

TEACHERS' RETIREMENT BOARD

REGULAR MEETING

Item Number: **9**

SUBJECT: Economic Impact of CalSTRS Investments

CONSENT:

ATTACHMENT(S): 1

ACTION:

DATE OF MEETING: November 6, 2014 / 45 mins.

INFORMATION: X

PRESENTER: Ed Derman

PURPOSE

The purpose of this item is to introduce the 2014 study of the economic impact of CalSTRS investments in California.

BACKGROUND

At the September 2013 meeting, the results of a study of the economic impact of benefits paid by CalSTRS were presented to the board. The study being presented at this meeting uses a sectoral-share approach to estimate jobs supported in California by the companies in the CalSTRS investment portfolio. Data from the four main asset classes were evaluated. These asset classes account for about 96 percent of the total portfolio and include: global equities (57 percent of the portfolio), fixed income (16 percent), real estate (12 percent) and private equity (11 percent).

There is no universally accepted methodology for a study of this type because the impact of financial markets on the “real economy” (employment, real wages, interest rates and so on) is often debated by economists. While the impact of an investment in a start-up company can be quantified more directly, the impact of secondary investments in non-IPO shares of stocks or bonds is more diffused and complex. Nonetheless, CalSTRS’ investments in these markets provide critical financing for ongoing operations of these companies.

KEY FINDINGS

This item highlights the key finding of the study as the full report from Dr. Ashok Bardhan is attached.

For calendar year 2013, CalSTRS’ investments in California in public equities, fixed income, private equity and real estate totaled \$19.38 billion—15.2 percent—of CalSTRS’ \$127.4 billion invested in the U.S. The portfolio is thus weighted toward California as federal economic data indicates the state accounts for 11.2 percent of the U.S. economy in terms of employment and

about 13 percent in terms of gross domestic product. California has a disproportionate share of high-growth sectors, including technology, biotechnology and media, and CalSTRS has significant investments in many companies in these sectors.

This study estimates that between 2.1 million and 2.8 million jobs are supported in California by the companies in CalSTRS' investment portfolio. CalSTRS' portion of these jobs is calculated by multiplying CalSTRS' percentage of ownership by the jobs estimated from the sectoral-share approach. This results in a range of 85,000 to 87,000 jobs supported in California by CalSTRS' investments.

PRESENTER

Dr. Ashok Bardhan was formerly Senior Economist at the Fisher Center for Real Estate & Urban Economics, Haas School of Business, UC Berkeley. He has an M.S. (Physics/Mathematics, Russia), an M.Phil. (International Relations, India), and a Ph.D. (Economics, Berkeley). He is lead co-author of the book, "Globalization and a High-Tech Economy: California, US and Beyond" (Springer 2004), and lead co-editor of two recent books: "Global Housing Markets: Crises, Policies and Institutions," (Wiley 2011) and "The Oxford Handbook of Offshoring and Global Employment" (Oxford University Press 2013).

Dr. Bardhan's research interests encompass the economy of California, housing and real estate, and global linkages of the technology sector. His work includes papers and consulting on global financial integration and real estate; on sources of sustainable urban development; on innovation issues in manufacturing versus services; on the impact of global capital flows on US mortgage markets; and on globalization and offshoring of Research & Development.

Dr. Bardhan has been a consultant to technology startups, and to international trade, finance and real estate firms.

Dr. Bardhan's work and research has been featured in the New York Times, the Economist, Wall Street Journal, Brookings Institution Policy Briefs, U.S. House and Senate filings, Financial Times, Council on Foreign Relations, National Academy of Sciences, Institute of International Economics, OECD and scores of other publications of both academic and non-academic nature, in the U.S., Europe and Asia.

IMPACT OF CALSTRS' INVESTMENTS ON CALIFORNIA'S ECONOMY

Dr. Ashok Bardhan

Former Senior Economist
Fisher Center for Real Estate & Urban Economics
Haas School of Business
University of California, Berkeley

EXECUTIVE SUMMARY

The California State Teachers' Retirement System is the largest educator-only pension fund in the world with an investment portfolio valued at \$189.1 billion as of June 30, 2014. Its investments comprise a range of asset classes that include public equities, fixed income, private equity and real estate.

This report analyzes the impact of CalSTRS' investments on the California economy, including estimates of jobs supported in the state. There is no universally accepted methodology to assess this impact. The first step in a study of this kind is to estimate the number of jobs a company in the CalSTRS investment portfolio has in California. A common method to measure impact is by multiplying a company's percentage of facilities in California by the company's number of employees. While this approach represents one attempt to evaluate job impact, it is one of the many methods currently under debate.

This study, unlike previous studies by other pension plans, uses a more detailed sectoral-share approach to estimate jobs supported in California by the companies in CalSTRS' investment portfolio. This approach estimates jobs supported by (1) identifying the detailed economic sectors where the companies in CalSTRS' investment portfolio operate, and (2) multiplying California's share of total U.S. employment in those sectors by each company's number of employees.

The following is an example of how the sectoral-share approach estimates jobs in California for CalSTRS' public equity and fixed income portfolios:

CalSTRS invests in Company A, which employs approximately 265,000 people in the U.S. and operates in the banking sector. California's share of U.S. employment in the banking sector is about 10 percent. The sectoral-share approach estimates Company A's jobs in California by taking a 10 percent share of 265,000 jobs. Thus 2,650 of this company's total jobs are attributed to California.

Analyses of CalSTRS' top 300 firm holdings, including Apple, Exxon and Microsoft, were used to highlight impacts such as jobs supported and its concentrations in the different regions in the state.

For calendar year 2013, CalSTRS' investments in California in public equities, fixed income, private equity and real estate totaled \$19.38 billion—15.2 percent—of CalSTRS' \$127.4 billion invested in the U.S.

Estimates for jobs supported by CalSTRS' private equity portfolio also begin by identifying the economic sectors where the companies operate. However, public information on private equity ownership is limited. To overcome this constraint, the employment number for the median-sized private company in the same sector in California is used instead, and data on private companies with headquarters in California is available from Hoovers. This employment number is applied to each of CalSTRS private equity investments in the same sector, and the jobs are totaled. A simplified example is below:

Assume CalSTRS' investment in private equity includes only two companies: one company in media and a second company in pharmaceuticals. The Hoover database shows that a median-sized privately-held company in the media and pharmaceutical sectors in California employs 250 and 500 people respectively, resulting in a total of 750 jobs in this scenario.

Finally, jobs supported by CalSTRS' real estate portfolio are estimated from two economic input-output models. These models take into account the interconnections and linkages between various sectors of the economy, how expenditures get distributed across sectors, and how further rounds are induced and the impact they produce. They are used by public and private-sector entities to capture the economic multiplier effect in a specific geographic region. The models estimate that CalSTRS' numerous real estate investments support 79,000 jobs in California.

The study estimates that, together with other investors, between 2.1 million and 2.8 million jobs are supported in California by the companies in CalSTRS' investment portfolio. CalSTRS' share of these jobs is calculated by multiplying CalSTRS' percentage of ownership in these companies by the jobs estimated from the sectoral-share approach. This results in a range of 85,000 to 87,000 jobs supported in California by CalSTRS investments.

IMPACT OF CALSTRS INVESTMENTS ON CALIFORNIA'S ECONOMY

INTRODUCTION

The California State Teachers' Retirement System is the largest educator-only pension fund in the world. CalSTRS was founded in 1913 and provides retirement, disability and survivor benefits to California's public school educators and their families. While it began with 120 retired members and 15,000 active members, today CalSTRS serves California's 868,000 public school educators and their families from the state's 1,600 school districts, county offices of education and community college districts.

As of June 30, 2014, the CalSTRS investment portfolio was valued at \$189.1 billion. CalSTRS administers a hybrid retirement system, consisting of traditional defined benefit, cash balance and voluntary defined contribution plans as well as disability and survivor benefits. CalSTRS is administered by the Teachers' Retirement Board, which is responsible for maintaining sound, healthy and stable returns to ensure current and future benefits to CalSTRS members, their families and survivors. The twelve board members set policies, make rules for the system and ensure benefits are paid in accordance with legal statutes. Day-to-day operations of the system are the responsibility of the nine-person Executive Staff.

CalSTRS assets come from contributions by members and employers, investment earnings, and appropriations from the State of California's General Fund. CalSTRS investments comprise a whole range of asset classes—including domestic and foreign public equities; holdings of fixed income securities, including corporate bonds, U.S. treasuries, mortgage and other asset backed securities, and short-term loan positions; investments in private equity and venture funds; and real estate investments. As a public pension fund, CalSTRS has a long-term investment horizon.

Like any other large institution with significant fiduciary responsibilities, CalSTRS invests in a very wide range of asset classes so as to diversify and minimize risk, while striving to achieve healthy returns. With regard to geographic distribution, CalSTRS invests locally in California, domestically across the U.S., and globally. California is an obvious target for investments because its Gross State Product, or total output of goods and services by the state's economy, was \$2.2 trillion in 2013. This makes California the seventh largest economy in the world, and it accounts for about 13 percent of U.S. gross domestic product.¹

California has an innovative, dynamic and fast-growing economy that provides a range of attractive opportunities for various investments. It is a global leader in the high-tech, innovation and service sectors, and it has a very large number of locally-headquartered companies that are globally competitive. California has been on the cutting edge of every emerging industry for

¹ http://www.bea.gov/newsreleases/regional/gdp_state/2014/pdf/gsp0614.pdf

decades and is a significant exporter of high-tech goods and services. It is also home to high-skilled labor and is located on the Pacific Rim, the most dynamic economic region on the planet.² CalSTRS is a long-term investor with a long-term vision. Its primary fiduciary responsibility is to ensure stable and healthy returns that support benefit payments to its members. Yet, this responsibility can be compatible with investment in California's thriving economy. Investment in California can serve a deeper social commitment to the members of CalSTRS and their families—most of who reside in the state—and to the long-term interests of California residents because these investments help promote a bright future for the state, which in turn sustains a healthy and vibrant public school system.

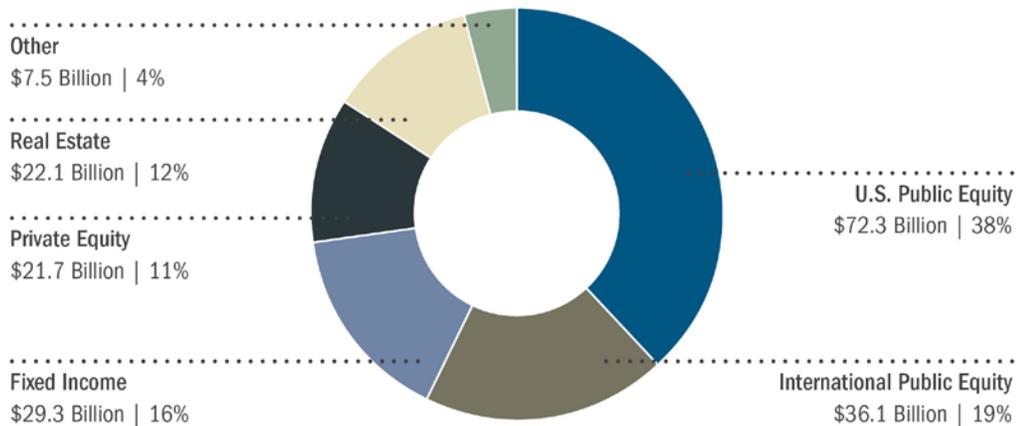
This report analyzes the economic impact of investments made by CalSTRS on the state of California. The report deals with the economic impact on the ground, specifically the impact on *employment*, of four asset classes:

1. Publicly-traded U.S. equities: Stocks of public companies traded on stock exchanges in the United States, such as Apple, IBM and so forth.
2. Fixed income securities: Investments in bonds issued by the U.S. government, such as U.S. treasuries and agency securities; bonds issued by companies, such as corporate bonds; mortgage-backed securities and asset-backed securities; and high-yield securities.
3. Private equity investments: Investments in privately held companies that are typically not publicly traded on stock exchanges; investments in venture funds; and other funds involved in private placements.
4. Real estate investments: Investments in land, residential, office, industrial and retail properties at various stages of the investment cycle.

² <http://www.census.gov/foreign-trade/statistics/state/data/ca.html>. Also, see Bardhan et al *Globalization and a High-Tech Economy*. Springer US, 2004.

Figure 1

CalSTRS Holdings by Asset Category



Note: Data as of June 30, 2014

The shares of various types of asset classes in CalSTRS' investment portfolio are depicted in Figure 1 above, with stocks—both U.S. and international—accounting for about half of the entire portfolio, followed by fixed income, real estate and private equity investments.

