

Are California's Companies Shifting Their Employment to Other States?

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February 15, 2007

**Public
Policy
Institute of
California**

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Summary

This paper extends our analysis of the demography of California businesses. We study whether California companies are shifting their operations to other states, and we also consider movements in the opposite direction. That is, are all companies – whether headquartered in California or not – downsizing their operations in the state and expanding relatively more elsewhere? Or are there shifts in the operations of California-headquartered companies to other states that are offset wholly or in part by shifts into the state among companies headquartered elsewhere, perhaps reflecting an increased tendency for firms in all states to diversify the locations of their operations? Such changes could be informative about the business climate in California – especially changes in the location of births of new establishments, which may be most responsive to economic, regulatory, and other conditions that create variability in profitability across states.

The evidence points to some shifts in the operations of businesses headquartered in California to other states. However, the main shifts in the location of economic activity of companies headquartered in California occurred at the height of the economic boom of the late 1990s. In addition, the shift of employment of California-headquartered companies to other states has been 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, except for a dip during the early to mid 1990s. The timing of the changes for California-headquartered companies and the dip in the state's share of national employment, as well as the offsetting movements into the state by companies headquartered elsewhere, make it difficult to argue that these changes reflect a bad business climate in recent years. Nonetheless, they do raise the question of whether policymakers should be concerned about an increasing tendency for California workers to be employed by companies headquartered outside of California.

Acknowledgments

We would like to thank David A. Coulter for providing some of the funding to support this study. We are grateful to Don Walls for helpful discussions and to Jeff Melton for helpful comments. Ingrid Lefebvre-Hoang provided outstanding research assistance. Mark Baldassare, Jon Haveman, Ellen Hanak, and seminar participants at the Public Policy Institute of California have offered helpful comments. The views expressed are those of the authors and do not reflect the views or policies of the Public Policy Institute of California

Introduction

Employment growth in a dynamic, modern economy such as California's is the net result of underlying processes of job creation and destruction. Job creation in the state stems from the expansion of existing businesses, births of new businesses, and relocations of businesses from other states, and job destruction stems from contractions and deaths of existing businesses and relocations of businesses from California to other states.

Past concerns over the state's business climate focused on the issue of relocation, with the argument that California was losing jobs as businesses fled the state, and conversely that healthy job growth required efforts to attract businesses from other states. However, using a unique data set on business establishments, our prior research found that business relocation – that is, physical relocation of existing business establishments – contributes trivially to changes in employment in California, and that business relocation did not change much over the past decade or so. Jobs lost to relocation were in higher wage industries than jobs gained through relocation, but even a measure of jobs lost to relocation that is weighted by earnings rather than by the number of jobs indicated trivial effects of relocation. Furthermore, there is no evidence that business relocation behavior in an industry is indicative of larger trends in that industry.¹

This evidence has two key implications. First, any policy responses to concerns over the business climate were likely badly misdirected if they emphasized business relocation. Second, business relocation is not an informative indicator or “barometer” of the business climate. Instead, we are likely to learn much more about employment change in California by focusing on births, deaths, expansions, and contractions.

In this paper, we therefore extend our analysis of the relocation of economic activity. In addition to physical relocation of existing business establishments, the relocation of economic activity and 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. We initially chose a narrow focus on physical relocation because the policy debate was explicitly about this phenomenon. But there are at least two reasons why expansions, contractions, births, and deaths – and the relocations of economic activity that accompany them – could be more important indicators of California's economic conditions than physical relocation.

First, our earlier work established the sheer quantitative importance of births, deaths, expansions, and contractions, implying that these are far more likely to be informative about the business climate. Second, even if relocation were not trivially small, changes in 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 therefore may be an unusual response to small changes in conditions affecting the profitability a business might expect in California relative to another state. However, an existing firm looking 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

¹ See Neumark et al. (2005, 2006) for the evidence, as well as discussion of the debate regarding the business climate in California.

may well be advantages – such as customer relations – to remaining in a particular market).² Similarly, decisions by a business with multiple establishments regarding which establishments to expand (or contract) 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 businesses have shifted their operations out of state (via expansion of out-of-state establishments, creation of more new establishments outside the state, deaths of more establishments in the state, or contractions at establishments in the state). Business groups responding to our earlier research suggested that this was occurring, based in part on anecdotal or limited survey evidence,³ 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 outside the state 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, paralleling what was noted in our earlier work on business relocation (Neumark et al., 2005), 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 of California *into* the state. Although we have somewhat less information on this offsetting behavior, we shed what light we can on whether there are shifts in economic activity of California-headquartered firms to out-of-state destinations and offsetting movements in the other directions.

In all of this research, we continue to use the National Establishment Time-Series (NETS). In the past, we have used data on California business establishments. However, for this paper we had to expand the data set to include establishments related to businesses operating in California. Thus, in addition to establishments in California, the data set has been expanded to include establishments outside the state owned by California-headquartered firms. The dataset covers the years 1992-2004 and includes an average of 2.4 million establishments per year.⁴

Our detailed empirical analysis has four main findings:

- The share of employment (as well as the share of establishments) 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;
- The share of births of establishments of California-headquartered firms that were outside California has increased, and the share in California has correspondingly

² To clarify, an establishment is a single site at which business is conducted, such as a store or factory. A firm or business may consist of many establishments.

³ For the latter, see California Business Roundtable and Bain & Company (2004).

⁴ Note that the data extend one year further than in Neumark et al. (2006).

declined. The peak of the share of births outside California occurred at the height of the economic boom of the late 1990s;

- 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 dipped in the early to mid 1990s and has risen since then.
- Looking at key industry sectors at both the high and low end of the earnings distribution, there is no evidence of more adverse developments in higher-paying industries, and if anything the opposite, as California's share of national employment has risen relatively more in higher-paying industries.

The primary purpose of our research agenda is to establish the facts regarding the "demography" of California businesses and employment.⁵ However, despite the focus of our research on establishing the facts, it is also important to try to interpret them. To that end, we offer two interpretations of the evidence.

First, 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 business climate in California. 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.

Second, there is arguably some trend toward more dispersion of firms' activities across states, with California firms employing more workers and opening more establishments out of state, and non-California firms employing more workers within the state over time.⁶ This trend may reflect nothing more than a sub-national manifestation of some of the same forces spurring increased globalization—such as reduced communications costs. It is conceivable that this trend poses some challenges to the state, although this is speculative, as discussed later in the paper.

⁵ We view the "demography" analogy as appropriate. Our previous research focuses on births and deaths of business establishments in the state, on the migration of business establishments *between* states, and on the "life-course" of businesses—how they expand or contract. In this paper, we focus more on business establishments and their corporate "families," studying how family members migrate to and take root in other locations.

⁶ We do not have the data to study all births outside of California. In addition, establishing longer-term trends with our data is somewhat tenuous, and there have been some reversals since the late 1990s.

The National Establishment Time-Series Database

Because this data set has been described in detail elsewhere, we focus our discussion here on issues unique to the questions we explore in this paper.⁷ The NETS data include all business establishments (including the public sector) located in California at any time between 1992 and 2004, as well as establishments outside of California that belonged to firms headquartered in California during the same period. The NETS captures births and deaths, as well as relocations (as studied in our earlier research), and includes a measure of employment. Thus, we can obtain measures of changes in the number of establishments resulting from births and deaths (as well as relocation), and changes in employment associated with these phenomena as well as expansion and contraction of existing establishments.⁸

In this paper, we use the NETS data in two ways that we have not before, and hence we want to provide some information on the properties of the data with respect to these two uses. First, although we do not have the NETS data for all establishments operating throughout the United States, for some purposes we are interested in describing various employment shares relative to total U.S. employment (in the aggregate or by industry). Because, as documented in Neumark et al. (forthcoming), different data sources (including the NETS) report different measures of employment, we obtained from Walls & Associates (the company that creates the NETS) the time-series of aggregate U.S. employment, and employment by industry, as measured by the NETS over our sample period.

This time-series is displayed in Figure 1, which also provides a comparison with the two other major sources of estimates of U.S. employment – the Current Population Survey and the Payroll Survey. Two things are obvious from the graph. First, employment is higher in the NETS, 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. The same phenomenon occurs in aggregate California data, as shown in Figure 2.

Two factors likely explain these differences. 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 et al., forthcoming). In addition, we suspect that this kind of doubling up of businesses owned by the same individual may have peaked during the expansion of the late 1990s, although we cannot verify this. Second, the NETS is sometimes slow to detect new business establishments, although as shown in Neumark et al. (forthcoming) it does eventually pick up births quite accurately. Thus, toward the end of any period at which the NETS data ends, there should be a reported dropoff in employment.⁹ We have attempted to verify this in two ways. First, we previously worked with a version of the

⁷The data are described in Neumark et al., 2005, 2006. A more detailed discussion of the NETS data is provided in Neumark et al. (forthcoming).

⁸ Technically speaking, the NETS measures the number of jobs rather than the number of employed people. However, we use the two terms interchangeably.

⁹ 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.

NETS database for California extending through 2003. As shown in Figure 3, although there is 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,¹⁰ for earlier years the match is very good.¹¹ At the same time, the gap in the last year is small relative to the employment changes over the longer period and the differences between the data sources displayed in Figure 2, so this represents a small part of the overall story.

Regardless, the fact that the run-up and dropoff is reflected in the NETS in both the U.S. and California data suggests that it is a property of the data that is unlikely to create serious problems for our use of the data – namely, to look at characteristics of employment in California in comparison to employment in the rest of the country.¹²

The second new use to which we put the NETS data in this paper – and one that is fundamental to our inquiry – is to study the joint behavior of establishments owned by the same firm. Because our previous research focused only on establishments, we did not engage in any assessment of how accurately the NETS matches establishments belonging to parent companies. For our purposes, we would like to be assured that the NETS identifies existing establishments of firms and perhaps most importantly – because we know that identifying new establishments is the most difficult task in the data collection – births of new establishments of existing firms. Of course, in this paper we are interested in establishments both inside and outside California. Our assessment of how well the NETS matches establishments to multi-establishment firms is reported in the Appendix.

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 data set because the NETS detects new establishments with some delay. This suggests that the data – while informative and the best we have – still need to be viewed with some caution, especially when it comes to the latter years of the sample period. At the same time, we see no reason why the types of problems that sometimes occur should bias our results in one direction or the other, a point to which we return after discussing the results.

