Occasional Papers

Interstate Business Relocation: An Industry-Level Analysis

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Public Policy Institute *of* California

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Using data covering all establishments ever located in California during 1992-2003, we study interstate business relocation and other establishment and employment dynamics in different industries. We find that job loss due to interstate relocation is uniformly small across industries. Although some industries such as manufacturing and information services are more footloose, relocation in these industries is usually more common in both directions (into and out of California), resulting in a net effect that is still small. We also find that although job loss due to interstate relocation is concentrated in better-paying industries, the imbalance and the overall flows are sufficiently small that the effect of relocation on the composition of jobs is small as well. Moreover, job creation and job destruction in these industries due to business births and deaths, and expansion and contraction of existing businesses, typically far outweigh any job losses due to relocation. Finally, relocation in a particular industry is not an indicator of the overall economic health of that industry; net job loss from relocation in an industry does not predict that businesses are failing to expand or to be created in that industry.

Overall, these findings reinforce our earlier conclusions that policymakers' (and the media's) concerns about jobs leaving California are for the most part unwarranted. Interstate relocation has a negligible effect on state employment, has little impact on the composition of jobs, and is not an indicator of the health of an industry. Thus, a focus on relocation is unlikely to be helpful either in devising effective policies to create or retain jobs or in detecting more serious problems an industry faces. California's overall business environment is much more dependent on business expansion, contraction, formation, and closure, and understanding what drives the business climate and how good or bad it is should be based on these much larger sources of changes in employment and its composition.

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Introduction

Employment growth is a major goal of state economic policy. Changes in employment are driven by continuous job creation and job destruction, which in turn are the result of six dynamic processes including the birth, death, growth, contraction, and in-migration and out-migration of business establishments. We are engaged in a long-term ongoing project to study the job creation-destruction processes in California with an emphasis on quantifying and better understanding the contribution of each of these business establishment dynamics to employment changes in the state, at the aggregate state level as well as inter-regionally.

As part of this ongoing project, we report in this paper some interim results about business establishment dynamics at the industry level and their roles in affecting California state employment growth. We focus in particular on the effects of interstate business relocation because this issue has figured prominently in recent policy discussions in California. More specifically, we study (1) whether some industries are more mobile and thus whether interstate business relocation is a primary driver of employment trends in any of the major industries, (2) whether out-migration of jobs tends to occur more in high-wage industries, and (3) whether job loss or gain through interstate relocation provides a good indicator of the general health of an industry in California.

For at least a decade, 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 California has a hostile business environment, making relocating businesses the "poster child" for critics of policies affecting the state's businesses.[1] Until recently, however, little was known about trends in interstate business relocation and the impact of this relocation on employment change in California. Moreover, no systematic research has been done examining the types of jobs that are moving out of or into California.

In a previous study (Neumark et al., 2005), we argue that in thinking about interstate business relocation, one should not focus exclusively on businesses leaving California and ignore those that move into California. In addition, one should examine the effect of business relocation in a broader context that incorporates other types of business dynamics that influence employment growth in the state, including the formation of new business establishments and the expansion, contraction, and closure of existing establishments. To the extent that there is a role for public policy to encourage employment growth, it should focus on the processes of employment change that have the greatest potential to encourage employment growth.

Our work on business relocation relies on a newly constructed database – the National Establishment Time-Series (NETS) – which is the first data source that enables a study of business relocation in relation to the other processes of job creation and destruction. Major findings in our previous work include the following. First, California generally loses establishments and jobs due to business relocation, but the flow is small and hence the impact on employment is negligible. Second, employment growth is primarily driven by business

[1] For earlier examples, see Groves, 1992; Weikel, 1992; Howe, 1993; and Vartabedian, 1993. More recent examples are provided in Neumark et al., 2005.

expansion, contraction, births, and deaths, rather than by interstate relocation. And third, business establishments are much more likely to move locally than across state boundaries.

In the research described in this paper, we expand our analysis in three directions that provide a richer understanding of business relocation. First, it is generally expected that business establishments in some industries are more mobile than in other industries; for example, businesses that produce or sell tradable goods may find it much easier to relocate outside California and at the same time to maintain their customer base inside the state. 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 our previous conclusion about the effects of business relocation at the aggregate level may understate the significance of relocation for certain industries because we are averaging over industries where relocation is a viable strategy and industries where it is not. Thus, it is particularly important to explore how serious interstate relocation is in the more mobile industries.

Second, our previous study took the approach of simply counting the total number of jobs moving out of and into California in each year during 1992-2002, without accounting for the quality of the jobs. In other words, we considered all jobs the same. This is potentially inadequate because if the jobs created by in-migration differ from the jobs lost due to out-migration, relocation could change the composition of jobs; if, on net, relocation costs more high-quality jobs, then a simple focus on the number of jobs affected by relocation my understate the problem. We focus on one particular dimension of job quality – variation in pay – asking whether relocation tends to cost California higher-paying jobs. This 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 easy to measure, 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.[2] Pay varies across occupations, skills, and institutions (such as unionization). Here, though, we focus on differences by industry, because in the NETS data we have detailed industry classifications of business establishments. Average earnings in different industries in California vary considerably. In 2003, average annual pay was about $74,000 in finance and insurance and $54,000 in manufacturing. In contrast, in retail, average pay was only $28,000.[3] 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.

[2] 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. This emphasizes that average effects mask details about effects in different parts of the distribution (in this case, the skill distribution).

[3] 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 in full-time vs. part-time work.

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 the 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 observable by the media and others or is a more 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.

This is an ongoing project in which important questions still remain for future research. In particular, our future work will examine dynamics that are not relocations of existing business establishments, but instead are other types of relocations of economic activity that may reflect a poor business climate; examples include California-based firms increasingly opening branches outside of California rather than inside the state, and business headquarters moving out of the state. We will also explore regions within California to understand whether employment dynamics are more favorable in some regions than others and whether intra-state job migration is an important dynamic. We also emphasize that the research reported in this paper is work in progress and subject to revision as the research moves toward completion. Because of the significance of the issue of California's business climate, however, an interim report on our ongoing work on business relocation and dynamics more generally may prove useful to policymakers and other interested parties.