The objective of this report is to answer the following questions:

- What share of CalSTRS' investments is apportioned to California?
- Are CalSTRS' investments weighted toward California?
- How do CalSTRS' investments impact the economy of California?
- How do CalSTRS' investments affect the level and pattern of employment in the state?
- How many jobs in the state do CalSTRS' investments support?

Research is scarce from globally-invested pension funds that seek to answer these types of questions. Also, a universally accepted methodology does not exist. In particular, measuring the regional employment impact of publicly-traded companies with widespread global presence is complex. Isolating that impact to the boundaries of California from their globally-aggregated financial and employment records requires the development of assumptions and methodology about how their business activity is distributed geographically and how investment ownership—including ownership acquired through secondary market transactions—truly impacts employment. Similarly, measuring the employment impact of ownership in private equity companies, where proprietary information is closely held and public databases offer limited information, presents other challenges. Each of the four asset classes presented unique constraints for this study.

Share of California's Economy in the United States

In this report, a sectoral-share approach is used to estimate how many jobs in California are supported by companies in CalSTRS' investment portfolio. Then, CalSTRS' percentage of ownership is applied to this employment figure to estimate a final range of employment impact values.³

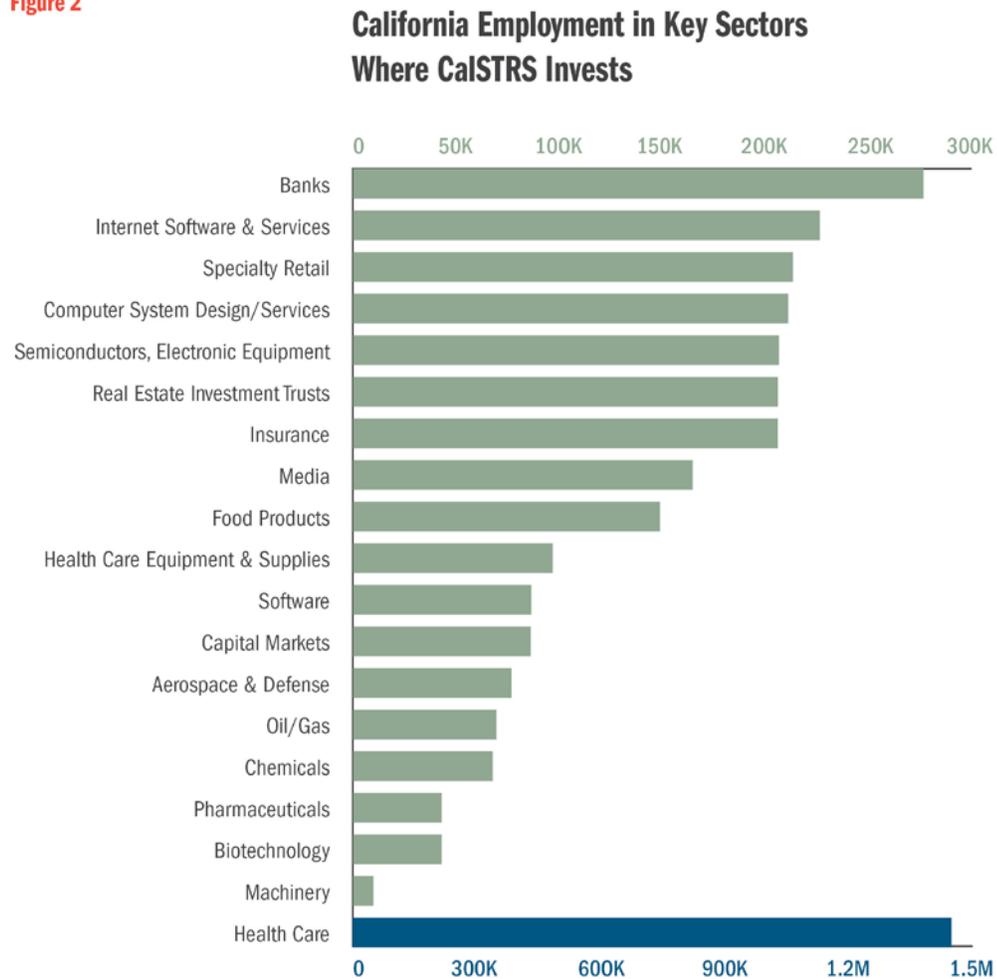
To begin, California's share of total U.S. employment is calculated for each relevant sector in which these companies operate.⁴ Figure 2 below shows the total employment for key sectors in California where CalSTRS invests.⁵ The sector with the largest employment in the state is healthcare providers and healthcare services, with 1.45 million people out of total state employment of 12.7 million. Other sectors with significant employment include banks, internet software and services, specialty retail, computer systems design and services, and semiconductors and electronic components.

³ This exercise is undertaken because firms report overall employment, not employment by state.

⁴ Sources used: Sector descriptions of individual investments/firms are matched with the North American Industry Classification System codes at Census.gov. Total employment by firm is obtained from Hoover's and from ReferenceUSA databases. Raw employment data by sector for both the U.S. as a whole and for California is downloaded from the Annual Survey of Manufacturers and from County Business Patterns through the American factfinder website: <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml#none>.

⁵ Reliable sector-wise employment data was available for 2011, so the share calculations are based on that year.

Figure 2



Note 1: CalSTRS has investments in 66 economic sectors. Not all sectors are shown in Figure 2.

Note 2: Health Care is by far the largest sector by employment and is represented along the bottom axis.

While Figure 2 shows absolute employment numbers in California, Figure 3 below shows that the media, semiconductors & equipment, and software sectors in California have the highest share of U.S. employment (compared to all sectors in which CalSTRS invests). Overall, California’s share in the U.S. economy is 11.2 percent in terms of total U.S. employment.

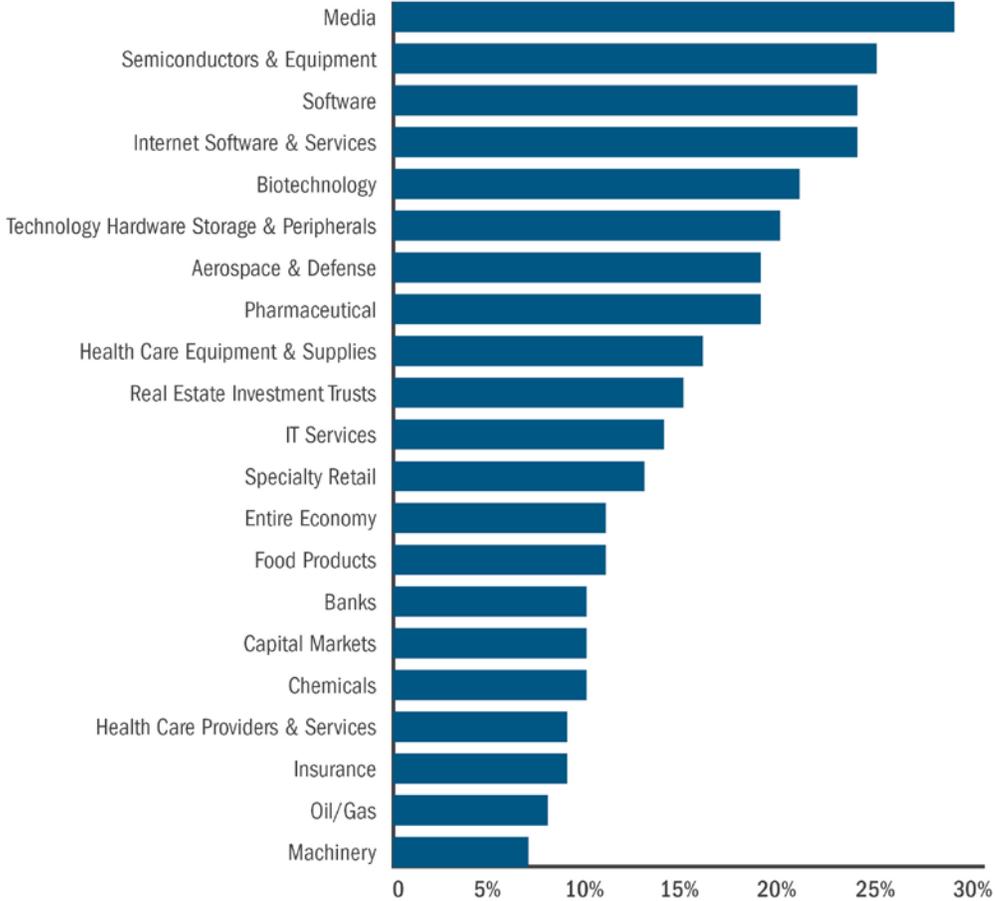
As Figure 3 shows, California has a disproportionate⁶ share of employment in key high-tech sectors, such as hardware storage, Internet software and services, semiconductors and semiconductor equipment, biotechnology and media. Because the market value of companies in these sectors represents a relatively higher percentage of the total public equity market, the CalSTRS portfolio has significant investments in many companies in these sectors, meaning a

⁶ “Disproportionate” or “weighted toward California” are phrases used in this report to imply a share greater than 11.2 percent, which is the average share of California in total U.S. employment. This 11.2 percent is the key benchmark for the state’s share in U.S. economic activity.

large share of CalSTRS' investments are weighted in favor of California and thus support a larger than average share of employment in the state. Companies in CalSTRS' public equity portfolio have a share in California of 13.2 percent by employment.⁷

Figure 3

California Share of U.S. Employment in Key Sectors Where CalSTRS Invests



Note: CalSTRS has investments in 66 economic sectors. Not all sectors are shown in Figure 3.

PUBLICLY-TRADED EQUITIES

CalSTRS investments in U.S. and non-U.S. public equities totaled approximately \$102.5 billion as of December 31, 2013. These investments are controlled by the Global Equity Policy, which was established by the Teachers Retirement Board. The Global Equity Policy defines the Fund

⁷ This share is higher than California's 11.2 percent share of U.S. employment.

investment objectives, strategic asset allocation, risk constraints and portfolio structure, and sets boundaries that ensure prudence and care in the management of Global Equity assets. The Policy mandates a three-part global portfolio comprised of U.S., non-U.S. developed and emerging market countries. The investment objective for Global Equity is to invest its assets to improve the diversification of the total investment portfolio and to enhance its risk-adjusted total return.

CalSTRS manages the asset allocation, selection, and oversight of all portfolios. The broad equity portfolio target composition is two-thirds U.S. equities and one-third non-U.S. equities, with a range of plus or minus 10 percent. U.S. equities are invested using passive and active management strategies. The target for passive management is 70 percent, while the target for active management is 30 percent, and both have a range of plus or minus 10 percent. To the extent that companies in the CalSTRS benchmarks have a significant California presence, a strategy toward passive investment will result in a greater share of CalSTRS investments in California. CalSTRS employs a mix of in-house asset management expertise and external professional asset management firms.

Top Public Equity Holdings

Figures 4 and 5 below show CalSTRS' major public equity investments by sector and the top holdings in individual publicly-traded companies, respectively. The total market value of U.S. public equities as of December 31, 2013, was \$66.65 billion. Approximately 34 percent of these investments were in companies at least partly involved in manufacturing.⁸

Most of CalSTRS' major holdings are in large corporations—a veritable who's-who of the industrial flagships of the U.S. economy. Overall, CalSTRS invests in 3,156 publicly-traded U.S. companies. A judgmental sample of the top 300 holdings in U.S. equities accounts for \$48.95 billion—73.5 percent—of total CalSTRS investments in U.S. publicly-traded companies⁹. The average investment in these companies is \$163 million, and the weighted average share of CalSTRS' holdings in market capitalization of these 300 companies is 0.32 percent.¹⁰

⁸ Manufacturing is defined here as the production of tangible goods, such as oil and gas, in addition to the traditional definition of manufacturing. Manufacturing is mentioned because many economists believe it plays a vital role in creating well-paying jobs, promoting productivity growth, and developing and delivering services.

⁹ CalSTRS top 300 holdings' share of California employment is 14 percent, compared to 13.2 for the entire public equity portfolio.

¹⁰ While this might seem small relative to the market cap of these companies, it should be noted that these are publicly-traded companies with very large market caps. For example, CalSTRS has over \$1.5 billion invested in Apple, but the market cap of the company is over \$500 billion. Large institutions are very well diversified and have to be careful about the impact of their investments on the market price. In fact, there are very few companies in which CalSTRS' share of investment is more than 1 percent of the company's market cap.

