the "attraction" between regions in terms of the factors other than size that lead to large flows between regions. As the table shows, as a result of this adjustment, the Northern Sacramento Valley to Greater Sacramento flow is increased greatly and becomes the largest one. But the flow from Greater Los Angeles to the Inland Empire still remains very large. Other flows, such as the Bay Area to Greater Los Angeles, are much smaller when adjusted for the size of those regions.

Intrastate job flows, of course, go in both directions. Even when net flows between regions are small, there can be sizable gross flows going in

[9]See Appendix B for an explanation of this adjustment process.



NOTES: The 10 largest net job movements in California, among regions, 1992–2004. Arrow thickness is proportional to net migration between the pair of regions. The underlying data are from Table 5.4, column 1.

Figure 5.5—Top Ten Net Job Flows Between Regions, 1992–2004

both directions. Table 5.5, column 1, presents the ten largest gross job flows between regions.[10] Although 76,000 jobs moved from Greater Los Angeles to the Inland Empire, 24,000 jobs moved from the Inland Empire to Greater Los Angeles, making this reverse flow the second-largest gross flow between regions.[11] The gross flows between Greater Los Angeles

[10]Table 5.7 shows the top gross flows ranked by the adjusted measure.

[11]The difference in the gross flows between any pair of regions equals the net flow. Therefore, the 76,260 gross flow from Greater Los Angeles to the Inland Empire minus the

Table 5.4

Top Ten Net Job Flows Between Regions, 1992–2004

From	To	Net Migration (1)	Adjusted Net Migration (2)
Greater Los Angeles	Inland Empire	52,077	8,937
Bay Area	San Diego border region	6,739	1,533
Bay Area	Greater Sacramento	6,470	2,412
Bay Area	Greater Los Angeles	5,286	239
Greater Los Angeles	Central Coast	4,775	1,701
Bay Area	Northern San Joaquin Valley	4,758	3,608
Greater Los Angeles	Greater Sacramento	4,640	957
Greater Los Angeles	San Diego border region	3,868	487
Northern Sacramento Valley	Greater Sacramento	1,389	11,145
San Diego border region	Inland Empire	1,291	1,116

NOTE: The computation of the adjusted flows is described in Appendix B.

and the Inland Empire are unusual in that one direction is so much larger than the other, generating the large net flow discussed above. The third- and fourth-largest gross flows were between the Bay Area and Greater Los Angeles, in both directions; the fifth- and sixth-largest gross flows were between Greater Los Angeles and the San Diego border regions, again in both directions. These flows are more typical: The gross flows between regions are relatively similar in magnitude, and the net flow is small relative to the gross flow. For instance, a large share of the 24,000 jobs that moved from the Bay Area to Greater Los Angeles was offset by the 18,000 jobs that moved from Greater Los Angeles to the Bay Area. As with other employment dynamics, looking only at the gross movements in one direction—as often happens in the public debate—yields a misleading picture of economic trends. Furthermore, looking at individual flows

24,183 gross flow in the reverse direction equals the 52,077 net flow shown in Table 5.4.

between pairs of regions reveals facets of relocation behavior that can be obscured in the aggregate. For instance, although the Inland Empire is a net gainer from intrastate migration and the Bay Area is a net loser, the net flow between the regions was 742 jobs from the Inland Empire to the Bay Area.

The more populous regions in the state account for the largest gross and net intrastate flows, but intrastate migration is actually a less-important employment dynamic in these regions. Generally, intrastate and interstate migrations have their strongest effects in different regions. In the densely populated coastal regions of California, intrastate moves accounted for a smaller share of all migration than elsewhere. As a share of all moves (gross flows, both intrastate and interstate), interstate moves dominated in the Bay Area (63%), followed by Greater Los Angeles and the San Diego border region, as shown in Figure 5.6. In less-urban and in inland areas, interstate moves accounted for only 15–30 percent of all flows across regional borders. To the extent that California competes with other states for jobs, this

Table 5.5

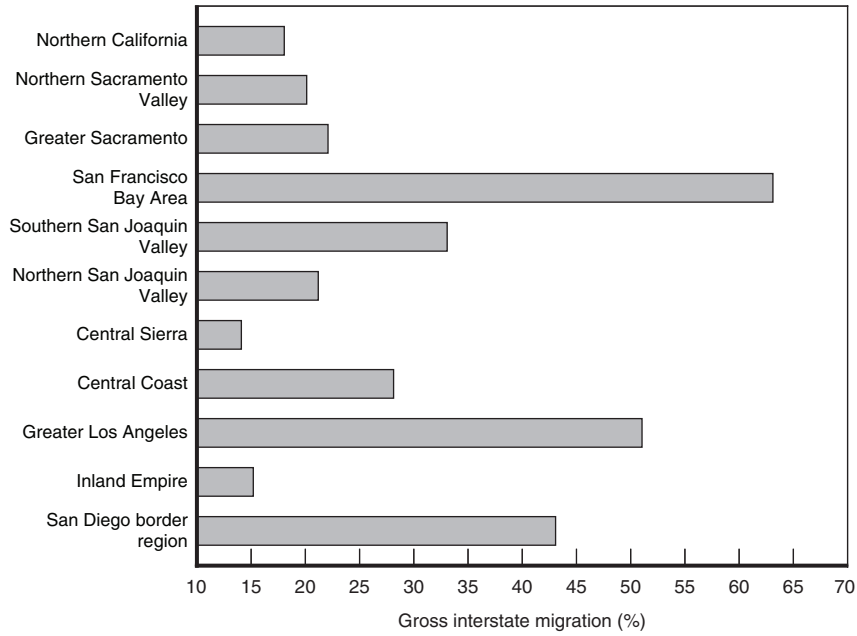
Top Ten Gross Job Flows Between Regions, 1992–2004

From	To	Gross Migration (1)	Adjusted Gross Migration (2)
Greater Los Angeles	Inland Empire	76,260	13,088
Inland Empire	Greater Los Angeles	24,183	4,150
Bay Area	Greater Los Angeles	23,620	1,067
Greater Los Angeles	Bay Area	18,334	829
Greater Los Angeles	San Diego border region	17,290	2,176
San Diego border region	Greater Los Angeles	13,422	1,689
Bay Area	Greater Sacramento	12,223	4,556
Bay Area	San Diego border region	9,557	2,174
Greater Los Angeles	Central Coast	9,457	3,369
Bay Area	Northern San Joaquin Valley	7,697	5,837

NOTE: The computation of the adjusted flows is described in Appendix B.

competition is primarily between the coastal urban areas in California and other states. Elsewhere in the state, establishment migration means mostly intrastate migration. Even in such regions as Central Sierra, Northern California, and the Inland Empire, all of which directly border neighboring states, intrastate migration accounts for the vast majority of job flows into and out of those regions. This pattern underscores the importance of looking at both interstate and intrastate relocation when comparing the effect of job migration on regional economies. Looking only at interstate relocation misses most of the migration that inland and rural areas experience and misleadingly suggests that job movements are primarily a coastal, urban phenomenon.

In sum, the effect of business migration at the regional level is larger than it is in California as a whole, accounting for nontrivial shares of job creation and destruction in several regions. Even so, in the regions where migration contributes most to overall employment changes, migration is



NOTE: The underlying data are in Table 5.3, column 6.

Figure 5.6—Gross Interstate Migration as a Share of All Migration, 1992–2004

dwarfed by expansions, contractions, births, and deaths. Interstate out-migration accounts for only 2.3 percent of job destruction in the Bay Area, and intrastate in-migration accounts for only 5.9 percent of job creation in the Inland Empire; these are the two largest values for interstate and intrastate migration, respectively, and are smaller on a net basis. In contrast, at the regional level, births and expansions account for around 55–60 percent and 35–40 percent, respectively, of job creation; and deaths and contractions account for 60–65 percent and 30–35 percent, respectively, of job destruction. Gross intrastate and interstate migration together account for 2–3 percent of job creation and job destruction in most regions, with the Inland Empire, at 6.5 percent, being the main exception.

What Are the Characteristics of and Likely Motivations for Intrastate Migration?

Establishments migrate not only between states and between regions but also between counties within the same region. The pattern of establishment migration may be informative about why businesses move. Businesses could move their operations a short distance—within a county or to a neighboring county—for several reasons. Short-distance moves can change the cost of office space or land, since real estate prices differ by neighborhood or even by block. Short-distance moves change which businesses are neighbors; if a business benefits from being a short walk from its suppliers or customers, moving even a very short distance can change costs or productivity. Short-distance moves can affect transportation costs if, for instance, an establishment moves closer to an airport or freeway interchange. For retail establishments, short-distance moves can change their customer base. And, finally, short-distance moves may result from changes in local development policies that have limited geographic scope.

Long-distance moves—including moves from one region to another and from one state to another—can affect all the same factors as short-distance moves, but a key difference is that long-distance moves typically put the business in a different labor market (and, more rarely, in a different

product market).[12] An establishment that moves from Marin County to Orange County, for instance, might be able to entice some employees to move and to allow others to commute long distance or telecommute, but much of the Marin-based workforce will be replaced by Orange County–based workers. Short-distance moves can also cause worker turnover if employees are unwilling to have longer commutes: Every employee makes an individual tradeoff between compensation, job characteristics, and commuting. Still, the broader point holds that businesses looking for differently skilled or lower-cost labor are more likely to make long-distance moves than are businesses looking only to affect real estate costs or other factors that change over short distances.[13]

To understand how far establishments are moving within California, we look at movements between all possible pairs of the 58 counties in the state. The results indicate that intrastate migration is most common over short distances. The most common cross-county moves are between adjacent counties, from the more urbanized county to the less-urbanized county.

The largest intrastate gross flow was from Los Angeles County to Orange County, followed by the reverse flow, as shown in column 1 of Table 5.6. All top ten gross flows are between adjacent counties.[14] However, more populous counties naturally have larger job flows, and larger counties tend to be geographically clustered and hence next to each

[12]Other location-specific factors, such as proximity to a research university or a major international airport, can be affected by longer-distance moves more than by short-distance moves if the benefit or cost of those factors accrues throughout a region rather than only in a smaller area such as a neighborhood or town.

[13]If establishments were identical in their demand for different types of labor, demand for real estate, and so on, they would respond similarly to productivity and cost differences between locations and we would observe migration in only one direction; the same location decision would increase profits equally for all establishments, since they are identical. However, establishments differ in the types of labor they use and the amount of land they need; they also differ in idiosyncratic factors, such as which location for the business would minimize the chief executive officer's commute, which Whyte (1988) identified as the factor that best predicted the location to which companies leaving New York relocated. Thus, different establishments make different location choices, and we observe gross job flows in both directions between pairs of locations.

[14]San Francisco and Alameda are "adjacent" in the sense that they are connected by a bridge, and one does not have to cross any other county in traveling from one to the other. The other nine pairs share a land border.

Table 5.6

Top Ten Gross Job Flows Between Counties, 1992–2004

From	To	Gross Migration (1)	Adjusted Gross Migration (2)
Los Angeles	Orange	78,410	185
Orange	Los Angeles	46,346	110
Los Angeles	San Bernardino	35,759	246
Santa Clara	Alameda	35,303	881
San Francisco	San Mateo	33,987	2,413
Los Angeles	Ventura	29,920	348
San Francisco	Alameda	22,252	846
Orange	Riverside	19,641	515
San Bernardino	Riverside	19,253	1,468
Santa Clara	San Mateo	18,559	864

NOTE: The computation of the adjusted flows is described in Appendix B.

other. To assess whether flows between nearby counties are more common, we again adjust the flows by the sizes of the two economies.[15] To focus on flows that are economically significant, in Table 5.7 we present the top ten adjusted gross migration flows for unadjusted flows of more than 1,000 jobs. The top ten flows are no longer only between large counties, but every one of the top ten adjusted flows is still between adjacent counties. Therefore, short-distance in-state moves are far more common than long-distance in-state moves.[16]

[15]Gross flows give a better picture than net flows of which types of migration are most common, since large gross flows in both directions would offset each other and result in a small net flow.