¹⁰ The NETS release for year t includes data through year $t-1$.

¹¹ 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 Appendix B of Neumark et al. (2006).

¹² As we discuss in Neumark et al. (forthcoming), 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 Payroll Survey estimates reported in Figures 1 and 2.

Findings on California Companies and Their Changing Role in State Employment

We report the main empirical results in five steps. First, we describe evidence on changes in the numbers and location (inside and outside the state) of business establishments owned by companies headquartered in California. Second, we describe similar evidence focusing on employment rather than a count of establishments. Third, we delve more deeply into some of the dynamics underlying these changes, looking explicitly at births and their contribution to employment growth. Fourth, 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 for which some differences might be expected. In each case, we note the key result, and then provide details of the analysis.

1) The share of establishments owned by California-headquartered firms that were located in the state declined; but the decline occurred during the economic boom of the late 1990s.

Table 1 lists four columns describing 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 turn to establishments in California that belong to multi-establishment firms – first those belonging to firms headquartered in California, and then firms headquartered outside of California. The fourth column shows establishments outside the state owned by firms headquartered in the state.¹³

Table 1 shows that the count of all three types of establishments belonging to multi-establishment firms peaked in 2001, and then declined somewhat, following the business cycle. By computing the ratio of the sum of columns 1 and 2 in Table 1 to the sum of columns 1, 2, and 4, we obtain the share of establishments of California-headquartered firms that are located in California. This series is graphed in Figure 4, 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 to about 96 percent in 1999-2001, and then rose slightly.¹⁴ The numbers in Table 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

¹³ There are a very small number of establishments (typically around 500 per year) for which the headquarters identifier is missing, and a larger number (averaging around 12,000 each year) for which 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, and our conclusions remained the same.

¹⁴ Figures 4 and 6 also show the trend in the share of establishments of California-headquartered multi-establishment firms *only* that is located in California; this 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 multi-establishment firms shows how firms in a better position to respond to productivity or cost differentials across states behave. The main findings of Figures 4 and 6 – 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 6 are more similar because single-establishment firms, while numerous, are smaller and therefore account for a considerably less-than-proportionate share of employment.

companies headquartered outside the state. The time-series on this latter share, graphed in Figure 5, exhibits a relatively steady increase initially, which accelerated at the end of the decade, followed by a decline, although not to the levels of before the boom of the late 1990s. Roughly speaking, the movements in the series graphed in Figures 4 and 5 are in offsetting directions.¹⁵

Thus, this evidence points to some decline in 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. In other words, it occurred during the high-tech boom that was probably one of the most successful eras in California's recent economic history.

2) The share of employment in the state in establishments owned by California-headquartered companies fell slightly, again around the time of the economic boom in the late 1990s.

Next, we report similar analyses for employment levels rather than establishment counts. The four columns of Table 2 exactly parallel those in Table 1. In all four columns, employment peaks in 2001, paralleling the overall employment figures discussed earlier. Figure 6 combines columns 1, 2, and 4 to display – for California-headquartered firms – the share of employment in establishments located in California. This series is qualitatively similar to the series for establishment counts in Figure 4, 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 7 shows the share of state employment accounted for by establishments of firms headquartered outside of California. As for establishments, this series increases over the late 1990s, and then falls back a little. In this case, over the entire period, the share seems to quite directly offset the decline in employment among establishments owned by California-headquartered multi-establishment firms.¹⁶

Overall, then, 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 owned by California-headquartered companies in California, and a similar shift in the same direction in terms of employment. These shifts were at least partially offset by increases in the share of establishments and employment owned by firms headquartered out-of-state, suggesting that the changes are more attributable to an expanding geographic focus of multi-establishment firms located both inside and outside the state. This result, 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.

¹⁵ This does not have to be the case. In Figure 4, the denominator is the number of establishments located anywhere that are part of California-headquartered firms; in Figure 5, the denominator is the number of establishments located in California that are part of firms headquartered anywhere. Both of the series could, for example, be declining.

¹⁶ Again, though, these shares have different denominators and can in principle move in the same or opposite directions.

3) *The share of out-of-state establishment births for California companies has increased, as has the share of out-of-state job creation due to establishment births; as for overall employment, this increase was concentrated around the time of the economic boom of the late 1990s.*

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 changed over time for California-headquartered and non-California-headquartered 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 cycle because a company looking to expand faces a clean slate regarding where to locate employment, as it has the option of creating a new establishment anywhere. This analysis of births inside and outside California directly addresses concerns that our earlier research missed an important avenue by which California companies were relocating economic activity outside the state – not by the physical relocation of establishments, but rather through decisions about where to create new establishments.

Figure 8 plots the number of establishment births inside and outside the state for California-headquartered multi-establishment 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). In the early to mid 1990s, births in California fell sharply (after the first year), while births outside California rose modestly. All births rose sharply during the economic boom, and then declined. 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. Prior to the economic boom, the share of births in California fell because of declining births in the state, while during the boom it continued to decline, although *not* because California-headquartered firms continued to reduce establishment births in the state during this period, but rather because an increasing number of births in the state did not keep up with the even sharper increase in the number of births outside the state.

Figure 9 moves from establishment births to the jobs created by establishment births. The figure reveals that these job creation numbers are relatively volatile, and that job creation due to births both inside and outside California rose sharply during the boom and then fell substantially. Overall, the share of jobs created by births that occurred inside the state fell 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 there was some shift of employment of California-headquartered firms to out of state; not surprisingly, perhaps, some of this occurred via births.

Finally, a comparison of Figures 8 and 9 suggests little overall longer-term change in job creation due to births inside versus outside the state for these California-headquartered companies, although we see a more steady downward trend in establishment births outside the state. The difference has to 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 revisit some of the data issues discussed earlier. We suggested that one potential problem with the NETS data is a lag in detecting some

establishment births. However, as long as 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 8 or 9. Of course this condition may not hold exactly, which is why we think that a little caution has to be exercised with respect to interpreting results for the last couple years of NETS data.

4) 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 the nation as a whole has been quite stable and perhaps even risen recently.

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 of 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 fell back somewhat afterward), making this interpretation tenuous. Moreover, it is possible that the pre-boom to post-boom decline in activities of these companies in the state is not a negative harbinger at all, but instead simply reflects shifts in the locus of employment relative to headquarters, with business operations becoming more dispersed.

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 has to be the case if the share accounted for by 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 the economic operations of firms becoming more far-flung. In contrast, if these non-California firms are also reducing their employment in California (although perhaps just not as fast as California-headquartered firms), then the evidence would point to decreasing attractiveness of the state as a place to do business.

To address these questions – placing the question of the behavior of California-headquartered firms in the context of the “two-way street” that can characterize the relocation of economic activity – Figure 10 displays the time-series on the share of employment in California as a share of total employment of firms headquartered outside of California.¹⁷ 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 in which 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 more related to increased employment away from headquarters in both directions, rather than solely to businesses shifting their economic activity out of California.

Another way to see this is that the share of total U.S. employment in California remained relatively stable over the sample period, falling during the early to mid 1990s but then rising

¹⁷ 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, as displayed earlier in Figure 1. We can compute total employment in firms headquartered outside California by subtracting from this total the employment of firms headquartered in California.

subsequent to the boom of the late 1990s. This is illustrated in the top panel of Figure 11 for NETS employment, as well as employment measured in both the CPS and the payroll survey. Of course, the U.S. population share residing in California could have changed in ways that help generate this pattern in the employment share. 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 graph flattens slightly, reflecting the fact that California's share of the U.S. population fell from the early to the mid 1990s and then rose again. But the qualitative pattern is the same.

5) The shift of economic activity of California-headquartered firms to out of state is strongest 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 of California to inside the state occurred for all of these industry sectors, although most sharply for finance and insurance.

All of 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 vary 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 higher-paying industries, while the offsetting expansion into California might consist of lower-paying jobs. In such a case, the shifting locus of ownership and employment might be worrisome.

We look at four industry groupings that seem to be significant with respect to issues about the business climate and the changing job market: technology industries,¹⁸ manufacturing, finance and insurance, and retail. We chose the technology sector because this 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 jobs," based largely on the fact that manufacturing pays high wages and generous benefits. We study finance and insurance because findings in our previous research (Neumark et al., 2006) indicated that this was one industry in which there appeared to be a non-negligible net relocation of jobs from California to other states. In addition, this is an industry with 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 3 shows the average annual pay in these sectors.

For these industry groups, we present analyses similar to those presented above. We report results for the share of California employment attributable to California-headquartered firms, and for the share of employment of non-California-headquartered firms that is located in California; these results for each industry are analogous to the results in Figures 6 and 10 for the

¹⁸ We define this sector as including the following NAICS codes: 334 (computer and electronic product manufacturing, which includes computers and computing equipment, communication 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 (this revision to the NAICS happened between the 1997 and 2002 NAICS versions). We excluded 5415 (computer systems design and related services) because national employment aggregates from the NETS were made available to us only at the 3-digit level.

overall economy. Figure 12 displays these shares for the technology sector. The share of employment in California-headquartered 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 firms headquartered outside California rose sharply from 1996 to 1997 and continued to drift fitfully upward afterward. 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 of California to have employment in a different state from the headquarters.

Figure 13 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 that 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 relative to other states. And among firms headquartered outside California, the share of their employment 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 14. 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 15 shows a similar if somewhat less marked pattern of geographic dispersion for retail trade – a drop in the California 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 16 shows the share of national employment in California for each of the four highlighted industries (analogous to Figure 11 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, due to an initial drop between 1993 and 1994, and slow growth subsequently.¹⁹ 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 of the industries most often flagged as most problematic with respect to the quality of jobs. In contrast, California's relative position in terms of 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.

¹⁹ This does not mean that retail jobs are not proliferating, but instead simply that retail has grown more in other states.

Conclusion

This paper presents another installment of our research on the demography of California business establishments and employment. Here, we examine the dynamics of businesses headquartered in California, extending our earlier analysis of the physical relocation of businesses from California to other states to consider the broader set of dynamic processes that could underlie relocation of economic activity. In particular, we ask whether California companies are shifting their operations to other states – in terms of either the number of business establishments or the level of employment – through expansions and contractions of existing establishments, as well as births and deaths of establishments. These types of changes could be informative about the business climate in California – perhaps most importantly changes in births of new establishments, which may be most responsive to economic, regulatory, and other conditions that create variability in profitability across states.