Figure 4

Major Investments by Sector

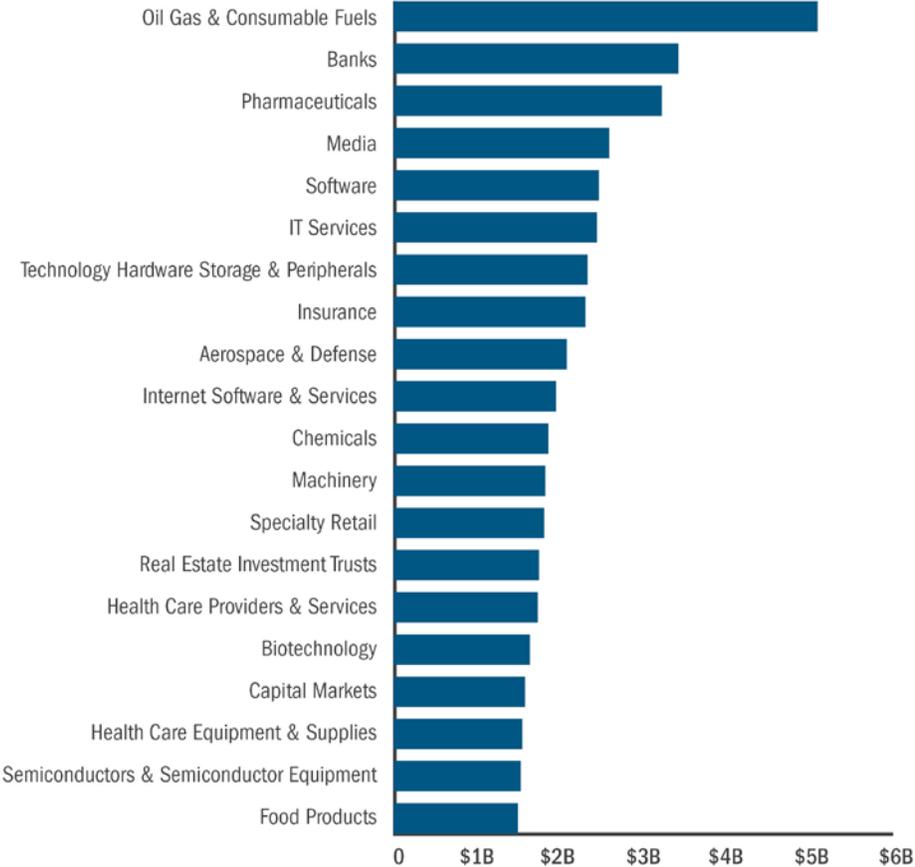


Figure 5

Major Holdings of U.S. Public Equities

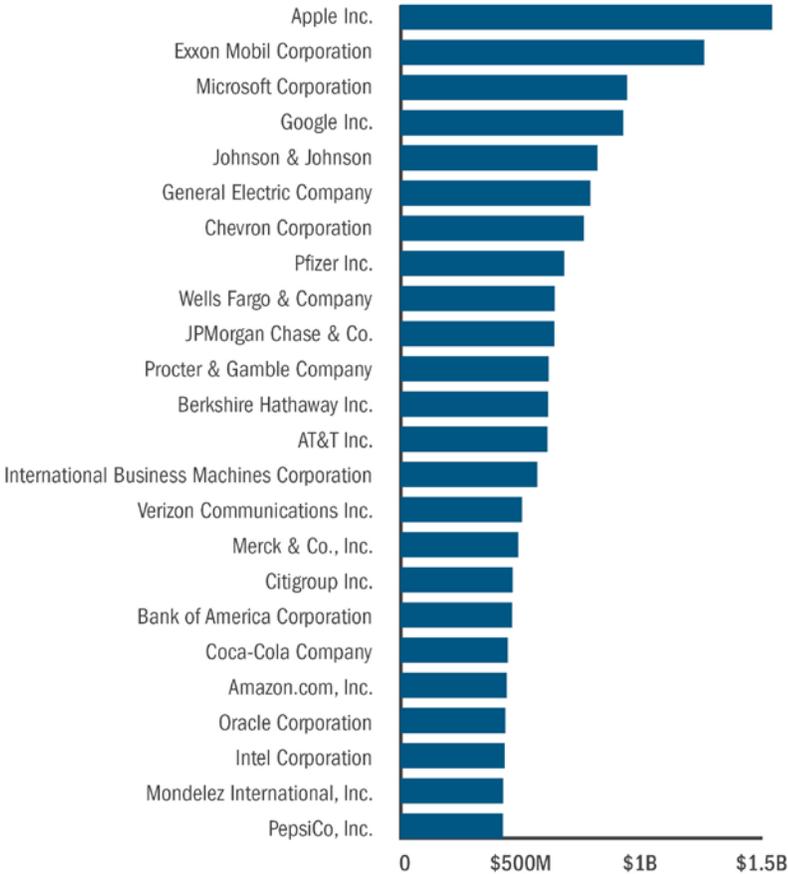


Figure 6 below shows the geographic distribution across the United States of CalSTRS' top 300 investments in publicly-traded U.S. companies.

Figure 6

Headquarters of Top 300 Holdings of U.S. Equities



Forty-six companies—15 percent—within CalSTRS' top 300 holdings are headquartered in California. Of these 46 companies, 32 have their headquarters in the Bay Area and 14 have their headquarters in Southern California. The market value of CalSTRS' investments in these 46 companies totals \$10.3 billion—21 percent—of the \$48.95 billion invested in the top 300 holdings. In other words, there is a tilt toward California-headquartered companies in CalSTRS' top 300 holdings. The Bay Area-based companies in CalSTRS' public equity portfolio support 1.55 million jobs overall, and the Southern California companies support 501,000 jobs.

Figure 7
 Bay Area Holdings of U.S. Equities

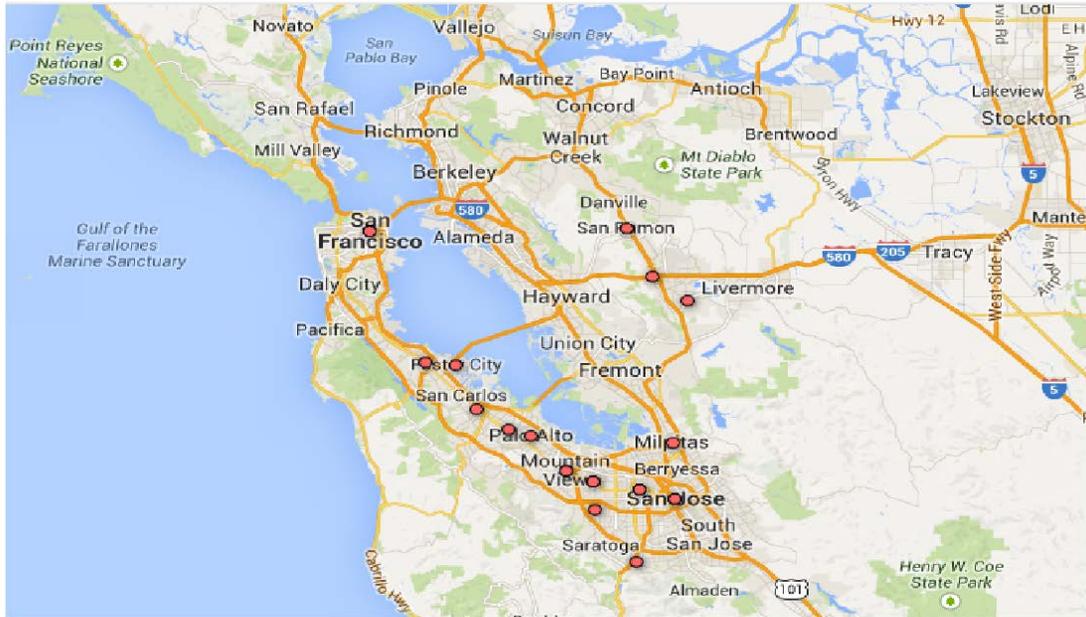
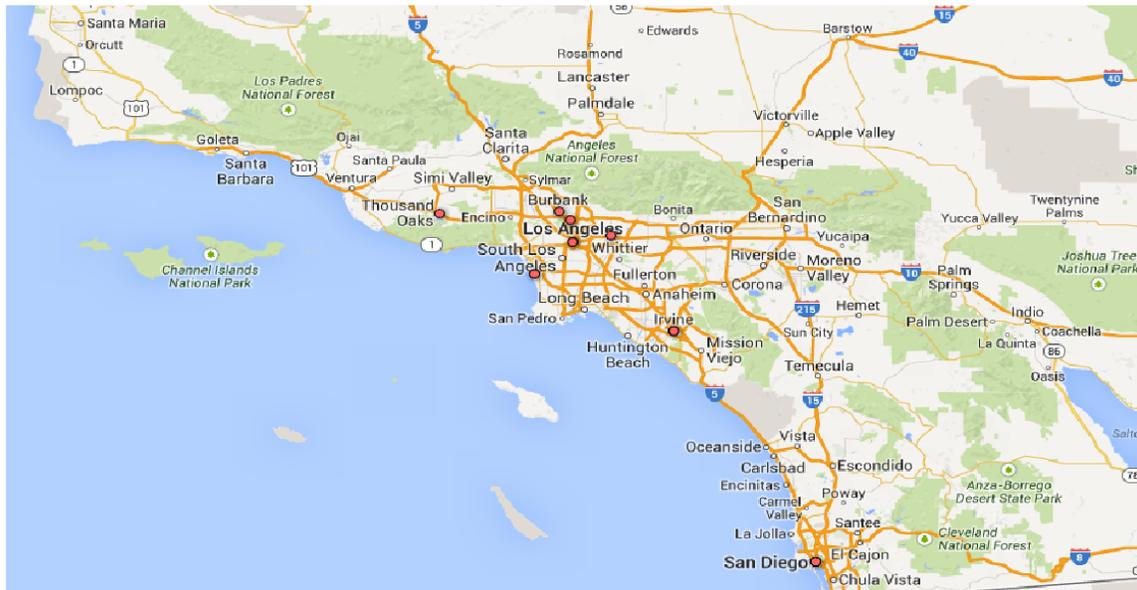


Figure 8
 Southern California Holdings of U.S. Equities

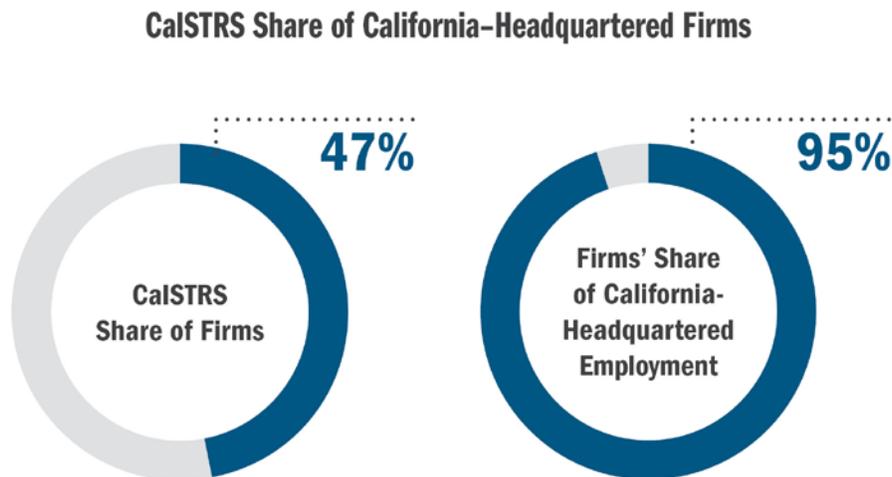


The high-tech dominance of the Bay Area is underscored by the fact that 21 of the 32 companies operate in high-tech sectors such as Internet and information technology, semiconductors and biotechnology. In Southern California, four out of the 14 are high-tech companies.

CalSTRS Investments in Publicly-Traded Companies (California-Headquartered)

CalSTRS invests in 471—nearly 50 percent—of the 996 publicly-traded companies headquartered in California. This is a total market value of \$12.6 billion of investments in these companies, or 18.9 percent of the \$66.65 billion invested in the 3,156 publicly-traded U.S. companies. These 471 companies account for 3.47 million out of 3.63 million—95 percent—of the total employment of all the California-headquartered publicly-traded companies. Total employment of these companies at their headquarters is on average 6.38 percent, or 231,690. The total employment number in the state for all California-headquartered companies in CalSTRS’ portfolio is 18.34 percent of 3.47 million, or 636,701 jobs.¹¹

Figure 9



¹¹ See Appendix for complete methodology. In short, data is downloaded from databases on all California-headquartered publicly-traded companies. This data is matched with all 3,156 equities in CalSTRS’ portfolio. California-headquartered companies are isolated within the top 300 (46) and within the remaining 3,156 (425). The employment data for these companies is obtained from ReferenceUSA and Yahoo Finance. CalSTRS’ generic sector description for each company is matched with the North American Industry Classification System codes. California’s share of total U.S. employment is calculated for each NAICS code, and then for each company. In many cases there were multiple NAICS codes for CalSTRS’ generic sector descriptions. For the California-headquartered companies in the portfolio, the share is 18.34 percent, as a whole, although for each company the share is different depending on the NAICS code. The share is applied to individual company employment data. The California employment for all companies is then summed up.