The National Establishment Time-Series Database

Our empirical study relies on data from the National Establishment Time-Series (NETS), covering all business establishments that were located in California at any time between 1992 and 2003; the NETS is constructed by Walls & Associates. 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); establishment location (zip codes, including the four-digit extension); 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.[4]

A relocation of a business establishment in the NETS data is identified by street address and zip code changes from one year to another. Both establishments that moved out of California and establishments that moved into California are included in the database, so we are able to fully track interstate relocation. However, although this type of relocation has been the focus of policymakers and the media, it has some limitations in describing geographic relocation of economic activity.

First, if a California company sets up an establishment in another state, that establishment does not count as a relocation. That is, this establishment "branches out" but does not "move out." The two should not be regarded as equivalent, because branching out does not necessarily mean that the company is creating a job elsewhere that it otherwise would have created in California, although it could. Second, the NETS database only tracks establishments and their overall employment. It does not allow us to observe when specific jobs or positions are shifted between two discrete locations of the same firm. This type of relocation, which also constitutes relocation of jobs between establishments, will only be observed in our dataset as employment expansion or contraction. Also, relocations that involve the consolidation of activities originally at two or more locations into a single location will be reflected in our data as one establishment growing and another closing. Thus, "relocation" refers to direct relocations of businesses from one location to another, and our analysis in this paper considers this type of relocation by industry. The NETS will detect the other activities related to the relocation of business activities, but not classify these as business relocations per se. We maintain that this classification is correct, but want to emphasize that there is more to the movement of economic activity across geographic boundaries than relocations of establishments from one location to another.

Like all datasets, the NETS has imperfections. 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 provided by Dun & Bradstreet (D&B). While D&B focuses only on the accuracy of the current (latest) cross-sectional data, the goal of the NETS is longitudinal accuracy. When D&B provides a new snapshot of the U.S. economy, the NETS does not simply add one more year to the database, but also uses the information from the new data to update some of the imputations in previous years, to backfill

[4] This section provides a brief overview of the dataset. A more detailed discussion, as well as some evidence on the quality of the NETS data, is provided in Appendix A.

the information that was not captured in previous years, or to change data now reported differently.[5] For example, an establishment might be specified as dead in 2002 because D&B could not find it in that year; yet it was found later and showed up again in the D&B data in 2003. In this case, Walls & Associates, in constructing the NETS, have to go back to fix 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 highly pertinent to our research 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 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 between 2002 and 2003. 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. But typifying the necessity of creating more accurate 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 mistakenly assigned to 2003 only because they were detected then.[6]

Because of this important development in the latest version of the NETS database, we believe that it is necessary to update some of our previous analysis based on the most recent data; the updated estimates are reported in Appendix B. We also update the results to include an additional year of data that has become available. As the appendix explains, there are no qualitative changes in the conclusions reached in the earlier article.[7]

[5] This process of data revision is common to almost all economic measurement, including, for example, GNP growth, productivity, employment, and price inflation.
[6] Private communications with Donald Walls (January-February, 2006).
[7] The NETS database is also frequently revised because Walls & Associates continuously receive feedback from data users. As with the construction and maintenance of any large database, it is impossible for Walls & Associates to detect all the errors and inconsistencies and eliminate them before a version of the data is released. Instead, Walls & Associates continuously improve the data quality based on reports from data users about inconsistencies they find in the process of using the database.

Findings on Interstate Business Relocation by Industry

Table 1 (page 15) reports the first set of results on business establishment dynamics and employment change by industry. We focus on NAICS industry sectors in this table, although we also conduct some analysis at the industry subsector level. For each industry, the first column in Table 1 shows total employment in 1992. Columns 2-5 show the cumulative one-year employment changes during 1992-2003 and decompose the total changes into three sources: expansions minus contractions, births minus deaths, and in-migration minus out-migration. We measure employment changes based on one-year intervals, consistent with the methodology used in our previous study (Neumark et al., 2005).[8] Columns 6-9 report the same figures on a percentage basis, showing the annualized percentage change in employment and the separate components in each industry.[9] Finally, the last column reports average annual pay (as of 2003) in each industry.[10] Our findings are presented below:

1) Net job loss from interstate relocation is similar in "footloose" industries and other industries

We first look at differences in job loss due to relocation by industry, with an emphasis on asking whether it is more significant in more mobile industries for which it is easier (less costly) to move operations to alternative locations. This analysis focuses on columns 5 and 9 of Table 1, which show the levels of employment change due to relocation, and these changes as shares of 1992 employment. Overall, California lost 97,687 jobs during 1992-2003 due to relocation, an annualized rate of .06 percent of employment; this figure means that, on an annual basis, job loss due to relocation in California was six one-hundredths of one percent of total employment. Column 5 shows that the net effect of interstate relocation varies across industries. Nearly all industries – 17 out of 20 – lost jobs due to relocation. Three industries – manufacturing, finance and insurance, and professional and technical services – lost more than 10,000 jobs. Only mining gained more than 1,000 jobs.[11] However, as in the aggregate, the

[8] See, for instance, Table 1 of Neumark et al. (2005). Other tables in that article were based on 3-year intervals, and we briefly reported results for even longer intervals. For simplicity, going forward we will focus on one-year intervals, and to create 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.

[9] 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 .73 percent (Table 1, column 6, first row) corresponds to a cumulative growth rate of 8.3 percent over the 11-year period 1992-2003. This cumulative growth rate is slightly larger than one gets by multiplying .73 percent by 11, although that multiplication does yield a close approximation.

[10] 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 11-year period.

[11] 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, NY, to San Ramon, CA.

contribution of relocation to total employment change (whether positive or negative) within industries is relatively small. Only in one industry – finance and insurance – is the annualized rate of job loss due to business relocation as high as .25 percent.

