LOCALIZED EFFECTS OF CALIFORNIA'S MILITARY BASE REALIGNMENTS: EVIDENCE FROM MULTI-SECTOR LONGITUDINAL MICRODATA

by

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Abstract

Cuts in U.S. Department of Defense budgets have led to changes in the personnel levels at military bases throughout the United States. Because these bases are often significant sources of civilian and military employment and also provide customers for local businesses, closing them distresses local citizens, business leaders and politicians. In early April 1998, Defense Secretary William Cohen launched a new drive to close dozens more military bases. Given the timeliness and magnitude of these actions, and in light of the predictions of hardship surrounding them, it is important to realistically assess the impact of substantial personnel changes at military bases on employment at neighboring businesses. This study utilizes a new and uniquely well-suited confidential dataset to analyze this issue at the level closures' impact are thought to occur: individual establishments and their employees. Using an establishment-level panel dataset that covers all private establishments in California with positive employment from 1989 to 1996, I examine how the employment dynamics of establishments across the full spectrum of industries are affected by personnel changes at nearby military bases and find that despite establishments' growth rates declining, more establishments going out of business and fewer new ones starting, when bases close workers' employment prospects actually improve.

Keywords: Military Base, Services, Policy, Regional

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presented in this paper are attributable to the author and do not necessarily reflect concurrence by the U.S. Bureau of the Census.

"Cold War military budgets not only provided security, they provided jobs."
Secretary of Defense William S. Cohen
U.S. Conference of Mayors,
Washington, DC January 29, 1998

"Cohen to Renew Push to Close Military Bases"
Headline from Wall Street Journal article
April 2, 1998

I. Introduction:

Recent waves of military base closings alarmed people who believed that their jobs and businesses depended on spending by locally-based military personnel. Surprisingly, several studies done on the economic aftermath of base closures have not found the expected dire consequences. However, much of this research is either based on case-studies which cannot control for other causal factors, or uses data that are too aggregate to be very revealing. Given that Defense Secretary Cohen is calling for additional rounds of base closures in the near future, it is important to examine the localized consequences of military base restructuring at their source: individual establishments. In this study I use multi-sector, establishment-level panel data covering all private sector employers in California from 1989 to 1996 to model the localized effects of base closings on business and employment growth.

My results indicate that base closings do indeed negatively affect establishment net growth rates, in part by reducing the probability of new businesses starting-up. This has the added effect of helping to reduce the turmoil in the local economy. Surprisingly though, the typical worker's employment prospects actually improve, especially in retail sectors, possibly because of increased patronage by retired military personnel brought about by the closing of on-base businesses such as the

Post Exchange and Commissary.

1. *Closing a Military Base:*

In an attempt to minimize the politicalization of military base closure decisions, Congress authorized the Base Realignment and Closure (BRAC) process. The BRAC criteria for selecting bases for closure cover military value, pecuniary savings, and the impact of closure on the local economy and environment. Thus far there have been four rounds of BRAC closures: one each in 1988, 1991, 1993, and 1995, and Defense Secretary Cohen is calling for two additional rounds within the next decade.

Several years may pass between the announcement of a base's closing and the departure of the last group of DOD personnel. Closing a large base, like closing a large factory, is a complicated process that takes time and planning. In fact, even when 'closed', many bases must undergo an extended clean-up process to remove any potentially hazardous materials such as chemicals or munitions before new tenants can safely occupy the site.

2. *Dispersion of Closed Bases:*

BRAC rounds have impacted individual states unequally. Figure 1 was created using Department Of Defense (DOD) data that give employment levels at military bases or cities in California by year from 1989 to 1996.[1] It shows the total losses of personnel (military and civilian) from BRAC shut-downs by state — and California's losses of an estimated 28,000 personnel dominate the graph. The next closest state is Pennsylvania with estimated losses of approximately 12,000 workers. Of

[1]I wish to thank Roger Jorstad at the Directorate for Information Operations and Reports for his assistance in obtaining these data.

course California's population and economy are also the largest in the country so Figure 2 shows the losses of base personnel as a percent of the states' civilian labor force. Now California's losses no longer stand out. Proportionally, South Carolina was harder hit, especially since almost all the BRAC job losses occurred at the Charleston Navy Base.[2]

Still, California's military bases employer considerable numbers of personnel. As employers, they are comparable in magnitude to major manufacturing sectors. Figure 3 highlights this by comparing the 1986 employment levels of three 'industries': steel (for the whole U.S.),[3] transportation equipment (California only)[4] and military base employment for the whole state. All three of these industries share the unfortunate distinction of having undergone periods of substantial worker reallocation. In Figure 3, I compare the net job flows for these industries from 1984 through 1993.[5] Interestingly, (sadly?) the magnitude of net job destruction at military bases rivals that of some of the worst downturns in these manufacturing sectors.[6]

3. *Military Bases Effects on Local Economies:*

The interactions between military bases and localities is complicated. According to Dardia, McCarthy, Malkin, and Vernez (1996), it may depend on the ratio of civilian to military personnel, the

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[2]The good news for Charleston has been that local job losses the base's closure have not been catastrophic. The region has actually prospered (McDermott 1995).

[3]SIC 331.

[4]SIC 37.

[5]The base data allow only me to produce flows as far back as 1985.

[6]These flows do not cover the worst years of job destruction in the steel industry.

number of base workers who are either retired military personnel or spouses of military personnel, the number of spouses working in the community, the number of retired military in the community, the base's proximity to an urban area, and the percentage of the local population accounted for by the base. Dardia et al (1996) find that an important limiting factor of a base's economic impact on a locality is the presence of a Post Exchange or PX, and other on-post business establishments that sell many food and retail goods at a discount. Typically, goods sold at a PX (retail goods) or a base Commissary (food and beverages) are priced between 18 and 25% below retail value.[7] Consequently, large bases which feature well-stocked PX's, commissaries, and on-site medical care frequently attract substantial populations of retired military personnel seeking to exploit these benefits as part of their retirement package.

4. *Empirical Studies on BRAC's Economic Impact*:

Public concern about base closures was in part fueled by numerous studies predicting that BRAC would have terrible consequences on local economies. For example, the California Military Base Reuse Task Force (1994), predicted that some counties' unemployment rates could increase by 60% once their bases closed. These predictions have generally proven to be inaccurate. Most authors of studies on the de facto effects of base closures have found that the actual effects of base closings are far less severe than originally feared.

For example, the Office of Economic Adjustment commissioned a study on the effects of bases closed in the 1960s and 1970s and found that by 10 or 15 years later, new employers at the base sites

[7] See the 1996 *Guide to Doing Business With The Navy Exchange System* and the 1997 *Annual Report to the President and Congress of the Secretary of Defense*.

typically employed more people than the military establishments they replaced. Other case studies, such as that by Dardia, et al. (1996), focus on the more immediate effects of realignments on communities. They studied three (formerly) large California bases that closed in recent BRAC rounds. They look at changes in population, local employment, and housing values and compared changes in these variables with projections and with comparable California bases that remained open. They conclude that while in some cases there were disruptions to the localities, they were not nearly as severe as forecasted.

To my knowledge, only a few studies of BRAC's economic consequences for base communities use regression analysis to control for other economic factors. For example, Cook and Webb (1997) examine the effects of changes in DOD spending on local communities. Their data cover the buildup of the 1980s and the realignments of 1990s. They find that the effects of DOD spending on local communities are very small. At best, it takes at least $250,000 of defense spending to produce one private sector job. As small as this effect is, it is slightly higher than what other authors have found. Davis, Loungani, and Mahidhara (1997) found that it takes 34 to 54 thousand 1982 dollars in contracts to buy one private sector job.

In this study I exploit mult-sector, establishment level panel data to search for the consequences of military base restructuring where they are most likely to occur: at individual establishments. I do this by modeling the establishments' net employment growth rates as a function of changes in military base employment and a set of control variables.

II. Model:

The general form of my model is[8]:

$$NET_{it} = f\,(NetBase_{idt} + PopRatio_{it} + NetBase_{idt} \times PopRatio_{it} + SIC_{it} + SMSA_{it} + YEAR_{t} + MU_{it} + AGE_{it} + SIZE_{it} + \varepsilon_{it}) \qquad \textbf{(1)}$$

where NET is the net employment growth rate as defined by Davis, Haltiwanger, and Schuh (1996). SIC, SMSA, and YEAR are dummy variables for the 4-digit industry classification, the standard metropolitan statistical area, and the year. AGE measures the establishments' age in years. SIZE is the average (across two years) size class for the establishment. NetBase is the sum of net employment flows at military bases within an increment of distance from the establishment and Popratio is the ratio of local military base personnel to the total local workforce. I discuss my reasons for including each variable in the following sections.

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[8] I adopt the following notation: "i" denotes plants, "t" is year, and "d" is a distance unit between 5 and 50 miles.