CalSTRS Investments in All U.S. Publicly-Traded Equities (Not Just California-Headquartered)

To assess the employment impact of all 3,156 U.S. companies in CalSTRS' portfolio, a judgmental sample of the top 300 holdings are analyzed. The sectoral-share approach is applied to these top 300 investments, which account for 73.5 percent of the entire equity portfolio. The total global employment in these top 300 holdings is 19.8 million. The share approach—using sector matching, taking California's share of U.S. employment by sector and applying that share to the employment of these 300 companies—gives a 13.2 percent employment share in California. Not surprisingly, this 13.2 percent is lower than the 18.34 percent employment share for California-headquartered companies, which represent and specialize in sectors of comparative advantage for the state.

However, it should be noted that 13.2 percent still suggests a California-oriented stance in terms of those sectors where the state has a higher than “normal” 11.2 percent share¹². The employment in California in CalSTRS' top 300 investments is 2.63 million, or 13.2 percent of 19.8 million. Thus, the 3,156 companies in CalSTRS' U.S. equity portfolio have a total number of jobs in California of 3.57 million.¹³

A number of caveats should be added to the employment estimates of companies in CalSTRS' portfolio. Databases report *global* employment figures for individual companies, not U.S. employment. This is a data issue that all such studies have to contend with. Therefore, it is appropriate to adjust the employment estimate in California by the average share of foreign employment of U.S. companies. Researchers differ regarding the share of foreign employment of major U.S. companies, but the range is 50 percent to 68 percent.¹⁴

Upon applying this range, the estimated employment in California of companies in CalSTRS' U.S. equity portfolio ranges from 1.78 million to 2.4 million, which includes jobs supported in California-headquartered companies. This does not suggest that CalSTRS “creates” these jobs because CalSTRS' ownership is predominantly from secondary market investments transacted on the stock exchange (see Appendix). Also, there is a host of other investors in these companies. However, together with other investors, CalSTRS' investments do support the ongoing operations of these companies and the employment they generate.¹⁵

In summary, CalSTRS average investment share of the market capitalization of these companies is 0.32 percent. Therefore, of the 1.78 million to 2.4 million estimated California jobs at companies in CalSTRS' public equity portfolio, it can be said that CalSTRS supports 5,700 to 7,700 of them.

¹² California's share of U.S. employment, as referenced earlier.

¹³ By proportionate extrapolation, under the assumption of similar sectoral structure for the remaining companies.

¹⁴ <https://www.project-syndicate.org/commentary/are-us-multinationals-abandoning-america->, and a number of Bureau of Economic Analysis and other reports.

¹⁵ It could be pointed out that others could have invested in these stocks if CalSTRS had not done so. True enough, but ultimately the investment by someone is critical and necessary to finance firm activity, both in primary and secondary markets, and hence sustain those companies and jobs.

Fiduciary Objective and Investments in California

Investment results are critical to a mature pension plan like CalSTRS, meaning its primary fiduciary responsibility centers on balancing the overall risk-return mix, regardless of investment location. CalSTRS does not target investments because they are located in the state, but if all things were equal, CalSTRS would give preference and consideration to a California-based investment. The economic prosperity of the state, school districts and CalSTRS members is in the long-term interest of the fund, but ancillary benefits do not take precedence over risk and return.

However, California is fertile ground for investment because of its growing, dynamic and innovative economy, and because high-tech sectors are good investment vehicles. California-based companies have a disproportionate share of the total market value of publicly-held companies. As such, CalSTRS' predominantly-passive U.S. equity investment strategy¹⁶ means its investments gravitate toward companies headquartered in the state, as well as toward companies that have a sectoral composition more heavily weighted toward California. The fact that these objectives are not contradictory is validated by CalSTRS' portfolio. For example, the weighted average total returns of California-headquartered companies in 2013 are significantly higher than for the portfolio as a whole.¹⁷

	Average Return 2013	Weighted Average Return* 2013
46 California-headquartered Companies in Top 300 U.S. Equity Holdings	47.4%	39.6%
All 471 California-Headquartered Companies	51.8%	37.7%
All 6,029 U.S. and Global Equity Holdings	31.4%	35.2%

*Weighted by market value of holdings. Also, CalSTRS investments are higher, on average, in those California-headquartered companies that support higher employment, which is also partly a result of larger investments going to larger companies.¹⁸

¹⁶ U.S. equities have a target for passive management of 70 percent and a target for active management of 30 percent.

¹⁷ While the calculations for the 471 California-headquartered companies are only for 2013, the five-year returns, as of August 15, 2014, for some of the key California-weighted sectors in which CalSTRS invests are as follows: media 240.7 percent; the entire IT cluster 105 percent; biotechnology 258 percent; aerospace and defense 126 percent; pharmaceuticals 97.3 percent; versus 94.7 percent for the S&P as a whole (source: E-research Fidelity).

¹⁸ It is not just a size effect, because the correlation between investments and employment in all California companies with CalSTRS investments (both big and small) is higher than that for the large 46 companies headquartered in the state.

FIXED INCOME INVESTMENTS

Fixed Income is the first internally managed asset class at CalSTRS. As of December 31, 2013, CalSTRS invests \$28.1 billion in fixed income assets and an additional \$18.7 billion in short-term securities. CalSTRS internally manages portfolios consisting of U.S. dollar denominated securities, including short-term securities, U.S. Treasury and Agency securities, mortgage-backed securities, commercial mortgage-backed securities, investment grade corporate bonds and high yield securities. CalSTRS also oversees external managers who assist in the management of \$5.1 billion in opportunistic global fixed income strategies that range from high yield bonds and bank loans to structured real estate investments. CalSTRS operates several non-core programs, such as securities lending, internal and external currency management, and a \$600 million Global Inflation Securities portfolio.

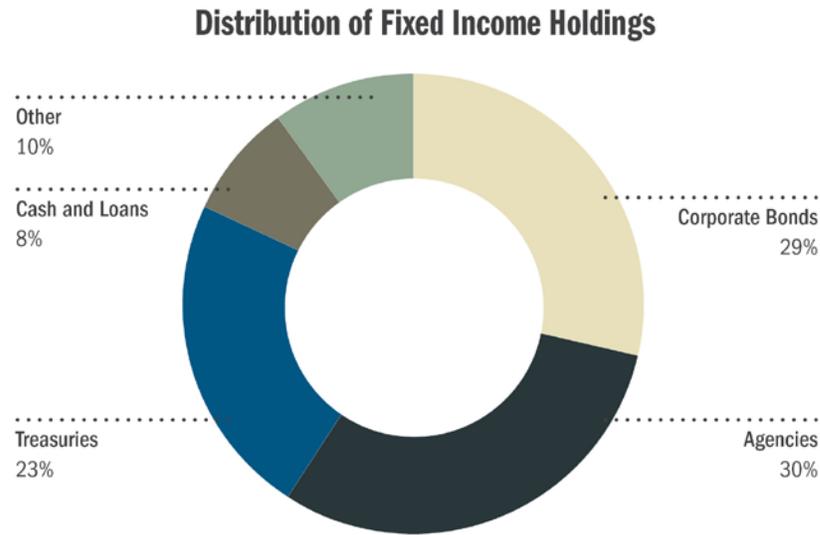
The fixed income group of investments also includes an additional portfolio involving a portion of the cash collateral held for lending activity. Fixed income holdings are well diversified across a number of classes of fixed-income securities as shown in Table 1 and Figure 10 below.

Table 1

CATEGORY	AMOUNT (\$ BILLION)	ADDITIONAL AMOUNT IN COLLATERAL PORTFOLIO (\$ BILLION)
TOTAL FIXED INCOME	31.50	13.74
CORPORATE BONDS	9.18	2.93
AGENCIES	9.60	1.09
TREASURIES	7.16	
CASH EQUIVALENT	2.50	7.26

Note: Data as of June 30, 2013

Figure 10



Note: Data as of June 30, 2013

Corporate bonds will be the primary focus of this section because they are the most relevant securities to measure impact on California employment.¹⁹ CalSTRS invests in 2,527 different corporate bonds that belong to 1,317 unique companies globally. The median year of maturity of these bond holdings is 2020 and the average coupon rate is 5.95 percent.

While there is a significant component of foreign corporate bond holdings, the major share falls on U.S. companies. Figure 11 below shows the distribution of corporate bonds by broad categories and Table 2 lists some of CalSTRS top corporate bond investments in U.S. companies.

¹⁹ U.S. treasuries and agency securities matter in terms of the impact on interest rates, which are a nationwide phenomenon.

Figure 11

Distribution of U.S. Corporate Bond Holdings

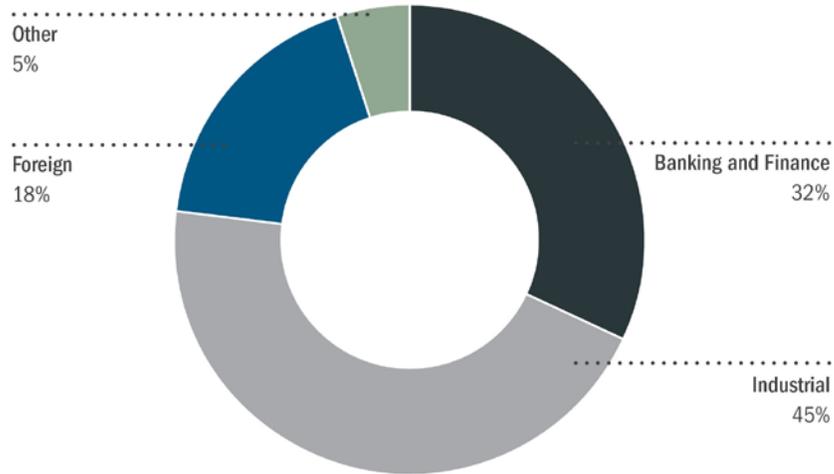


Table 2

TOP CORPORATE BOND HOLDINGS	
COMPANY NAME	MARKET VALUE OF HOLDING (\$ MILLION)
JPMORGAN CHASE	254.36
GENERAL ELEC CAP CORP	187.68
BANK OF AMERICA	186.45
GOLDMAN SACHS GROUP	161.37
CATERPILLAR	108.34
LEHMAN BROTHERS	100.92
WELLS FARGO BANK	96.74
COMCAST CORP	77.23
WAL MART STORES	71.84
VERIZON COMMUNICATIONS	55.25

Corporate Bonds of California Companies and Entities, and California's Share in Residential Mortgage Backed Securities (RMBS) and Asset Backed Securities (ABS)²⁰

CalSTRS invests in debt obligations of 95 different California-headquartered public and private companies, as well as public agencies and other entities. As of June 30, 2013, it had holdings of \$679 million in these entities, or 9.6 percent of total U.S. domestic bond investments. CalSTRS also had an additional \$452 million in the collateral portfolio, or about 20 percent of the total U.S. corporate bond holdings in that segment of the fixed income portfolio. The overall bond holdings are more or less commensurate with California's weight in the U.S. economy, but the market value of California-based and California-associated collateral underlying RMBS and ABS in the main fixed income portfolio has a share of about 20 percent (\$1.56 billion out of a total U.S. collateral value underlying RMBS and ABS of \$7.59 billion). This implies a heavier weight in favor of California-associated investments in terms of overall economic activity, but commensurate with the state's share in U.S. residential real estate.²¹ The latter is understandable given CalSTRS stable and passive fixed income investment management, and because California has a disproportionate share of housing and mortgage values. Thus, CalSTRS' investments support the housing market in the state.

California-Headquartered Companies

Not surprisingly, many bond investments are in the very same publicly-traded companies where CalSTRS has public equity holdings. To account for this and avoid double counting employment, the common holdings are separated. From this, about 30 California-headquartered entities emerged out of 95 whose debt receives CalSTRS' investment. These are bonds of California-based private companies, companies acquired by out-of-state firms, and various state and local agencies and entities that provide vital municipal services. California employment for these companies is estimated at 195,042 jobs. In other words, together with other investors, CalSTRS' investments in these entities help support 195,042 jobs in the state. However, unlike public equities, there is no consistent way of getting a measure of CalSTRS' share of long-term debt of companies in whose corporate bonds it invests, in order to get a pro-rated CalSTRS share of employment impact.