To identify which industries are footloose, we decompose the gross number of jobs created during 1992-2003 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. In Table 2 (page 16), all of these are again expressed as annualized rates of change relative to initial employment. Column 7 shows gross migration (the sum of in-migration and out-migration) 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.[12] Excluding two very small industries (mining, and management of companies and enterprises, accounting for 0.3 percent and 0.1 percent of state employment in 1992, respectively), the four most footloose industries are information, finance and insurance, manufacturing, and professional and technical services.[13] All of these industries produce goods or provide services that can be delivered over long distance, and thus businesses do not have to locate close to their customer bases. In contrast, public administration, educational services, utilities, health care and social assistance, and accommodation and food services all need to be close to their customers and thus are among the least footloose industries.

In Table 3 (page 17), we assess how important moves are relative to other employment dynamics for each industry. For the economy as a whole, in-migration accounts for nearly 1 percent of gross job creation; expansions of existing establishments account for 39 percent, and births of new establishments account for 60 percent. Out-migration accounts for a larger share of gross job destruction – 1.5 percent – with contractions of existing establishments accounting for 32 percent and deaths of establishments accounting for 66 percent. For the most footloose industry – information – in-migration and out-migration account for 2 percent and 3 percent of gross job creation and destruction, respectively. 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 due to relocation – move-outs account for only 3 percent of gross job destruction.

Despite the higher incidences of moves in footloose industries, these industries do not appear to perform particularly worse than other industries in terms of net job loss due to relocation. In fact, the information sector is the most footloose, as shown by an annualized gross migration rate of .7 percent in Table 2, but the annualized net migration rate, as shown in Table 1, is only −.08 percent, far smaller than that of finance and insurance. And, of course, during 1992-2003, the information sector was one of the state's fastest-growing industries, at an annualized rate of over 2 percent.

Manufacturing, another footloose industry, experienced a net loss of jobs due to relocation, but as shown in Table 1 the net effect of relocation in this sector is still negligible,

[12] The gross migration figures in column 7 are conceptually the sum of gross in-migration from column 3 and gross out-migration from column 6. Because we annualize the data using the formula for compound growth, column 7 is not exactly equal to the sum of columns 3 and 6.

[13] 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 industries discussed in the text.

accounting for an annualized loss of only .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 thought to be more sensitive to the business environment and more responsive to incentives or disincentives created by local policies.[14] Manufacturing is often perceived as the most mobile of sectors, and as transportation and communication costs have fallen over time, manufacturing plants have probably become even less constrained in their location decisions.

Like other states in the nation, California experienced a significant loss of manufacturing jobs between 1992 and 2003. Total manufacturing employment fell over 1 percent a year during this 11-year period, for a decline of 261,624 manufacturing jobs.[15] However, the net loss of 21,000 manufacturing jobs due to relocation is dwarfed by the net loss of 480,000 manufacturing jobs due to establishment deaths in excess of births (see Table 1). In other words, many manufacturing jobs disappeared not because a large number of plants moved to other states but because many plants were shut down.[16]

One industry that is potentially more problematic is the finance and insurance sector, where job loss due to net out-migration of business establishments was nearly as high as in manufacturing despite the industry being only about one-third as large; job loss due to relocation occurred at a rate four times higher than that of the economy overall, and in-migration in this industry was low. We examined the data on relocation in this industry year by year, which show that in all but two years during 1992-2003 the finance and insurance industry lost jobs due to relocation. Many of the services in the finance and insurance industry are not mobile because they need to be located close to customers; examples are bank branches and insurance agents' offices. However, back-office functions, such 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 due to relocation in this sector occurred in credit intermediation and related activities (NAICS 522, with 12,629 jobs lost to relocation) and insurance carriers and related activities (NAICS 524, with 4,980 jobs lost to relocation).[17] We should emphasize, however, that although the finance and insurance industry suffered the most serious job loss through relocation, employment overall grew an at annualized rate of .86 percent, which exceeded the .73 percent growth of overall state employment over the same period (see Table 1). Nonetheless, the out-migration in finance and insurance is sufficiently out of proportion that it calls for closer examination.

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[14] Of course, it is possible for them to move not only to other U.S. states, but also to foreign countries.
[15] The annualized rate of employment loss of 1.06 percent in manufacturing is equal to a cumulative decline in employment of 11 percent for the period 1992-2003.
[16] Of course, the NETS does not track moves overseas, which would be regarded as closures. From the perspective of simply accounting for job loss, the distinction may be irrelevant. But from the perspective of policy it is quite important.
[17] Looking at the data by company, the NETS database identifies the relocation of Bank of America headquarters from San Francisco to Charlotte, NC, in 1999, when Bank of America merged with NationsBank, as a significant contributor to the employment loss in this industry from relocation. However, even for Bank of America and NationsBank, employment changes due to births, deaths, expansions, and contractions are far larger than those due to relocation.

2) Job loss due to interstate relocation has tended to occur in higher-paying industries

Next, we consider the relationship between relocation and annual average pay in the industry. This analysis focuses on columns 5 and 9 of Table 1, which show cumulative employment changes due to relocation and annualized growth rates, and column 10, which reports average pay.

There is evidence indicating that relocation costs more jobs in higher-paying than in lower-paying industries. In particular, columns 5 and 10 show that 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 20 industries represented in Table 1 are broad sectors, many of which contain high-paying and low-paying subsectors.