[16]None of the top adjusted gross flows between counties is in the southern part of the state. One reason for this is that counties in the south are larger, so an establishment that moves a given distance is less likely to cross a county line. For instance, a move from one end of Riverside County to the other covers a longer distance than a move from Marin County to Santa Cruz County. One should not draw the conclusion that establishments

Table 5.7

Top Ten Adjusted Gross Job Flows Between Counties, Larger Flows Only, 1992–2004

From	To	Gross Migration (1)	Adjusted Gross Migration (2)
Yuba	Sutter	1,072	41,343
Fresno	Madera	3,469	7,512
Solano	Napa	2,640	6,876
Sacramento	Placer	8,754	3,176
Marin	Sonoma	4,088	2,979
Napa	Solano	1,089	2,836
Stanislaus	Merced	1,325	2,695
San Francisco	San Mateo	33,987	2,413
Madera	Fresno	1,069	2,315
Placer	Sacramento	6,170	2,238

NOTES: The computation of the adjusted flows is described in Appendix B. Only gross flows over 1,000 are included.

The net job flows reveal where employment is shifting within the state. Unlike gross flows, net flows can reveal whether migrating businesses in aggregate prefer one area to another and show the overall effect of migration between two areas on employment. Table 5.8 lists the top ten net flows between counties. The largest, a shift of 32,000 jobs from Los Angeles to Orange, was entirely within Greater Los Angeles; all top ten net flows were between adjacent counties.[17] Furthermore, all but one of the top ten net flows were either outward from a central county in a metropolitan area (Los Angeles to Orange, San Bernardino, Ventura, and Riverside; San Francisco to San Mateo and Alameda) or eastward from the coast (Santa

in the southern part of the state are less mobile or move shorter distances than those in the central or northern parts of the state.

[17]Again, "adjacent" is used in the sense of directly touching or connected by a bridge.

Table 5.8

Top Ten Net Job Flows Between Counties, 1992–2004

From	To	Net Migration (1)	Adjusted Net Migration (2)
Los Angeles	Orange	32,064	76
Los Angeles	San Bernardino	25,133	173
Santa Clara	Alameda	23,541	587
San Francisco	San Mateo	20,183	1,433
Los Angeles	Ventura	15,796	184
San Francisco	Alameda	15,046	572
Orange	Riverside	13,349	350
San Mateo	Alameda	11,096	752
Los Angeles	Riverside	9,091	78
San Bernardino	Riverside	8,557	652

NOTE: The computation of the adjusted flows is described in Appendix B.

Clara to Alameda; San Mateo to Alameda; and Orange to Riverside). Figure 5.7 shows the top county moves, ranked by net job flows. Again, the thicknesses of the arrows are proportional to the flows. Note that we compared the net flows for all county pairs; the figures show only Bay Area and Los Angeles area counties because these are the counties where the top ten flows all occur. Adjusting these net flows for sizes of each county's economy, the top ten flows are spread more throughout the state, but again nearly all are flows outward from a central county in a metropolitan area, such as Fresno to Madera, or eastward, such as San Mateo to Alameda (see Table 5.9), and all are between adjacent counties. Intrastate migration, therefore, shifts jobs in California inland and into less-urbanized areas.

These migration patterns cannot, by themselves, explain why businesses move, but they are more consistent with some reasons for moving than with others. The dominance of short-distance moves between adjacent counties suggests that businesses are not moving primarily in search of differently

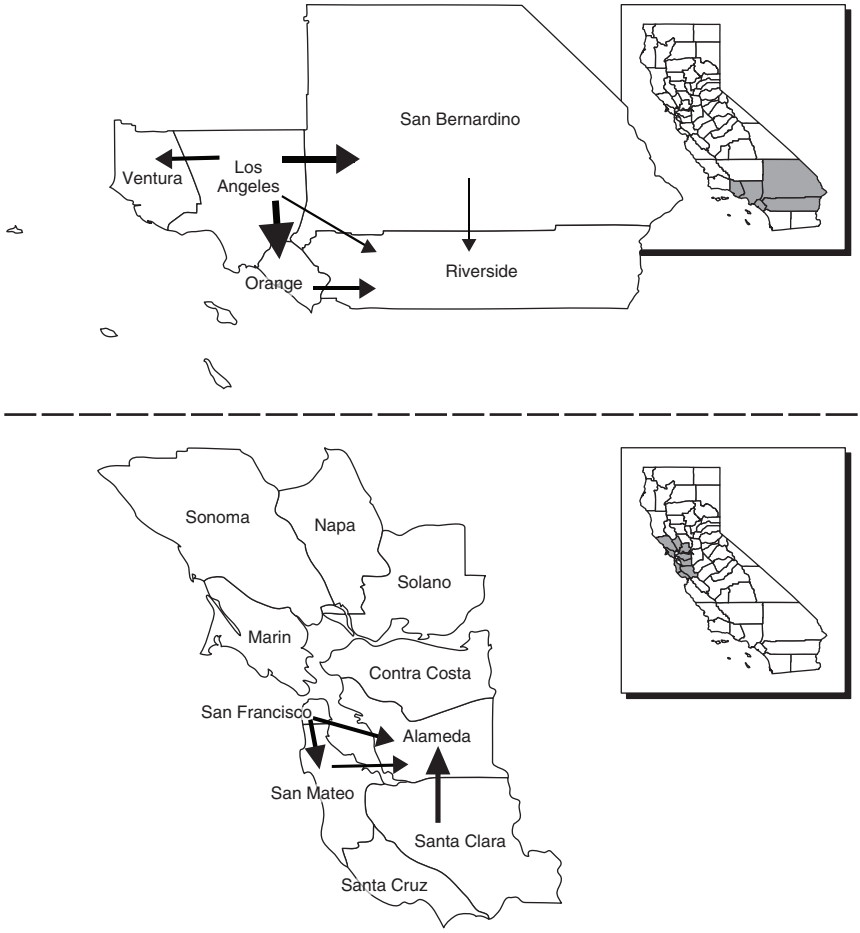


Figure 5.7—Top Ten Net Job Flows Between Counties, 1992–2004

skilled or cheaper labor or regionwide business climate conditions. Rather, the prevalence of short-distance moves is more consistent with businesses seeking to be closer to productivity-enhancing business clusters, or to be in different real estate markets, or to be closer to workers or customers that have moved toward cheaper real estate. The net tendency of businesses to move outward from a central county or inward from the coast is consistent with businesses looking for cheaper land or office space, since

Table 5.9

Top Ten Adjusted Net Job Flows Between Counties, Larger Flows Only, 1992–2004

From	To	Net Migration (1)	Adjusted Net Migration (2)
Fresno	Madera	2,400	5,197
Solano	Napa	1,551	4,039
Marin	Sonoma	3,331	2,428
San Francisco	San Mateo	20,183	1,433
Santa Cruz	Monterey	1,072	1,075
Sacramento	Placer	2,584	937
Contra Costa	Solano	1,926	818
San Francisco	Marin	4,034	796
San Mateo	Alameda	11,096	752
Sacramento	El Dorado	1,083	742

NOTES: The computation of the adjusted flows is described in Appendix B. Only net flows over 1,000 are included.

California real estate is consistently more expensive closer to the coast and in denser areas. Local policy differences could also be a factor. Since zoning, permitting, and other regulations that restrict supply contribute to higher real estate prices, and since regulations affecting real estate could be correlated with other regulations that affect businesses, it is possible that places with cheaper land are also places where the regulatory environment encourages business growth. This is purely speculation, and we raise it only to point out that businesses migrating toward areas with cheaper land could be doing so to reduce their cost of real estate or, alternatively, because land costs are correlated with other costs of doing business. In future work, we hope to assess how local economic development policies influence business location decisions.

Is Relocation at the County Level an Indicator of a County's Economic Health?

Although both interstate and intrastate relocation are small shares of job creation and destruction at the regional level, we can ask the same question about relocation at the regional level as we did at the industry level. Is relocation the tip of the iceberg? That is, despite relocation's small contribution to job creation and destruction, is migration nonetheless a useful indicator of births, deaths, expansions, and contractions and therefore of the economic health of a region? Relocation, relative to other employment dynamics, receives a disproportionate amount of attention in the public debate, in part because it is easier to observe than other dynamics. If net employment changes in a region are correlated with net employment changes that are due to other dynamics, then relocation patterns are a useful metric for overall regional economic conditions.

Looking at the 11 regions, we find that migration does appear to be a useful indicator of overall economic conditions. The fastest-growing region between 1992 and 2004, the Inland Empire, was the largest net gainer of jobs from intrastate relocation (Figure 5.4). The slowest-growing regions, the San Francisco Bay Area and Greater Los Angeles, were the largest net losers of jobs from both interstate relocation (Figure 5.1) and intrastate relocation (Figure 5.4).

To examine the tip-of-the-iceberg hypothesis more carefully, we use 58 counties rather than 11 regions, just as at the industry level we focused on about 100 disaggregated industries rather than 20 broad industry sectors. Disaggregation results in more observations and wider variation in growth rates and migration levels. This wider variation was noted above: In Marin and San Francisco Counties, the percentage of jobs lost from net interstate migration was over 4 percent, even though at the regional level the largest job loss from net interstate migration was 1.34 percent, for the San Francisco Bay Area. At the other extreme, some counties, such as Contra Costa, Imperial, and Merced, gained jobs from net interstate migration, even though no region did. Similarly, intrastate migration shows more variation at the county level than at the regional level. Regional job changes from net intrastate migration range from a 0.7 percent loss in Greater Los Angeles to a 5.5 percent gain in the Inland Empire; at the

county level, San Francisco lost 6.7 percent of its jobs from net intrastate migration, Alameda grew by 6.3 percent from net intrastate migration, and Riverside grew by 8.2 percent.[18]

To assess the tip-of-the-iceberg hypothesis more carefully, therefore, we use all 58 counties to examine correlations between job change from relocation and other sources of employment growth. Our analysis indicates that job migration flows—especially intrastate flows—are useful indicators of a county's economic health, confirming what a casual look at regional trends revealed. The correlation at the county level between employment growth from dynamics other than migration (births, deaths, expansions, and contractions) and employment growth from net interstate migration (weighted by 1992 county employment so that large counties such as Los Angeles count more than smaller counties) is 0.30. The correlation between employment growth from dynamics other than migration and employment growth from net intrastate migration (weighted by 1992 county employment) is 0.65. Therefore, employment change from relocation at the county level is highly correlated with employment change from births, deaths, expansions, and contractions. The relationship is stronger for intrastate relocation than for interstate relocation but is strong for both.[19] The tip-of-the-iceberg hypothesis therefore holds for the county level, in contrast to our above finding that industry-level interstate relocation bears no relationship to absolute or relative industry employment growth at the statewide level.