Non-California-Headquartered Companies

It is possible to isolate those publicly-traded companies where CalSTRS' bond holdings are its only investment.²² Based on a random sample of 6 percent of the total non-California, rest-of-the-U.S. sample of corporate bond holdings, the total employment in California by companies not

²⁰ RMBS is a debt obligation whose cash flows come from residential debt, that is, payments of interest and principal made by homeowners on mortgages, home-equity loans and subprime mortgages. A residential mortgage-backed security is comprised of a pool of mortgage loans created by financial institutions. The cash flows from each of the pooled mortgages are packaged into classes and tranches, and then securities (RMBS) are issued for purchase by investors. ABS are similar claims on cash flows arising out of leases, credit card debts, accounts receivable and so on.

²¹ California's share in total residential valuation in the U.S. is about 19 percent based on California and U.S. average house prices and housing stock (author calculations).

²² In the case of CalSTRS corporate bond holdings of non-California-headquartered privately held companies, there is no consistent way of gauging employment impact within the state.

headquartered in California and not duplicated in the public equity calculations given earlier, is 141,885.²³ Applying the same foreign employment adjustment done to public equity companies, non-California-headquartered companies in CalSTRS' bond portfolio have about 70,942 to 96,481 jobs in California.

There is no reliable way to measure CalSTRS' investment share of outstanding debt of U.S.-based firms. However, an estimate of a random sample suggests CalSTRS may hold a range between 0.1 percent and 0.2 percent. This estimated range, applied to the California-headquartered and non-California-headquartered company jobs (between 265,984 and 291,543, which was totaled from above) gives approximately 265 to 583 jobs in California supported by CalSTRS' fixed income portfolio.

PRIVATE EQUITY INVESTMENTS

Private equity is an investment category that funds and invests in debt or equity of privately-held companies that are typically not publicly traded on stock exchanges. The private equity program within CalSTRS was established in 1988 and operates through limited partnership commitments, fund-of-funds, side-by-side co-investments with fund-of-funds and secondary transactions.²⁴ Currently, 77 percent of the portfolio is invested within the United States, with the program benchmark criterion for the portfolio being the Russell 3000 index, which is the broadest measure of about 98 percent of the public equity market, plus 3 percent.

The portfolio involves 122 active manager relationships and four fund-of-funds, with more than 125 underlying funds. Three of the fund-of-funds focus on investing in new and emerging markets and in underserved markets domestically. The fourth fund-of-fund focuses on venture undertakings. With a fair market value of approximately \$22.7 billion as of September 30, 2013, the portfolio distribution is as follows: 72 percent in buyout, 13 percent in debt-related investments, 6 percent in venture capital and 9 percent in equity expansion of privately-held companies. The most recent net investment return rate for a one-year period was 19.6 percent, with annual returns of 13.6 percent since inception.

As of June 30, 2013, CalSTRS had total private equity investments of \$44.78 billion in 3,845 entities globally. This amount reflects both the realized, or paid out investments, as well as still-on-the-books, unrealized amounts. The unrealized amount was \$22.4 billion.²⁵

Of the ongoing unrealized private equity investments, there are 642 in California for a total market value of \$1.99 billion, or 13.6 percent of the total unrealized U.S. private equity holdings

²³ Companies that CalSTRS has equity holdings of and that have been accounted for in the previous section are not included. Employment data for the non-duplicated companies is acquired from databases mentioned earlier and extrapolated for the entire set of corporate bonds, and an average sectoral employment share of California of 8.9 percent for the sectors in which these companies operate is applied to that figure (see footnotes in public equity section and Appendix).

²⁴ Fund-of-funds investment strategy is an investment in a number of funds that in turn invest in other funds and assets.

²⁵ The analysis of employment impact deals only with the unrealized amount.

of CalSTRS. This figure is greater than the share of California’s weight in the U.S. economy. Figure 12 below shows a regional division of CalSTRS’ private equity holdings.

Figure 12

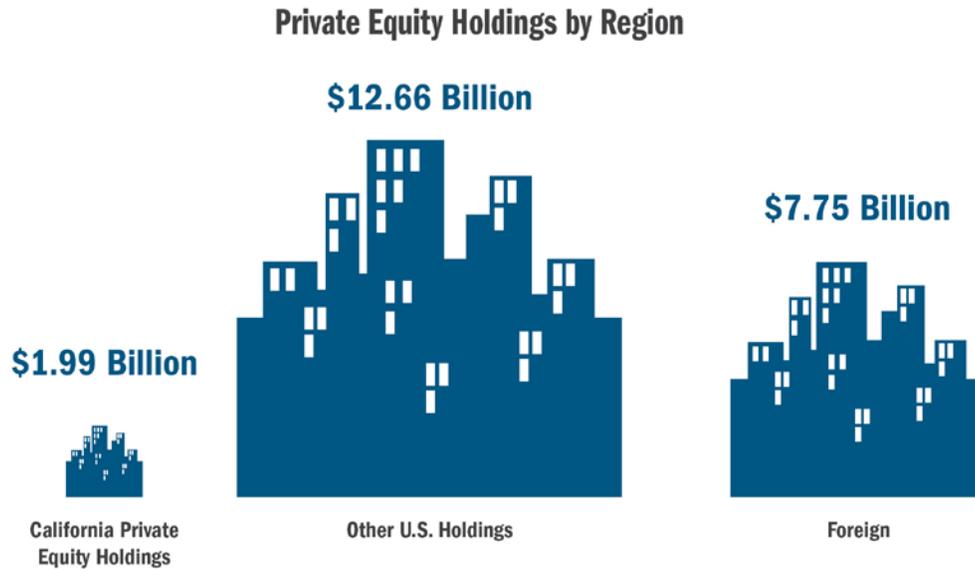


Table 3 below shows the distribution across sectors of CalSTRS’ private equity holdings in California. While investments in information technology companies still constitute the largest segment, overall private equity investments are well diversified across major industries and sectors. With investments in 104 cities in the state, there is broad geographical diversification across the state—much more so than the investments of other asset classes. This is unsurprising because private equity investments are usually in smaller, privately-held companies that are in their initial growth stages.

Table 3

PRIVATE EQUITY HOLDINGS IN CALIFORNIA	
SECTOR	AMOUNT (\$ MILLION)
Information Technology	596.16
Consumer Discretionary	306.72
Health Care	226.43
Financials	177.90
Energy	174.39
Industrials	167.22

Figures 13, 14, 15 below depict private equity investments in the state and its two large sub-regions. Additionally, Figure 16 shows locations of private equity high-tech investments, and Figure 17 displays a heat map that weights locations by market value of investments—the greater values are shown as a deeper red.