We therefore repeat our analysis in Table 1 at the subsectoral level, looking at 100 3-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-pay industries (with the lowest average annual pay), medium-pay industries, and high-pay industries. Table 4 (page 18) shows the decomposition results in these three industry groups. Column 5 shows that interstate relocation during 1992-2003 cost low-paying industries about 27,000 jobs and medium-paying industries about 16,000 jobs. The highest-paying third of industries accounted for 55,000 jobs lost due to net relocation – over half the total for the state. Column 9, which reports the annualized rate of employment change due to net migration, tells the same story. The high-paying industries lost jobs due to net migration at an annualized rate of .1 percent, over twice the rate of the low-paying and medium-paying industries. These results clearly show that California has tended to lose higher-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 net job growth due to relocation and annual pay, weighted by 1992 industry employment, is −.07. This correlation is not statistically significant (p=.49) and is strongly influenced by two industries that experienced extreme rates of net migration over the period. Excluding these industries yields a correlation of −.20, which is statistically significant (p=.05).[18]

The much stronger relationship, however, is the link between average industry wages and gross migration. Higher-paying industries are much more footloose than low-paying industries. The correlation between wages and gross migration at the 3-digit NAICS level is .51 (p<.001) – far stronger than the correlation between wages and net migration. Accordingly, the correlations between wages and gross in-migration and out-migration are high and statistically

[18] 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.

significant (.45 and .43, respectively).[19] This strong correlation between footloose industries and wages may lead to an exaggerated perception about California losing good jobs. While it is indeed true that jobs in high-paying industries are much more likely to leave the state than are jobs in low-paying industries, jobs in those same high-paying industries are also much more likely to move into the state.[20]

Overall, our analysis shows that job loss due to 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 impact – although modest – on the composition of jobs in California.

Table 1 shows that California lost .06 percent of jobs annually jobs due to interstate business relocation. This number counts all jobs as equal. For 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 due to relocation tended to occur in high-paying industries, simple calculations of total employment changes due to business relocation may understate the economic impact of relocation.

We can, of course, report the effects of relocation disaggregated by industry, as we have just done. But we are also interested in providing a summary measure of the impact of relocation on the composition of jobs. One simple way to take into account the cross-industry differences in pay is to calculate an earnings-adjusted job loss figure. In particular, we choose 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, one may count one job lost in this industry as a loss of 1.5 jobs. Similarly, if a retail job pays only half of average earnings, one may count 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 due to relocation as the following:

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

where w is overall average annual earnings, w_i average annual earnings in industry i, N_i the job gain through in-migration, and O_i the job loss due through out-migration. Applying this formula at the industry subsector level (that is, 3-digit NAICS) gives an earnings-adjusted job loss of 102,200 over the period of 1992-2003, versus the 97,687 figure reported in Table 1,

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

[20] Though beyond the scope of this research, one hypothesis about why high-paying industries are more footloose is that many footloose industries are footloose in part due to their reliance on information technology and therefore need better-skilled – and hence higher-paid – workers. 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.

treating all jobs as the same. Taking out the two outlier industries, the earnings-adjusted job loss rises to 111,486 jobs over the period. In terms of the annualized rate, this represents a loss of .066 percent of earnings-adjusted jobs, compared with the annualized loss of .056 percent reported in Table 1.[21,22]

This exercise confirms that the simple sum of job loss/gain over different industries underestimates the economic effect of the loss due to interstate relocation because California has tended to lose higher-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 .066 percent instead of .056 percent.

3) Interstate relocation does not appear to be an indicator of more substantial problems of job creation or destruction

Finally, we ask whether industries experiencing job loss due to relocation were also experiencing job loss due to either the excess of deaths over births, or of contractions over expansions. If so, it is possible that policymaker and media attention focused on relocations is detecting more widespread problems, and that perhaps the focus is on relocations because these are most easily observable or provide the most salient evidence of economic problems faced by an industry. We have shown, thus far, that job loss due to relocation, in itself, does not pose a serious problem because relocation is small and negligible relative to job change from expansions, contractions, births, and deaths – even in higher-paying and footloose industries. But if the patterns of net job change due to deaths minus births or contractions minus expansions are similar to the pattern of relocations, the small job losses owing to relocation could represent much more serious problems. For example, the disproportionate loss of higher-paying jobs due to 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 Table 1 suggest that this may not be the case. For example, job loss due to relocation is most pronounced in finance and insurance, but this industry had robust net job creation due to both expansions minus contractions and births minus deaths. As a result, although this industry experienced the most extreme job loss due to relocation (on a percentage basis, and nearly on an absolute basis), it added a total of 73,856 jobs during 1992-2003, for an annualized growth rate of .86 percent. The same qualitative conclusion is true for professional and technical services, which lost a disproportionate share of employment due to relocation but registered even stronger job growth overall. These examples

[21] Table 1 reports the annualized job loss for the economy as .06 percent, and in the text above we report the figure to three decimal places (.056 percent) to show the comparison with the earnings-adjusted figure more clearly. We could just as well report the two rounded numbers (.06 percent and .07 percent).

[22] 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 due to relocation in industry i. Thus, this .066 percent annualized job loss can also be interpreted as the proportion of total wage bill that was lost due to interstate relocation.

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 due to each of the three net processes, which gauge whether trends in employment due to expansions minus contractions, births minus deaths, and relocations are similar or not. Using data at the NAICS industry subsector level, weighted by 1992 employment, we find the correlation between net migration and net growth due to expansions and contractions to be −.13 (p=.19); between net migration and net growth due to births and deaths, the correlation is .01 (p=.94); and between net migration and net growth due to all four of the other dynamics (expansions, contractions, births, and deaths) it is −.08 (p=.43). 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.[23] Thus, job loss due to relocation in particular industries is generally not indicative of larger problems in those industries.

[23] 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, as the estimated correlation is only −.003 (p=.98). That is, despite any upward bias this estimate is still below zero.

Conclusion

Using data covering all establishments ever located in California during 1992-2003, we study business relocation and establishment dynamics in different industries, presenting interim results from an ongoing longer-term research project. We find that job loss due to interstate relocation is small across virtually all industries. It is true that 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 in both directions (into and out of California), resulting in a net effect that is still small.

We do find that job loss due to interstate relocation tends to occur in better-paying industries. While this indicates that California is losing higher-paying jobs to other states, the "bias" toward higher-paying jobs does not translate into a substantial effect on the overall composition of jobs because the total number of job 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 a trivial effect on the state's labor market.