To a large extent, this research was prompted by responses to our earlier research focusing on business relocation. These responses argued that such a focus was too narrow and pointed to other suggestive evidence that California-based companies were moving their operations elsewhere – but more in terms of decisions about where to create new establishments than relocations of existing establishments. Of course, as with relocations, it is essential to consider movements in both directions. That is, are all companies – whether headquartered in California or not – downsizing their operations in the state and expanding relatively more elsewhere? Or are shifts in the operations of California-headquartered companies to other states offset wholly or in part by shifts into the state among companies headquartered elsewhere, perhaps reflecting an increased tendency for firms across the nation to diversify the locations of their operations?

The evidence points to some shifts in the operations of businesses headquartered in California to other states. This is reflected in the number of establishments, the level of employment, and births of new establishments. However, there are two critically important qualifications to this evidence. First, the main shifts in the location of economic activity of companies headquartered in California occurred at the height of the economic boom of the late 1990s; in some cases the shifts in the locus of operation of these companies stayed near levels attained in that period, and in some cases they reverted somewhat to pre-boom levels. Second, 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 the result that California's share of national employment has remained roughly constant, with a dip in the early to mid 1990s. In addition, the evidence suggests that California's share of national employment has increased more in higher-paying than in lower-paying industries, although this conclusion is based on an analysis of a select group of key industries rather than the entire spectrum of industries.

In our view, this evidence has two implications. First, 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 the state 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.

Second, there is arguably some trend toward more dispersion of firms' activities across states, with California firms employing more workers and opening more establishments out of state, and non-California firms doing the same within California, although establishing longer-term trends with our data is somewhat tenuous, and there have been some reversals since the late 1990s. This trend may be nothing more than a sub-national reflection of some of the same forces spurring increased globalization, such as reduced communications costs.²⁰ Moreover, the fact that companies based outside California are expanding their operations in the state would seem to belie arguments that – on the whole – California has become more hostile to business.

Indeed, the only circumstances in which the observed shifts in the geographic locus of economic activity among California-headquartered companies, and in the locus of ownership of businesses in California, should be viewed as troubling is if there are some reasons to prefer that California workers are 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 may 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 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.²¹ In this paper 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 empirical facts.

²⁰ 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.

²¹ Headquarters can be a source of 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, total employment reporting to California headquarters, and the share of employees working in headquarters unchanged.

Figure 1: U.S. Employment Levels in the NETS, the Current Population Survey, and the Payroll Survey, 1992-2004

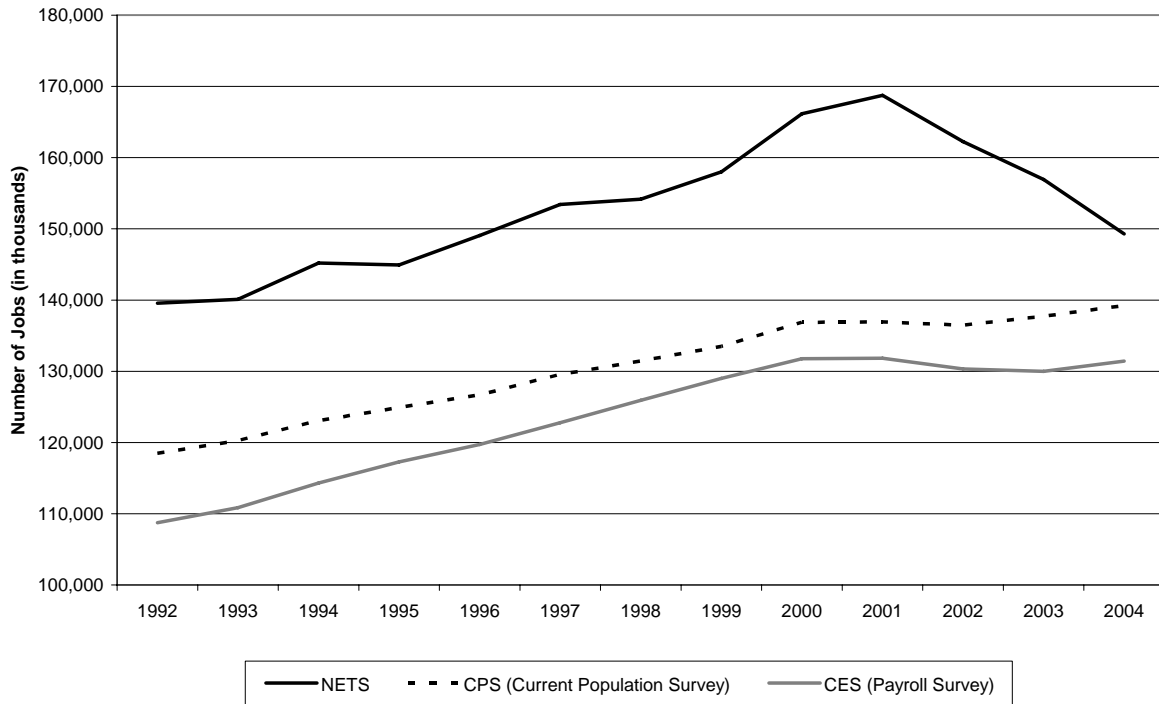


Figure 2: California Employment Levels in the NETS, the Current Population Survey, and the Payroll Survey, 1992-2004

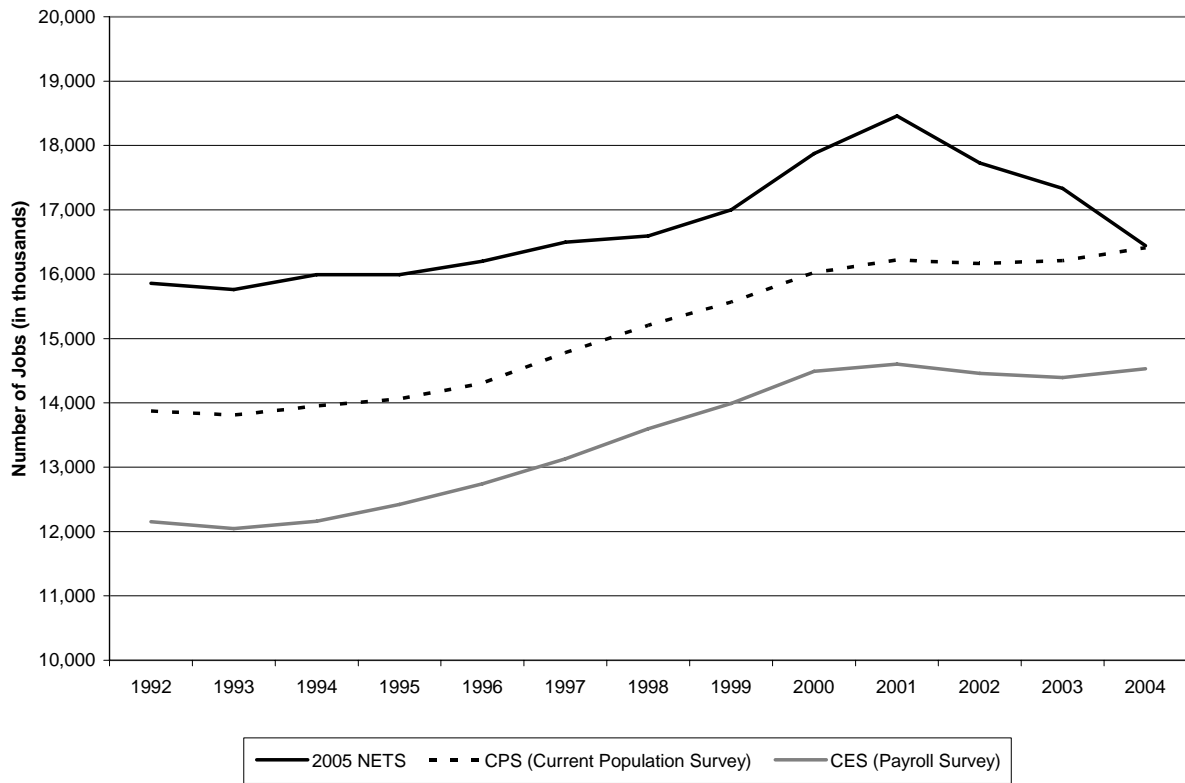


Figure 3: Changes in California Employment Across NETS Releases

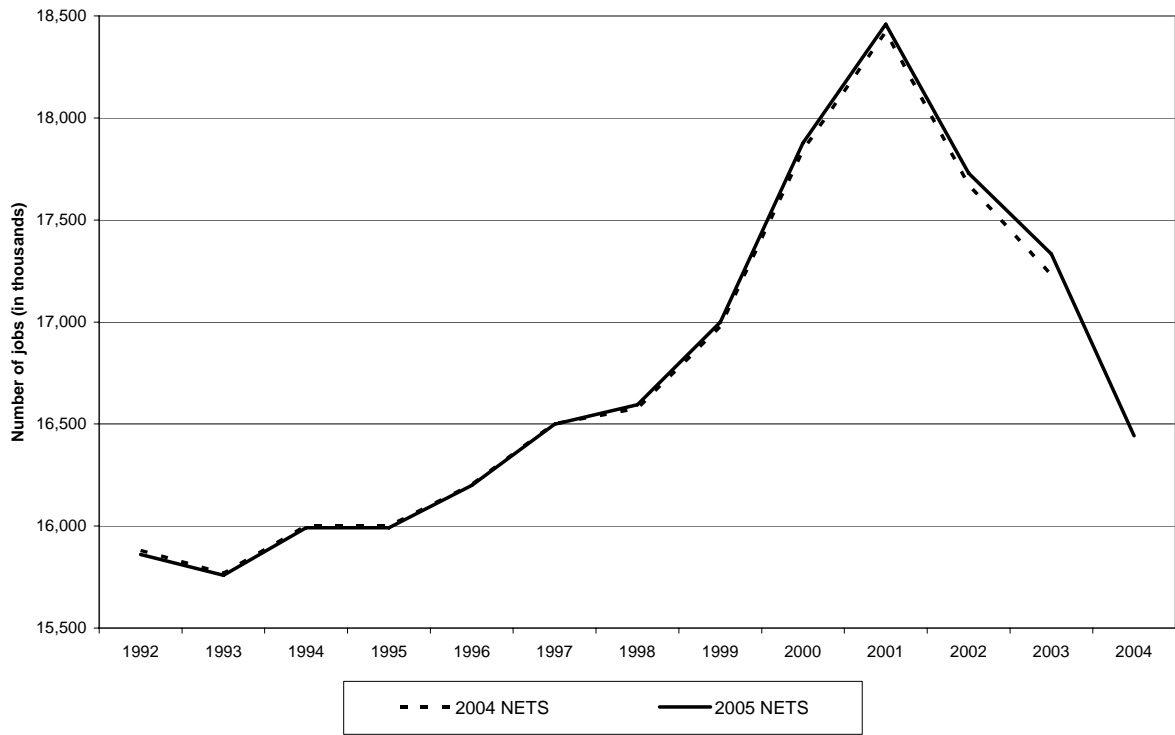


Figure 4: Share of California Establishments Owned by California-Headquartered Firms, 1992-2004