1. *The Military Base Variables:*

My regression model includes two types of military base variables: net base employment flow and the ratio of base employment to total local employment. There are actually ten net base employment variables in the model which run in increments of 5 from 5 to 50. Each one of these variables is the sum of positive and negative employment changes at bases within the specified number of miles from the individual establishment. That is, $NetBase_{15}$ is the sum of all positive and negative employment changes at bases within 10 to 15 miles of the establishment. Define PosBase as the sum of positive employment changes at bases within the specified distance from the establishment in year t (and define NegBase analogously) so that:

$$NetBase_{idt} = \sum_{b=1}^{B} PosBase_{bt} - \sum_{b=1}^{B} NegBase_{bt} \quad \forall \; bases(b) \; within \; d \; miles \; of \; plant \; i \qquad \textbf{(2)}$$

Finally, Popratio is the ratio of base personnel to private-sector employees within 50 miles of the establishment. It is intended to measure the importance of military bases to the local economy. If b indexes bases and Employment is a count of personnel, then Popratio is:

$$PopRatio_{it} = \frac{\sum_{b=1}^{I} Employment_{bt}}{\sum_{i=1}^{I} Employment_{it} + \sum_{b=1}^{B} Employment_{bt}} \quad \forall \; b \; within \; 50 \; miles \; of \; plant \; i \qquad \textbf{(3)}$$

I include both level and interacted effects of the two base employment variables in the model. The interacted effects are intended to capture the different effects that base personnel reductions have on communities where military personnel are a larger part of the total local labor force.

2. *The Establishment-level Control Variables:*

I include a number of variables in my model that are designed to control for factors that have been shown in other empirical work to strongly affect establishment net job growth rates. Many authors have shown that these growth rates are dominated by idiosyncratic factors and that plants exhibiting dramatic changes (e.g., startups and shutdowns) account for a large portion of the observed gross job creation and destruction within an industry (Dunne, Roberts, and Samuelson (1989), Davis, Haltiwanger, and Schuh (1996)).

One factor that affects establishment growth rates is ownership status. Davis, Haltiwanger, and Schuh (1996) show that plants that are part of multi-unit firms have different job creation and destruction patterns than single-unit businesses so I include the variable MU to indicate if the establishment is part of multi-unit company. Similarly, establishment size has long been known (Dunne Roberts, and Samuelson 1989) to be strongly correlated with net job creation behavior. Larger establishments are more stable than smaller establishments and tend to exhibit smaller net job creation rates so I include an establishment SIZE category variable in the regressions. Employer age is another important determinant of differences in net and gross job flow rates across plants. Haltiwanger and Krizan (1998) show that, holding size constant, young plants grow faster than mature plants and that very young plants (e.g., plants that are 1-2 years old) grow much faster, on average, than plants that are even just a bit older. This evidence led me to include an AGE variable which categorizes plant size into 9 classes.

Although idiosyncratic factors may dominate establishment growth rates, I also include a number of variables in the models that are designed to account for macro economic effects. For example, SIC is a dummy variable controls for 4-digit industry effects. SMSA dummy variable for the establishment's Standard Metropolitan Statistical Area and will help to control for (non-military base) regional effects. Finally, year dummies help control for business cycle effects.

I estimate four specifications of this model which are distinguished by the definition of NET. In the first specification NET is establishment net growth. This model is intended to capture the effects of military base realignments on establishments' growth rates. The second model uses the absolute value of NET. This metric captures the amount of 'churning' - both positive and negative - at establishments. By churning I mean the reallocation of factors of production, particularly labor, within the economy. The last two models are simply employment weighted versions of the first two. This shifts the emphasis of the analysis from establishments to workers.

III. Data:

To estimate my models I use a combination of DOD data on base employment levels, and confidential establishment-level micro data housed at the Census Bureau's Center for Economic Studies (CES).

1. *Military Installation Data:*

The DOD data give the military and civilian employment levels at military bases or cities in California by year from 1989 to 1996. From these levels I constructed a set of employment flow statistics for total (civilian + military) workers at a set of the larger bases.[9] Unfortunately, the DOD data do not contain information about the latitude and longitude of the perimeters of the bases. To define the location of the bases, I relied on the Census Bureau's Internet site. This site features the 'TIGER' mapping machine that allows the user to view a fairly detailed map for any zip code or city name in the U.S.[10] Additionally, it displays the exact latitude and longitude of a map marker that the user can place. Using this tool I located approximately five points for each military installation roughly corresponding to the northern, southern, eastern, and western extremes as well as the approximate center of the installation. I discuss how I used this information in a later section.

2. *Census Bureau Data:*

The establishment-level data come from the U.S. Census Bureau's Standard Statistical Establishment List (SSEL). The SSEL is a central multipurpose business register maintained continuously by the Census Bureau since 1972. It serves as a comprehensive source of list frames for the various Economic Census and Economic Surveys conducted by the Bureau and includes all legal entities with positive payroll across all sectors of the economy. The unit of measurement is the individual establishment.

I used an abstract of these data containing establishments from a broad range of sectors that

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[9]See Appendix 1 for a table of the personnel changes at bases included in this study.

[10]http://tiger.census.gov/cgi-bin/mapbrowse-tbl

operated in California between 1989 and 1996.[11] My abstract contains approximately 4.7 million observations. These data contain information on each establishment's: SIC, plant identification numbers, employment, payroll, and zip code. To fix the plants' physical location I used commercially available data that give the coordinates of zip codes' centroids. I am not able to place the exact location of individual establishments.

The biggest challenge in using these SSEL data is accurately linking the establishments' data across years so as to not overstate establishment entry and exit which would artificially inflate the net employment change variable NET. To accomplish this, I match the micro data files using plant identifiers known as Permanent Plant Numbers (PPNs) that the Bureau of the Census assigns to establishments. In principle, PPNs remain fixed during changes in organization or ownership. However, the actual assignment of PPNs is far from perfect. During the construction of the Longitudinal Research Database (LRD) which encompasses the Census of Manufacturers and the Annual Survey of Manufacturers, many PPN linkage problems were detected through analyses of the data by many different individuals (see the appendix of Davis, Haltiwanger and Schuh (1996) for more discussion on PPN linkage problems in the LRD).[12]

Because the SSEL data have not previously been linked together, it is undoubtedly the case that initial attempts that rely only on PPNs will leave a greater number of longitudinal linkage problems

[11]The sectors include: Construction, FIRE, Manufacturing, Retail, Services, Transportation, and Wholesale.

[12]The LRD is a plant-level, longitudinal, manufacturing-sector data set that has been used extensively for economic research. It is housed at the Center for Economic Studies at the U.S. Bureau of the Census.

than remain in older data sets like the LRD. To correct some of the remaining linkage problems, I use the name and address information in the files and a sophisticated matching software (Automatch) to improve the matches. Most data processing software takes a very literal approach to this sort of information, thus limiting its value for matching purposes. For example, if an establishment's name is 'K Auto Mart Inc.' in one file and has the exact same name in the other, the two records will match. However, if in the second year the establishment's name is 'K Auto Mart Incorporated' it will not match the previous record if linked using conventional software because the two entries are not exactly the same. Clearly, abbreviations, misspellings, and accidental concatenation can substantially reduce the usefulness of these fields for matching purposes if literal matches are required.

However, the software I used is designed to recognize many alternative specifications for the same name and address. That is, it can recognize that abbreviations such as "St" that frequently appear in addresses may stand for "Saint" as in "St James Street" or "Street" as in "Saint James St." The software assigns probability-based weights to the set of potential matches and the user determines the cut-off value of the Weights that gives him the best set of 'valid' matches.[13]

3. *Calculating Distances:*

I define the distance between an establishment and a military base as the shortest distance between the boundary of the base and the establishment's zip code centroid. However, as mentioned above, I fix only the location of the corners of the military bases, I do not have data on the entire

[13] Two types of errors are unavoidable in this process. First, some 'true' matches will not be made and some 'false' matches will be. My review of the individual records indicates that the overall error rate is, nevertheless, substantially diminished

perimeter, so calculating the 'shortest' distance is not entirely straightforward. Adding to the problem is the fact that most military bases are irregularly shaped and their centers of population are not visible on TIGER maps. Therefore, I developed an algorithm to approximate the location of the base perimeter relative to the zip centriod based on a weighted average of the location of the two corners it is nearest.[14] I use the minimum distance between the zip centroid and any of my location points of the base (north, south, east, west, center, or approximation of boundary) as my measure of distance.

To calculate distances I use the Haversine Formula (Sinnott (1984)) which presumes a spherical earth and requires that the locations of the two points be in spherical coordinates. Distance is computed as follows.

$$dlon = lon2 - lon1,\ \ dlat = lat2 - lat1 \tag{4}$$

where lat1, lon1 are the coordinates of the establishment, lat2 and lon2 are the coordinates of the base, and the radius of the earth is r, and:

$$a = (\sin^2(\frac{dlat}{2}) + \cos(lat1) \times \cos(lat2) \times (\sin^2(\frac{dlon}{2})) \tag{5}$$

where:

$$c = 2 \times arsin(\min(1, \sqrt{a})) \tag{6}$$

the distance can be expressed as:

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[14]See Appendix 2 for details.

$$Distance = r \cdot c \quad \textbf{(7)}$$

where r is a rough approximation for the radius of the earth (Chamberlin 1996) equal to:

$$r \approx 3963 - 13 \cdot \sin(lat1) \quad \textbf{(8)}$$

IV. Results:

1. *Job Flows:*

Before proceeding with the regression results, I present some statistics on the dependent variable. Figure 5 shows average gross and net job flows by major sector and Figure 6 shows the percent of the flows accounted for by births and deaths. I checked the manufacturing gross creation and destruction by comparing them to the same statistics computed from the LRD for 1992-1993. The LRD gross creation and destruction statistics are approximately 9.3% and 16.2% percent respectively. By contrast, the SSEL data yield a positive rate of about 12.8% and a destruction rate of 17.6%. However, the two data sets yield shares of births and deaths that are also quite close. Births account for 32.2% of positive flows in the LRD and about 29.5% in the SSEL data. Deaths are 31.6 % vs. 32% respectively. Since the LRD has been criticized for understating the contributions of smaller establishments which the SSEL should capture quite well, and since smaller establishments are well-known to be more volatile than larger establishments (Davis, Haltiwanger, and Schuh 1996), I am not overly concerned by the direction or magnitude of these differences.