Finally, we find that, at the industry sector level, what is happening with relocation tends to be uncorrelated with job creation and destruction through business expansion, contraction, births, and deaths. In other words, in industries losing relatively more jobs due to relocation, it is approximately equally likely that more jobs are created by business formation (net of closure) or expansion (net of contraction) in those industries than that these other sources of employment change lead to job loss. Relocations in an industry do not appear to be the "tip of an iceberg" indicating more serious problems with the industry as a whole.

Overall, these findings reinforce our earlier conclusions that a focus on interstate business relocation is unlikely to be helpful either in devising effective policies to create or retain jobs or in detecting more serious problems an industry faces. Of course, this research does not answer the question of whether California has a good or bad business climate.

Furthermore, this research is part of an ongoing project. Our future work will address some important issues not covered here. We will examine other types of relocations of economic activity that may reflect a poor business climate, such as an increasing tendency for California-based firms to open new branches outside of California rather than inside the state, or more business headquarters moving to other states. We will also explore regions within California to understand whether employment dynamics are more favorable in some regions than others and whether intra-state job migration is an important dynamic.

Still, these findings imply that in order to gain a better understanding of California's overall business environment, it is much more important to understand what drives business expansion, contraction, births, and deaths; and our findings emphasize that policy interventions – if any are needed – should target these much larger sources of employment change.

Table 1: Business Establishment Dynamics and Annualized Employment Change by Industry, 1992-2003

NAICS Codes	Major Industry Title	Starting Employment	Net employment change, 1992-2003				Annualized change as share of 1992 employment				Average Annual Pay, 2003 [1]
			Total	Expansion-Contraction	Birth-Death	Move	Total	Expansion-Contraction	Birth-Death	Move	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
11-92	All industries [2]	15,853,186	1,315,540	1,614,941	-201,714	-97,687	0.73%	0.89%	-0.12%	-0.06%	$45,459
11	Agriculture, forestry, fishing and hunting	234,126	-4,375	29,881	-33,740	-516	-0.17%	1.10%	-1.40%	-0.02%	$19,891
21	Mining	47,698	-16,723	-7,438	-12,930	3,645	-3.85%	-1.53%	-2.83%	0.67%	$77,304
22	Utilities	100,462	-16,594	-5,623	-10,583	-388	-1.63%	-0.52%	-1.01%	-0.04%	$69,167
23	Construction	779,563	73,571	184,062	-104,273	-6,218	0.82%	1.95%	-1.30%	-0.07%	$42,669
31-33	Manufacturing	2,370,727	-261,624	243,051	-483,949	-20,726	-1.06%	0.89%	-2.05%	-0.08%	$53,713
42	Wholesale trade	927,694	13,130	193,119	-172,854	-7,135	0.13%	1.73%	-1.86%	-0.07%	$52,011
44-45	Retail trade	1,664,174	161,754	120,144	45,425	-3,815	0.85%	0.64%	0.25%	-0.02%	$28,242
48-49	Transportation and warehousing	524,899	38,653	21,556	24,685	-7,588	0.65%	0.37%	0.42%	-0.13%	$41,991
51	Information	498,543	175,950	128,279	52,112	-4,441	2.79%	2.10%	0.91%	-0.08%	$72,186
52	Finance and insurance	749,030	73,856	121,587	-27,459	-20,272	0.86%	1.38%	-0.34%	-0.25%	$73,827
53	Real estate and rental and leasing	450,768	56,470	34,157	25,016	-2,703	1.08%	0.67%	0.49%	-0.05%	$40,031
54	Professional and technical services	1,300,031	221,961	211,824	22,267	-12,130	1.44%	1.38%	0.15%	-0.09%	$67,796
55	Management of companies and enterprises	8,260	18,497	14,206	4,089	202	11.28%	9.52%	3.72%	0.22%	$65,006
56	Administrative and waste services	748,000	158,928	127,879	38,775	-7,726	1.77%	1.45%	0.46%	-0.09%	$27,895
61	Educational services	957,826	133,797	89,125	44,250	422	1.20%	0.81%	0.41%	0.00%	$39,325
62	Health care and social assistance	1,446,721	210,100	138,210	73,010	-1,120	1.24%	0.83%	0.45%	-0.01%	$40,196
71	Arts, entertainment, and recreation	258,168	76,461	35,730	41,949	-1,218	2.39%	1.19%	1.38%	-0.04%	$38,744
72	Accommodation and food services	969,213	115,480	38,085	80,861	-3,466	1.03%	0.35%	0.73%	-0.03%	$15,817
81	Other services, except public administration	878,446	95,376	11,570	86,032	-2,226	0.94%	0.12%	0.85%	-0.02%	$23,585
92	Public administration	938,837	-9,128	-114,463	105,603	-268	-0.09%	-1.18%	0.97%	0.00%	$54,309

[1] Source: Quarterly Census of Employment and Wages (QCEW). 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 of the two industries is chosen.

[2] Excludes unclassified establishments (NAICS 99).

Table 2: Gross Employment Change during 1992-2003 as Annualized Shares of 1992 Employment, by Industry