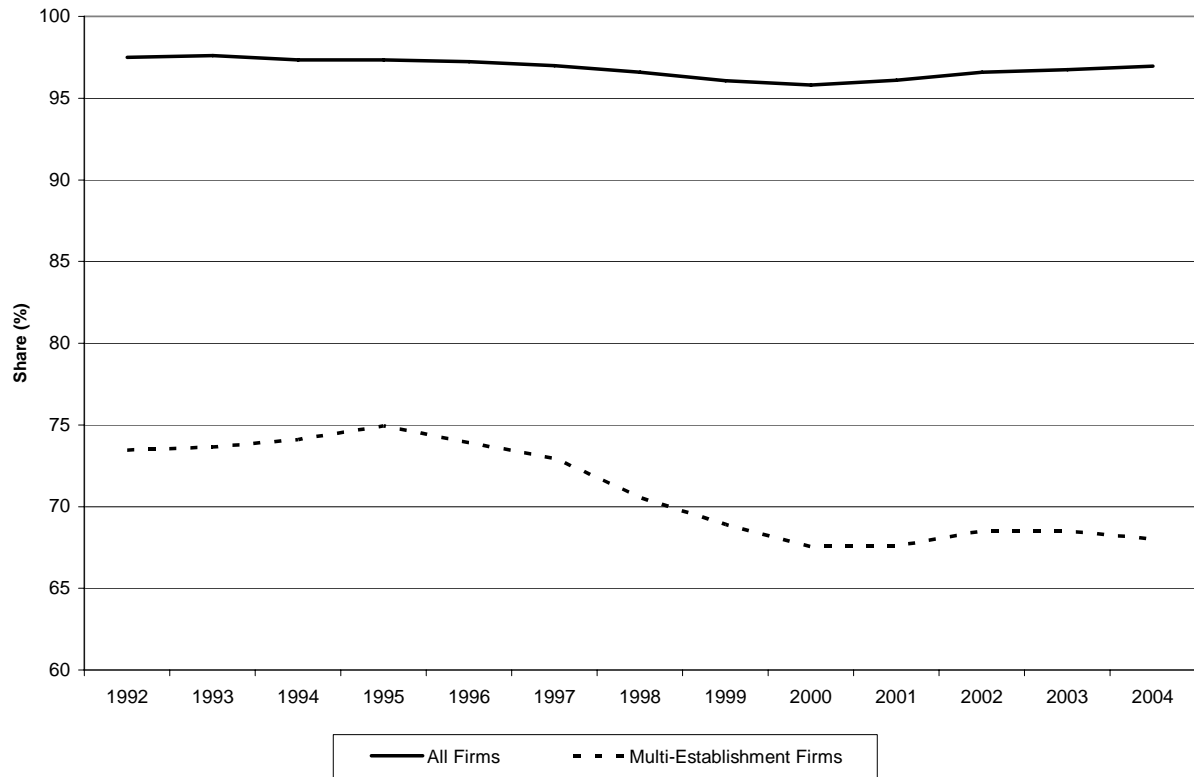


Figure 5: Share of California Establishments Owned by Firms Headquartered Out of State, 1992-2004

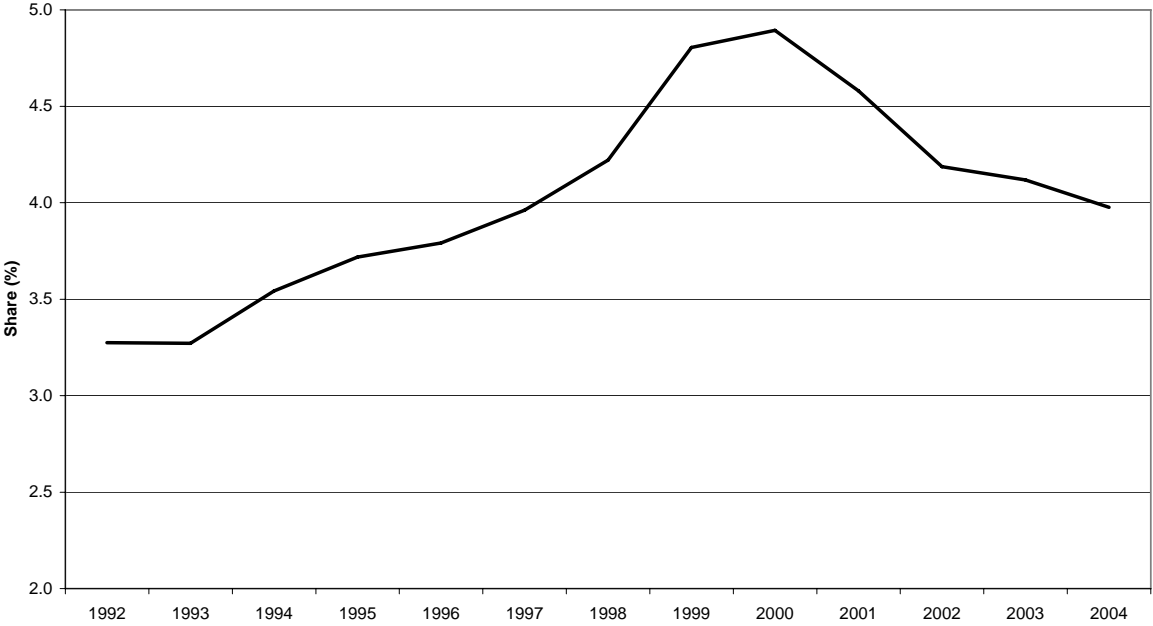


Figure 6: California's Share of Employment in California-Headquartered Firms Located in California, 1992-2004

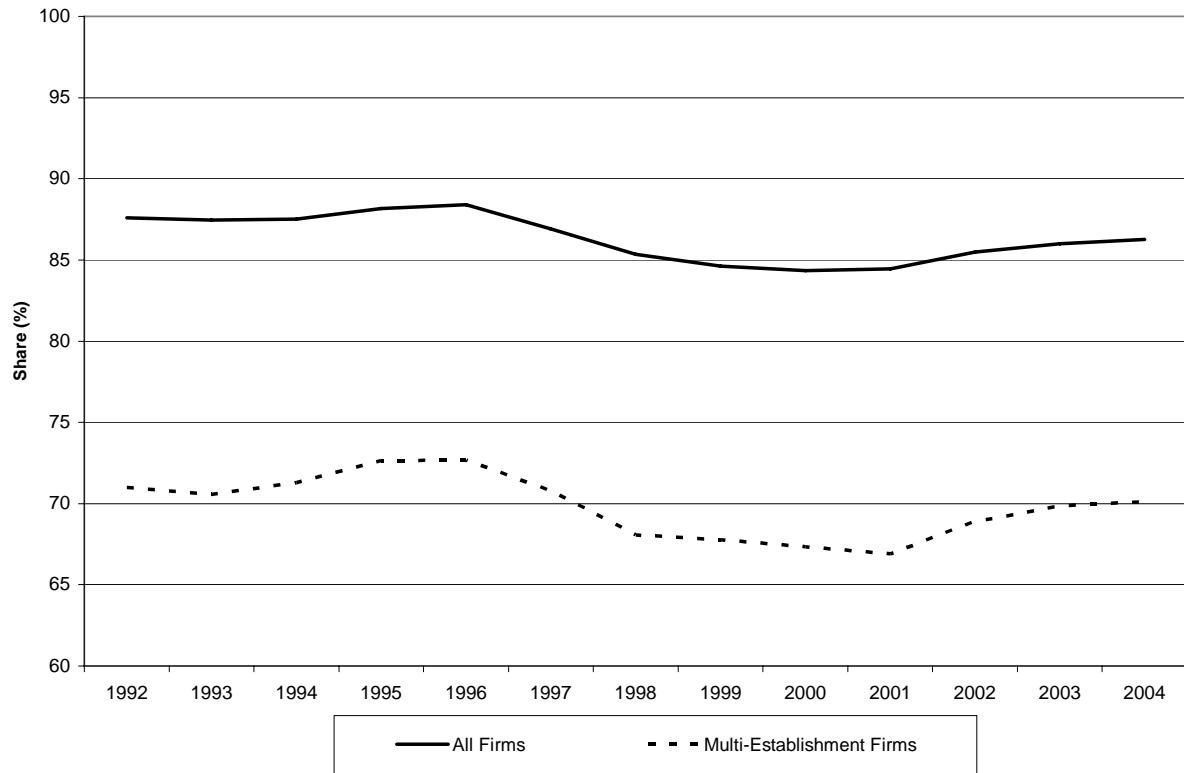


Figure 7: Share of California Employment in Firms Headquartered Outside of California, 1992-2004



Figure 8: Establishment Births Inside and Outside California of Multi-Establishment California-Headquartered Firms