Just because relocation is the tip of the iceberg does not mean that local economic development policy should be geared toward luring

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[18]Despite the larger relative flows at the county level than at the regional level, relocation in every instance remains small relative to other sources of job creation and destruction. For every county, gross interstate in- and out-migration accounts for less than 5 percent of gross job creation or destruction, respectively. For counties, gross intrastate in- and out-migration almost always account for less than 12 percent of gross job creation and destruction, respectively. The only exception is Lassen County, where gross intrastate out-migration accounted for 16 percent of gross job destruction, but with employment of approximately 9,000 in 2004, this higher percentage in Lassen County is relative to a very low base.

[19]These correlations are not driven solely by a few heavily weighted observations. Excluding counties with employment greater than one million (Los Angeles, Orange, San Diego, and Santa Clara), the correlations are 0.36 for interstate relocation and 0.48 for intrastate relocation.

establishments from elsewhere and preventing local establishments from being lured elsewhere. The positive correlations do not mean that policies designed to raise employment growth by encouraging in-migration or discouraging out-migration would have any effect on expansions, contractions, births, or deaths. Rather, the positive correlations imply only that migration patterns at the county level are a useful metric that should be watched, because they may be indicative of other factors—including local policy—that are making a particular county more or less amenable to job growth.

6. Conclusions

Our analysis of the location decisions of California's businesses, and their implications for employment dynamics, has taken us far beyond earlier evidence that interstate business relocation is a minor phenomenon.[1] Looking at the industry level, at the regional level, and at the broader set of location decisions associated with firms expanding out of and into the state, we have presented numerous findings that enrich our understanding of business location decisions and how they affect employment. We now return to the original themes that inspired the report and, finally, to the question of what these dynamics say about California's business climate.

Migration of Jobs

Our first theme was to investigate whether job migration has economic significance for particular industries or regions within the state, even though at the state level relocation is negligible. We find that job loss from interstate relocation is small across virtually all industries, although losses are more prevalent in finance and insurance than in other industries. Some industries, such as manufacturing and information, are more footloose in the sense that interstate relocation occurs more frequently. However, relocation in these footloose industries is often more common in both directions—not only out of California but also into California—resulting in a net effect that is still small.

Job loss from interstate relocation tends to occur in better-paying industries. Although this indicates that California is losing high-paying jobs to other states, the "bias" toward high-paying jobs does not translate into a substantial effect on the overall composition of jobs because the total number of jobs affected by relocation is small. We illustrate this by showing that even if we take earnings differences into account, by weighting relocating jobs at the industry level by average industry earnings, interstate relocation still has only a very small effect on the state's labor market. Furthermore, in our analysis of businesses expanding out of and

[1] See Neumark, Zhang, and Wall (2005).

into California, the evidence suggests that California's share of national employment has increased more in high-paying than in low-paying industries, although this conclusion is based on an analysis of a select group of key industries rather than on the entire spectrum of industries.

The conclusions for regions are similar to those for industries. Some regions lost more jobs from interstate relocation than others: The Bay Area—San Francisco and Marin Counties in particular—lost considerably larger shares of net jobs to other states than any other region did. Still, interstate migration is always of small magnitude relative to births, deaths, expansions, and contractions. Most regions and counties experience almost no net job loss from interstate migration, and some counties even gain.

Just as some industries are more footloose, some parts of the state have experienced more interstate relocation, in both directions, than others. Migration into and out of the state is primarily a phenomenon of the most urbanized, coastal regions. In the rest of the state, intrastate migration accounts for the majority of migration-related job flows into and out of regions, although these intrastate job flows are still small relative to the other employment dynamics.

Overall, these findings reinforce earlier conclusions that a focus on interstate business relocation is unlikely to be helpful in devising effective policies to either create or retain jobs. Although interstate relocation affects some industries and regions disproportionately, interstate relocation is very small relative to other employment dynamics in every industry and in every region. Whether looking at an industry, a region, or the state's economy overall, to gain a better understanding of the business environment, it is much more important to understand what drives business expansion, contraction, births, and deaths. Our findings emphasize that policy interventions—if any are needed—should target these much more important sources of employment change.

Relocation as an Indicator of Economic Performance

Our second theme focused on the usefulness of relocation as an indicator of economic performance in an industry or in a county. We found that although migration is not a useful indicator of industry performance, it is a useful indicator of county economic performance.

At the industry-sector level, employment growth from interstate relocation is uncorrelated with job creation and destruction through business expansion, contraction, births, and deaths. In other words, industries losing relatively more jobs from relocation are not also losing more jobs for other reasons. This lack of correlation holds for the absolute level of industry employment growth in California as well as for industry employment growth in California relative to that of the United States. Thus, relocations in an industry do not appear to be the tip of an iceberg indicating more serious problems with the industry as a whole.

In the county-level analysis, however, although interstate migration is small in magnitude, it *is* a useful indicator of the overall health of a local economy. The correlation between interstate migration and other sources of employment growth is positive and large at the county level. The correlation between intrastate migration and other sources of employment growth at the county level is also positive and even stronger. From the perspective of local policymakers, migration into and out of their areas is a useful indicator of overall employment trends. Even though local policy should not focus on curbing out-migration or encouraging in-migration—because migration contributes little to overall job creation and destruction—policymakers can treat migration patterns as evidence of local economic performance. Of course, for migration patterns to be a useful indicator, local policymakers need to account not only for the often-well-publicized business moves out of their areas but also for business moves into the area.

Business Location Decisions

Our third theme was to discover what dynamics other than interstate relocation could reveal about the California economy and its businesses. Our analysis in Chapter 3 of firms expanding into and out of California revealed that there is arguably an overall trend toward more dispersion of firms' activities across states, with California firms employing more workers and opening more establishments in other states, and non-California firms doing the same within California.[2] This trend may be a subnational

[2]Establishing longer-term trends with our data is somewhat tenuous, and there have been some reversals since the late 1990s

reflection of some of the same forces spurring increased globalization, such as reductions in communications costs caused by improvements in information technology.[3]

The possibility that firms are more dispersed geographically is certainly an important research question. It might also be an important policy question if there are reasons to prefer that California workers be employed by companies headquartered in the state. It is conceivable that such reasons exist if owners of companies residing in the same state in which many of their employees work better internalize some of the costs that their decisions impose on their employees. For example, policies aimed at increasing worker skills and earnings might generate positive externalities to the community that are more likely to be internalized by business owners who live in the same community. Similarly, decisions about closing business establishments or contracting an establishment's workforce might generate negative externalities and hence be undertaken less readily by business owners in the state. However, it is important to emphasize that any such arguments are purely speculative at this stage.[4] In this report we do not attempt to study *why* a changing locus of ownership of business establishments within the state is important, but rather to establish the patterns of business location decisions.

The other dynamic we looked at—intrastate relocation—also yielded tentative conclusions that are important for future research. Intrastate moves are more common than interstate moves and, among intrastate moves, short-distance moves are more common than long-distance moves. After adjusting for the population of counties, nearly all the top flows are between adjacent counties, outward from the central county or inland from the coast. These patterns are consistent with businesses moving in search of cheaper real estate, although other reasons could be equally or more important. It is less plausible, however, that businesses move within

[3]A reduction in communications costs is consistent with our finding that geographic dispersal increased most for finance and insurance, which produces intangible outputs, and least for manufacturing, where outputs are tangible and transportation costs matter more.

[4]Headquarters can be a source of other benefits, including local philanthropy and civic pride, even if the firm's employment is located elsewhere. Rather, here we are asking whether there is a cost of geographic dispersion that leaves California employment as well as total employment reporting to California headquarters unchanged.

California primarily to seek differently skilled or cheaper labor. If labor were a primary reason for business relocation, then short-distance moves within a labor market should be less prevalent than they are. Of course, it is still possible that differences in labor costs or skill levels are a primary reason for the long-distance moves.

This research, although spurred by questions about the state's business climate, uncovered trends that suggest benefits from looking more closely at two forces that could be having important effects on business location—information technology and real estate markets. These are high on our future research agenda.

Implications for the State's Business Climate

Finally, we return to the question of the state's business climate. After looking at industry and regional dynamics, interstate and intrastate relocation, and business expansions, what does California's recent history imply about the state's business climate? Because interstate relocation contributes very little to job creation and destruction, interstate relocation per se yielded no evidence on the state's business climate. The analysis of business expansions presents a fuller picture. It seems difficult to interpret the shift of the locus of employment of California-headquartered firms to out of state as a reflection of a deteriorating California business climate in recent years. Given that this shift was sharpest during the economic boom of the late 1990s, it cannot be attributed to business climate problems unless one is willing to argue that the business climate was worse during that period, which strikes us as implausible. Moreover, the fact that companies based outside California are expanding their operations into the state would seem to belie arguments that—on the whole—California has become more hostile to business. And since they were expanding into California most during the late 1990s, it is even more implausible that the business climate was most unfavorable then.

Overall, the shift of employment of California-headquartered companies to other states (via births and other processes) has been more than offset by increased employment in the state by firms headquartered elsewhere, with the result that California's share of national employment has remained roughly constant, with a dip during the economic downturn of the early to mid-1990s. In recent years, California's share of national

employment has risen. As a summary measure of California's relative economic performance, this suggests that there has been no deterioration in the state's business climate, even though business climate concerns have been voiced more loudly in recent years.

The regional analysis, however, does raise questions about the business climate of the state and its regions. Because relocation is a useful indicator of *local* economic health, and because some regions, such as the Bay Area, lost jobs from both interstate and intrastate migration, California's business climate might have had negative local effects on employment growth. How could the business climate result in local job losses from migration? One possibility is that some state policies have a more negative effect in some regions.[5] A second is that local policy, rather than state policy, creates an unfavorable business climate in some regions; local zoning laws, for instance, could restrict development that would otherwise contribute to employment growth. Similarly, the migration of jobs into the Inland Empire may be evidence of a particularly favorable business climate but, if so, it is unclear whether the state created a business climate that benefited the region, whether localities in the Inland Empire directly contributed to a positive business climate, or whether the region benefits from other elements of a good business climate, such as more plentiful and hence cheaper land. Assessing how local employment changes are affected by state policy interacting with local conditions and by local policy directly is a priority for future research. Our finding of strong growth in some regions and weaker growth in others is an important reminder that the California economy is, in fact, a collection of regional economies. Each region, county, and neighborhood offers businesses different productivity advantages and costs, and local business climates—whether influenced by state or by local policy—may matter as much or more to business decisions as the state's business climate.

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[5] For example, environmental regulations, even if set at the state or federal level, may affect areas differently, depending on both the industry mix and existing environmental conditions of regions and on how the regulations are implemented and enforced. Similarly, tax policy can affect high- and low-income regions and industries differently.

Appendix A

Assessment of the NETS

The data construction effort necessary to build the NETS is massive and complicated, presenting numerous challenges. Furthermore, the D&B data (which are the basis of the NETS) used in much earlier research have been criticized (see, for example, Birley, 1984; Aldrich et al., 1989; Davis, Haltiwanger, and Schuh, 1996), in particular for overstating total employment and for poor tracking of new establishments. For these reasons, we have—at various stages of our research—undertaken a good deal of investigation to document and examine the quality of the NETS data to assess their reliability and their potential limitations and to consider how these limitations might affect results of various analyses. In this appendix, we summarize findings from our assessments of the NETS data, emphasizing issues that are most pertinent to the research described in this report.[1]

Statewide Employment

The most basic question one might ask is how well the NETS measures employment levels in California. Figure A.1 provides the time-series on California employment in the NETS, as well as in the Current Population Survey and the Current Employment Statistics payroll survey.[2] Two things are obvious from the graph. First, employment is higher in the NETS, echoing the concern raised above about the NETS overstating employment. And, second, employment in the NETS is more volatile, in particular showing a much sharper run-up and decline associated with the expansion of the late 1990s and subsequent recession. As a consequence, the NETS suggests lower overall employment growth over the entire sample period

[1] Much of the evidence reported in this appendix appears in Neumark, Zhang, and Wall (2007).