To check the non-manufacturing statistics, I compared my results with the non-manufacturing job flow statistics published on the Internet by the Census Bureau.[15] These numbers come from a data set derived from the SSEL. The job creation and destruction rates, as well as the contribution of births and deaths to these rates, are similar to my results. This evidence, in combination with that from the LRD, gives me increased confidence that my net job creation statistics are reasonable, an important consideration given the novelty of these data.

Although the manufacturing gross job flow rates are among the lowest of all the sectors, I expected that there might be and even bigger difference between the manufacturing and non-manufacturing sectors because of manufacturing's relatively high fixed costs of entry and exit which should reduce establishment birth and death rates, and as Figure 6 shows, several non-manufacturing industries such as FIRE and Retail do show higher percentages of births and deaths. However, in other non-manufacturing sectors such as services and construction, births and deaths do not seem to constitute a substantially greater portion of the gross flows than they do in manufacturing.

2. *Regression Results:*

The regression results are reported in Tables 1 through 4. There is one table for each of the four models. The first column gives the values of the coefficients, the second reports the T-statistic. Each Table has three groups of rows. The first group reports the estimated coefficients of the change in base employment variables in distances of 5 to 50 miles, by 5 mile increments. The next row is for the

[15] See http://www.census.gov/epcd/ssel_tabs/view/tab9_93.html.

estimated Popratio coefficient and it's T-statistic. Finally, the last group of rows report the coefficients on the interacted Popratio*NetBase variables.

Table 1: Dependent Variable=Net Growth Rate

One of the greatest fears about base closings is that businesses that depend on base personnel for their business will close en masse when the bases shut down. The results in Table 1 address this concern. Table 1 contains the results for the models that feature the net growth rate of establishment growth.[16] All of the results tables are structured in a similar way to Table 1. The first column contains the names of one of the three sets of variable: Net Base Employment Change, Popratio, and the interacted effect of (Net Employment Change) * (Popratio). Since Net Employment Change and the interacted terms are in increments of 5 miles, the second column labels the distance of the variable. For example, when the label in the "Distance" column has a value of "10 miles", the coefficients and t-statistics are for changes of employment at bases between 5 and 10 miles from the establishment. The next set of columns contain the value of coefficients and the accompanying t-statistics. Those coefficients with absolute values of t-statistics greater than or equal to 2 are denoted by asterisks. The last three columns of Table 1 shows the net effect of the level and interacted variables at selected values of Popratio. For example, the value of the statistic in the first row, last column of Table 1 is "0.000". This is because when you multiply -0.024 by the Popratio variable with a value of 0.090 (which is at the 95% of the distribution of Popratio values), you get approximately -0.002. Since the value of the

[16]Given the purpose of this paper and the large number of specifications being reported, I do not show the results from the control variables. However, I can report that they showed no unexpected patterns: younger plants were more volatile than older plants etc.

level effect at 5 miles is equal to +0.002, the sum of the two effects is approximately equal to zero. I discuss this finding below.

Several interesting patterns emerge from Table 1. First, note that the coefficients on the effects of net employment changes have the expected positive coefficients. That is, base employment changes and net employment growth rates at establishments are positively correlated. When bases lose employment, business grow at slower rates and vice-versa. However, while most of the coefficients are statistically significant, they are relatively small. Recall that these variables are in units of thousands. Using the first row of the first column of Table 1 as an example, an expected and/or current change of 1000 workers (military or civilian) at a base within 5 miles of a typical California establishment results in a decline of an establishments growth rate of only 0.2%.

The base's distance from the establishment does not seem to affects how strongly it impacts the business's net growth in any obvious manner. The coefficients for the Net Employment Change variables are positive and significant, but no consistent patterns emerge according to the bases distances from the establishment.

As I mentioned above, many of the interaction term coefficients are negative, implying that establishments in communities where military bases are large relative to the number of private sector workers (i.e. small towns) are actually *less* likely to shrink when military bases close than are businesses located in large cities. This evidence contradicts predictions of economic disaster for businesses in small towns because of BRAC. On the other hand, as shown in the last few columns of Table 1 these effects are quite small and only changes the net effect when the value of Popratio is at its 95^{th} percentile or greater and then only for the effects of base closings within 5 miles or less of the establishment: a very specific case from which I hesitate to draw any conclusions.

Table2: Dependent Variable = Absolute Value of Net Growth:

The absolute value of the net growth rate of establishments allows measurement of the amount of resource reallocation or 'churning' occurring at individual businesses after military bases close. Many studies have documented an enormous amount of churning in the economies of both industrialized and developing nations (Dunne, Roberts, and Samuelson 1989; Davis, Haltiwanger, and Schuh 1996; Roberts and Tybout 1996,). By churning I mean both expansion and contraction of continuing establishments' employment levels as well as the opening and closing of whole plants. Such transfers of resources can be an essential component of economic growth by facilitating the adoption of new technology (Cooper, Haltiwanger, and Power 1997), and enhancing productivity growth through a process of 'creative destruction'.[17] However, they also impose costs on individuals and establishments, and consideration of economic costs is an important part of the BRAC process. Scaling back or shutting down businesses in one location and expanding or opening them in another displaces workers who must locate new employment, a process with significant explicit and implicit costs. Even under the best circumstances churning costs include the temporary underutilization of labor and capital.

Regional circumstances and national business cycles strongly affect the amount of churning in the economy. For example, Davis, Haltiwanger, and Schuh (1996) show that during recessionary periods gross job destruction rates typically rise sharply while gross creation rates drop - but less

[17] Schumpeter (1942) coined the term 'creative destruction' and several important endogenous growth models feature it. See for example: Aghion and Howitt (1992), Caballero and Hammour (1994) and Campbell (1997). For a survey of the empirical evidence see Foster, Haltiwanger, and Krizan (1998).

sharply than destruction rates rise. That is, recessions — periods of low net employment growth — are characterized by a slight reduction in gross job creation rates and large increases in gross job destruction rates.

By contrast regions with relatively low net job creation rates often have lower job creation rates and only marginally higher job destruction rates than high-growth regions. Dunne, Roberts, and Samuelson (1989) examine the patterns of gross flows across expanding and contracting census regions and find that during the 1967-1972 period, employment gains from openings varied by about 10 percent between expanding and contracting regions while job destruction from plant deaths varied by only about 2 percent. Similarly, Eberts and Montgomery (1994) conclude that variations in employment across regions (whether 'region' is defined as a county, SMSA, state, or census region) are dominated by differences in job creation rates.

The base employment change coefficients in Table 2 are statistically significant and positive, indicating that reductions in base employment are correlated with reductions in the amount of churning in nearby establishments. Note also that the results show a sensitivity to distance. Personnel changes at bases nearer to establishments have stronger effects than those further out. Taken together these patterns imply that when bases lose personnel, businesses generally experience less churning, especially if they are relatively close to the base.

By contrast, the coefficients on the interacted terms are uniformly negative but not large enough to substantially affect the net effect of base changes as computed in the last three columns of Table 2. Here, as in Table 1, only in the extreme case of a business being within 5 miles of the closing base and in a relatively small town is the net impact noticeably different from the level effect coefficient for the same distance. When bases lose personnel, businesses in large and small towns alike experience less churning (though the rate is marginally smaller in small towns).

Since Eberts and Montgomery (1994) report that establishment births are especially sensitive to regional effects, I regressed the following probit model on the data:

$$Birth_{it} = f(PopRatio_{it} + NetBase_{idt} * PopRatio_{it} + SIC_{it} + SMSA_{it} + YEAR_{t} + MU_{it} + NetBase_{idt} + \epsilon_{it}) \quad \textbf{(9)}$$

I ran an analogous model for establishment deaths and the results for both models are shown in Table 2a. First, consider the establishment birth regression results. The coefficients on the base employment change variables are uniformly positive, indicating that when bases lose personnel there are fewer establishment births. Note also that changes in base employment most strongly affect the births of nearby establishments. The coefficients get progressively smaller as distance increases. On the other hand, the signs of the coefficients for the interacted terms are mixed, making it difficult to draw any conclusions about how base closings differ in their effects in relatively small towns. It appears however that in small towns business are more likely to start nearby bases that lose personnel than they are further away. This may be to replace some of this businesses that were formerly located on the base.

The coefficients of the establishment death model show patterns that are more difficult to interpret. The coefficients on the changes in base personnel variables are of mixed signs. Positive coefficients indicate that when bases lose personnel fewer establishments go out of business and this pattern holds for those establishments near bases. However, establishments further away from bases are actually more likely to go out of business as a result of changes in base personnel levels. Perhaps some businesses benefit from the closing of base PXs and Commissaries and that military retirees in the community who formerly shopped on-base begin to frequent local businesses instead, reducing the establishment death rate. I discuss this idea at length in the following section.

Table 3:Dependent Variable = Net Growth Rate (weighted by employment):

The regressions that produced Tables 3 and 4 repeat the exercises of those for Tables 1 and 2 but are weighed by the establishments' average employment. Weighting by employment shifts the emphasis of the analysis from establishments to workers. For example, Table 3 displays evidence on the effects of reductions in base employment on the employment prospects of workers. It is entirely possible that base closings affect businesses and workers differently.