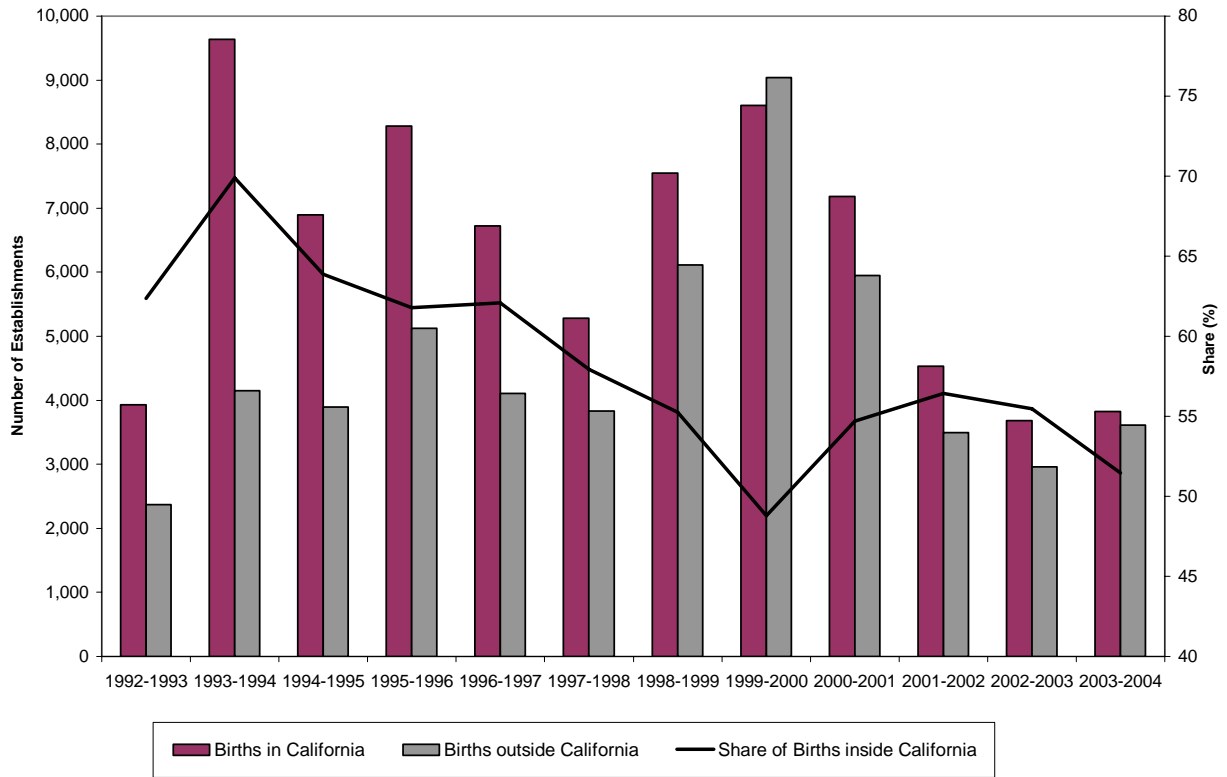


Figure 9: Employment Creation from Births Inside and Outside California of Multi-Establishment California-Headquartered Firms

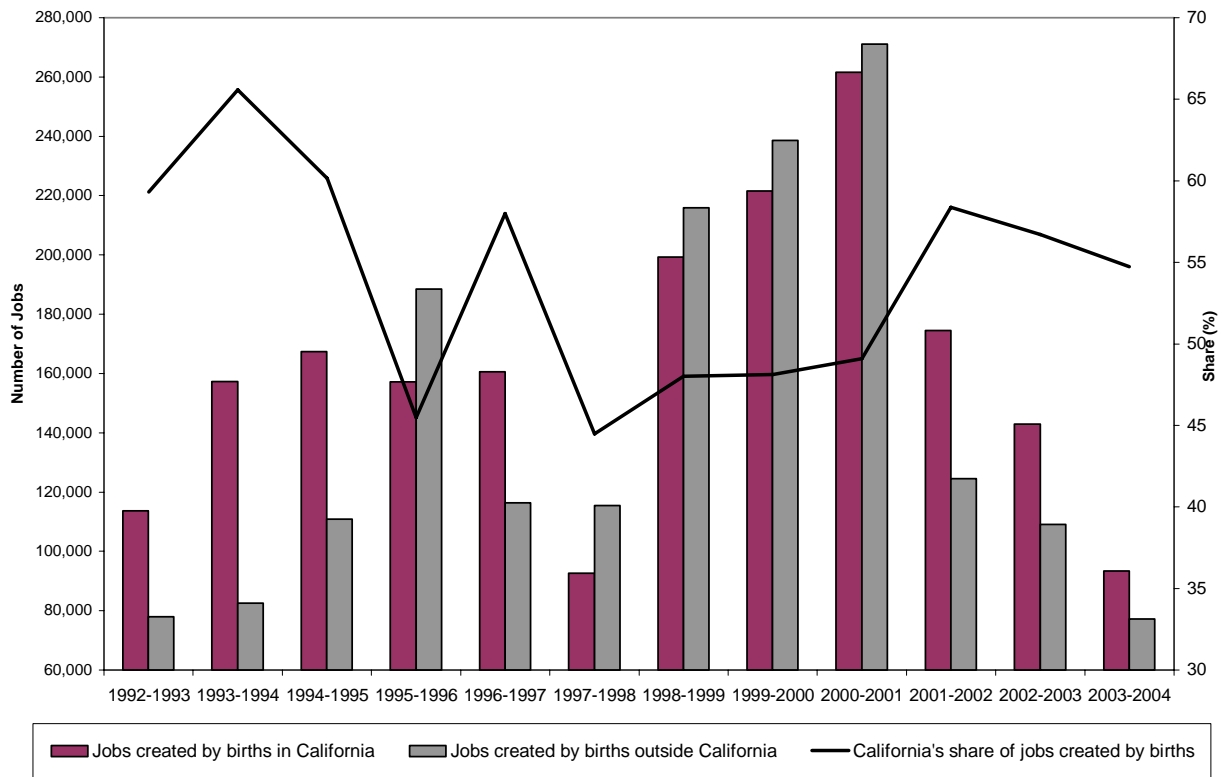


Figure 10: California's Share of Employment of Firms Headquartered Outside of California

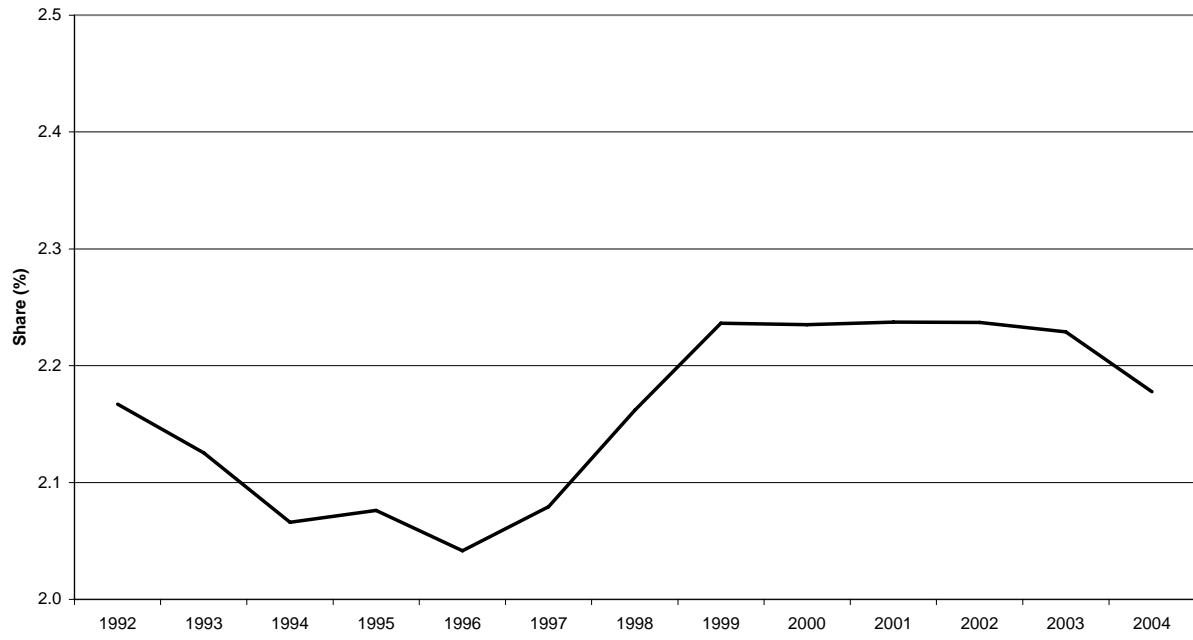


Figure 11: California's Share of Total U.S. Employment (top panel); California's Employment Share Divided by California's Population Share (bottom panel, for NETS only)