[2] The CPS is a household survey, and the CES is a survey of business establishments. Both are done monthly and are used to estimate employment levels and changes for the U.S. economy as a whole and for individual states.

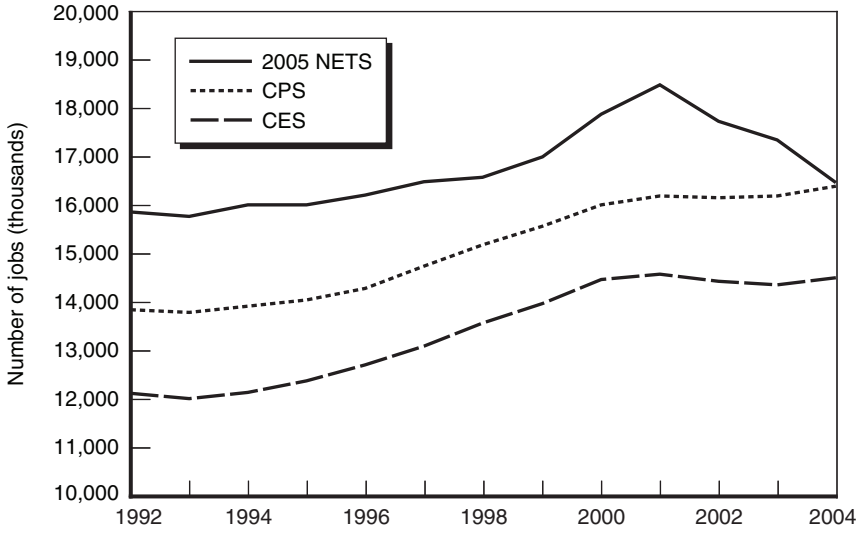


Figure A.1—California Employment Levels in the NETS, the Current Population Survey, and the Current Employment Statistics, 1992–2004

than do the other two data sources, although through 2002 the implied employment growth is similar and indeed sharper in the NETS.

Two sets of factors likely contribute to these differences—one related to the counting of small businesses and the other to the tracking of new establishments. First, the NETS counts each job in each business establishment, including, for example, counting as two jobs an individual who owns two proprietorships. This double-counting, plus better coverage of small business owners, helps explain the higher overall employment level (Neumark, Zhang, and Wall, 2007).[3] In addition, we suspect that doubling up of businesses owned by the same individual may have peaked during the expansion of the late 1990s, although this is speculative. Second, as also noted above, the NETS is sometimes slow to detect new business establishments, although as shown in Neumark, Zhang, and Wall (2007) and discussed below, it does eventually pick up births quite

[3]Note that this is not the same as holding two jobs. The BLS figures cited above on multiple jobholding do not include persons with two self-employed jobs (Stinson, 1997). We are not aware of any source of information on the frequency of having more than one business that might be reported in the NETS.

accurately. Thus, the NETS would underreport employment in the most recent year for which data are available and would revise upward the employment level in that year when the subsequent years' data are collected.[4]

We have attempted to verify this by comparing the time-series for California with data from a previous version of the NETS database for California extending through 2003. As shown in Figure A.2 (and mentioned in Chapter 2), there is in fact some tendency for the final year of the NETS to undercount employment—as indicated by the gap in 2003 between the 2004 and the 2005 NETS releases,[5] whereas for earlier years the match is very good.[6] On the other hand, the gap in 2003 is small relative to the employment changes over the longer period and the differences between the data sources displayed in Figure A.1, so this represents at best a small part of the overall story.[7]

A key question, then, is how the decline in employment in the last couple of years of the NETS data, which is likely partly spurious, might affect our analysis. One central part of our analysis (in Chapter 3) concerns the share of employment overall, and of particular types of establishments, in California and that in the rest of the United States. Although Figure A.1 indicates that different data sources provide different measures of overall employment levels in California, to the extent that these data sources display similar behavior for the United States as a whole, comparisons between employment in California and that in the rest of the United States based on the NETS should be reliable. To address this issue, Figure A.3 displays the time-series on employment for the NETS, the CPS, and the

[4]In contrast, there is no reason to expect the NETS to be nearly as slow to detect establishment deaths—which would otherwise offset fewer births—because the deaths occur among already-existing establishments.

[5]The NETS release for year t includes data through year $t - 1$.

[6]Although not shown in the figure, there is considerably less correspondence for all years between the 2003 and 2004 NETS releases. But this is likely because of measurement changes in the NETS between these two releases, which are discussed in Chapter 2 and in Appendix B of Neumark, Zhang, and Wall (2006).

[7]More generally, as we discuss in Neumark, Zhang, and Wall (2007), each data source has different properties and different errors that are not fully understood—as illustrated, for example, by the gap between the CPS and the CES estimates reported in Figure A.1.

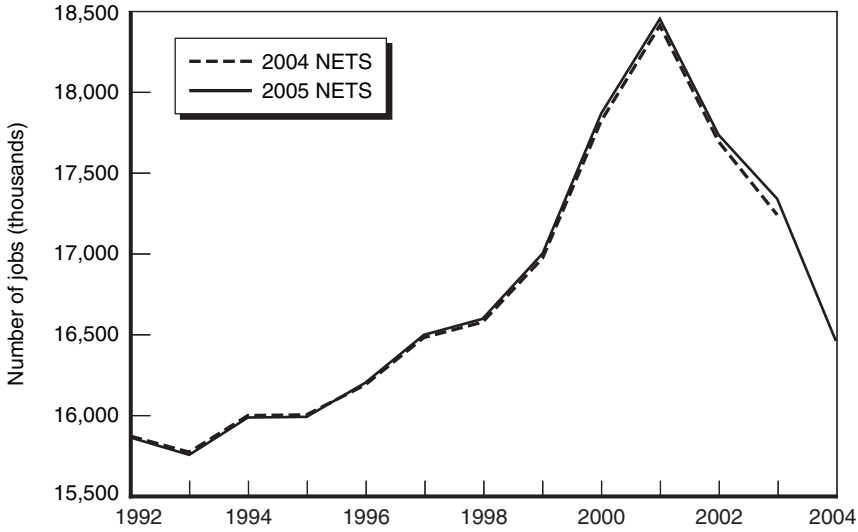


Figure A.2—Changes in California Employment Across NETS Releases, 1992–2004

CES for the United States as a whole.[8] The differences between the data sources—in terms of both of overall level as well as the sharper run-up and drop-off in the NETS—are reflected in the U.S. data as well. Thus, the NETS data should not present problems with regard to measuring employment in California in comparison to employment in the rest of the country.

A second part of our analysis focuses on relocation by industry, which also requires information on employment growth by industry. We have examined the time-series on employment for each major industry, and with the exception of the three smallest industries, they all reveal the same behavior as the aggregate series in Figure A.1, with a peak in or just before 2002 and a sizable subsequent decline thereafter.[9] Thus, the decline in employment in the last two years of the sample reflected in the NETS is

[8]We do not have the NETS data for the entire United States, but we obtained from Walls & Associates the time-series of aggregate U.S. employment (as well as U.S. employment by industry, which we use in Chapter 4), for our sample period.

[9]The three small industries that are exceptions are mining and utilities, which show steady employment declines over the period, and the tiny industry of management of companies and enterprises, which shows rapid growth over most of the period.

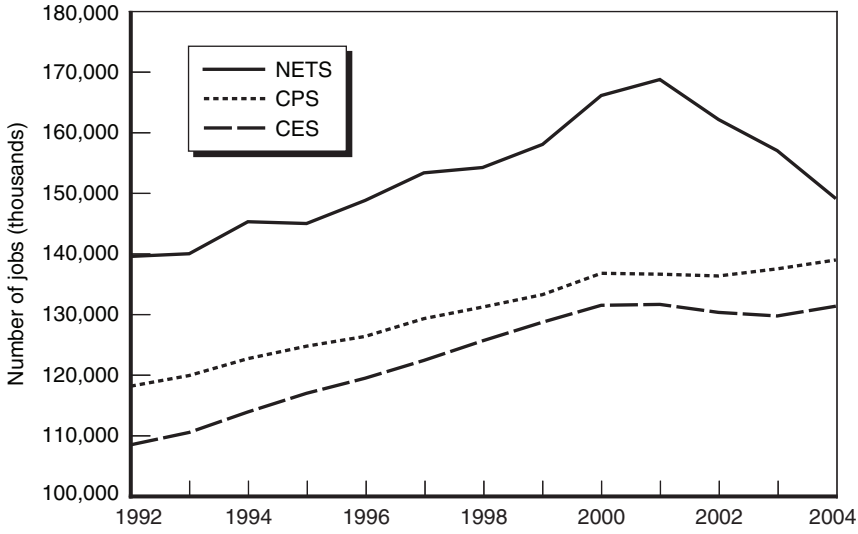


Figure A.3—U.S. Employment Levels in the NETS, the Current Population Survey, and the Current Employment Statistics, 1992–2004

quite consistent across industries and unlikely to influence in an appreciable way our industry-level analysis.

Finally, the third part of our analysis focuses on regional changes within California. We have examined the time-series on employment for each region, and they nearly uniformly reveal the same behavior as the aggregate series in Figure A.1, with a peak in 2002 and a sizable subsequent decline. Moreover, the decline is sharper in regions for which employment as measured by other sources also fell more sharply. Together, this evidence suggests that the problem with the NETS data that leads to some spurious slowdown in employment in the last couple of years is relatively consistent across regions, and is also unlikely to generate problems for our regional analysis.

Overall, although we admit to being troubled by the decline in employment in the last two years of the NETS data, in light of the evidence just discussed, we are quite confident that this decline does not materially influence the results of our analysis. In addition to the evidence just discussed, it is important to note that nothing in our analysis depends heavily on the last couple of years of the NETS data. Indeed, most of our analyses rely on either base year (that is, 1992) employment or on the

average of one-year changes over all the years in the sample. The only analysis that emphasizes the time-series pattern of behavior is that in Chapter 4 and there—even though we do not think data problems have much influence on our results—we remind the reader that the data from the last couple of years need to be viewed cautiously.

Local Employment

Given our focus on industries and regions, we are interested in how well the NETS measures employment levels at the industry and region levels. We compare estimates of employment levels using the NETS estimates from the Quarterly Census of Employment and Wages and the CES.[10] The QCEW is based on ES-202 data, which excludes the self-employed, proprietors, domestic workers, unpaid family members, and some other groups. The CES covers all nonfarm payrolls. Unlike the NETS, these datasets provide aggregate statistics only at various geographic, industry, or establishment-size levels and not at the establishment level. But for our purposes, comparisons of measurements at the county level are useful.

We compare employment at the county-by-industry levels.[11] Figure A.4 plots the data for the alternative measurements of employment by county and industry from the NETS and the QCEW. If the measurements agreed exactly, they would all lie on a 45-degree line, which is drawn in the figure. It is clear from examination of the figure, as well as the very high computed correlation of 0.994, that employment levels in these two data sources correspond very closely. On the other hand, the points

[10] As noted above, the CES is a monthly payroll survey. The QCEW covers nearly all jobs.