NAICS Codes	Major Industry Title	Gross job creation			Gross job destruction			Gross migration	Average Annual Pay, 2003 [1]
		Expansion	Birth	Move in	Contraction	Death	Move out	Move in+out	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
11-92	All industries [2]	3.47%	4.98%	0.10%	2.79%	5.05%	0.15%	0.25%	$45,459
11	Agriculture, forestry, fishing and hunting	3.45%	2.97%	0.04%	2.59%	3.90%	0.06%	0.10%	$19,891
21	Mining	2.29%	2.96%	1.09%	3.36%	4.66%	0.45%	1.50%	$77,304
22	Utilities	2.66%	2.99%	0.02%	3.04%	3.68%	0.06%	0.08%	$69,167
23	Construction	4.30%	4.66%	0.05%	2.79%	5.40%	0.12%	0.18%	$42,669
31-33	Manufacturing	3.98%	3.56%	0.18%	3.33%	4.79%	0.26%	0.44%	$53,713
42	Wholesale trade	4.07%	4.96%	0.14%	2.71%	5.96%	0.21%	0.34%	$52,011
44-45	Retail trade	2.55%	5.78%	0.05%	2.03%	5.63%	0.07%	0.13%	$28,242
48-49	Transportation and warehousing	3.01%	5.07%	0.06%	2.73%	4.81%	0.19%	0.25%	$41,991
51	Information	4.60%	7.17%	0.32%	2.99%	6.68%	0.40%	0.70%	$72,186
52	Finance and insurance	3.81%	5.54%	0.08%	2.74%	5.73%	0.32%	0.40%	$73,827
53	Real estate and rental and leasing	3.54%	5.52%	0.07%	3.04%	5.22%	0.13%	0.20%	$40,031
54	Professional and technical services	4.15%	6.34%	0.15%	3.11%	6.25%	0.24%	0.38%	$67,796
55	Management of companies and enterprises	11.64%	9.49%	0.67%	4.59%	7.51%	0.46%	1.11%	$65,006
56	Administrative and waste services	4.65%	6.47%	0.13%	3.61%	6.22%	0.23%	0.36%	$27,895
61	Educational services	3.03%	2.47%	0.01%	2.39%	2.13%	0.01%	0.02%	$39,325
62	Health care and social assistance	3.03%	4.64%	0.05%	2.36%	4.34%	0.06%	0.10%	$40,196
71	Arts, entertainment, and recreation	3.61%	6.94%	0.09%	2.69%	6.15%	0.13%	0.22%	$38,744
72	Accommodation and food services	2.16%	4.81%	0.03%	1.87%	4.32%	0.06%	0.09%	$15,817
81	Other services, except public administration	3.04%	5.89%	0.04%	2.95%	5.38%	0.06%	0.09%	$23,585
92	Public administration	2.41%	4.00%	0.00%	3.25%	3.29%	0.00%	0.01%	$54,309

[1] Source: Quarterly Census of Employment and Wages (QCEW).

[2] Excludes unclassified establishments (NAICS 99).

Table 3: Components of Job Creation and Destruction by Industry, 1992-2003

NAICS Codes	Major Industry Title	Job creation-destruction 1992-2003						Average Annual Pay, 2003 [1]
		Share of gross job creation that is:			Share of gross job destruction that is:			
		Expansion	Birth	Move in	Contraction	Death	Move out	
11-92	All industries [2]	38.8%	60.3%	0.9%	32.4%	66.1%	1.5%	$45,459
11	Agriculture, forestry, fishing and hunting	54.0%	45.4%	0.6%	37.9%	61.3%	0.8%	$19,891
21	Mining	35.9%	48.0%	16.1%	38.5%	57.0%	4.5%	$77,304
22	Utilities	46.4%	53.2%	0.4%	44.1%	55.2%	0.7%	$69,167
23	Construction	47.3%	52.2%	0.5%	30.7%	68.1%	1.2%	$42,669
31-33	Manufacturing	52.3%	45.8%	2.0%	38.2%	59.3%	2.6%	$53,713
42	Wholesale trade	43.4%	55.4%	1.2%	27.3%	70.9%	1.8%	$52,011
44-45	Retail trade	27.1%	72.4%	0.5%	22.8%	76.4%	0.8%	$28,242
48-49	Transportation and warehousing	34.6%	64.8%	0.6%	33.1%	64.8%	2.0%	$41,991
51	Information	35.2%	62.8%	2.0%	26.1%	70.8%	3.0%	$72,186
52	Finance and insurance	38.3%	61.0%	0.7%	28.2%	68.9%	2.9%	$73,827
53	Real estate and rental and leasing	36.4%	63.0%	0.6%	33.8%	65.0%	1.2%	$40,031
54	Professional and technical services	36.5%	62.5%	1.1%	29.1%	69.0%	1.9%	$67,796
55	Management of companies and enterprises	56.9%	41.3%	1.8%	33.4%	63.8%	2.7%	$65,006
56	Administrative and waste services	39.1%	60.0%	0.9%	33.0%	65.2%	1.7%	$27,895
61	Educational services	55.7%	44.0%	0.2%	53.0%	46.8%	0.2%	$39,325
62	Health care and social assistance	37.3%	62.1%	0.5%	32.7%	66.6%	0.7%	$40,196
71	Arts, entertainment, and recreation	30.2%	69.1%	0.6%	26.4%	72.4%	1.2%	$38,744
72	Accommodation and food services	28.1%	71.6%	0.3%	27.4%	71.8%	0.8%	$15,817
81	Other services, except public administration	30.7%	69.0%	0.3%	32.4%	67.0%	0.6%	$23,585
92	Public administration	35.7%	64.3%	0.0%	49.6%	50.3%	0.1%	$54,309

[1] Source: Quarterly Census of Employment and Wages (QCEW).

[2] Excludes unclassified establishments (NAICS 99).

Table 4: Business Establishment Dynamics and Annualized Employment Change by Average Pay, 1992-2003

NAICS3 Percentile	Pay Level	Starting Employment	Net employment change, 1992-2003				Annualized change as share of 1992 employment				Average Annual Pay, 2003 [1]
			Total	Expansion-Contraction	Birth-Death	Move	Total	Expansion-Contraction	Birth-Death	Move	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All industries [2]	15,853,186	1,315,540	1,614,941	-201,714	-97,687	0.73%	0.89%	-0.12%	-0.06%	$45,459
0-33%	Low pay	5,343,244	638,033	450,821	214,486	-27,274	1.03%	0.74%	0.36%	-0.05%	$24,681
33-67%	Medium pay	5,275,779	359,635	623,910	-248,465	-15,810	0.60%	1.02%	-0.44%	-0.03%	$43,373
67-100%	High pay	5,234,163	317,872	540,210	-167,735	-54,603	0.54%	0.90%	-0.30%	-0.10%	$68,772

[1] Source: Quarterly Census of Employment and Wages (QCEW).

[2] Excludes unclassified establishments (NAICS 99).