Surprisingly, the results in Table 3 indicate that local workers' employment prospects actually *improve* as bases lose personnel — and in small towns, the effects are even stronger. This indicates that at least some businesses expand when military bases close, presumably in response to increased sales of goods. To understand how this may occur, recall Dardia et al.'s (1996) argument that military bases serve as magnets for retired military personnel because they are centers of affordable medical care, food, banking, entertainment, and retail goods and services. As bases close, the number and quality of these services declines and eventually disappears. When this happens, retirees must seek alternative sources of goods and services within the community, which partially offsets the loss of patronage from the closed base. In a Chicago Tribune article (Young 1994) written shortly after the closing of Chanute Air Force Base in Rantoul, Illinois, local businessmen reported about 5% higher sales revenue for food and retail goods. They attributed the increase in sales to the estimated 5,000 military retirees in the community who now had either to purchase goods locally or travel 150 miles to the closest military base.[18]

To explore this idea further I ran the model that created Table 3 separately for two types of retail businesses: Food Stores (SIC 53) and General Merchandise Stores (SIC 54) and then for all non-retail businesses. The results of these three regressions are reported in Table 3a. If base closings were reducing any industries business, I would expect it to be retail establishments. However, the coefficients for these two retail sectors are negative and significant, indicating that they tend to employ more workers when bases lose personnel, not less. Furthermore, in the last two columns of Table 3a I report the absolute value of the ratio of the respective retail industry coefficients to the non-retail industry coefficients, rounded to the nearest integer. These columns allow quick comparison of the magnitude of the retail vs. non-retail sectors' coefficients. Clearly, the retail sectors are more strongly affected (though in a 'good' way) than are the non-retail sectors. The results of Table 3a give me increased confidence that part of what is happening when bases close is that local businesses are servicing customers who formerly shopped on-base.

Table 4: Dependent Variable = Absolute Value Net Growth (weighted by employment):

Finally, consider the statistics in Table 4 that give evidence on the effects of reduction in net base employment on the employment volatility experienced by workers. Both the level and interaction terms show sensitivity to distance. The coefficients on the net employment changes for small distances are generally positive, indicating that as base employment declines, so does employment volatility.

[18] An alternative hypothesis is that new businesses that locate on the converted bases account for the increased patronage. I find this unlikely because of there is typically a substantial lag between the close of a base and the establishment of a new business. Appendix 3 contains a running tally of the new workers at California military bases affected by BRAC.

However, the coefficients in Table 4 change signs and become negative and significant for changes in base employment at distances of 35 miles or more. Recall that the results in Table 2 and Table 2a, which measured the sensitivity of establishment churning to base employment changes, were also sensitive to distance from the base. There it appeared that businesses closer to the base were less volatile than those further out. This was in part because both birth and death rates for establishments near to bases were typically lower. It could easily be that these same forces are causing employment to be less volatile for changes at nearer bases than for those further away.

The Popratio Variables:

Popratio measures the ratio of military base personnel to private sector employees within 50 miles of the establishment (see equation 3). It is meant to control for the importance of bases to the local economy. But it also yields information on the growth rates of establishments in communities whose economies are dominated by military installations. In Tables 1 and 3 the Popratio coefficients are uniformly negative and significant indicating that businesses in communities where bases are especially important tend to grow slower than those in more diverse economies. By contrast, Popratio is positively correlated (Tables 2 and 4) with the absolute value of net employment growth, which means that businesses in communities where military installations dominate the economy are more volatile than those where military installations are less important.

V. Conclusions:

In this paper I merged DOD data on military base personnel changes with a unique establishment-level, multi-sector panel data set from the U.S. Census Bureau and examined how establishment growth rates and volatility are correlated with personnel changes at local military bases. My results indicated that base closures are negatively correlated with establishment net growth rates, though slightly less so in small communities. On the other hand, workers' employment prospects improve as bases shrink and the effect is actually stronger in smaller towns. I attribute this surprising result to the presence of large communities of retired personnel who settle near bases. As Dardia et al. (1996) point out, these people are forced to begin buying goods and services from the local community instead of the base Commissary or PX once the base is closed. In support of this argument I presented evidence that some retail businesses (Grocery and Department Stores) benefit more from base closings than non-retail businesses.

I also find that the amount of churning (reallocation of factors of production) in local communities declines when bases lose personnel. Part of this reduction is attributable to a lower establishment birth rate. However, for businesses and workers in towns where bases are relatively large compared to the local population, this effect is somewhat muted. Turmoil carries costs and benefits. The costs are underutilized labor and capital. On the other hand it also allows increases in productivity, particularly in the service sector.

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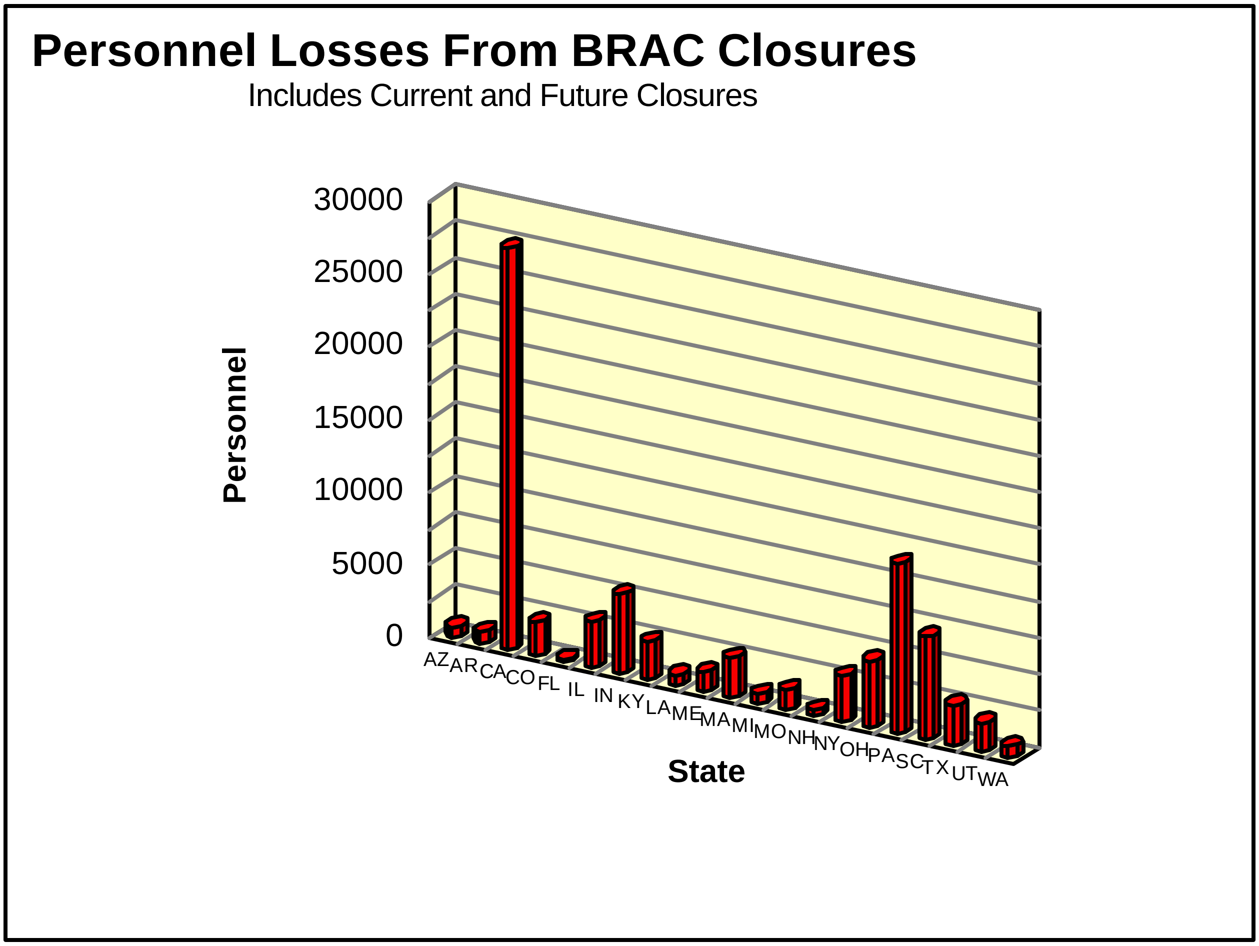

Personnel Losses From BRAC Closures
Includes Current and Future Closures
Personnel
30000
25000
20000
15000
10000
5000
0
AZ AR CA CO FL IL IN KY LA ME MA MI MO NH NY OH PA SC TX UT WA
State