Figure 13
Private Equity Investments in California

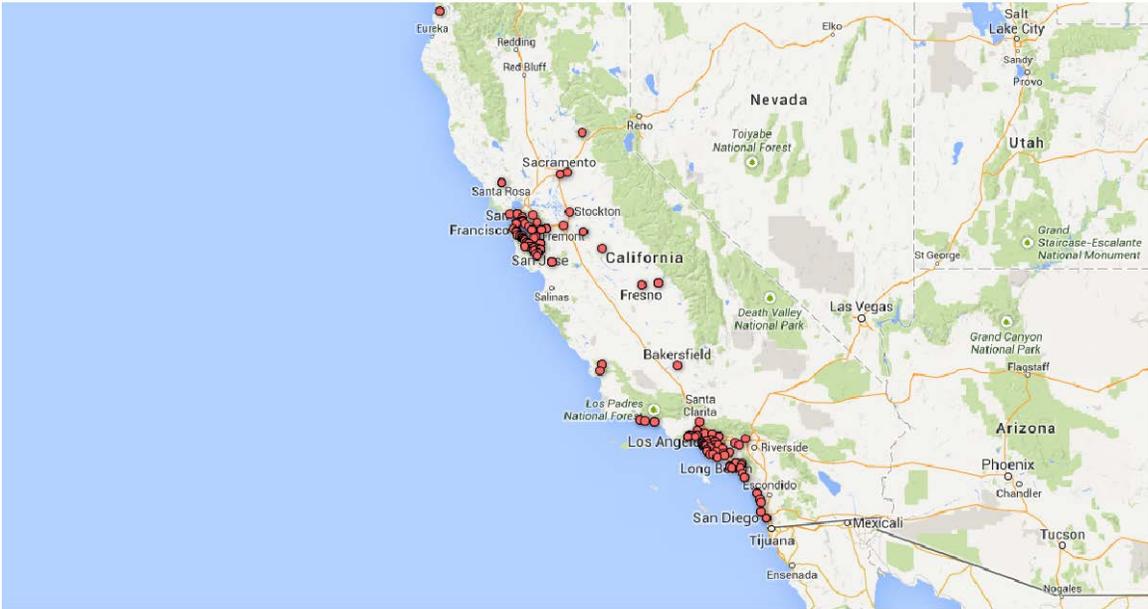


Figure 14
Private Equity Investments in Northern California

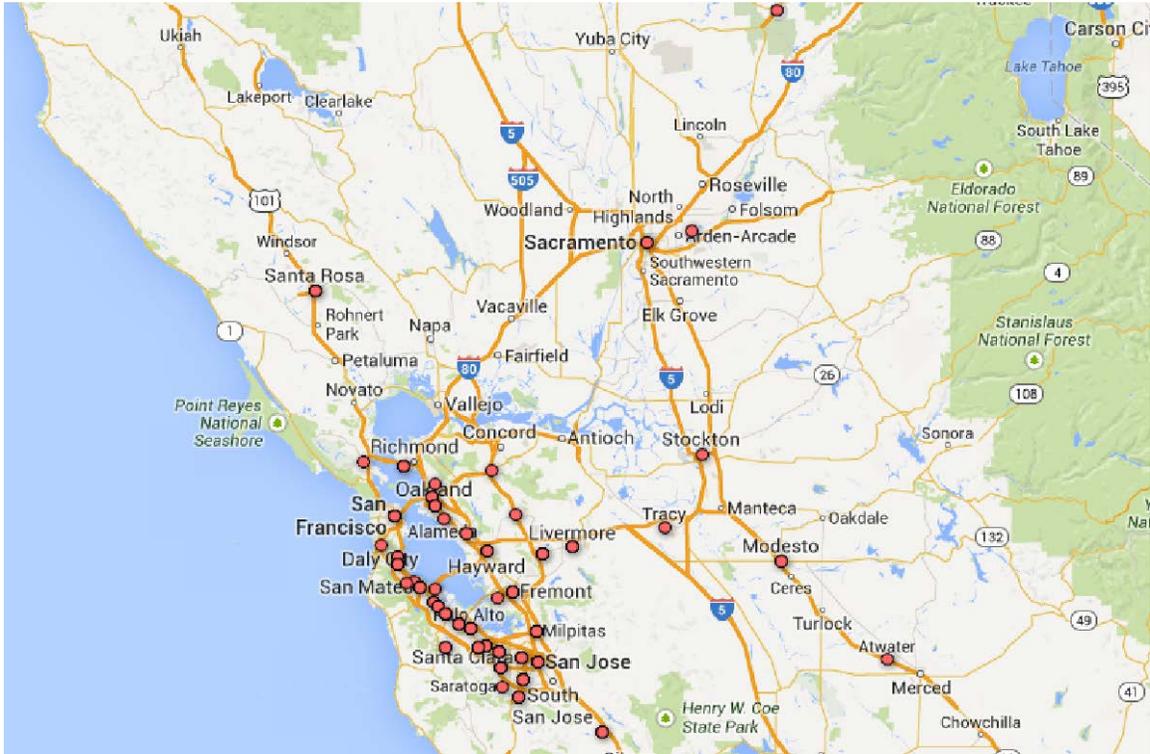


Figure 15
Private Equity Investments in Southern California

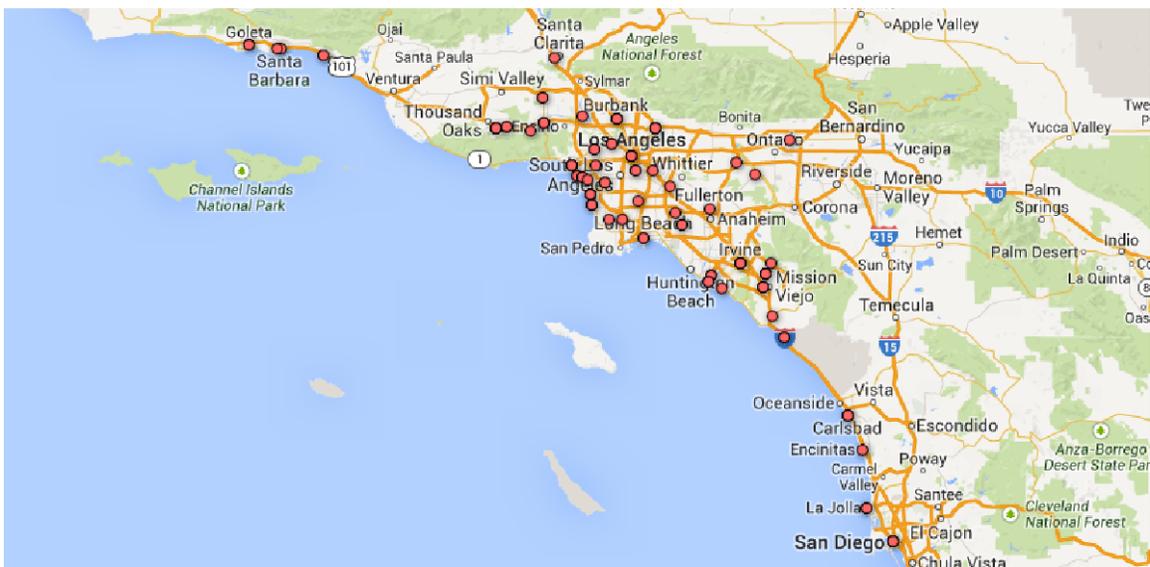


Figure 16
Private Equity High Tech Investments in California

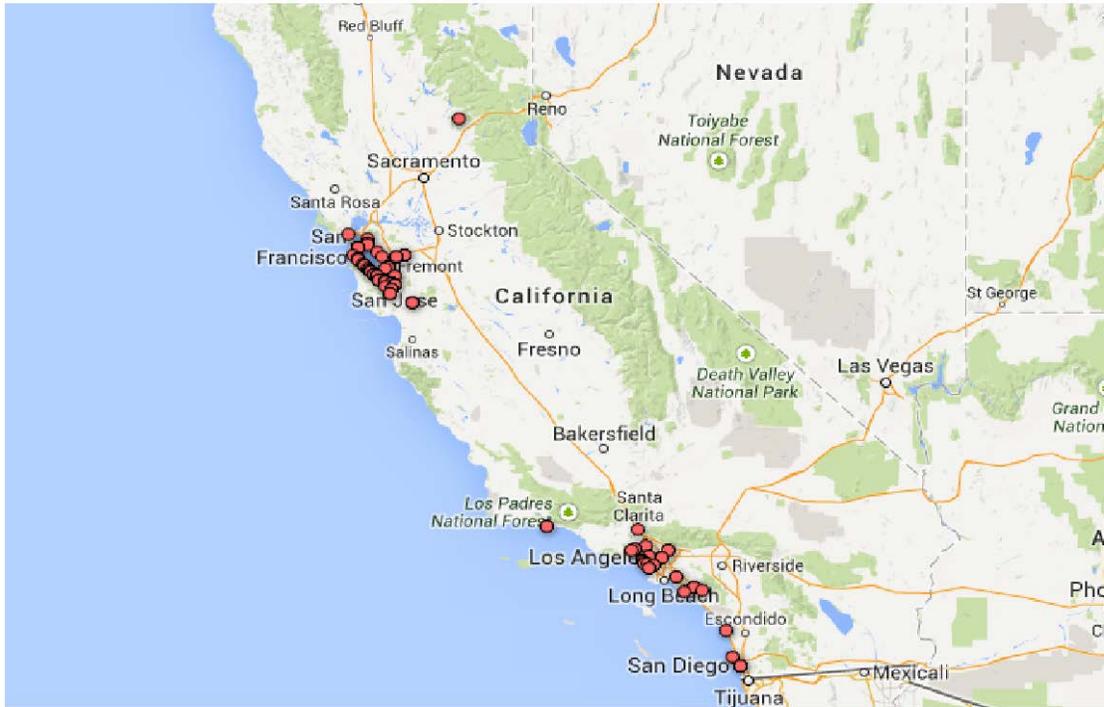
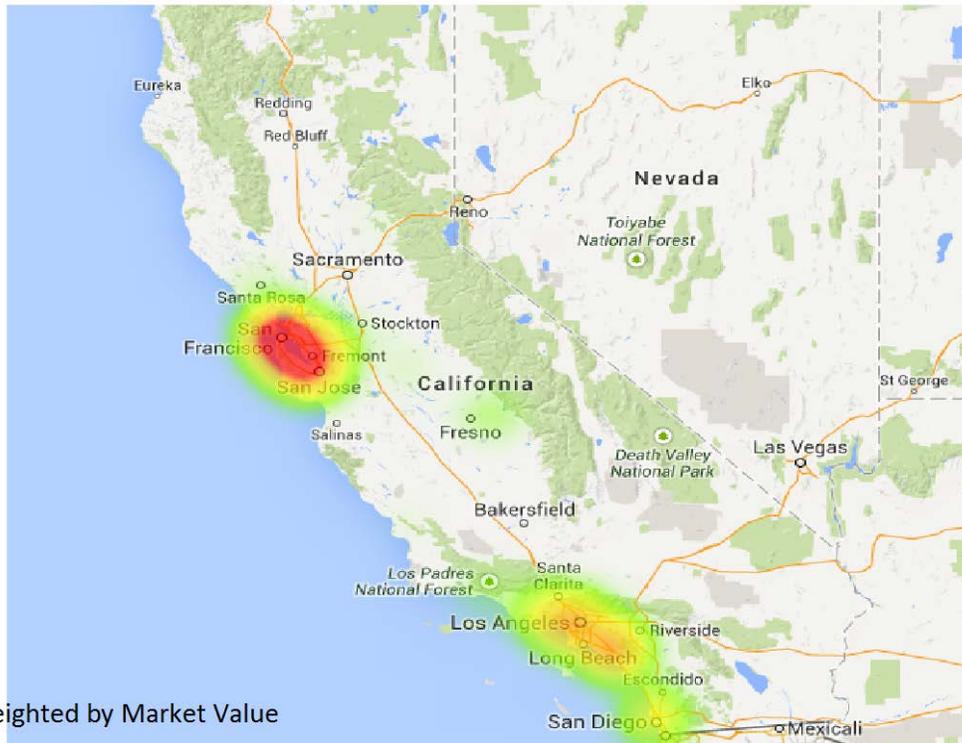


Figure 17
Heat Map of Private Equity Investments*



*Weighted by Market Value

There are some unique obstacles to estimating the number of jobs supported by CalSTRS' private equity investments. There are no publicly available databases, and regulatory, as well as proprietary, investment strategy imperatives preclude many disclosures. On the other hand, in terms of their employment impact, most private equity investments, unlike public equities, have a more direct, localized and focused impact, partly because of firm size and operations and partly because of the nature of some primary market investments.

A number of assumptions have to be made because of these obstacles. The methodology involves matching the sub-sectors in which these companies operate²⁶ with company databases filtered for data on private (non-publicly-traded, non-publicly-owned), California-headquartered companies in the same sector. The next step involves choosing employment for the median-sized company in that sector.²⁷ All companies in that sector are attributed this level of employment, and this step is repeated for all the sectors. The total employment is then summed up across the 642 companies.

The companies in CalSTRS' private equity portfolio support 65,614 jobs in California. Unlike public equities, there is no reliable way to measure CalSTRS' investment share in the market value of these companies, so CalSTRS' pro-rated share of these jobs is indeterminable. However, a sizeable number of private equity investments in the state are in underserved²⁸ cities (see Figure 18 below). Companies in CalSTRS' private equity portfolio support more jobs in these cities—54 percent—than in cities where the household income is higher than the median.

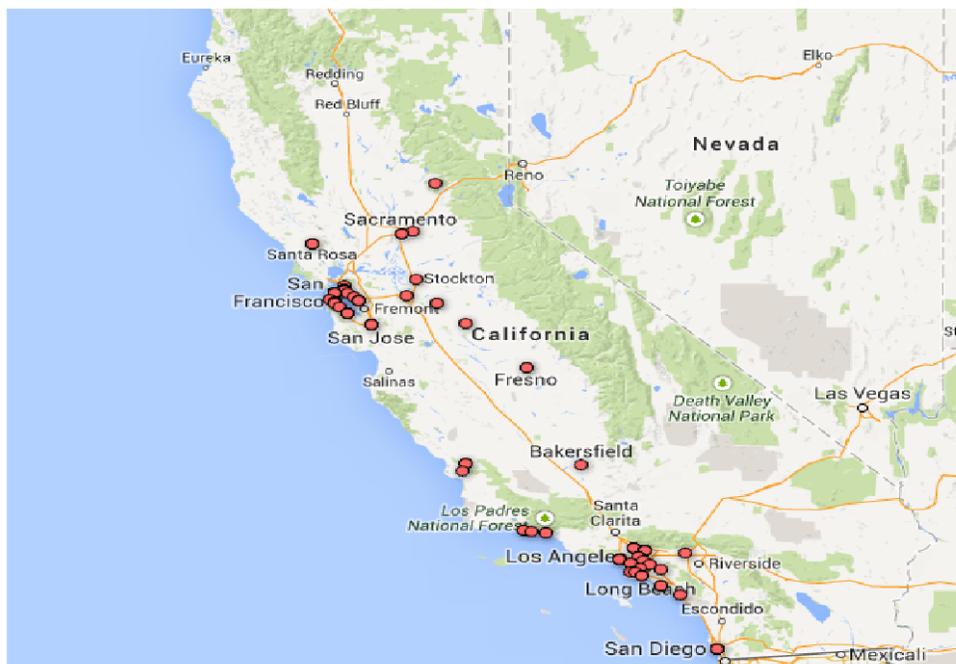
²⁶ Data on which sectors the individual companies operate in is available.

²⁷ Median rather than average because a few very large privately held companies skew the average.

²⁸ For purposes of this report, these are cities with less than the median statewide household income of \$61,632. Median household income from the American Community Survey: <https://www.census.gov/acs/www/>. Low-income cities with private equity investments include Vernon, Atwater, Compton, Fresno, Modesto, Oakland and Stockton.

Figure 18

Private Equity Investments in Cities With Less Than Median Income



REAL ESTATE INVESTMENTS

The primary investment and strategic objectives of CalSTRS' real estate portfolio include providing diversification to the overall investment portfolio, ensuring stable cash flows and providing a hedge against inflation. CalSTRS invests in all the major property types, including residential (apartment complexes and single-family developments), office and retail properties, and warehouse and industrial assets.

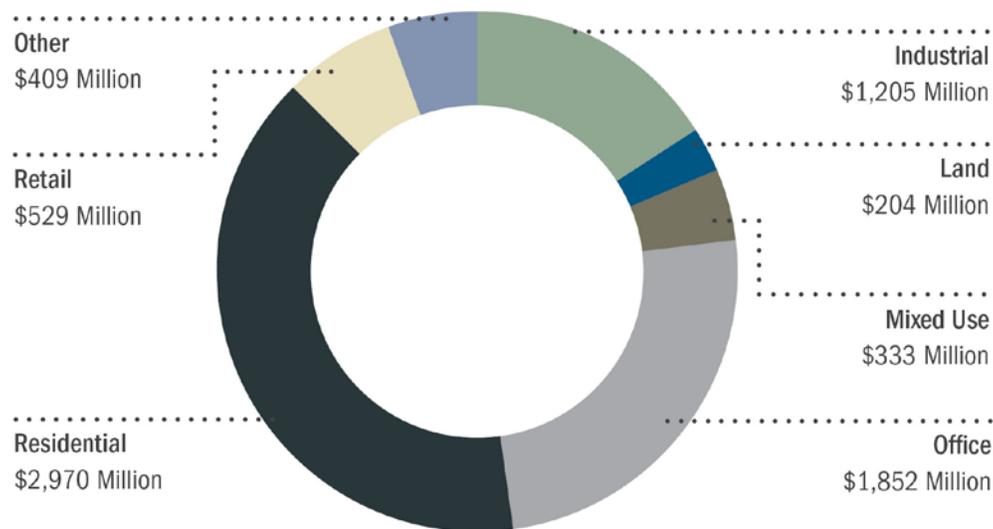
CalSTRS operationalizes its real estate investments through various ownership vehicles and investment channels. These include joint ventures, where CalSTRS invests with operating partners in order to leverage the latter's unique domain expertise. It also invests in commingled funds, where it invests together with other institutional investors in various open-ended and closed-ended funds. Other investments include positions in real estate investment trusts, which are claims on publicly-traded companies that invest in real estate equity and debt, and targeted specialized separate accounts that involve agreements with real estate investment managers for specific projects and assets. About 12 percent of CalSTRS' portfolio is in real estate assets. This amount is distributed across the U.S. and internationally.