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Appendix A. The NETS Data

The NETS is a long-term project of Walls & Associates in conjunction with Dun and Bradstreet (D&B). We currently have access to a version of this dataset that covers all business establishments that were located in California at any time between 1989 and 2003, and their respective parent headquarters (regardless of location).[24] This version of the NETS database begins with 14 cross-sectional files of the full Data Universal Numbering System (DUNS) Marketing Information (DMI) file for each year from 1990 through 2004, each of which covers the previous year. Thus, we refer to the years covered by the data, i.e., 1989-2003 for the full sample period. The primary purpose of D&B's data collection effort is to provide information on businesses to the business community in order to enhance their decisionmaking by constructing a set of "predictive indicators" (e.g., the D&B Rating and PayDex scores). 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, through a massive data collection effort, including making over 100 million telephone calls from four calling centers each year, as well as obtaining information from legal and court filings, newspapers and electronic news services, public utilities, all U.S. Secretaries of State, government registries and licensing data, payment and collections information, company filings and news reports, and the U.S. Postal Service.[25] Particular efforts are devoted to identifying the births and deaths of establishments. For every establishment identified, D&B assigns a DUNS number as a means of tracking the establishment. Beginning around 1990, the DUNS has increasingly become the standard way of tracking business and has been adopted by many government agencies in the United States and internationally.[26]

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 contemporaneous data files, because inaccuracies would hurt D&B's business and might even result in lawsuits. D&B has established a sophisticated quality control system and engages in extensive quality and consistency checks.[27] Thus, the data in each cross-section should provide high quality "snapshots" of business establishments (Birch, 1987; Audretsch, 1995).

Walls & Associates entered into a collaboration with D&B with a very different purpose in mind – namely, to provide a dynamic view of the U.S. economy using 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

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[24] We also have access to all establishments in other states if they report to headquarters in California, or if they and some California establishments report to the same headquarters (regardless of location). These data are not used for the research described in this paper but will be analyzed as part of our longer-term research project.

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

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

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

death if it occurs. This is a multistage process, the most important steps of which include merging the data files, imputing data when data are not reported, eliminating duplicate records, merging records on establishments for which the DUNS number changes yet which appear to cover the same establishment (which happens occasionally), and identifying establishment relocations.

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 of 1989-2003, the database includes information each year on between 1.4 and 1.9 million establishments in California that provide about 15 million to 18 million jobs. Because D&B's coverage increased sharply when they started to use telephone book Yellow Pages to identify business units in 1992, we decided to exclude the 1989-1991 data available in the NETS from our analysis.

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 North American Industry Classification System (NAICS) has increasingly been adopted to replace the SIC codes, and that the NAICS codes reflect more precisely the contemporaneous nature of the U.S. economy, Walls & Associates provides a NAICS-SIC "crosswalk" that allows researchers to classify industries based on the NAICS codes.[28] Our analysis in this study uses the NAICS codes.

The data construction effort necessary to build the NETS is massive and complicated, and D&B data used in much earlier research have been criticized (see, for example, Birley, 1984; Aldrich et al., 1989; Davis et al., 1996). For these reasons, we have undertaken a good deal of investigation to document and examine the quality of the NETS data in order to assess their reliability and their potential limitations, and how these limitations might affect results of various analyses. Our major findings regarding the quality of the NETS data are noted below.

First, employment levels calculated from the NETS are highly correlated with those calculated from alternative data sources, but the NETS tends to give higher employment levels, primarily due to a better coverage of small-size establishments and the counting of proprietors of small establishments.[29] Second, because some employment data in the NETS – especially for new establishments – are imputed, and because employment reported in the database tends to be rounded (to multiples of 10, 50, and 100), employment appears to change less frequently than is actually the case. This implies that establishment-level employment changes in the NETS are more reliable over a longer term than over a short period. Third, checked against newspaper stories about business relocation, the NETS appears to have captured almost all the business moves that can be verified independently. And finally, a comparison of the NETS database with

[28] Walls & Associates created this "crosswalk" based on the SIC-NAICS correspondence tables from the U.S. Census Bureau (available at http://www.census.gov/epcd/www/naicstab.htm, viewed May 17, 2006). The tables from the Census Bureau do not cover all the SIC codes that appear in the D&B data; Walls & Associates constructed the links between NAICS codes and SIC codes that are not already included in these tables (private communications with Donald Walls, May 12, 2006).

[29] We have compared NETS data with several alternative employment data sources, including the Quarterly Census of Employment and Wages (QCEW), the Current Employment Statistics (CES), and the Size of Business (SOB) data.

other sources of information on establishment births shows that the NETS captures most new business establishments and generally reports business founding dates accurately.[30] These investigations have made us confident that the NETS database can provide reliable information about the sources of employment change in California, and in particular about the role of business relocation, although like all datasets, it is not perfect.

[30] For a more detailed discussion of the NETS database and its reliability, see Neumark et al. (forthcoming).

Appendix B. Interstate Business Relocation and Its Effects on Employment in California: Some Updated Results

In this appendix, we update the main results presented previously in Neumark et al. (2005) using the latest version of the NETS data. Notice that even using the latest data, these results still come out with a lag of two years or more, which is unavoidable given the time it takes to collect and compile the data and to analyze them. This kind of lag is inevitable in nearly all empirical research that involves measurement of economic activities.

In Table B-1, we calculate the net loss of establishments/jobs due to interstate business relocation for each year during 1992-2003, where we focus on the size of the loss relative to the state economy. In Table B-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 "2004 data," respectively), highlighting the changes in the results that stem from the updating of the database by Walls & Associates.