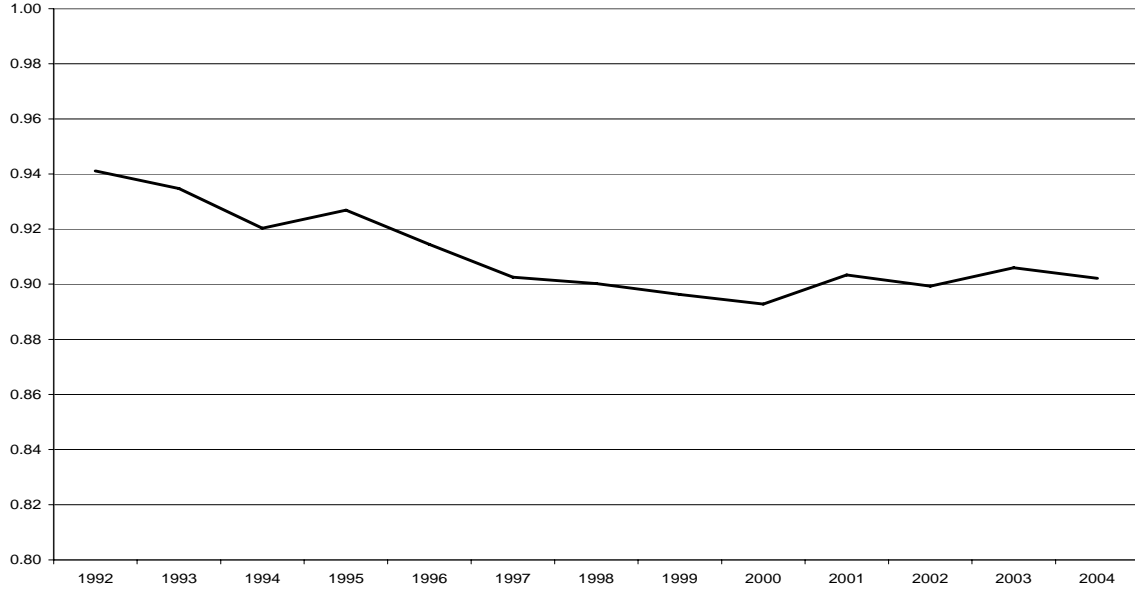
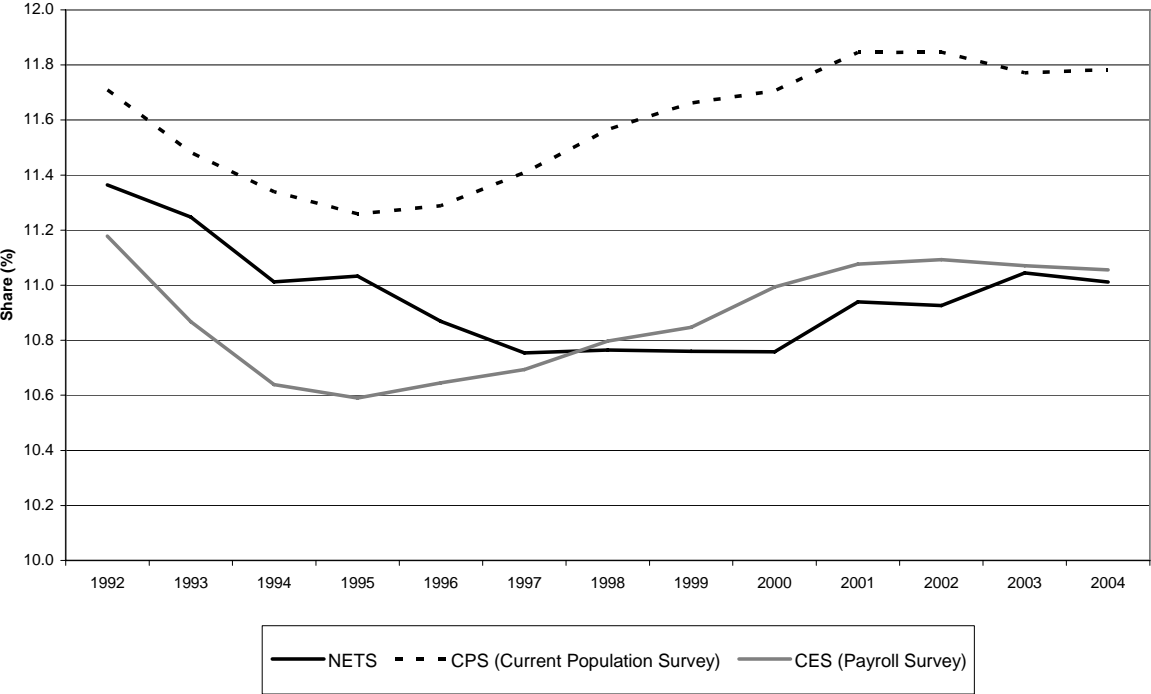