CalSTRS invests 20 percent of its U.S. real estate portfolio in California. This is significantly higher than California’s share of total U.S. economic activity and slightly higher than the state’s share of total U.S. real estate market value.²⁹

CalSTRS invests in 452 properties in California that are geographically diversified across many counties and regions of the state. Figure 19 below shows the distribution of California real estate assets by property type, with residential properties accounting for about 40 percent of the total real estate investment in the state.³⁰

Figure 19

California Investments by Property Type



Note 1: Data as of December 31, 2013.

Note 2: Figure 19 represents 452 properties in California for a total gross value of \$7.5 billion.

Note 3: The average real estate investment is \$16.6 million.

Figure 20 to Figure 23 below map the location of various property investments in the state. Residential real estate has the largest geographic spread. Figure 24 gives the heat map, where all the holdings in the state are weighted by the market value of CalSTRS’ holdings. Real estate is an asset class in CalSTRS’ portfolio that is weighted more toward Southern California than Northern California.

²⁹ The key benchmark measure for this report has been California’s 11.2 percent share of U.S. employment. The California share of U.S. gross domestic product is about 13 percent. The California share of all U.S. real estate assets is estimated to be between 16 percent and 18 percent. This is based on the Federal Reserve’s Flow of Funds accounts, state housing data, and total commercial real estate stock and price estimates (author estimates).

³⁰ These include both direct and indirect investments through funds, joint ventures and so forth.

Figure 20

All Property Investments in State: Direct and Indirect

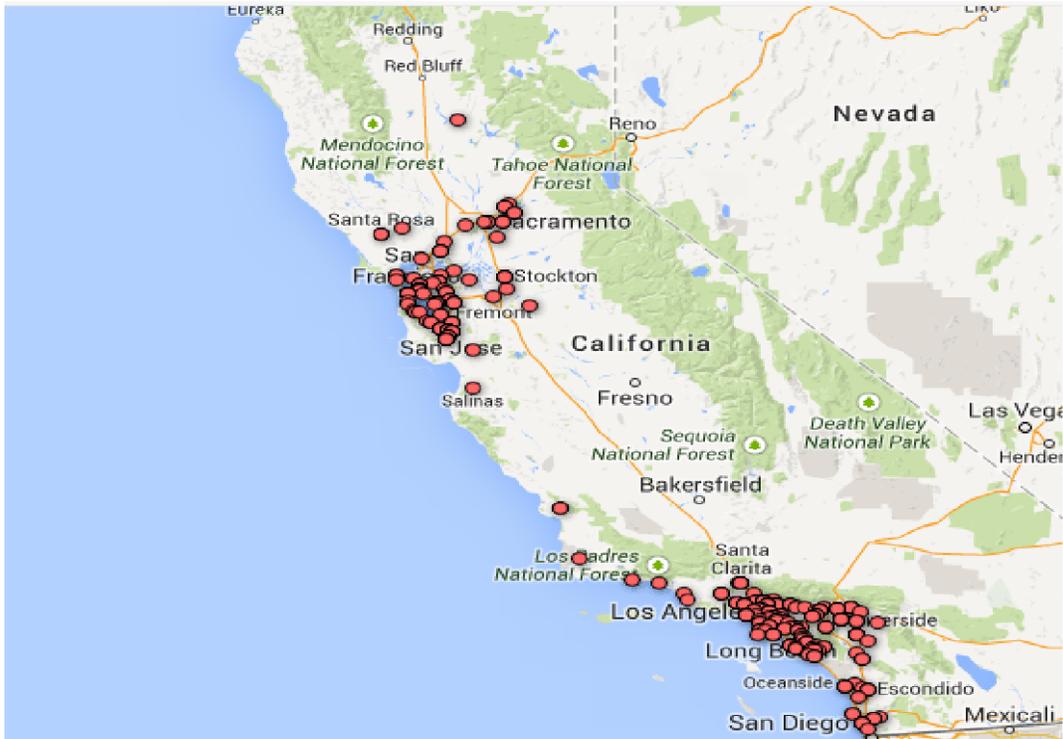


Figure 21
Office: 92 Properties

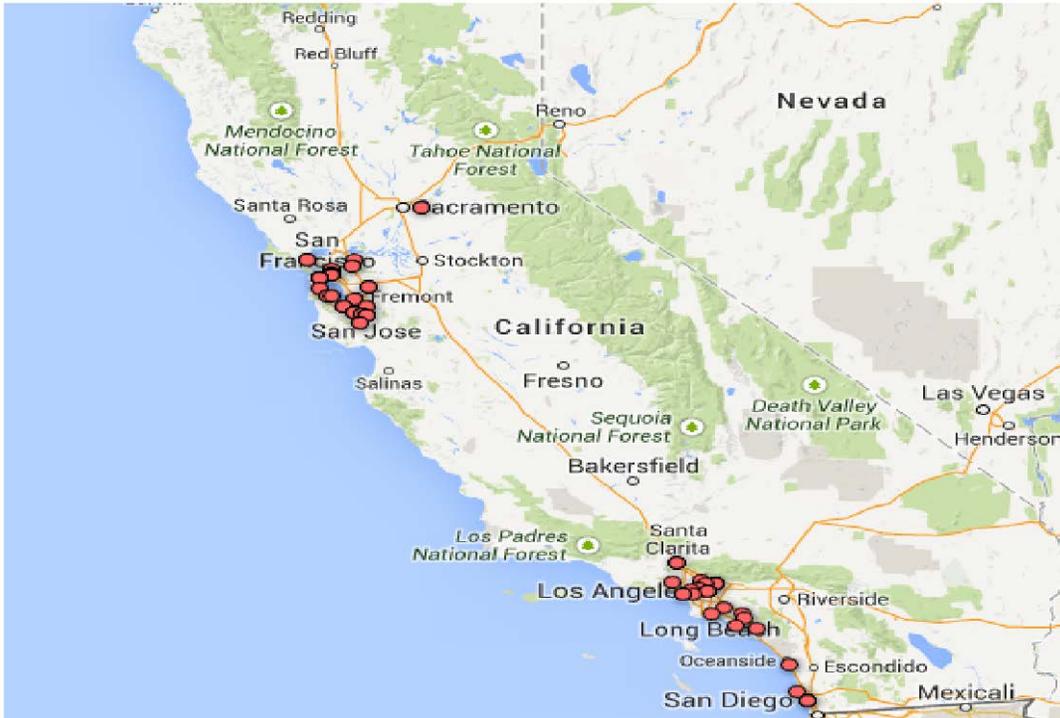


Figure 22
Industrial: 84 Properties

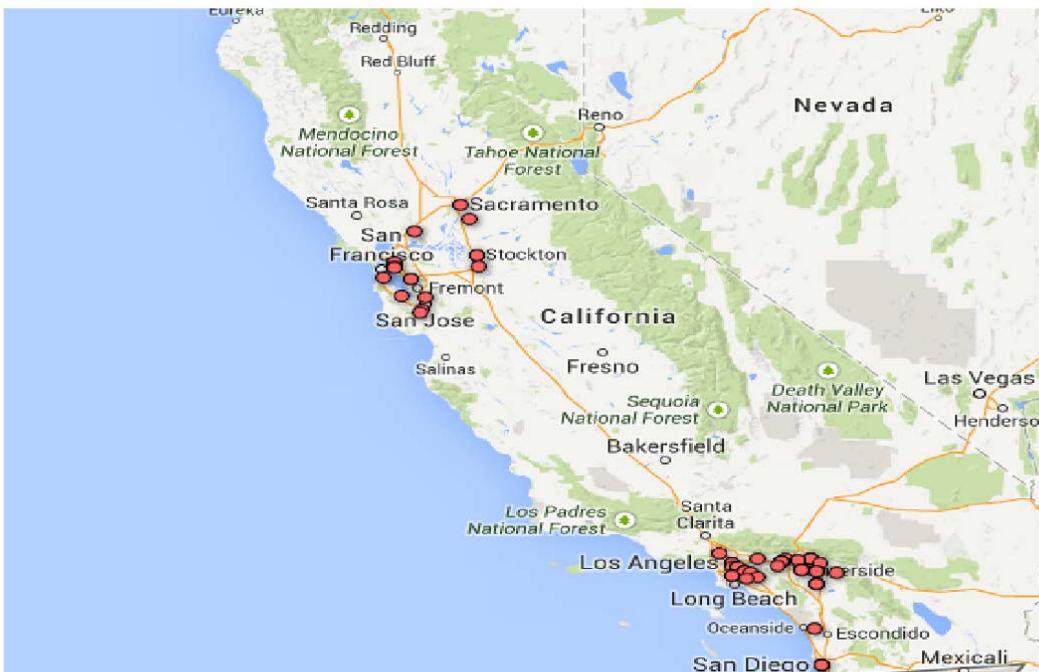


Figure 23
Residential: 163 properties, Apartments and Single Family

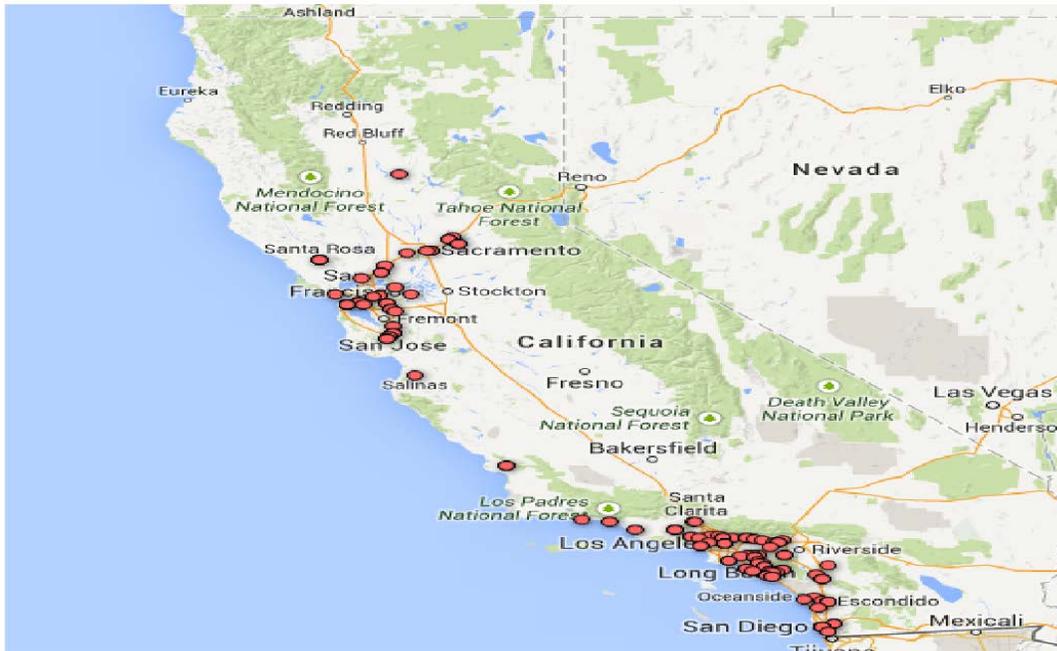
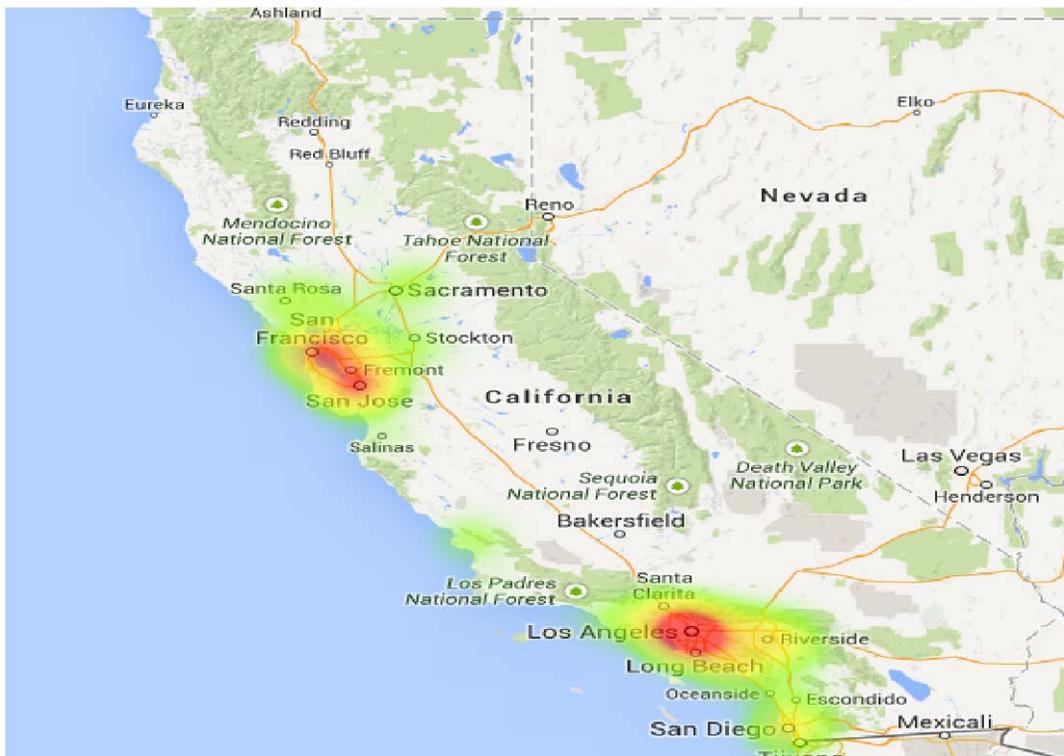


Figure 24
Heat Map: Properties Weighted by CalSTRS' Interest



The real estate asset class does not have a standard database from which to estimate employment, so a different approach must be used. However, the impact of real estate investments can be very local, with relatively small leakage of payments and expenditures outside the state. Table 4 below lists the job estimates by property type and the multiplier effects generated in the state through investments in real estate development and construction.³¹ Table 5 includes the total job impact.