Figure 1

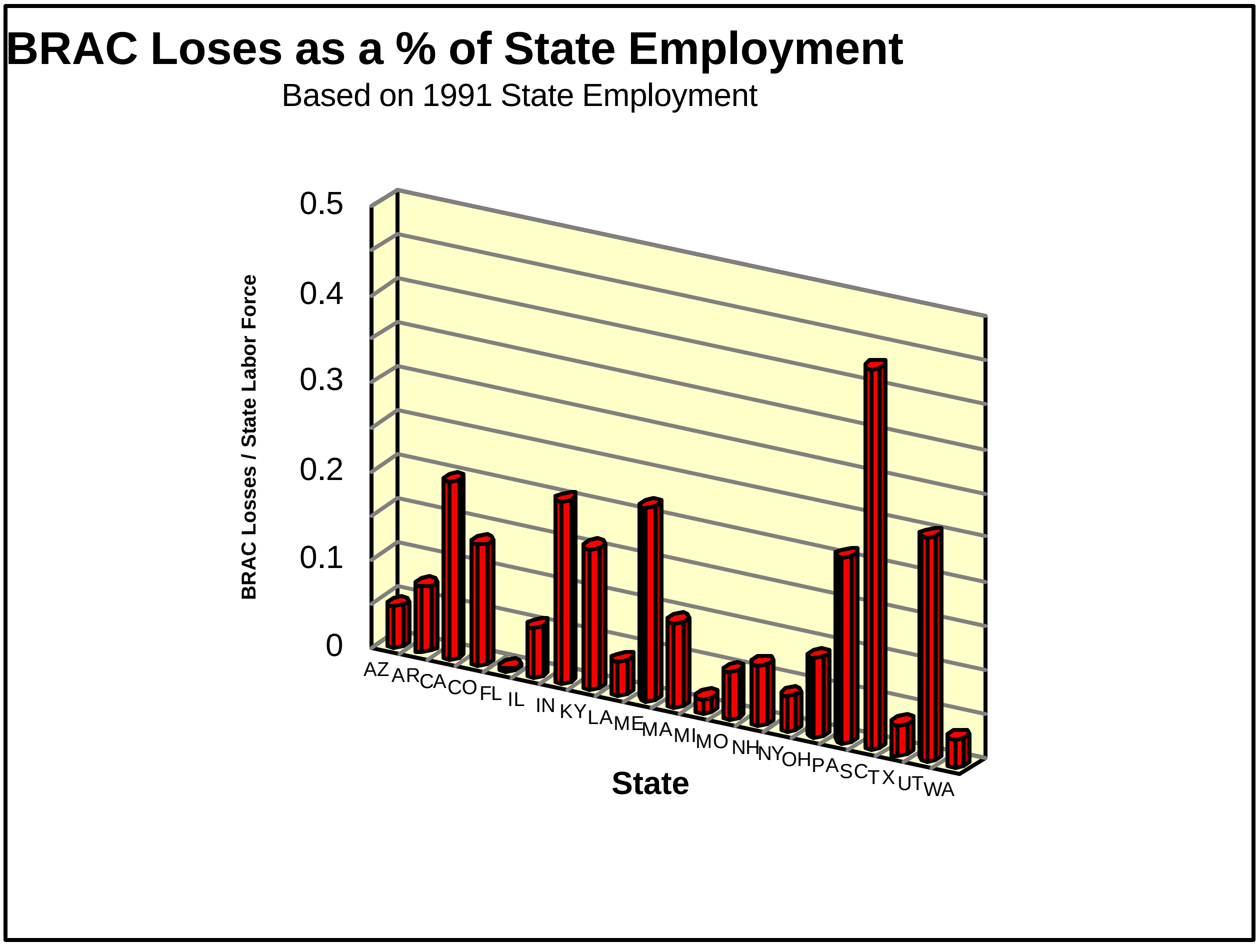

BRAC Loses as a % of State Employment
Based on 1991 State Employment
BRAC Losses / State Labor Force
0.5
0.4
0.3
0.2
0.1
0
AZ AR CA CO FL IL IN KY LA ME MA MI MO NH NY OH PA SC TX UT WA
State

Figure 2

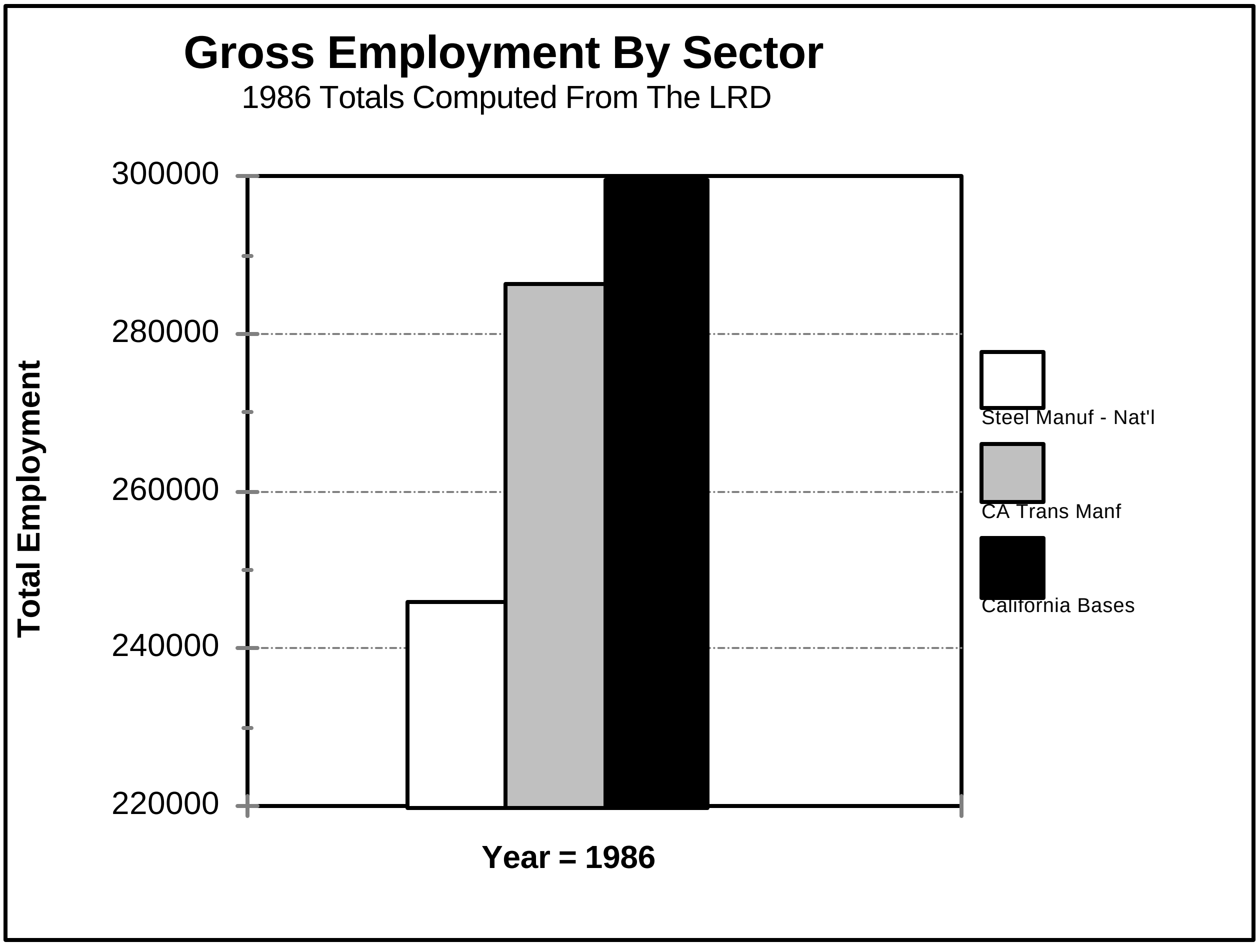
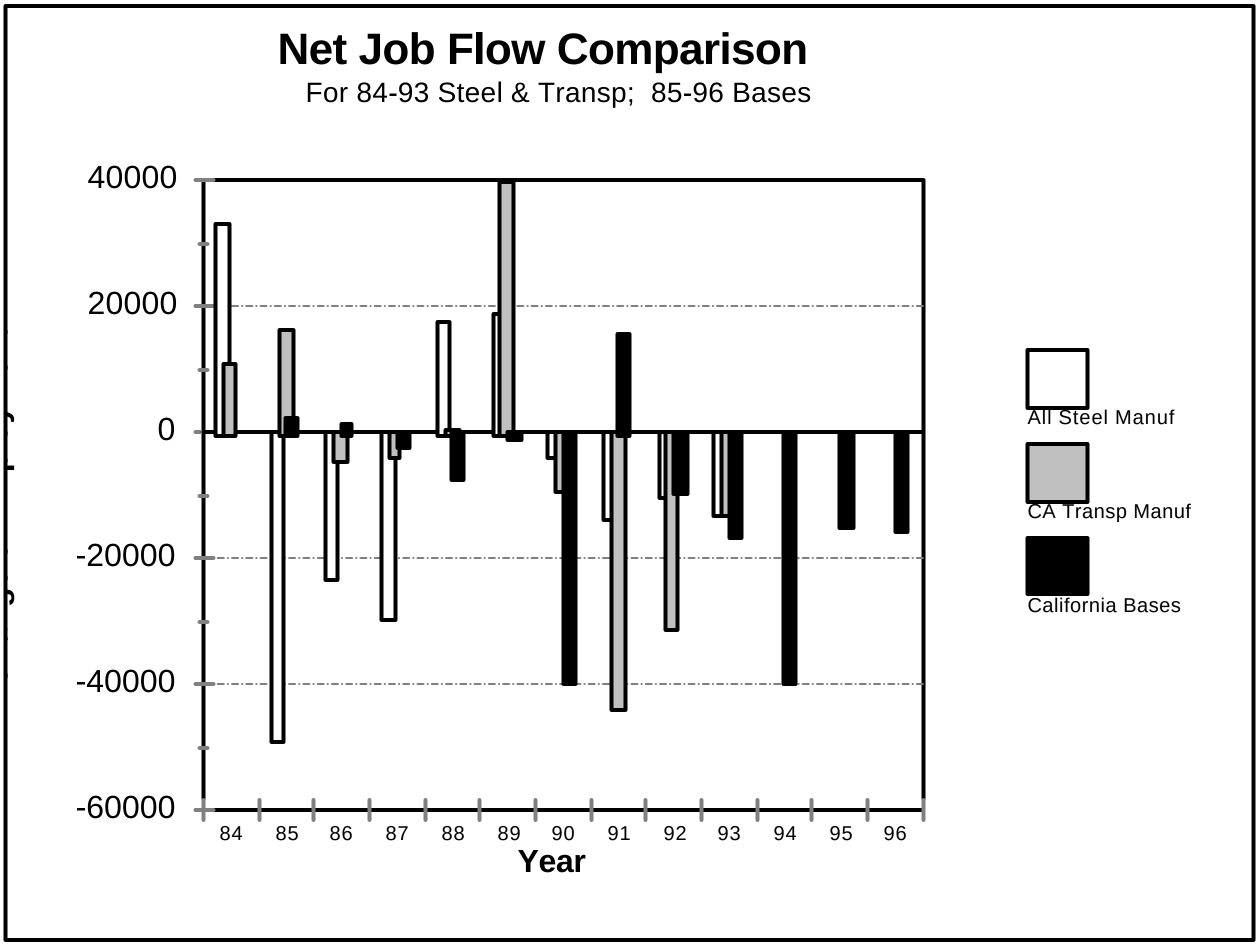