Figure 12: Technology Sector, 1992-2004

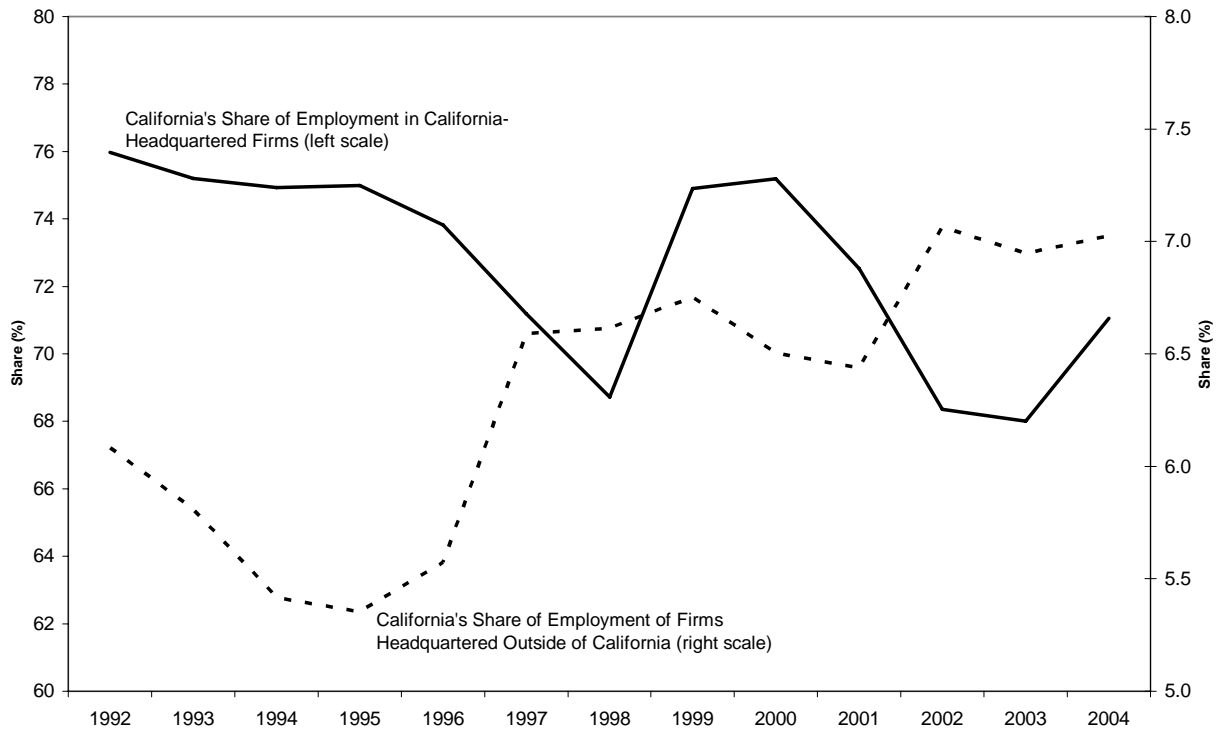


Figure 13: Manufacturing, 1992-2004

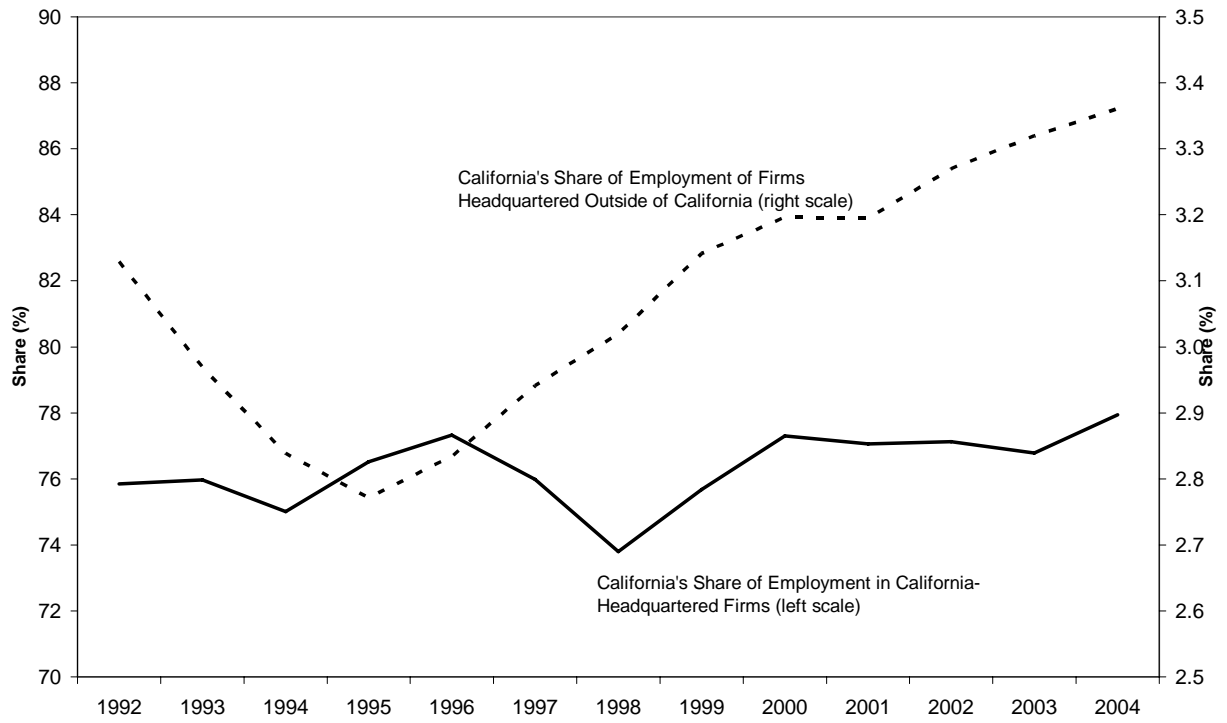


Figure 14: Finance and Insurance, 1992-2004

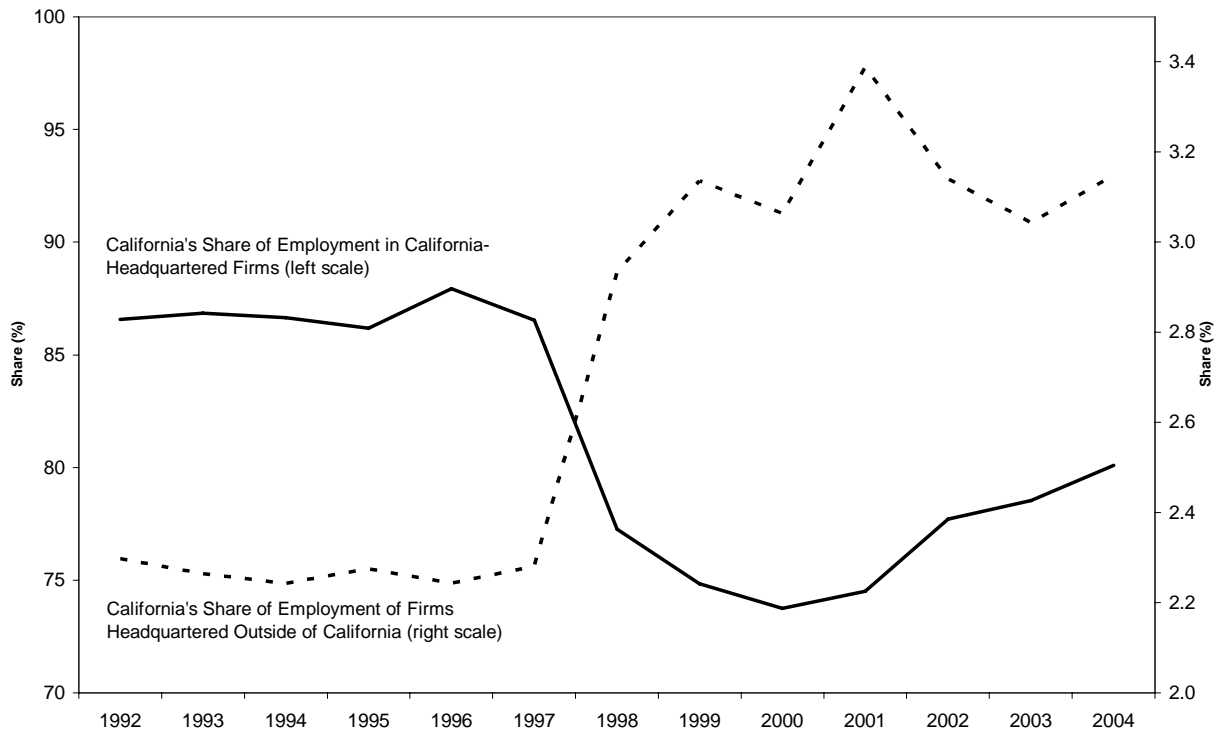


Figure 15: Retail, 1992-2004

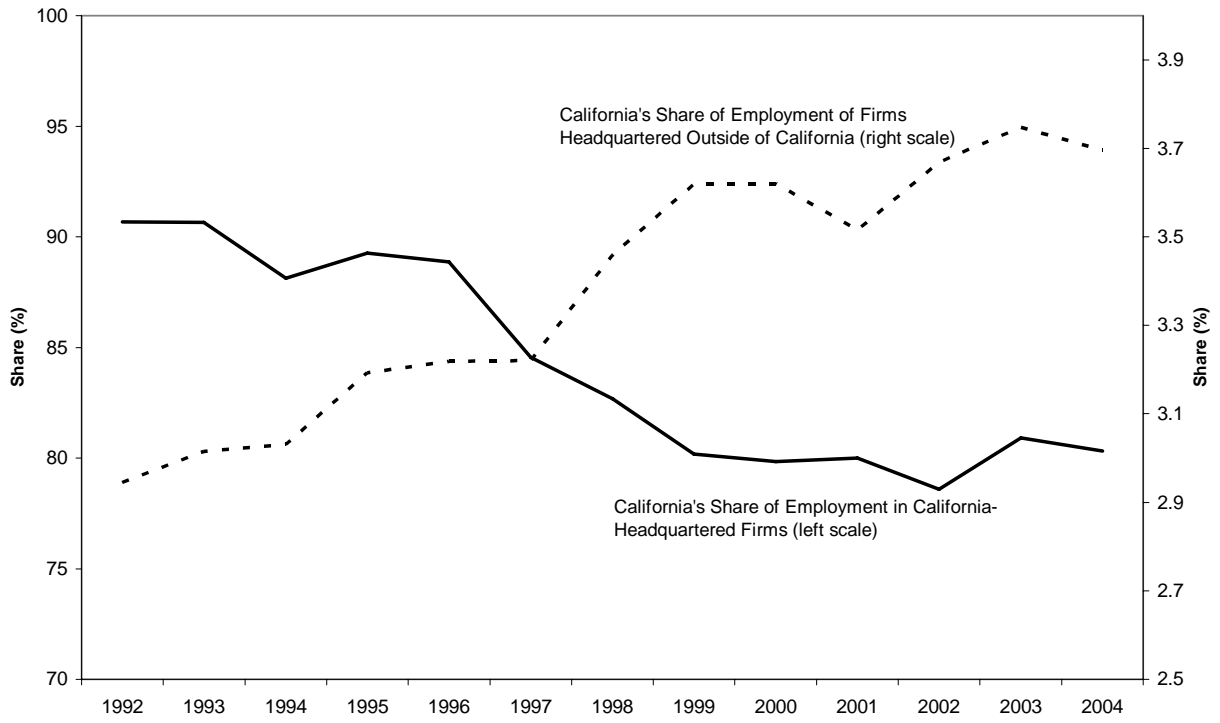


Figure 16: California's Share of U.S. Employment by Industry (top panel); California's Employment Share by Industry Divided by California's Population Share (bottom panel)

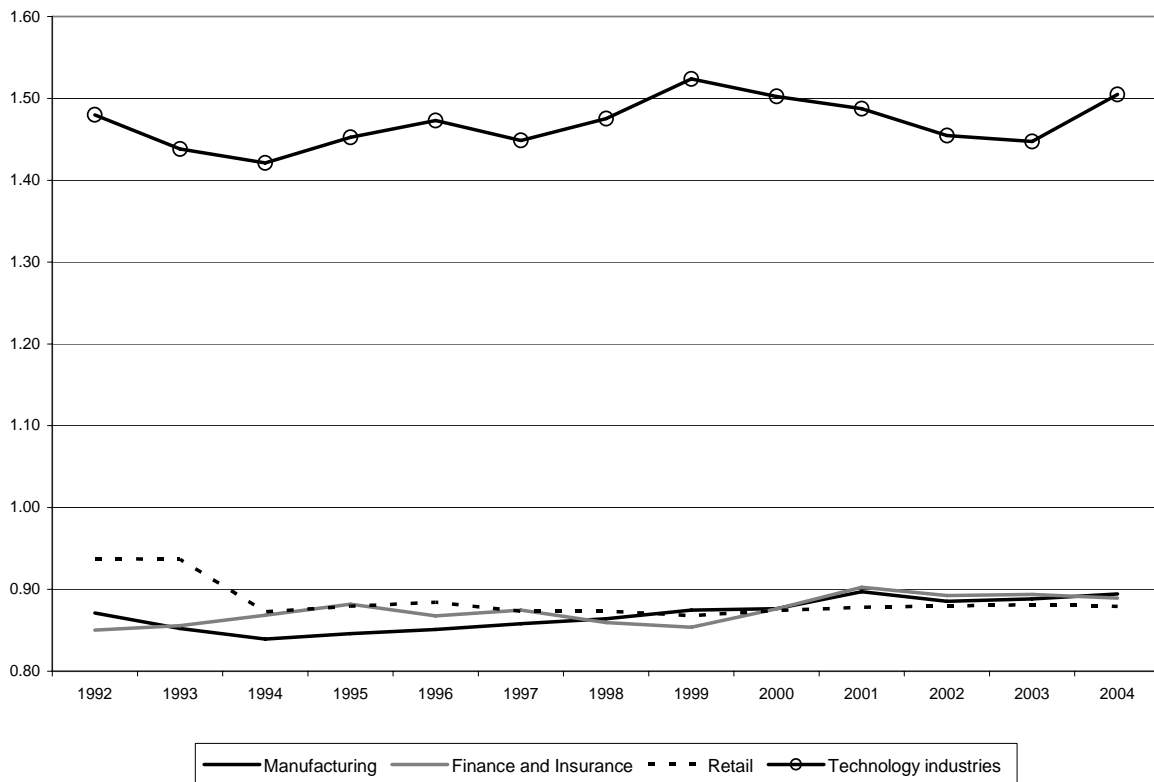
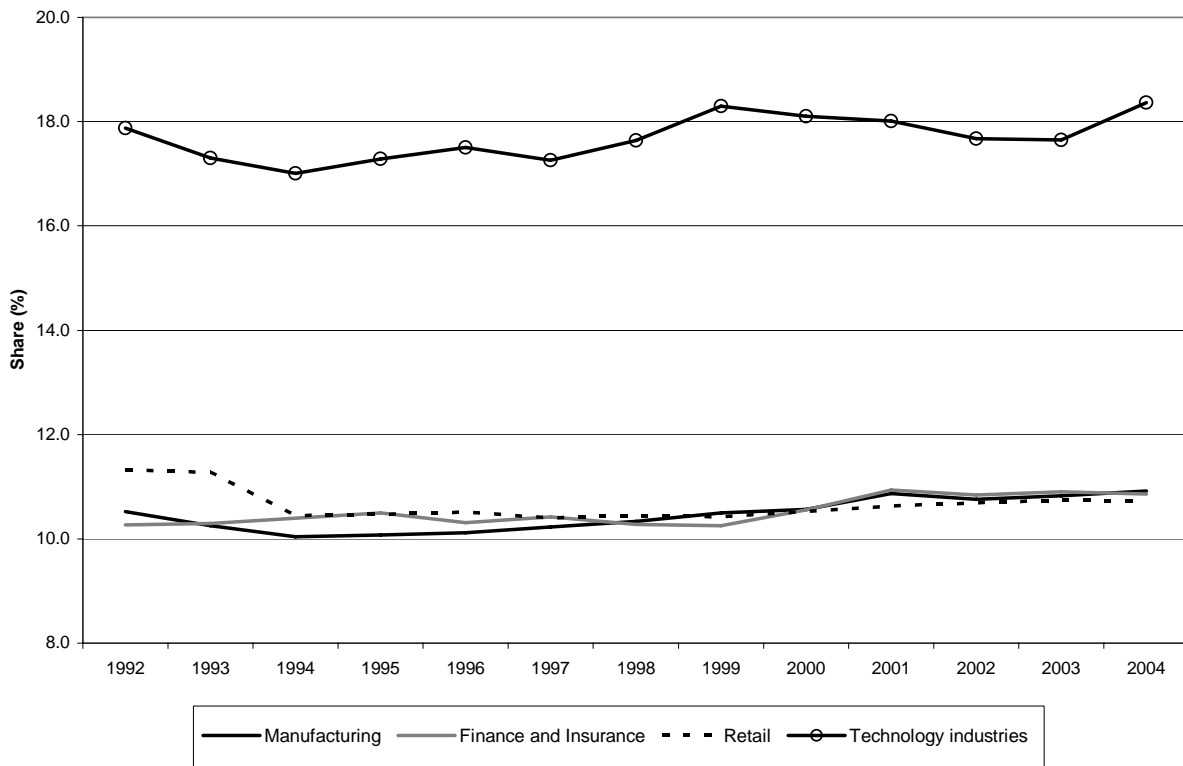


Table 1: California Business Establishments by Type of Establishment, 1992-2004

	Single-establishment firms in CA	Establishments in CA, of multi- establishment firms		Establishments outside CA, of multi- establishment firms
		<i>Headquartered in CA</i>	<i>Headquartered outside CA</i>	<i>Headquartered in CA</i>
	(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

Table 2: California Employment by Type of Establishment, 1992-2004

	Single-establishment firms in CA	Establishments in CA, of multi- establishment firms		Establishments outside CA, of multi- establishment firms
		<i>Headquartered in CA</i>	<i>Headquartered outside CA</i>	<i>Headquartered in CA</i>
	(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

Table 3: Average Annual Pay in Industry Sectors, 2004

	Average Annual Pay
Technology Sector	\$91,449
Manufacturing	\$56,520
Finance and Insurance	\$80,156
Retail trade	\$28,905

Source: Quarterly Census of Employment and Wages, 2004.