Table 4

CONSTRUCTION/REAL ESTATE MULTIPLIERS			
TYPE	JOBS PER \$ MILLION INVESTED	INDUCED JOBS	INDUCED OUTPUT (\$)
Industrial	6.7	4.2	664,000
Mixed Use	6.8	4.9	770,000
Office	6.8	4.9	770,000
Residential	4.6	5.3	781,000
Retail	6.8	4.9	770,000
Other	6.8	4.9	770,000

Note: Induced output is per \$1 million invested.

Table 5

REAL ESTATE INVESTMENTS AND JOBS IN CALIFORNIA			
PROPERTY TYPE	DIRECT JOBS	INDUCED JOBS	LOCAL TAXES/REVENUES (\$ MILLION)
Single-Family	1,134	1,306	19.29
Multi-Family	12,531	14,438	208.60
Industrial	8,074	5,061	
Office	12,591	9,073	
Retail	3,594	2,590	

Note: Revenue estimates based on National Association of Home Builders estimates for investments in single-family and multi-family housing and local taxes and revenues. Not shown are the Mixed-Use and Other categories, which generate an additional 8,700 jobs.

³¹ The jobs created because of each \$1 million invested by property type can then be used to generate total employment impact and total induced output. Source: SRRI.

Real estate job estimates have been generated from regional input-output models. These models take into account the interconnections and linkages between various sectors of the economy, how expenditures get distributed across sectors, and how further rounds are induced and the impact they produce. They are used by public and private-sector entities to capture the economic multiplier effect in a specific geographic region.

Over their lifecycle³², CalSTRS' real estate investments helped create and sustain 79,000 jobs in California. These investments also had a multiplier effect that generated an additional \$5.5 billion of economic activity in California.³³

CONCLUSION

The California State Teachers' Retirement System is the largest educator-only pension fund in the world, with a total investment portfolio valued at \$189.1 billion. It invests in a range of asset classes, including domestic and foreign public equities; real estate investments; holdings of fixed income securities, including corporate bonds, U.S. treasuries, mortgage and other asset backed securities; and investments in private equity and venture funds.

CalSTRS' fiduciary responsibility does not require the fund to commit to investments that sustain jobs and grow local economies in California. Yet, compared to California's 11.2 percent share in total U.S. employment, CalSTRS' investment in all asset classes are weighted towards the state. Table 6 below shows CalSTRS' U.S. investment, California investment and percent share in California in different asset classes.

CalSTRS' portfolio weighting toward California is no surprise. The state is fertile ground for investment with a growing, dynamic and innovative economy—one that is the seventh largest in the world and accounts for about 13 percent of U.S. gross domestic product. This economic reality places CalSTRS in a unique position, as its mission to achieve a healthy investment return also serves a deeper social commitment to the growth of California's economy and the long-term welfare of its residents.

³² The lifecycle begins with construction activity.

³³ Sources: SRRI and National Association of Home Builders. The RIIMS II multipliers developed by the Department of Commerce also give similar results. The local taxes/revenue figures are based on National Association of Home Builders' estimates for investments in multi-family and single-family housing.

Table 6

ASSET CLASS	CALSTRS INVESTMENTS IN THE U.S. (\$ BILLION)	CALSTRS INVESTMENTS IN CALIFORNIA (\$ BILLION)	INVESTMENT SHARE IN CALIFORNIA (%)
Public Equities	66.5	8.8	13.2
Corporate Bonds	9.6	1.1	11.7
Private Equity	14.5	1.9	13.6
Real Estate*	36.8	7.5	20.4
Total	127.4	19.3	15.2

Note: Real Estate values shown are gross values.

CalSTRS' investments, together with the investments of others, support the jobs of those employed in California. Given the nature of secondary market investments—which comprise the majority of CalSTRS' portfolio and the holdings of other investors—it is difficult to directly attribute job creation to a single investor.

However, while secondary market investments may not have the direct employment impact of primary market investments, they promote continued company operations and thus support existing jobs. On the other hand, real estate and some of the private equity investments can have direct employment effects and other associated economic benefits.

Table 7 below shows the estimated California jobs at companies in CalSTRS investment portfolio. In the interests of consistency and continuity with other studies of this nature, the table lists the number of jobs supported and sustained by CalSTRS, **together with other investors (the first column)**. It also shows an estimate of CalSTRS' share of those jobs, based on its percentage of ownership in those companies. For real estate—a primary market investment—all jobs can be attributed to CalSTRS' investment. For private equity, CalSTRS' share could not be estimated because of the nature of these types of investments. In all, CalSTRS' investments support between 85,000 and 87,000 jobs in California.

Table 7

ESTIMATES OF JOBS BY ASSET CLASS		
ASSET CLASS	ESTIMATE OF CALIFORNIA JOBS AT COMPANIES IN CALSTRS PORTFOLIO	CALSTRS PORTION OF ESTIMATED CALIFORNIA JOBS
Public Equity	1,780,000-2,400,000	5,700-7,700
Fixed Income	265,984-291,543	265-583
Private Equity	65,614	<i>Indeterminable</i>
Real Estate	79,000	79,000
Total	2,190,598-2,836,157	84,965-87,283

Ultimately, it is the joint investment of all investors in primary and secondary markets that promote and support long-term economic development and growth. This financing in all its forms allows companies to sustain their operations and provide jobs to millions in California. Institutional investors like CalSTRS have an important role in boosting and sustaining California's economy. Few investors can provide the large volume of investment and the commitment to stable and healthy long-term returns that CalSTRS does. California's diverse economy allows CalSTRS to support economic growth in the state its members call home.

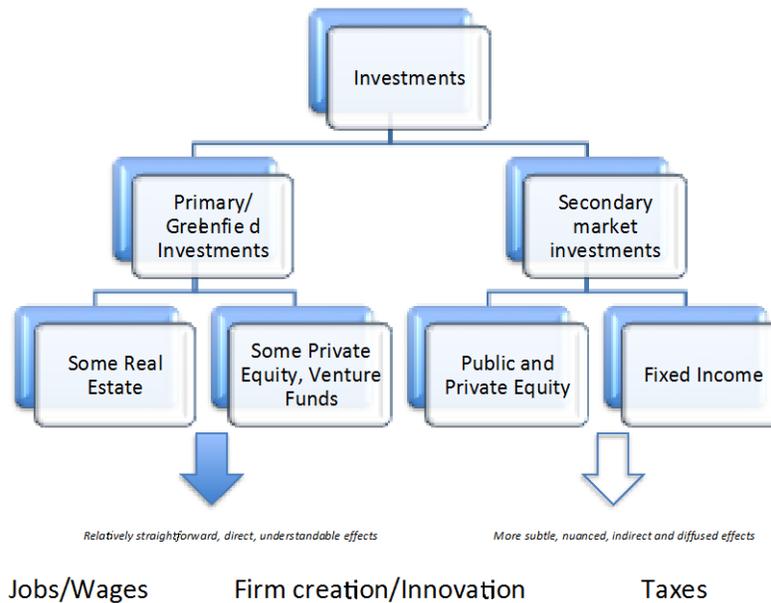
APPENDIX

The linkages between financial markets and the “real economy,” by which economists mean non-financial or non-nominal economic variables, such as employment, real wages and real interest rates adjusted for inflation, constitute a complex body of economic theory and practice. The impact of the former on the latter is a matter of major ongoing debates. This is particularly true concerning the impact of financial investments on the regional and local economy, and on its employment and wages. While the effect of greenfield, or new, start-up investments are somewhat akin to estimating the impact of benefit payments, transfer payments or foreign direct investment in the state, the impact of investments in secondary markets³⁴ for stocks and bonds are far more difficult to quantify and analyze.

Direct investments are economically akin to direct spending and payments that accrue as income to recipients. They generate consumption spending, as well as further rounds of income and spending, as the first batch of recipients spend their money and other recipients receive it. Job “creation” is, therefore, understandable in the case of direct, primary investments. In the case of secondary market investments, the employment “effects” are subtler. While job “creation” cannot be asserted because secondary markets involve transfers from one set of investors to another and because the employment has already been created in a functioning, operating company, one can still assert that these investments “support” or “sustain” the jobs and employment generated by these companies. These investments in secondary markets, whether in stocks or bonds, provide the essential fundament of financing for ongoing operations of a business. It is clear that, as for any other such large institutional investor, the vast majority of CalSTRS investments are in the secondary market category, because operational liquidity and the ability to enter and exit an investment are matters of concern and are more easily executable in deep secondary markets.

³⁴ Secondary financial markets are those where previously issued stocks and bonds are traded, such as the stock market (NASDAQ, NYSE), where the broad public buys stocks from other members of the public.

Simplified Typology of Investments to Understand their Potential Impact



The key technique, methodology and assumptions in this report revolve around taking employment shares of California in total U.S. employment in relevant sectors where CalSTRS has investments. The first step is to match the general sector description CalSTRS attributes to its investments to more precise North American Industry Classification System codes using the NAICS directory descriptions.

The California share of total U.S. employment is then calculated for each NAICS code from the Annual Economic Survey (County Business Patterns series and the Annual Survey of Manufacturers). There may be more than one code for each CalSTRS’ sector descriptions because they can be broad and mapped onto more than one NAICS code. The appropriate NAICS-based California share is then applied to individual firm employment data—acquired from company databases—and the California employment for all companies is summed up to get employment in the state.

The broad imputed “share” approach has been used in Feenstra and Hanson (1999) and extended to the case of California by Bardhan and Howe (2001) in a different context. The underlying assumption is that because the federal economic data are quite accurate and reflect an average over a large number of companies per sector, the NAICS shares, on average, are a reliable measure of companies’ California employment. Firm employment data is available only at the global level, so the California share approach is a key insight to separate and isolate California-specific effects.

Some studies estimate state-level employment numbers by multiplying the number of employees in each company by percentage/share of facilities in the state. While this is one method, under some circumstances it can underestimate state employment, for example where facility size is larger (such as in a large state). A method like this also does not take into account the investor's holdings across a wide range of companies and sectors, as well as the share of company ownership. In this report, the latter is also applied to the employment estimate, thus pro-rating and avoiding overgeneralizing the contribution of investments to state employment.

This report also used a judgmental sample of CalSTRS' 300 largest public equity investments, as well as a random sample of its fixed income investments.

Sources

HOOVER'S/Mergent Online

Ultimate source for public company financials, employment, sales, locational-geographic variables and other data built on Dun and Bradstreet's old databases.

ReferenceUSA

A comprehensive database on over 20 million businesses in the U.S. with details on establishment locations, employment, sector categories, revenues by each location, and so forth.

Yahoo Finance

Online source for financial information on companies and the stock market.

American Factfinder

American FactFinder is the primary way to access data from the Decennial Census, the American Community Survey, the Economic Census, County Business Patterns, the Population Estimates Program and Annual Economic and Manufacturing Surveys for both the U.S. and California.