Gross Employment By Sector
1986 Totals Computed From The LRD
300000
280000
260000
240000
220000
Total Employment
Year = 1986
Steel Manuf - Nat'l
CA Trans Manf
California Bases

Figure 3



Net Job Flow Comparison
For 84-93 Steel & Transp; 85-96 Bases
40000
20000
0
-20000
-40000
-60000
84
85
86
87
88
89
90
91
92
93
94
95
96
Year
All Steel Manuf
CA Transp Manuf
California Bases

Figure 4

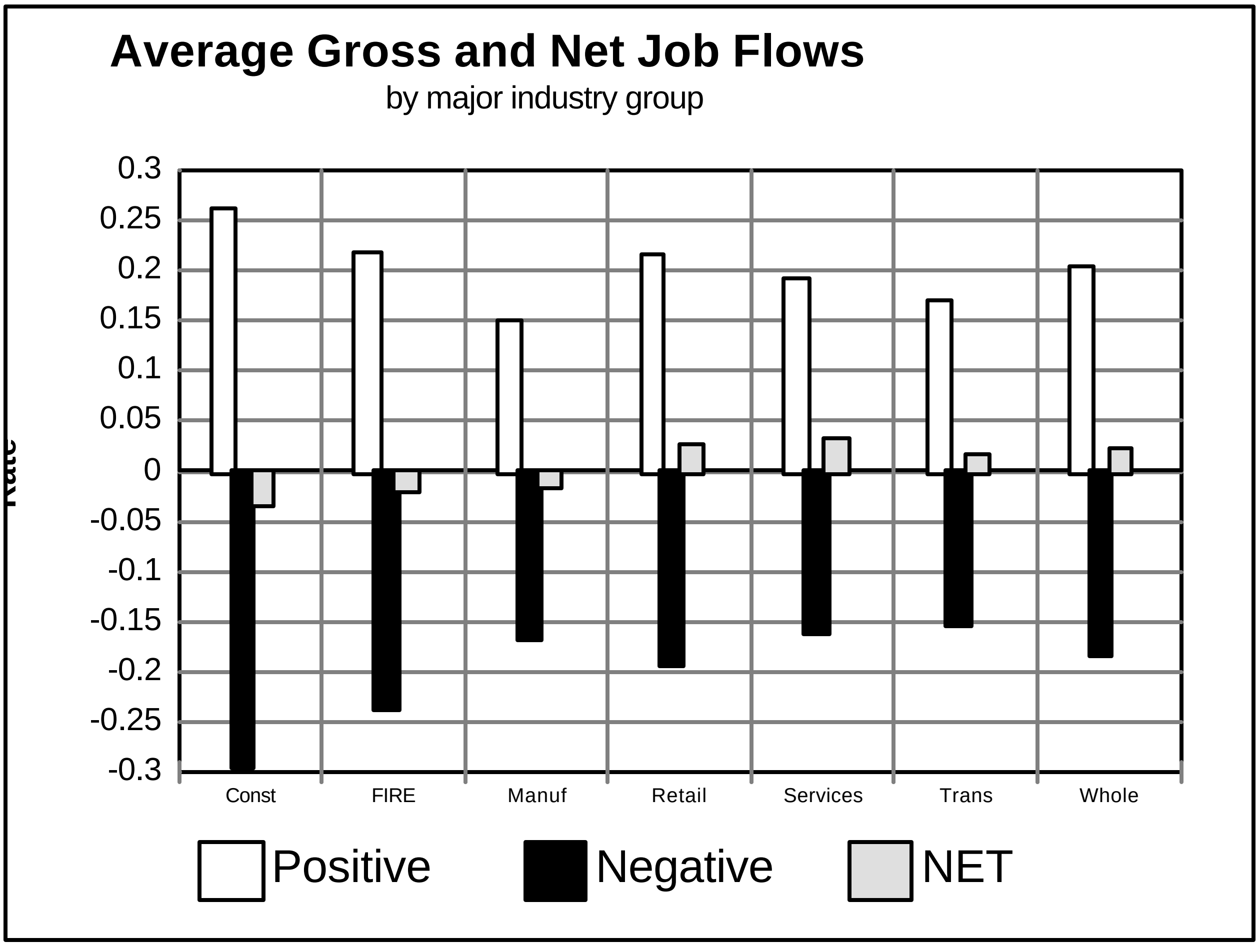

Average Gross and Net Job Flows
by major industry group
Rate
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
Const
FIRE
Manuf
Retail
Services
Trans
Whole
Positive
Negative
NET

Figure 5

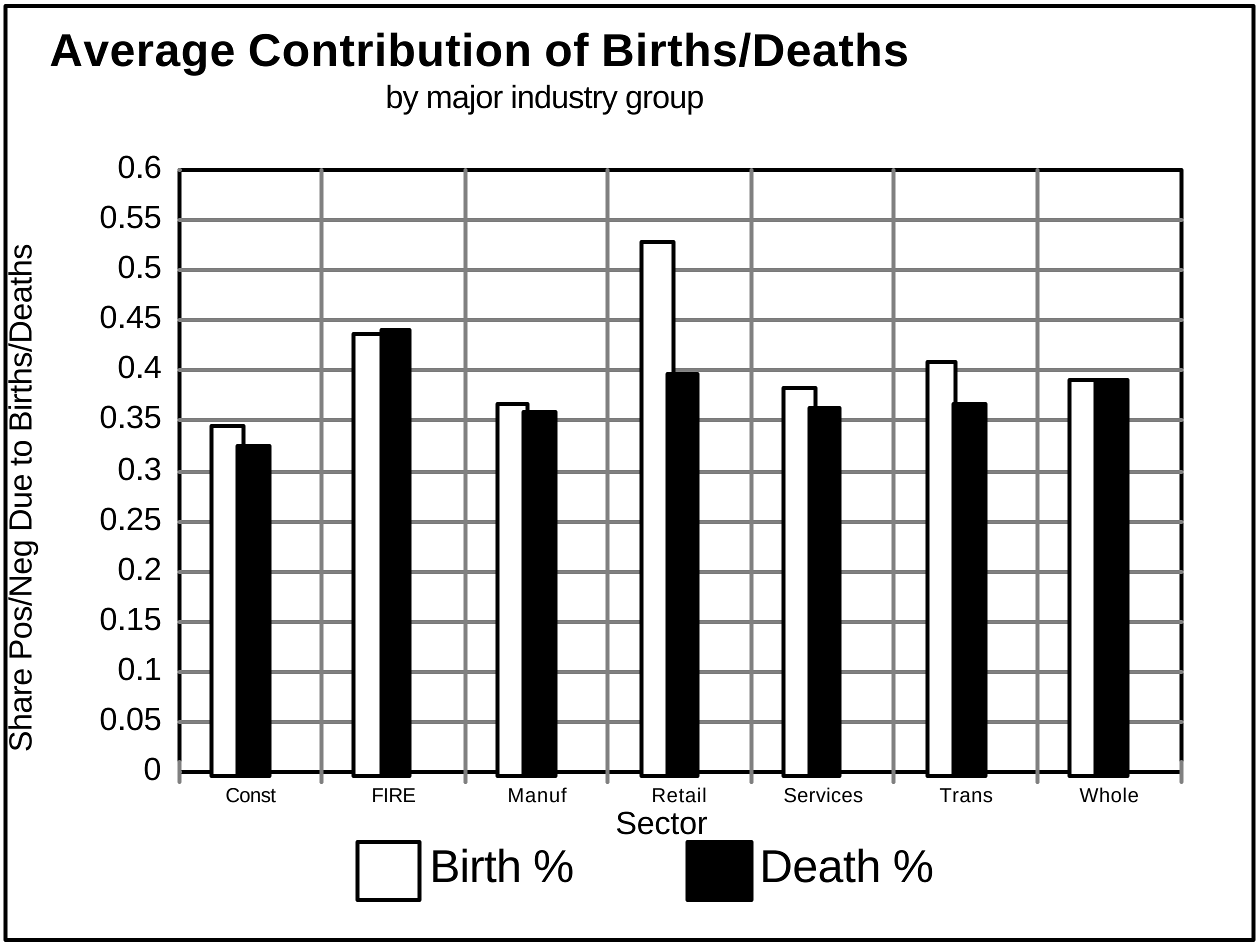

Average Contribution of Births/Deaths
by major industry group
Share Pos/Neg Due to Births/Deaths
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Const
FIRE
Manuf
Retail
Services
Trans
Whole
Sector
Birth %
Death %