[11] Looking at industry-county cells rather than just counties gives us a better indication of how the data sources match up, since offsetting errors in employment by industry within a county are not eliminated. We use 1997–2000 for the comparison with QCEW data because earlier years were not readily available, and subsequent years use the NAICS instead of SIC codes and hence cannot be directly compared. (When this assessment work was done, there were not enough years with NAICS data to do as meaningful a comparison.) We use the full sample period for the CES comparison. For both sources, we do this at the most disaggregated level at which QCEW data are publicly available for all counties—by county and one-digit SIC industry. Data at finer levels of industry disaggregation are often suppressed at the county level for reasons of confidentiality.

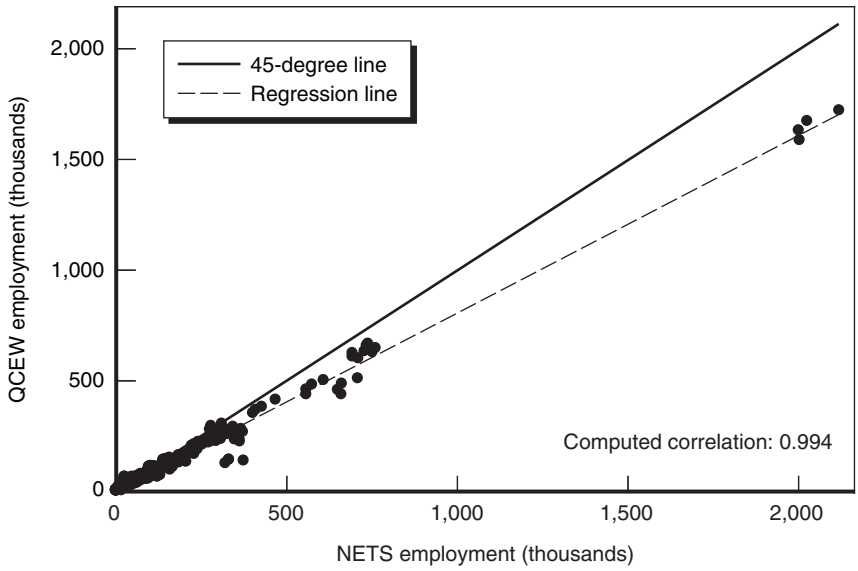


Figure A.4—NETS and QCEW Employment, by County and Industry, 1997–2000

actually lie on a line that is flatter than the 45-degree line, implying higher employment levels in the NETS.[12] There is a similarly high correlation (0.948) between employment levels in the NETS and those in the CES. Thus, the measurement of variation in employment levels across industries and counties is captured quite accurately in the NETS.

Employment Changes

Next, we turn to measurements of employment changes instead of levels. Two features of how the NETS data are constructed make employment changes less well correlated with the QCEW and the CES than employment levels are. First, at the establishment level, employment counts in the NETS are often rounded, so employment change is "sticky," and our estimates likely underreport the frequency with which establishments change their levels of employment, thereby

[12]The points that are farthest off the line, at high employment levels, are for service-related industries in Los Angeles. However, these points actually lie quite close to a regression line through the data.

underestimating the degree of employment change caused by establishment expansion and contraction.[13] Second, between 55 and 73 percent of each year's employment figures in the NETS are actual data, and the rest are imputed.[14] The imputation of employment data, like rounding, reduces the frequency of year-to-year changes in employment.

The implication of these measurement problems is that the NETS data compare less favorably with other data sources when we look at employment changes, rather than employment levels, especially for high-frequency (short-term) changes. As shown in Figure A.5, the correspondence between NETS and QCEW yearly employment changes by industry and county is not very strong, with a correlation of only 0.528. However, if we look at employment changes over periods of at least a few years, this problem is substantially mitigated; for example, the correlation rises to 0.864 for changes over three-year intervals (Figure A.6). This greater correspondence of employment changes over longer intervals is consistent with what we would expect based on the facts noted above regarding rounding and imputation. With rounding, the data will likely more accurately measure employment changes over a longer period, because rounding results in small changes being ignored but larger changes being measured. However, the analyses in this report do not focus on single year-to-year measurements of employment but rather on the average of annual employment changes over the whole sample period, in which case any errors in assigning an employment change to the correct year will largely cancel out.

Tracking Relocations

Obviously, our analysis depends critically on the accuracy with which the NETS tracks establishment relocations, both across California's borders and within the state. There are no other comprehensive datasets with

[13]Although employment rounding may bias some of our estimations, it is not a particularly serious problem for the measurement of employment levels if we believe that employment numbers are rounded to the closest "salient numbers." In that case, our aggregate levels are unlikely to be biased appreciably, because some people round their numbers up and others round them down.

[14]Imputation is a feature of establishments' earliest appearances in the database. Once actual employment data are provided for an establishment, they are very likely to be provided in all subsequent years.

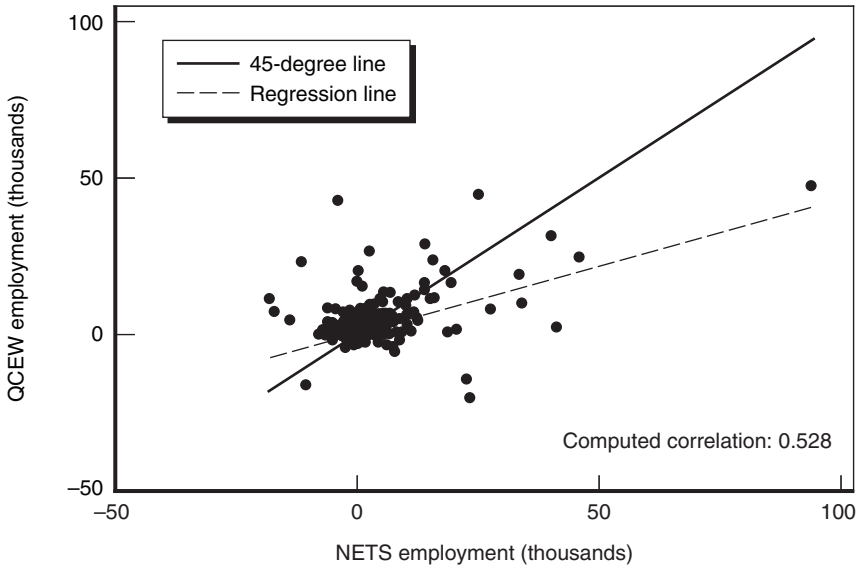


Figure A.5—NETS and QCEW One-Year Employment Changes, by Industry and County, 1997–1998, 1998–1999, 1999–2000

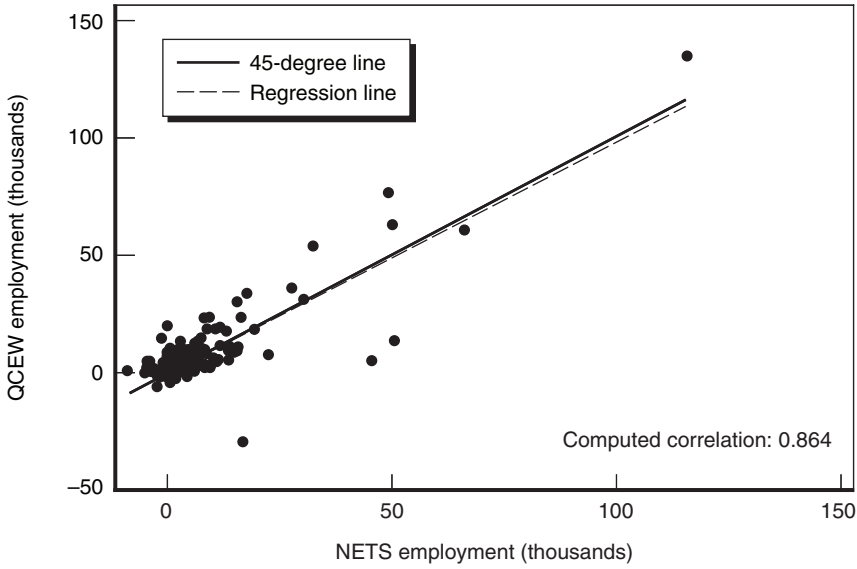


Figure A.6—NETS and QCEW Three-Year Employment Changes, by Industry and County, 1997–2000

which to compare measurements of geographic movement of establishments over time to such information in the NETS. Instead, we used Lexis-Nexis to conduct newspaper searches of business relocations involving California establishments, and we conducted a detailed comparison of evidence on relocation in the NETS database to evidence found in these searches. Our search was not meant to be exhaustive; it was intended only to obtain a replicable sample of press coverage of specific business relocations.

Using an algorithm designed to try to capture all references in the *Los Angeles Times* to businesses relocating in the 1996–2000 period, we identified 1,067 newspaper articles, from which we were able to identify 576 references to specific instances of business relocation, covering 452 unique relocation events.[15] Of these, 237 business relocations were confirmed as valid moves by the NETS database.

For the reported relocations not confirmed in the NETS, we undertook thorough efforts to independently verify whether there was in fact a relocation. It turns out to be very difficult to use other information sources to locate the establishments whose relocations are reported in the media but for which there is not an obvious match in the NETS. Ideally, we would contact the establishment directly and confirm that the reported relocation occurred. However, this becomes very difficult when establishments (or often, businesses) have been acquired by other firms, or for other reasons currently do business under a different name, or no longer exist. Naturally, these problems are more severe in trying to verify reports of relocation that are relatively old. Nonetheless, when possible we contacted the establishments directly. We also searched for company information using Hoovers.com[16] and Lexis-Nexis Company Information Search—web-based resources that track business addresses and would reveal new addresses for businesses that changed location.

[15]Neumark, Zhang, and Wall (2007) provide a detailed description of the relocation validity assessment, including the search algorithm used.

[16]Hoovers.com uses the same raw data provided by the DMI file as the NETS database. However, the search mechanism is very flexible, sometimes making it easier to locate establishments that could not be found through company keyword searches in the NETS database.

Of the 215 relocations not found in the NETS, 47 were confirmed as "invalid" moves.[17] Of the remaining 168 reports of relocation that we could not locate in the NETS database, we were able to independently verify that 18 relocations indeed occurred—all within California. Despite our best efforts using the methods described above, we were unable to confirm the remaining 150 reports of relocation from Lexis-Nexis. And at least 91 percent of these businesses (136 out of 150) are captured by the NETS database with no relocation indicated. Furthermore, 92 (68%) of these establishments were still in existence through 2002, although we were tracking only relocations that were reported between 1996 and 2000. If these establishments had relocated but had not been tracked properly as relocations by NETS, these establishments would have reported closing years close to the date of the relocation. Thus, although there are 150 relocations identified by the Lexis-Nexis search that we could not establish as invalid, we suspect that most were not in fact real relocations.

Most conservatively, therefore, 58.5 percent (237/[452 – 47]) of the valid business relocations that we identified from the *Los Angeles Times* could be found in our NETS dataset. This rate of confirmation differs dramatically depending on the distance over which the relocation occurred. We are able to confirm only 27 percent (21/77) of within-city moves, whereas we are able to confirm 70 percent (177/252) of between-city, within-state moves, and 74 percent (37/50) of cross-state moves. It is not surprising that the NETS detects only a relatively small share of within-city moves: Many within-city moves occur over such short distances that they could not be identified within the NETS database. For instance, several contacted establishments said that the moves had occurred, as indicated in the newspaper article, but the new location was adjacent to or "across the street" from the previous location. It is not worrisome for our purposes that the NETS detects only a relatively small share of within-city moves: The regional analysis in this chapter looks at moves that cross state, regional, or county boundaries and not moves within cities.