In every year during the 1992-2003 sample period, as shown in Table B-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 our previous study (Neumark et al., 2005) based on 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 in Section 2, 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 was 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 due to 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 relocation numbers in the last years in the new data, the largest losses are still in the early years of the sample period. For example, in terms of number of establishments lost to other states, the worst year is 1993-94. In that year, California experienced a net loss of 750 establishments to other states, which amounted to 0.05 percent of the total number of establishments in California. In terms of job loss from relocation, 1993-94 and 1996-97 represent the worst years. In these years, business relocation was responsible for a loss of 0.1 percent of California jobs. 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 due to relocation do not play much of a role in overall state employment change.[31]

Table B-2 presents decompositions of annual employment changes during 1992-2003. 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 B-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 B-2 is the comparison of the contribution of relocation to employment change with the contributions of other sources. Table B-2 shows, for example, that in the most recent year for which data are available, job creation due to expansion of existing establishments was 32 times larger than job creation from in-migration, and job creation due to births was 38 times larger. In a similar vein, job destruction due to contractions was 15 times larger than job destruction from out-migration, while job destruction due to deaths of establishments was 41 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.

In sum, the latest version of the NETS data, with one more year of data added to the panel, still shows that interstate business relocation has only a negligible effect on California's total employment. While the updating of the NETS data by D&B and Walls & Associates leads to higher estimates of the net loss due to relocation in recent years, even if one (erroneously) treats all of 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 next two years, there has been a considerable amount of interest in the trend of relocation in this period. The latest data do show an increase in job loss due to interstate relocation during 2002-2003. 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.

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

Table B-1: Business Relocation and Its Effect on Employment in California, 1992-2003

A. By number of establishments

Year	Net loss due to relocation		Total no. of establishments in CA		Net loss as percent of total	
	2003 data	2004 data	2003 data	2004 data	2003 data	2004 data
1992-93	-752	-733	1,503,787	1,404,103	0.050%	0.052%
1993-94	-751	-750	1,532,256	1,436,662	0.049%	0.052%
1994-95	-585	-585	1,515,142	1,449,520	0.039%	0.040%
1995-96	-346	-352	1,497,623	1,465,251	0.023%	0.024%
1996-97	-259	-262	1,521,247	1,530,034	0.017%	0.017%
1997-98	-131	-139	1,518,940	1,543,517	0.009%	0.009%
1998-99	-87	-98	1,492,105	1,529,791	0.006%	0.006%
1999-00	-26	-26	1,461,135	1,506,016	0.002%	0.002%
2000-01	-280	-446	1,519,325	1,574,302	0.018%	0.028%
2001-02	-268	-426	1,644,230	1,718,898	0.016%	0.025%
2002-03	---	-531	---	1,869,428	---	0.028%

B. By number of jobs

Year	Net loss due to relocation		Total no. of jobs in CA		Net loss as percent of total	
	2003 data	2004 data	2003 data	2004 data	2003 data	2004 data
1992-93	-13,241	-13,168	16,394,151	15,879,490	0.081%	0.083%
1993-94	-16,475	-16,449	16,266,713	15,768,516	0.101%	0.104%
1994-95	-14,088	-13,859	16,371,012	16,001,206	0.086%	0.087%
1995-96	-5,194	-5,235	16,241,156	15,999,677	0.032%	0.033%
1996-97	-17,136	-17,118	16,314,659	16,203,227	0.105%	0.106%
1997-98	-1,611	-1,665	16,546,553	16,501,267	0.010%	0.010%
1998-99	-4,544	-4,583	16,512,479	16,576,917	0.028%	0.028%
1999-00	-1,405	-1,620	16,864,781	16,977,344	0.008%	0.010%
2000-01	-5,330	-5,832	17,666,262	17,841,453	0.030%	0.033%
2001-02	-3,895	-5,727	18,149,748	18,421,442	0.021%	0.031%
2002-03	---	-12,275	---	17,671,970	---	0.069%

Table B-2: Decomposition of Employment Growth in California, 1992-2003

		1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Employment												
Starting	2003 Data	16,394,151	16,266,713	16,371,012	16,241,156	16,314,659	16,546,553	16,512,479	16,864,781	17,666,262	18,149,748	--
Employment	2004 Data	15,879,490	15,768,516	16,001,206	15,999,677	16,203,227	16,501,267	16,576,917	16,977,344	17,841,453	18,421,442	17,671,970
Ending	2003 Data	16,266,713	16,371,012	16,241,156	16,314,659	16,546,553	16,512,479	16,864,781	17,666,262	18,149,748	17,527,918	--
Employment	2004 Data	15,768,516	16,001,206	15,999,677	16,203,227	16,501,267	16,576,917	16,977,344	17,841,453	18,421,442	17,671,970	17,229,994
Job Creation												
	2003 Data	552,169	409,869	490,154	615,115	727,776	765,594	791,062	791,737	860,131	722,563	--
Expansion	2004 Data	550,008	408,896	481,444	610,155	726,722	759,555	788,606	781,202	836,440	660,532	611,563
	2003 Data	758,129	1,177,830	879,613	1,130,026	910,897	722,829	900,418	1,310,054	1,598,235	840,498	--
Birth	2004 Data	759,063	1,172,222	887,192	1,143,207	921,321	752,592	934,774	1,366,068	1,634,471	955,882	741,389
	2003 Data	13,853	8,977	14,136	13,158	11,073	15,098	18,893	15,589	18,586	12,656	--
In-Migration	2004 Data	13,759	8,888	14,124	13,173	11,118	15,172	19,064	16,225	21,148	16,492	19,340
Job Destruction												
	2003 Data	549,183	392,837	459,987	427,049	445,563	432,373	421,381	366,855	729,255	907,453	--
Contraction	2004 Data	547,794	392,192	454,469	429,625	448,715	435,867	424,552	371,916	711,483	904,218	481,697
	2003 Data	875,312	1,074,088	1,025,548	1,239,395	944,080	1,088,513	913,253	932,050	1,240,295	1,273,543	--
Death	2004 Data	859,083	939,787	901,837	1,114,952	884,170	998,965	893,818	909,625	1,173,607	1,455,941	1,300,956
	2003 Data	27,094	25,452	28,224	18,352	28,209	16,709	23,437	16,994	23,916	16,551	--
Out-Migration	2004 Data	26,927	25,337	27,983	18,408	28,236	16,837	23,647	17,845	26,980	22,219	31,615

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