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Appendix: Assessment of Tracking Establishments of Multi-Establishment Firms in the NETS

Our analysis relies on the ability of the NETS database to link companies' establishments both within California and in other states, both for companies based in California and companies based in other states, as well as 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. We have previously examined the ability of the NETS to track establishment openings (Neumark et al., 2005) but have not previously examined linkages among establishments belonging to the same company.

It is useful to assess the accuracy of the NETS for a few different types of industries for which the quality of information may vary. The problem, of course, is finding another source of data on companies that include 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. We also chose to try to construct similar information for Intel, in manufacturing, and for the Cheesecake Factory, in retail, based in large part on our ability to track down information on their web-sites on establishments and when they opened.

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 data sets. Two others match on city name.²²

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. 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

²² These matches are for relatively small cities—Rocklin (population 38,000) and San Bernardino (185,000). The street addresses did not match.

examined the website www.smallbusiness.dnb.com, which is based on more recent D&B data, and, in this data set, 13 of the 18 unmatched stores are listed, suggesting that D&B do capture all Wal-Mart stores, but sometimes with a delay, which is also reflected in the NETS.²³

Next, we consider the apparent Wal-Mart establishments in the NETS that do *not* match to the administrative data. Of the 40 such unmatched observations (174 minus 134), four are not coded as “general merchandise stores”; specifically, their SIC numbers are 42 (“motor freight transportation 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 incorrectly identified as Wal-Mart stores in the NETS.²⁴ Of the remainder, three were 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.²⁵

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 of the non-matches reflect delays in the NETS detecting new stores. Conversely, the last row of Table A.1 shows that the rate of “false positives” – i.e., establishments identified as Wal-Mart stores in the NETS data but not the Wal-Mart administrative data – relative to the Wal-Mart stores in the administrative data that had opened by the end to 2004, is 4.0 percent for California.

The administrative data cover 2,914 Wal-Mart stores outside of California, while the NETS database includes 3,714 “active” observations for which the company name is “Wal-Mart” and the headquarter DUNS number is that of the Wal-Mart Corporation (Table A.2). A

²³ 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.

²⁴ 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.”

²⁵ 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.

total of 2,485 stores in both databases match perfectly based on address across the two data sets, and 30 others match on city name.²⁶

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 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.²⁷ And finally, six observations are duplicates²⁸ that could appear to be businesses inside Wal-Mart if we investigated further, 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 new stores. The false positive rate is considerably higher than for the California data, at 22.8 percent.

For the entire non-California sample, it was infeasible to investigate all non-matches in detail. We did, however, 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 10) than the number of non-matches. 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 located inside Wal-Mart stores, such as pharmacies or photo labs, can be misnamed as Wal-Mart stores in the NETS, whereas the administrative data lists only Wal-Mart Supercenters and Discount Stores. We have also already noted that the NETS 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.²⁹

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

²⁶ 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.

²⁷ We cannot check all these observations. However, the analysis described earlier, 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.

²⁸ The definition of a duplicate that we use here is based on identical address, city, and state among records with a SIC 531 ("general merchandise stores").

²⁹ 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). According to the NETS, the average employment level of these 47 records is 109 employees, whereas the average number of employees of the 2515 matched stores is 255 employees. This suggests that neighborhood markets are included in the NETS "Wal-Mart" database.

opened in 2004, and all of the unmatched administrative records are for stores that opened in 2003 or later. All of these stores are already listed in www.smallbusiness.dnb.com.

In the NETS data, one unmatched observation has a SIC code corresponding to wholesale or transport, 10 observations are Sam's Clubs, and one unmatched observation appear to be a duplicate of an already matched observation.³⁰ 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 Corp 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 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 wholesale, 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 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). The false positive rate is 18.7 percent.

Overall, what do we conclude? For Wal-Marts, the NETS data appear to pick up 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 inferences 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 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. 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.

³⁰Duplication 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.

Intel

We carried out a similar analysis for Intel, based on information on U.S. Intel plants available on their website.³¹ 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 initially matched 12 of the 15 plants. However, Intel plants based on the company's website located in Irvine, California, and Raleigh, North Carolina, do not appear as Intel establishments in the NETS. The NETS does, however, list Corollary, Inc., located in Irvine, California. This company was acquired by Intel in Irvine to create its Irvine plant in 1997.³² 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 is actually just in the area,³³ and must actually be located 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 located in Chantilly, Virginia, appears in the NETS but as non-active 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 period in 2006), we thought it useful to compare the two data sources, using the latest figure from the NETS (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 at the plant, 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 badly. 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 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 – while 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 data sets 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.

³¹ <http://www.intel.com/jobs/usa/sites/>, viewed November 30, 2006.

³² <http://www.intel.com/jobs/usa/sites/Irvine/>, viewed May 1, 2006.

³³ 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.³⁴ As of May 2006, it operates 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 slowness in capturing new establishments. Overall, the NETS identifies 11 restaurants in California named “Cheesecake Factory,” while the company’s web-site lists 23 restaurants in California. All 11 of these establishments in the NETS match exactly to the company data, so there are no false positives. 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 2003,³⁵ so the non-matches 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.³⁶ Indeed, as shown in Table A.6, the NETS capture 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 Factory website but not appearing in the NETS database, 13 opened in 2005, nine in 2004, and 11 in 2003. 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 of 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 worse performance for out-of-state establishments occurs because the company was growing faster outside California, as illustrated in Figure A.1, which shows openings since 2000.³⁷

³⁴ <http://www.thecheesecakefactory.com/locations.htm>, viewed December 1, 2006.

³⁵ <http://investors.thecheesecakefactory.com/phoenix.zhtml?c=109258&p=irol-news&nyo=0>, viewed December 1, 2006.

³⁶ The two restaurants listed as non-active in the NETS are counted as matches.

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

Table A.1: Wal-Mart Data Checks, California Stores

	Administrative Wal-Mart data	NETS
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 (warehousing or transportation)		4
Sam's Club		27
Businesses inside Wal-Mart stores (e.g. Pharmacy, Photo Portrait...)		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)

California establishments, which were matched on headquarter DUNS number *or* company name, was the headquarter DUNS number incorrect.

Table A.2: Wal-Mart Data Checks, Non-California Stores

	Administrative Wal-Mart data	NETS
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

Table A.3: Wal-Mart Data Checks, Arizona Stores

	Administrative Wal-Mart data	NETS
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 or 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)

Table A.4: Wal-Mart Data Checks, Georgia Stores

	Administrative Wal-Mart data	NETS
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 or 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)

Table A.5: U.S. Intel Plants, Nationwide

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

* Corollary Inc.

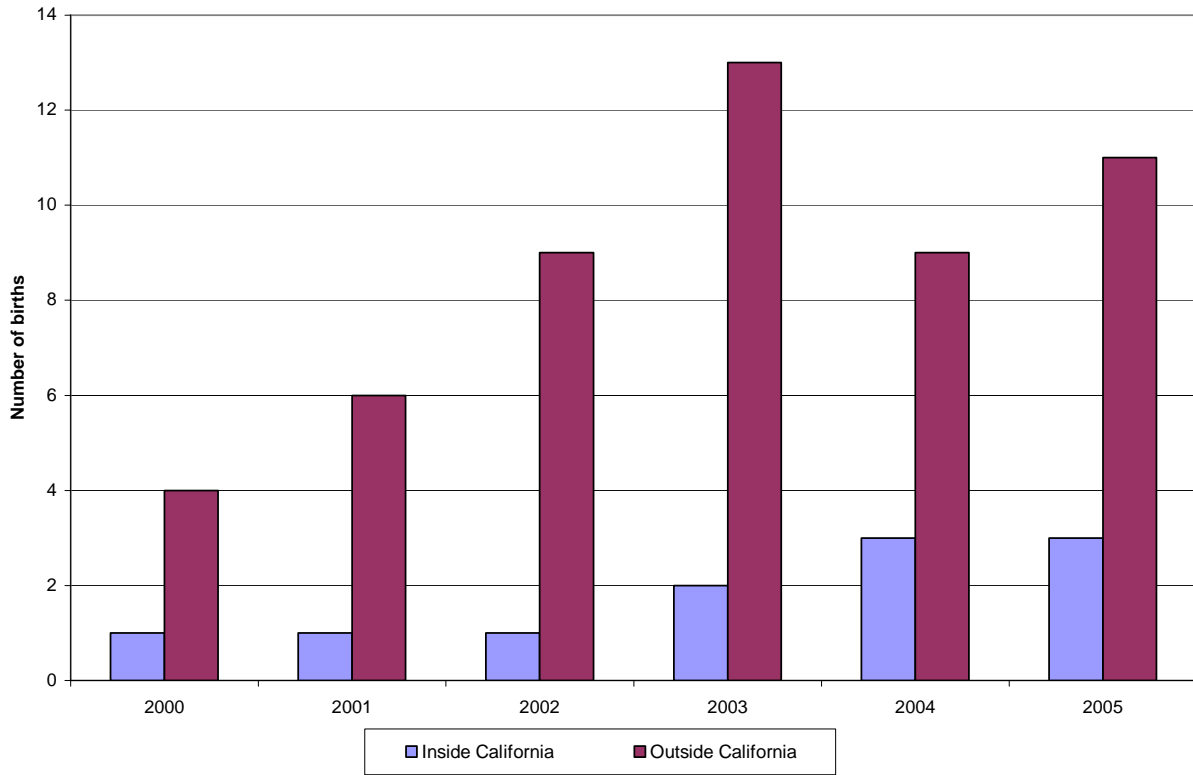
** Total of employment from establishments located at the same address

*** Walls 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.

Table A.6: Cheesecake Factory

	Restaurants located inside California	Restaurants located outside California
Match rates 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% $(19/(80-33)*100)$

Figure A.1: Openings of Cheesecake Factory Restaurants, 2000-2005



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