[17] Five moves turned out to be consolidations of businesses because the establishment at the destination already existed before the move; 17 cases were planned moves but did not occur later; 12 of the establishments at "destination" were new branches instead of relocated businesses; and 13 moves involved establishments such as schools and nonprofits that are not the focus of our research.

We do not expect every relocation to appear in Lexis-Nexis, but we do expect all real relocations that are covered in the media to also appear in the NETS. Given the difficulty of checking whether reported cases actually occurred, it is impossible to quantify exactly what share of real relocation is captured in the NETS. But for moves crossing city or state boundaries, we estimate that the share is well over 75 percent and probably closer to 100 percent; we base this estimate on the fact that most of the cases not captured by NETS cannot be independently confirmed as real relocations. Thus, we conclude that the NETS database does quite a good job of tracking business relocations, with a very low rate of false negatives, although our analysis probably pertains more to larger establishments that would be reported in the media.

Births and Deaths

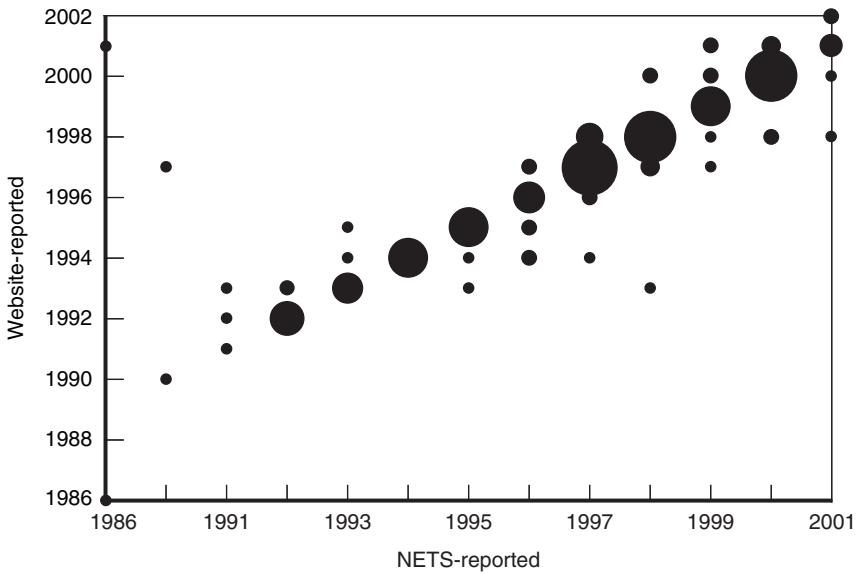
It is also important for our analysis that the NETS captures establishment births and deaths accurately. Births are likely to be particularly challenging, because by their nature they require that D&B find establishments that did not previously exist. To study the accuracy with which the NETS captures births, we needed a source of information on businesses with dates of birth. We identified such a source in the form of the BioAbility database of U.S. biotech companies, from which we extracted information on California companies.[18] We first chose companies that this database indicated were founded in our sample period for the NETS data (1992–2002), of which there are 300. To be more certain that we had the founding dates correct, we checked the BioAbility founding dates against company websites, retaining only the 161 cases for which the website also reported a founding date. Of these 161 cases, in 89 percent (142) the websites reported founding dates that corresponded exactly with the start year listed in the BioAbility database. If they did not match, we used the date from the company website, presuming that this was more accurate. We then checked these founding dates against the appearance of these companies in the NETS to determine how well

[18]This is a database of more than 2,000 U.S. biotech companies (based on a relatively narrow definition of biotech) maintained by BioAbility, a biotech consulting firm. See http://www.bioability.com/us_biotech_companies.htm (viewed on September 14, 2005).

the NETS captures births. Nearly all these companies could be located in the NETS database. Of these, 75 percent had start dates listed in the NETS that corresponded exactly with the company start dates reported on the website, 88 percent fell within one year, and 92 percent fell within two years. The correspondence between the two data sources is graphed in Figure A.7. The correlation between NETS start dates and start dates reported on company websites was 0.87. This check, then, indicates that the NETS tracks establishment births quite accurately, adding to the overall evidence of the reliability of the NETS data.

Linkages Between Establishments of the Same Firm

Finally, we assessed the quality of the linkages of establishments to firms in the NETS. For our purposes, we would like to be assured that the NETS identifies existing establishments and, perhaps most importantly—because we know that identifying new establishments is the most difficult



NOTE: Areas of symbols are proportional to the number of observations with the same dates in both data sources.

Figure A.7—Biotech Establishment Openings, by Year, Reported on Company Website and Reported by NETS, 1986–2001

task in of the data collection—births of new establishments of existing firms. Our analysis of changes in the geographic location of establishments and employment of companies headquartered in California and in other states (in Chapter 4) relies critically on the ability of the NETS database to link companies' establishments both within California and in other states, for both companies based in California and companies based in other states, as well as to provide accurate measurement of dates on which establishments opened and their locations. We were therefore interested in assessing the accuracy of the NETS data along both of these dimensions. Overall, we find that although the data clearly have imperfections, the tracking of firms' establishments works reasonably well. The shortcomings appear to be more severe in the most recent years of the dataset because the NETS detects new establishments with some delay.[19]

It is useful to assess the accuracy of the NETS for a few different types of industries for which the quality of information may differ. The problem, of course, is finding another source of data on companies that includes identifying their establishments along with their opening dates and locations. As it turned out, we had administrative information on all Wal-Mart stores and their opening dates from another source.[20] We also chose to try to construct similar information for Intel, in manufacturing, and for the Cheesecake Factory, in retail, in large part because of our ability to track down information on their websites on establishments and when they opened.

[19]Neumark, Zhang, and Wall (2005) examine the ability of the NETS to track establishment openings but do not examine linkages among establishments belonging to the same company.

[20]We obtained these data under a special agreement with Wal-Mart to study the relationship between Wal-Mart and retail employment. The analysis in Chapter 4 is related to this inquiry because it looks at, among other things, the share of retail employment in the state in establishments owned by companies headquartered elsewhere, which of course includes Wal-Mart.

Tracking Establishments of Multiestablishment Firms in the NETS

Wal-Mart

We began by checking all the "active" Wal-Mart stores in the United States from the administrative data against records of Wal-Mart stores in the NETS. Anticipating that there would be some discrepancies that would require further investigation, we first divided the administrative Wal-Mart records into stores in California and the remainder of stores. To investigate discrepancies, we examined records for California and for two states from different regions that Wal-Mart entered in different periods: Georgia, where Wal-Mart opened stores relatively early, and Arizona, which Wal-Mart entered later.

As shown in Table A.1, the administrative data list 152 Wal-Mart stores in California. In the NETS, we identified 174 "active" observations for which the company name is "Wal-Mart" and the headquarter DUNS number is that of the Wal-Mart Corporation. We find perfect matches for 132 stores in the two databases, based on addresses across the two datasets. Two others match on city name.[21]

Looking first at the unmatched stores from the Wal-Mart administrative data, of the 18 unmatched stores, one opened in 2005, 11 opened in 2004 or later, and 16 opened in 2003 or later. The most recent data in the NETS are for 2004. In addition, the NETS might sometimes be late in detecting new openings of Wal-Mart stores, although this is somewhat surprising given that these are large establishments. Regardless, it seems likely that a good share of the unmatched records in the administrative data is attributable to recent openings that are not yet reflected in the NETS, in part because the administrative data extend further (through January 2005) but primarily because of delays in detecting new stores. As further evidence of such delays, we examined the website www.smallbusiness.dnb.com, which is based on more recent D&B data; in this dataset, 13 of the 18 unmatched stores are listed, suggesting that D&B

[21] These matches are for relatively small cities—Rocklin (population 38,000) and San Bernardino (185,000). The street addresses did not match.

Table A.1

Wal-Mart Data Checks, California Stores

	Administrative Wal-Mart Data	NETS Data
Number of stores	152	174
Match on zip code or city and address	132	132
Match on city	2	2
Unmatched administrative records	18	
Unmatched stores with open date 2005	1	
Unmatched stores with open date 2004 or later	11	
Unmatched stores with open date 2003 or later	16	
Records with SIC codes 42 or 47 (transportation and warehousing)		4
Sam's Club		27
Businesses inside Wal-Mart stores		3
Unmatched NETS records		6
NETS match rate, stores open 2004 or earlier		**88.7 percent** ((134/[152 – 1]) × 100)
False positive rate for NETS, stores open 2004 or earlier		**4.0 percent** ((6/[152 – 1]) × 100)

does capture all Wal-Mart stores but sometimes with a delay, which is also reflected in the NETS.[22]

Next, we consider the apparent Wal-Mart establishments in the NETS that do *not* match the administrative data. Of the 40 such unmatched observations (174 – 134), four are not coded as general merchandise stores; specifically, their SIC numbers are 42 (motor freight transportation

[22]The information at www.smallbusiness.dnb.com is based on the D&B files, which are continually updated, whereas the NETS database is constructed using an annual snapshot from the D&B data and is of course released with some delay.

and warehousing) or 47 (transportation services) instead of 53 (general merchandise stores). We also checked the Sam's Club website (www.samsclub.com) to identify which unmatched sites were Sam's Clubs. We found that 27 of these 40 establishments are Sam's Clubs but are incorrectly identified as Wal-Mart stores in the NETS.[23] Of the remainder, three are businesses inside already matched Wal-Mart stores (such as Photo Lab at Wal-Mart or Pharmacy at Wal-Mart), which may not, in fact, be separate businesses, and six remain unmatched. We attempted to contact these six establishments by telephone, but there was either no answer or the number had been disconnected. We explored whether these six remaining unmatched observations were stores that had closed or relocated. The Wal-Mart data indicated no closings in California, but when Wal-Mart closes a store and opens a new one nearby, perhaps because the first store was too small, they do not consider this a closing. The administrative data also indicate whether existing Wal-Mart stores relocated in the past, although we do not have the past addresses. However, there is no indication in the administrative data that currently existing stores near the six unmatched addresses relocated in the past, so the unmatched observations do not appear to be old Wal-Mart store addresses.[24]

Overall, if we restrict attention to Wal-Mart stores that opened in 2004 or earlier, which are the only ones that should be included in the NETS, the NETS matches 88.7 percent of the Wal-Mart stores (134/[152 – 1]), and we suspect that nearly all the nonmatches reflect delays in the NETS detecting new stores. Conversely, the last row of Table A.1 shows that the rate of false positives—that is, establishments identified as Wal-Mart stores in the NETS data but not in the administrative data on Wal-Mart stores that had opened by the end of 2004—is 4.0 percent for California.

The administrative data cover 2,914 Wal-Mart stores outside California, and the NETS database includes 3,714 "active" observations

[23]For the California observations, the 27 establishments, with only one exception, identified as Sam's Clubs via phone calls had SIC code 539. Wal-Mart stores are usually coded as 531, for department stores.