Figure 6

Table 1: Dependent Variable = Net Growth Rate

Variable Name	Distance	Coeff	T-Stat	Net Effect of Base Changes Along Distribution of Popratio: 5% = 0.001	50% = 0.011	95% = 0.090
Net Base Employ Change						
	5 Miles	0.002 *	3.55	0.002	0.002	0.000
	10 Miles	0.004 *	5.79	0.004	0.004	0.004
	15 Miles	0.002 *	2.71	0.002	0.002	0.002
	20 Miles	0.006 *	9.21	0.006	0.006	0.006
	25 Miles	0.002 *	3.76	0.002	0.002	0.002
	30 Miles	0.002 *	4.06	0.002	0.002	0.002
	35 Miles	0.001 *	2.22	0.001	0.001	0.001
	40 Miles	0.004 *	8.68	0.004	0.004	0.004
	45 Miles	0.001	1.60	0.001	0.001	0.001
	50 Miles	-0.000	-0.48	-0.000	-0.000	-0.000
Popratio		-0.091 *	-5.19			
(Base Emp Chng) * (Popratio)						
	5 Miles	-0.024	-1.85			
	10 Miles	-0.079 *	-6.62			
	15 Miles	-0.029 *	-2.57			
	20 Miles	-0.099 *	-7.99			
	25 Miles	-0.034 *	-3.46			
	30 Miles	-0.020 *	-2.19			
	35 Miles	-0.017 *	-2.18			
	40 Miles	-0.021 *	-2.85			
	45 Miles	0.066 *	5.87			
	50 Miles	0.083 *	5.64			

Table 2: Dependent Variable = Absolute Value of Net Growth Rate

Variable Name	Distance	Coeff	T-Stat	Net Effect of Base Changes Along Distribution of Popratio 5% = 0.001	50% = 0.011	95% = 0.090
Net Base Employ Change						
	5 Miles	0.007 *	15.10	0.007	0.007	0.003
	10 Miles	0.006 *	11.32	0.006	0.006	0.006
	15 Miles	0.005 *	10.02	0.005	0.005	0.005
	20 Miles	0.005 *	9.85	0.004	0.004	0.005
	25 Miles	0.003 *	7.60	0.002	0.002	0.002
	30 Miles	0.002 *	6.10	0.002	0.002	0.002
	35 Miles	0.002 *	7.00	0.002	0.002	0.002
	40 Miles	-0.001 *	-3.01	-0.001	-0.001	-0.001
	45 Miles	0.001 *	4.79	0.001	0.001	0.001
	50 Miles	0.001 *	2.58	0.001	0.001	0.001
Popratio		0.094 *	7.43			
(Base Emp Chng) * (Popratio)						
	5 Miles	-0.050 *	-5.37			
	10 Miles	-0.027 *	-3.13			
	15 Miles	-0.021 *	-2.58			
	20 Miles	-0.039 *	-4.38			
	25 Miles	-0.035 *	-4.96			
	30 Miles	-0.017 *	-2.57			
	35 Miles	-0.010	-1.82			

	40 Miles	0.025 *	4.77	
	45 Miles	-0.005	-0.62	
	50 Miles	0.004	0.35	

Table 2a: Effects of Net Personel Changes on Births and Deaths

Variable Type	***Variable Distance***	***Births*** *Coeff*	*SE*	***Deaths*** *Coeff*	*SE*
Net Base Employ Change					
	5 Miles	0.021 *	0.001	0.009 *	0.001
	10 Miles	0.021 *	0.001	0.003 *	0.001
	15 Miles	0.015 *	0.001	0.004 *	0.001
	20 Miles	0.020 *	0.001	-0.002 *	0.001
	25 Miles	0.006 *	0.001	-0.001	0.001
	30 Miles	0.008 *	0.001	-0.001	0.001
	35 Miles	0.007 *	0.001	-0.000	0.001
	40 Miles	0.006 *	0.001	-0.008 *	0.001
	45 Miles	0.004 *	0.001	0.000	0.001
	50 Miles	0.003 *	0.001	0.001	0.001
Popratio		0.369 *	0.026	0.260 *	0.028
(Base Emp Chng) * (Popratio)					
	5 Miles	-0.137 *	0.020	-0.042 *	0.021
	10 Miles	-0.191 *	0.019	0.040 *	0.019
	15 Miles	-0.128 *	0.017	-0.017	0.018
	20 Miles	-0.254 *	0.019	0.030	0.020
	25 Miles	-0.081 *	0.015	-0.002	0.016

	30 Miles	-0.069 *	0.014	-0.017	0.015
	35 Miles	-0.045 *	0.012	-0.001	0.012
	40 Miles	0.007	0.011	0.048 *	0.012
	45 Miles	0.069 *	0.016	-0.123 *	0.019
	50 Miles	0.094 *	0.022	-0.162 *	0.024

Table 3: Dependent Variable = Net Growth Rate

Weight = Employment

				Net Effect of Base Changes Along Distribution of Popratio		
Variable Name	***Distance***	***Coeff***	***T-Stat***	***5% = 0.001***	***50% = 0.011***	***95% = 0.090***
Net Base Employ Change						
	5 Miles	0.001	1.84	0.001	0.000	-0.005
	10 Miles	0.000	0.57	0.000	0.000	0.000
	15 Miles	-0.001 *	-2.98	-0.001	-0.001	-0.001
	20 Miles	0.002 *	5.09	0.002	0.002	0.003
	25 Miles	-0.001 *	-3.24	-0.001	-0.001	-0.001
	30 Miles	-0.002 *	-8.72	-0.002	-0.002	-0.002
	35 Miles	-0.007 *	-24.13	-0.006	-0.006	-0.006
	40 Miles	-0.001 *	-2.86	-0.001	-0.001	-0.001
	45 Miles	-0.006 *	-26.50	-0.006	-0.006	-0.006
	50 Miles	-0.002 *	-11.36	-0.002	-0.002	-0.002
Popratio		-0.037 *	-3.07			
(Base Emp Chng) * (Popratio)						
	5 Miles	-0.062 *	-7.62			
	10 Miles	-0.050 *	-6.23			

	15 Miles	-0.014	-1.80	
	20 Miles	-0.110 *	-12.08	
	25 Miles	-0.047 *	-7.52	
	30 Miles	-0.050 *	-7.88	
	35 Miles	0.023 *	5.25	
	40 Miles	-0.044 *	-9.82	
	45 Miles	0.014	1.67	
	50 Miles	-0.068 *	-6.08	

Table 3a: Dependent Variable = Net Growth Rate

Weight = Employment

		Retail **SIC 53:Gen Merch**		***Retail*** **SIC 54:Food Stores**		***Non-Retail***		**Abs Value (Gen Mer / Non-Retail)**	**Abs Value (Food to Non-Retail)**
Variable Name	***Distance***	*Coeff*	*T-Stat*	*Coeff*	*T-Stat*	*Coeff*	*T-Stat*		
Net Base Emp Chg									
	5 Miles	-0.018 *	-2.70	-0.001	-0.48	0.002 *	3.59	10	1
	10 Miles	-0.027 *	-3.30	0.017 *	5.83	0.001	1.63	27	17
	15 Miles	-0.004	-0.64	0.003	0.97	-0.001 *	-2.44	3	2
	20 Miles	0.036 *	4.78	0.005	1.95	0.002 *	4.11	17	2
	25 Miles	-0.011 *	-2.15	-0.000	-0.18	-0.000	-1.16	26	1
	30 Miles	-0.025 *	-6.58	-0.009 *	-4.67	-0.002 *	-7.87	10	3
	35 Miles	-0.013 *	-3.05	-0.018 *	-10.04	-0.006 *	-20.43	2	3
	40 Miles	-0.023 *	-6.04	-0.009 *	-6.01	-0.000	-0.28	276	113
	45 Miles	-0.021 *	-7.02	-0.023 *	-18.73	-0.005 *	-20.81	4	4
	50 Miles	-0.009 *	-2.71	-0.007 *	-5.01	-0.002 *	-7.91	5	3
Popratio		0.041	0.29	0.012	0.18	-0.035 *	-2.52	1	0
(Base E Chng) * (PopR)									

	5 Miles	0.172	1.64	-0.061	-1.15	-0.074 *	-8.06	2	1
	10 Miles	0.002	0.02	-0.130 *	-2.85	-0.046 *	-4.90	0	3
	15 Miles	-0.098	-0.93	-0.181 *	-3.92	-0.003	-0.31	35	65
	20 Miles	-0.698 *	-5.92	-0.427 *	-8.86	-0.101 *	-9.28	7	4
	25 Miles	-0.102	-0.85	-0.079	-1.75	-0.051 *	-7.41	2	2
	30 Miles	0.223 *	2.54	-0.099 *	-2.63	-0.059 *	-7.97	4	2
	35 Miles	-0.155 *	-2.18	0.064	1.88	0.023 *	4.87	7	3
	40 Miles	0.149 *	3.23	-0.033	-1.27	-0.051 *	-10.05	3	1
	45 Miles	0.168	1.43	0.213 *	4.60	-0.001	-0.11	157	199
	50 Miles	-0.225	-1.38	-0.093	-1.79	-0.079 *	-6.13	3	1