[24]For each of the six unmatched records from the NETS, we used Google Maps to search for Wal-Mart stores near their addresses. For each "nearby" store we identified, we checked with the administrative data on closings to see if they had been relocated. However, all of them are coded as new stores.

for which the company name is "Wal-Mart" and the headquarter DUNS number is that of the Wal-Mart Corporation (Table A.2). A total of 2,485 stores in both databases match perfectly based on address across the two datasets, and 30 others match on city name.[25]

There are 399 stores from the administrative data that are unmatched. Of these, 29 opened in 2005, 130 opened in 2004 or later, and 167 opened in 2003 or later, again suggesting that much of the problem is delayed detection of new stores. On the other hand, there are 1,199 unmatched observations from the NETS database. Among these, 60 are not coded as general merchandise stores, and it appears that 474 are Sam's Clubs, based on their SIC codes.[26] And finally, six observations are duplicates;[27] further investigation might show that these are businesses inside Wal-Mart, according to what we found previously with California establishments.

Overall, focusing only on stores opened in 2004 or earlier, the NETS captures 87.2 percent of Wal-Mart stores; and, again, we suspect that most of the unmatched observations are attributable to delays in capturing data on new stores. The false-positive rate is considerably higher than for the California data, at 22.8 percent, which is troubling.

For the entire non-California sample, it was infeasible to investigate all nonmatches in detail. However, we did do this for two states (Arizona and Georgia), paralleling the earlier analysis of California stores. The high false-positive rate could reflect delays in capturing closings, but the administrative data suggest that there are far fewer closings (by a factor of about ten) than the number of nonmatches. More likely, there is a difference between the kinds of stores listed in the administrative database and those in the NETS identified as Wal-Mart establishments. Indeed, we already noted that some businesses inside Wal-Mart stores, such as pharmacies or photo labs, can be misnamed as Wal-Mart stores in the NETS, whereas the administrative data list only Wal-Mart Supercenters

[25]For the 30 matched on city name, the addresses generally did not match, but there is only one store per city indicated in both databases.

[26]We cannot check all these observations. However, the analysis described above, for California, and in the next paragraph, for Georgia and Arizona, suggests that stores coded as SIC 539 are almost certainly Sam's Clubs, even if identified as Wal-Marts in the NETS.

[27]Our definition of a duplicate is based on identical address, city, and state among records with SIC 531 (general merchandise stores).

Table A.2

Wal-Mart Data Checks, Non-California Stores

	Administrative Wal-Mart Data	NETS Data
Number of stores	2,914	3,714
Match on zip code or city and street number	2,485	2,485
Match on city	30	30
Unmatched administrative records	399	
Unmatched stores with open date 2005	29	
Unmatched stores with open date 2004 or later	130	
Unmatched stores with open date 2003 or later	167	
Records with SIC codes 42 (transportation and warehousing, 45 obs.), 20 (food and kindred products, 1 obs.), 38 (instrument and related products, 1 obs.), 55 (automotive dealers and gasoline service stations, 2 obs.), 59 (miscellaneous retail, 7 obs.), 73 (business services, 1 obs.), 75 (automotive repair, services, and parking, 2 obs.), 87 (engineering, accounting, research, management, and related services, 1 obs.)		60
Sam's Club (SIC = 539)		474
Duplicates		6
Unmatched NETS records		659
NETS match rate, stores open 2004 or earlier		**87.2 percent** ((2515/[2914 – 29]) × 100)
False positive rate for NETS, stores open 2004 or earlier		**22.8 percent** ((659/[2914 – 29]) × 100)

and Discount Stores. We have also already noted that the NETS usually lists Sam's Club stores under the Wal-Mart name. Wal-Mart Neighborhood Markets, of which there are about 100 in the United States according to the Wal-Mart website, are smaller Wal-Mart stores that are

not listed in the administrative database, yet would show up in the NETS under the Wal-Mart name.[28]

Turning to the information from two additional states, the administrative data list 51 Wal-Mart stores in Arizona. In the NETS database, we find 56 "active" observations in Arizona for which the company name is "Wal-Mart" and the headquarter DUNS number is that of the Wal-Mart Corporation (Table A.3). There are 41 exact matches based on address and one based on city. Three of the unmatched records from the administrative data opened in 2005, eight opened in 2004, and all the unmatched administrative records are for stores that opened in 2003 or later. All these stores are already listed in www.smallbusiness.dnb.com.

In the NETS data, one unmatched observation has an SIC code corresponding to transportation and warehousing, ten observations are Sam's Clubs, and one unmatched observation appears to be a duplicate of an already matched observation.[29] Thus, only one observation remains unmatched; there was no answer when we tried to reach this establishment by telephone. Thus, for Arizona, 87.5 percent of the stores in the Wal-Mart Corporation database are found in the NETS (excluding all the stores opened in 2005). The false-positive rate for Arizona is very low, at 2.1 percent.

The administrative data list 111 Wal-Mart stores in Georgia. In the NETS database, we find 156 "active" observations for which the company name is "Wal-Mart" and the headquarter DUNS number is that of the Wal-Mart Corporation (Table A.4). Ninety-eight stores in the two databases match perfectly based on address, and seven others match on city name. Eight stores from the Wal-Mart database remain unmatched, four

[28]These may or may not show up with the same industry code. In fact there were 47 unmatched observations with SIC code 54 (food stores). It appears that, according to the NETS, the average employment level of these 47 records is 109 employees (151 employees only including "actual figures" (= 30 records)) whereas the average number of employees of the 2,515 matched stores is 255 employees. This emphasizes the hypothesis that neighborhood markets are included in the establishments in the NETS identified as Wal-Mart stores.

[29]Duplication occurs occasionally in the D&B database, and duplicates are eliminated when detected. However, in this case there is apparently one duplicate left in the dataset, based on SIC code, address, city, state, and phone number.

Table A.3

Wal-Mart Data Checks, Arizona Stores

	Administrative Wal-Mart Data	NETS Data
Number of stores	51	56
Match on zip code or city and street number	41 (32 + 8 + 1)	41
Match on city	1	1
Unmatched administrative records	9	14
Unmatched stores with open date 2005	3	
Unmatched stores with open date 2004 or later	8	
Unmatched stores with open date 2003 or later	9	
Records with SIC codes 42 (transportation and warehousing)		1
Sam's Club		10
Businesses inside Wal-Mart stores		1
Duplicates		1
Unmatched NETS records		1
NETS match rate, stores open 2004 or earlier		**87.5 percent** ((42/[51 – 3]) × 100)
False positive rate for NETS, stores open 2004 or earlier		**2.1 percent** ((1/[51 – 3]) × 100)

of which opened in 2005, and the rest in 2004; they are all listed in www.smallbusiness.dnb.com.

Among the 51 unmatched observations from the NETS database, four are coded as transportation and warehousing, seven are businesses inside a Wal-Mart store (already matched), two appear to be duplicates of already matched records, 17 are Sam's Clubs, and one is a relocation not yet captured by the NETS; the NETS lists this store with its previous

Table A.4

Wal-Mart Data Checks, Georgia Stores

	Administrative Wal-Mart Data	NETS Data
Number of stores	111	156
Match on zip code or city and street number	98 (66 + 24 + 8)	98
Match on city	7	7
Unmatched administrative records	8	
Unmatched stores with open date 2005	4	
Unmatched stores with open date 2004 or later	8	
Unmatched stores with open date 2003 or later	8	
Records with SIC codes 42 (transportation and warehousing)		4
Sam's Club		17
Businesses inside Wal-Mart stores		7
Duplicates		2
Relocation not yet captured by the NETS		1
Unmatched NETS records		20
NETS match rate, stores open 2004 or earlier		**96.2 percent** ((103/[111 – 4]) × 100)
False positive rate for NETS, stores open 2004 or earlier		**18.7 percent** ((20/[111 – 4]) × 100)

address indicated in the administrative data on Wal-Mart closings. Thus, 20 records from the NETS remain unmatched; a majority of them have disconnected phone numbers. These numbers indicate that 96.2 percent of the Georgia stores in the Wal-Mart administrative database are found in

the NETS database (excluding all the stores opened in 2005). On the other hand, the falsepositive rate is high, at 18.7 percent.

Overall, what do we conclude? For Wal-Mart, the NETS data appear to capture most stores, although there are sometimes delays in picking up new stores in the D&B source data. These lags in picking up births imply that the dynamics of births we observe in the NETS may not be entirely accurate. This is relevant to the current research, suggesting that we have to be cautious about drawing conclusions from the NETS about changes in births in the last couple of years for which data are available. In addition, there is sometimes a tendency for the NETS to report Wal-Mart stores that the administrative data do not reveal. This remains unexplained. In the case of Wal-Mart, it appears unlikely to be due to delays in detecting moves or closings. And it is not clear why it would simply reflect incorrect assignment of headquarter DUNS numbers, since in that case telephone numbers should still be valid and indicate some other business. This false-positive rate is a limitation of the NETS data that must be kept in mind in evaluating this research and that requires further attention as research progresses with the NETS data. On the other hand, it is likely attributable in part to the large and complex nature of this particular corporation. At the same time, it should be emphasized that an important advantage of the NETS data is that the absence of confidentiality restrictions—in particular the provision of company names and other information—permits this kind of attention to data quality.

Intel

We carried out a similar analysis for Intel, using information on U.S. Intel plants available on its website.[30] This website lists 15 Intel plants nationwide, although there is no information on starting dates. We find all 15 of these plants in the NETS database, after some investigation (Table A.5).

We match 12 of the 15 plants easily. However, Intel plants included on the company's website in Irvine, California, and Raleigh, North Carolina, do not appear as Intel establishments in the NETS. However, the NETS does list Corollary, Inc., in Irvine, California. This company was acquired

[30]http://www.intel.com/jobs/usa/sites/ (viewed November 30, 2006).

Table A.5

U.S. Intel Plants, Nationwide

Addresses	Number of Employees According to Intel Website, May 2006–November 2006	Number of Employees According to NETS, 2004
Chandler, AZ	10,000	5,000
Folsom, CA	7,300	6,000
Irvine, CA	130	1[a]
Santa Clara, CA	7,500	6,200[b]
Colorado Springs, CO	1,000	300[b]
Hudson, MA	2,700	3,900[b]
Raleigh, NC	70	40
Parsippany, NJ	900	1
Rio Rancho, NM	5,200	6,500
Hillsboro, OR	16,000	8,000[b]
Columbia, SC	150	1
Austin, TX	550	180
Riverton, UT	625	75
Chantilly, VA	140	3[c]
DuPont, WA	1,300	1,500

[a]Corollary, Inc.
[b]Total of employment from establishments located at the same address.
[c]Walls & Associates estimate for 2003 (noted as 2004 in the NETS but corresponds to 2003 in reality), Intel establishment in Chantilly appears to be non-active as of 2005.

by Intel in Irvine to create its Irvine plant in 1997.[31] Presumably, the name of the company was not updated in the NETS although the headquarters identifier was updated to Intel. The Intel plant in Raleigh appears to be in

[31]http://www.intel.com/jobs/usa/sites/Irvine/ (viewed May 1, 2006).

the vicinity of that city,[32] in Cary, North Carolina, where we found an Intel plant using Google Maps and a matching Intel plant at the same location in the NETS. Finally, the Intel plant in Chantilly, Virginia, appears non-active in the NETS as of 2005 (its last year of business is 2004); this appears to be an error in the NETS data.