Table 4: Dependent Variable = Absolute Value of Net Growth Rate

Weight = Employment

				Net Effect of Base Changes Along Distribution of Popratio		
Variable Name	***Distance***	***Coeff***	***T-Stat***	***5% = 0.001***	***50% = 0.011***	***95% = 0.090***
Net Base Employ Change						
	5 Miles	0.004 *	10.93	0.004	0.003	-0.003
	10 Miles	0.005 *	11.29	0.005	0.005	0.005
	15 Miles	-0.000	-0.16	-0.000	-0.000	-0.000
	20 Miles	0.006 *	18.07	0.006	0.006	0.007
	25 Miles	0.000	1.82	0.000	0.000	0.000
	30 Miles	0.002 *	8.21	0.002	0.002	0.002
	35 Miles	-0.002 *	-9.78	-0.002	-0.002	-0.002
	40 Miles	-0.004 *	-20.75	-0.004	-0.004	-0.004
	45 Miles	-0.001 *	-5.61	-0.001	-0.001	-0.001

	50 Miles	0.000 *	2.71	0.001	0.001	0.001
Popratio		0.078 *	8.20			
(Base Emp Chng) * (Popratio)						
	5 Miles	-0.079 *	-12.17			
	10 Miles	-0.021 *	-3.27			
	15 Miles	0.047 *	7.56			
	20 Miles	-0.076 *	-10.48			
	25 Miles	-0.007	-1.43			
	30 Miles	-0.026 *	-5.17			
	35 Miles	0.007 *	2.09			
	40 Miles	0.043 *	12.04			
	45 Miles	0.015 *	2.25			
	50 Miles	-0.033 *	-3.70			

Appendix I: Net Changes In Personnel At California Bases

Base/City	90	91	92	93	94	95	96
Alameda	-119	-320	-154	-1093	-1059	-1200	-1959
Barstow	-188	-27	-41	210	23	-218	6
Beale AFB	-483	-51	-106	138	-137	-47	-72
Camp Pendleton	-12354	12246	-1420	-1026	-604	-389	29
Camp Roberts	-62	0	-17	-19	33	40	33
Castle AFB	-185	-160	-501	-121	-1380	-2795	-213
China Lake	-130	-12	-269	-162	-395	-97	-512
Concord	39	295	358	-554	-405	-321	-126
Corona	-12	93	6	-112	-30	-66	-60
Coronado	-239	50	44	-459	1	2	-32
Dublin	0	0	0	0	0	104	12
El Centro	-4	7	7	-30	29	11	4
El Toro	-3007	512	-475	528	-223	-704	-210
Fort Baker	-106	0	0	0	0	0	0

Fort Hunter Ligget	0	186	9	34	-12	11	-34
Fort Irwin	-1160	2795	-898	-144	-134	260	-614
Fort Ord	-6907	6244	-2685	58	-13454	-1167	100
George AFB	-926	-439	-2828	-1507	0	0	0
Imperial Beach	-45	8	19	-24	7	-9	-35
Lathrop	-192	411	4	-546	26	132	19
Lemoore	-183	-498	-65	5	71	92	96
Long Beach	-38	-57	113	-836	-2663	-671	-2130
Los Alamitos	-89	-24	-38	-46	26	64	10
March AFB	-494	-32	-28	240	120	-1723	-1749
Mare Isle Shipyard	-2170	-2099	95	-704	-2236	-2591	-2584
Mather AFB	-834	-371	-621	-2211	-408	0	0
McClellan AFB	-751	-1944	-220	-117	-253	-1201	-302
Miramar NAS	-69	80	78	-64	-630	133	-569
Moffet Field NAS	-4	-201	-236	-987	-1256	53	-129
North Island NAS	20	-2475	111	1692	-431	76	396
Norton AFB	-380	-637	-1121	-3014	-2204	-35	-164
Oakland Army Base	-316	0	0	0	0	0	0
Oakland Naval Supply	-225	-102	-422	-406	-431	-1472	-1477
Palmdale	123	-8	46	2	-2	-8	-1
Point Mugu	132	-91	-122	-213	-438	-259	-833
Port Hueneme	102	190	-62	32	-456	-281	-154
Presidio of SF	416	187	-990	-1069	-1238	-1587	-137
Sacramento	-486	-1342	2261	-1947	-1678	832	-183
San Diego NS	-4656	-1552	757	-1439	-7136	-2374	-1944
Santa Ana	8	330	37	-1299	197	-77	-420
Seal Beach	-36	49	-3	-133	-1013	802	7
Skaggs Island	-18	1	-81	-174	0	0	0
Stockton	-46	31	-36	-87	-166	-110	-11
Travis AFB	-644	216	-284	-73	327	703	-84
Treasure Island	0	0	0	0	0	0	0
Twentynine Palms	-2743	4050	44	419	-570	396	-314
Vandenberg AFB	-240	-61	-79	71	10	48	106
Total	-39701	15478	-9813	-17187	-40172	-15643	-16234

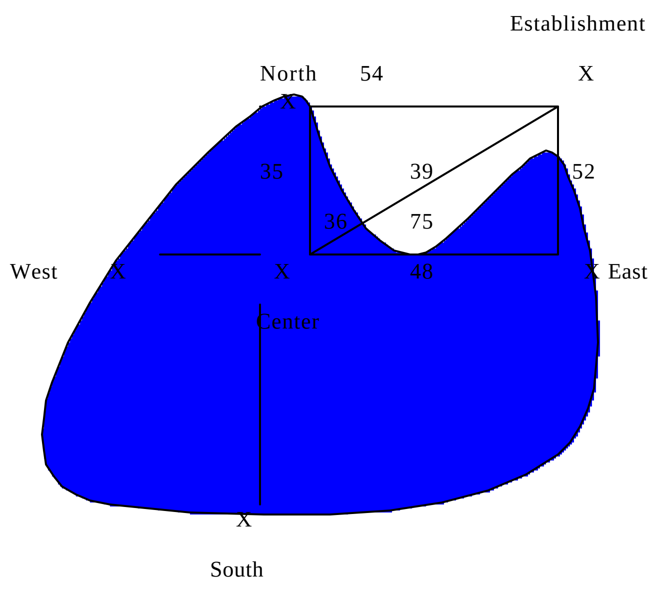
Appendix II: Minimum average distance algorithm

Most military bases are irregularly shaped, so it is likely that relying only on the four "corners" of the base to compute distances will overestimate how far a sizeable fraction of establishments really are from individual bases. To mitigate this problem I take the weighted average of the distance between the base's center and its corners closest to the establishment and subtract it from the distance from the bases's center to the establishment. This process is exhibited in Figure 7 on the following page.

Figure 7 shows a typically shaped military base with an establishment nearby it. Note the five coordinates labeled Center, North, South, East, and West that approximate the four points of the compass and the center of the base. Let the distance from the northern edge of the base to the establishment is 54 units, from the east its 52. The radii of the base to these two points are 35 and 48.

The distance from the center to the establishment is 75 but it lies only 36 units from the edge of the base in direct line from the center.

Define R_n as the distance from the center of the base to the mark on the northern edge. Similarly define R_e, as the distance to the eastern corner. E_n is the distance from the eastern edge of the base to the establishment and N_n is the analogous measurement from the north. My weighted average approximation of the distance from the center to the base to the edge in direct line with the establishment (whose 'true' value is 36) is labeled 'Rhat' on the diagram and is equal to 41.6 units. The true distance from the edge of the base (on the line from the center to the establishment) is equal to the distance from the center to the establishment minus the distance from the center to the edge of the base and is labeled 'Distance'. It is equal to 39. The estimated value of this distance (Dhat) is equal to the distance from the center to the establishment minus Rhat and is equal to 33.4. This value is slightly less than the actual value of this distance but is much closer to the 'true' distance from the base to the establishment than either of the distances from the closest corners.



Appendix 3 : Running Total of New Employment at BRAC Bases

Installation / City	Year / Source*				
	1996 / OEA	1996 / CEDAR	1995 / CEDAR	1994 / CEDAR	1993 / OEA

Alameda NAS		200			
Castle AFB	346	400	100	50	
El Toro					
Fort Hunter Liggett					
Fort Ord	544	600	300		
George AFB	393	450	100		0
Hamilton Army Airfield					
Hunters Point		500	500	100	
Long Beach	42				
Mare island			100		
March AFB	38	50			
Mare Isle Nav Shipyard	480	950			
Mather AFB	1,202	1,000	1,000	25	0
McClellan AFB					
Moffet Field NAS	202	2,009			
Norton AFB	689	2,200	600	125	
Oakland					
Oakland Army Base					
Presidio of San Francisco	1,040	1,040	100		
Sacramento	5,000	5,000	2,500		
San Diego		300	300		
Sierra Army Depot					
Treasure Island		300	300		
Tustin					

* OEA = Office of Economic Adjustment, U.S. Department of Defense
CEDAR = California Economic Diversification and Revitalization**

** I would like to thank Heather Wheeler at CEDAR for her generous assistance in obtaining these data