Given that the Intel website also provides employment levels at these plants (for some unspecified period in 2006), we thought it useful to compare the two data sources using the latest figure from the NETS, for 2004. In doing so, we noticed that, for some of the plants listed on the Intel website, we find many Intel establishments at the same address in the NETS. There is apparently some separation of businesses at the same Intel plant, but we assume that the website lists total employment there, and hence we add up across the NETS establishments at the same address. As reported in Table A.5, despite the very good matching of plants, in some cases the employee counts correspond poorly. The worst case is the plant in Parsippany, New Jersey, which, according to the Intel website, has 900 employees whereas the NETS reports only one employee. Similarly, the NETS lists one employee at Corollary, Inc., since 2001 (the Intel website lists 130 employees for Irvine) and also one employee at Columbia, South Carolina (the Intel website lists 150 employees for Columbia). We do not yet have an explanation for these discrepancies (and what are quite clearly errors in the NETS), although we do note that the cases with very low numbers in the NETS are for very small Intel plants. In addition, the numbers for the other plants—although not matching, which we would not expect—appear to be of the correct approximate magnitude. For example, the raw correlation between the employment levels in the two datasets is 0.90. And, overall, the matching between the two data sources is very good for Intel plants, although the NETS may incorrectly list one non-active plant in the last year covered by the data.

[32]The website reads: "Located in North Raleigh, and a few miles from the Raleigh/Durham International Airport."

Cheesecake Factory

Paralleling our analysis for Intel, we assembled data on Cheesecake Factory restaurants from their website.[33] As of May 2006, the company operated 103 restaurants under the Cheesecake Factory name (including 23 in California) and is headquartered in Agoura Hills, California.

Studying this company is instructive both because it is in another industry and because its expansion is relatively recent, so we get a worst-case scenario with regard to the NETS database's slowness in capturing new establishments. Overall, the NETS identifies 11 restaurants in California named "Cheesecake Factory," whereas the company's website lists 23 restaurants in California. All 11 of these establishments in the NETS match exactly to the company data, so there are no false negatives. But two in the NETS appear to have been active until 2004 and no longer in 2005 although they are still active in reality, reflecting the same type of problem we found for one Intel plant. According to press releases on the Cheesecake Factory website, of the 12 unmatched restaurants, three opened in 2005, three in 2004, and two in 2003,[34] so the nonmatches likely reflect delays in detecting new establishments in the NETS, as further indicated by the fact that five of the unmatched restaurants are listed in www.smallbusiness.dnb.com. The lower rate of capture of Cheesecake Factory restaurants by the NETS—with only 55 percent of establishments opening in 2004 or earlier listed in the NETS database—suggests that lags in capturing births are more serious for smaller establishments than for other businesses.[35] Indeed, as shown in Table A.6, the NETS captures 64.7 percent of restaurants opened in 2003 or earlier and 73.3 percent of restaurants opened in 2002 or earlier.

With regard to establishments outside California, the administrative data from the website lists 80 restaurants. Only 16 of these establishments match perfectly with observations from the NETS database, and three others match on city name. Of the 61 restaurants listed on the Cheesecake

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[33]http://www.thecheesecakefactory.com/locations.htm (viewed December 1, 2006).

[34]http://investors.thecheesecakefactory.com/phoenix.zhtml?c=109258&p=irol-news&nyo=0 (viewed December 1, 2006). Some of the other unmatched establishments opened earlier, and for others there is no information.

[35]The two restaurants listed as non-active in the NETS are counted as matches.

Table A.6

Cheesecake Factory Match Rates

	Restaurants Inside California	Restaurants Outside California
Match rate including restaurants opened in 2004 or earlier	55% ((11/[23 – 3]) ×100)	28.4% ((19/[80 – 13]) × 100)
Match rate including restaurants opened in 2003 or earlier	64.7% ((11/[23 – 6]) × 100)	32.8% ((19/[80 – 22]) × 100)
Match rate including restaurants opened in 2002 or earlier	73.3% ((11/[23 – 8]) × 100)	40.4% ((19/[80 – 33]) × 100)

Factory website but not appearing in the NETS database, 13 opened in 2005, nine in 2004, and 11 in 2003.[36] This results in a very low match rate of 28.4 percent of restaurants opened in 2004 or earlier. Again, as we subtract restaurants opened in recent years, the match rate increases: The NETS captures 32.8 percent of establishments opened in 2003 or earlier and 40.4 percent of those opened in 2002 or earlier. Nonetheless, this exercise indicates that for this particular chain, the NETS does not do a very good job of detecting all the establishments belonging to the company, and the problem is more severe for newer establishments. We believe this can be partially explained by the fact that the company has opened many restaurants in recent years and that the lower detection rate for out-of-state establishments occurs because the company was growing faster outside California, as illustrated in Figure A.8, which shows openings since 2000.[37]

[36]See footnote 34.

[37]One potential problem is that if establishments for some reason had an incorrect headquarters DUNS number, they would not appear in our version of the NETS dataset, which includes establishments outside California belonging to companies headquartered in the state (in this case) but which identifies these establishments based on the headquarters DUNS. However, we verified that for none of the California establishments, which were matched on headquarters DUNS number or company name, was the headquarters DUNS number incorrect.

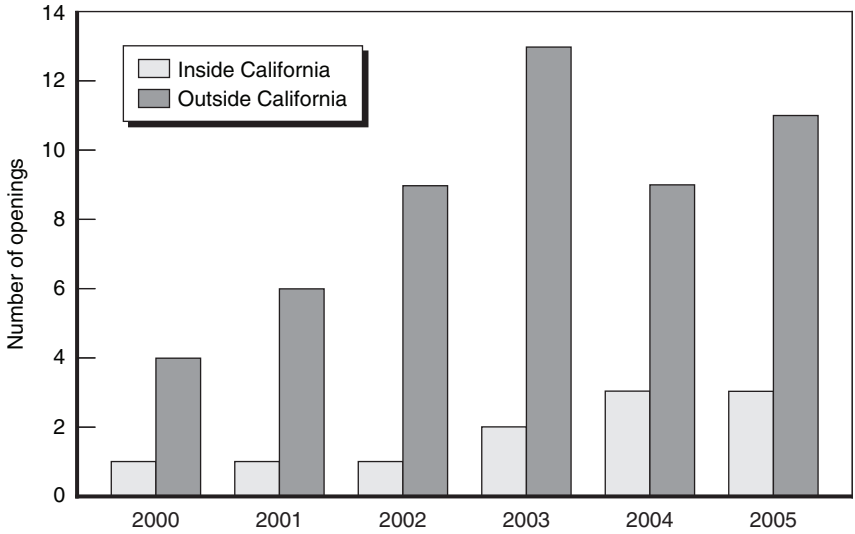

Figure A.8—Openings of Cheesecake Factory Restaurants, 2000–2005

Summary

Our assessment of the NETS data suggests that the data are generally reliable along the numerous dimensions for which we use them in this report. Nonetheless, although the data are clearly informative, they do need to be viewed with some caution, especially when it comes to the last couple of years of the sample period. Most important, perhaps, we see no obvious reasons why the types of problems that sometimes occur in the NETS should bias our results in one direction or the other.[38] And finally, it is worth emphasizing that no other data source can feasibly help address the questions we ask in this report. Government data sources, although likely more accurate along some dimensions, do not track relocations well (if at all) and there are severe restrictions on their use owing to confidentiality issues and timeliness of use.

[38]For example, because there are apparent errors in both directions (establishments in the administrative data sources that do not show up in the NETS and vice versa), it is not obvious that there is a bias one way or the other with respect to, for example, measurement of the share of employment in California reporting to California-headquartered companies, or changes in this share over time.

Appendix B

Adjusted Intrastate Job Flows

In Chapter 5, we adjust intrastate job flows—both gross and net—to take into account the sizes of regional economies.[1] Here, we first discuss the adjustment of gross flows; the adjustment of net flows follows from this quite naturally.

The basic idea behind our adjustment is that the movement of jobs between two regions is driven by two sets of factors. First, if there were no systematic pattern to geographic movements, but a subset of establishments simply moved randomly in each year, we would expect larger flows between larger regions (as defined below). Second, specific factors lead to systematically larger or smaller flows between regions irrespective of this size effect. The goal of our adjustment is to isolate the latter, constructing a measure that reflects variation only in the systematic factors that drive job flows between regions *net of* the effect of regions' sizes.

To implement this kind of adjustment, we first need to specify a model of job flows in the case of random, unsystematic behavior, which will yield flows that we want to net out in coming up with our adjusted job flows. We assume that a given fraction of jobs β moves in each year, and that the destination location is random, with the probability of ending up in region j (which could be the origin region as well as any other one) proportional to the share of employment in region j.[2] Given this assumption, the gross "random" flow from region i to region j, denoted $gross^{R}_{i \to j}$, is given by

$$gross^{R}_{i \to j} = emp_i \cdot \beta \cdot \frac{emp_j}{emp_{CA}} . \qquad \text{(B.1)}$$

The employment level in region i is given by emp_i; $\beta \cdot emp_i$ is therefore the number of jobs that move; and $\frac{emp_j}{emp_{CA}}$ is the share of state employment

[1] Although this section refers to "regions," the logic applies to counties as well.

[2] One could imagine other criteria, such as the proportion of the state's land area in the region. However, given the wide variation in population (and employment) density across regions, this does not seem like a reasonable model of behavior.

in region j (which could include the original region) and the share of jobs that move from region i that end up in region j. Clearly, as it is defined, $gross^{R}_{i\to j} = gross^{R}_{j\to i}$.

Equation (B.1) is convenient because it can be easily changed to yield the gross flow we would observe between regions i and j if all regions were the same size, with $emp_i = \frac{emp_{CA}}{I} = \overline{emp}$ for all i, where I is the number of regions. In this case, based on Eq. (B.1), the gross flow between any pair of regions, which we denote with a superscript *RSC* (random, with size constant) would be

$$gross^{RSC}_{i\to j} = \beta \cdot \frac{\overline{emp}^2}{emp_{CA}}. \tag{B.2}$$

We therefore take the observed gross flow, denoted $gross^{O}_{i\to j}$, and multiply it by the ratio of the gross flow we would expect randomly, holding size constant (i.e., between any two counties if all were the same size), to the expected random gross flow (i.e., between counties i and j taking in consideration their actual sizes), from which β and emp_{CA} cancel out, yielding

$$gross^{A}_{i\to j} = gross^{O}_{i\to j} \cdot \frac{gross^{RSC}_{i\to j}}{gross^{R}_{i\to j}} = gross^{O}_{i\to j} \cdot \frac{\overline{emp}^2}{emp_i \cdot emp_j}. \tag{B.3}$$

Clearly, if all regions were the same size, this adjustment would have no effect, as the ratio on the right-hand side would equal 1. On the other hand, for small regions, the denominator $emp_i \cdot emp_j$ is smaller than $\overline{emp}^2$ and more so when both regions are small. In this case the flow is adjusted upward. And it is similarly adjusted downward for large regions. Finally, because the ratio on the right-hand side of Eq. (B.3) will exceed 1 on average, we normalize the adjusted gross flows so that they sum to the unadjusted gross flows, yielding our final measure for the adjusted gross flow of

$$gross^{ADJ}_{i\to j} = gross^{A}_{i\to j} \frac{\sum_i \sum_j gross^{O}_{i\to j}}{\sum_i \sum_j gross^{A}_{i\to j}}. \tag{B.4}$$

Since net flows are simply differences between gross flows, that is

$$net^{O}_{i\to j} = gross^{O}_{i\to j} - gross^{O}_{j\to i} = -net^{O}_{j\to i}\,, \tag{B.5}$$

we simply apply our adjustment to each of the gross flows to get the adjusted net flows, so

$$net^{ADJ}_{i\to j} = gross^{ADJ}_{i\to j} - gross^{ADJ}_{j\to i}\,, \tag{B.6}$$

using the definition in Eq. (B.4).

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