

## SUMMARY OF PROFESSIONAL QUALIFICATIONS OF DR. CHRISTOPHER THORNBURG

### EDUCATION

Ph.D in Business Economics from The Anderson School at UCLA

B.S. in Business Administration from the State University of New York at Buffalo

### QUALIFICATIONS/EXPERIENCE

Dr. Christopher Thornberg, who oversaw and led all research connected with this SOQ, is a renowned and highly experienced PhD economist with training from one of the nation's top-tier economics' departments. Directly relevant to the current project are two comprehensive analyses that Dr. Thornberg has conducted in recent years on water projects in California for The Metropolitan Water District of Southern California.

In 2015, Dr. Thornberg was contracted by The Metropolitan Water District of Southern California to conduct a thorough evaluation of a number of high-level cost-benefit analyses focused on the Bay Delta Conservation Plan. The previously drafted analyses had come to starkly different conclusions about the net benefit of this major 50-year plan to re-establish water supply reliability and help restore and preserve the ecosystem of the Sacramento-San Joaquin River Delta. Dr. Thornberg was brought in to assess the methodology and conclusions of each study and provide a critical and accurate assessment to the Water District. Additional details about this project are included in the "Past Performance/Technical Approach" section of this SOQ.

In 2007, Dr Thornberg was one of two lead researchers on a large study focused on the potential benefits and costs to the State of California from land fallowing water transfer programs. The study used an innovative approach of looking to past natural experiments—largely the drought of the early 1990's—to estimate the impact of a reduction in water available for agricultural uses in the state. This report was a follow up to earlier work done by Dr. Thornberg in which he critiqued two economic impact studies done by other researchers on this same topic.

In addition to water specific work, Dr. Thornberg also has extensive experience conducting economic impact analyses for a wide variety of public projects and policies, conducting economic and revenue forecasting, and conducting economic policy analysis.

### PAST PROJECT PERFORMANCE/TECHNICAL APPROACH

Prior to launching Beacon Economics, Dr. Thornberg was a senior economist with UCLA's Anderson Forecast where he regularly authored economic outlooks for California, Los Angeles, the East Bay, and developed specialized forecasts for a variety of public and private entities. He previously taught in the MBA program at UCLA's Anderson School, in

the Rady School of Business at UCSD, and at Thammasat University in Bangkok, Thailand. He has also held a faculty position in the economics department at Clemson University.

Dr. Thornberg has extensive experience working with private and public sector clients to conduct economic and data analysis that supports successful decision-making. Included in this response are detailed descriptions of select projects and work products that illustrate Dr. Thornberg's relevant experience. The following list of projects is organized by the RFP task for which each is applicable in terms of expertise.

➤ **Cost-Benefit Analysis, Bay Delta Conservation Plan**

***Client:*** The Metropolitan Water District of Southern California

***Address:*** P.O. Box 54153, Los Angeles, CA 90054; Fax: 213-217-6052

***Contact:*** Jeff Kightlinger, General Manager and CEO, 213-217-6139 or  
*jkightlinger@mwdh2o.com*

In 2015, Dr. Thornberg conducted a comprehensive cost-benefit analysis of the potential impacts of the Bay Delta Conservation Plan (BDCP), a proposal that would create a system for moving water from the northern Sacramento-San Joaquin Delta to south and west of the Delta. For this project, staff built on and assessed the findings of three earlier analyses conducted for the BDCP.

The analysis then presented original estimates of the value of BDCP water exports and the value of reducing risk to the state's water supply from an earthquake. The goal was to determine if the BDCP is most likely to have a positive net benefit from a statewide perspective. To make this determination, the researchers conducted Monte Carlo simulations of expected BDCP benefits. These simulations are compositions of thousands of different scenarios that reveal the most frequent outcomes for each scenario.

For this project, the researchers applied four different water export scenarios:

- A restoration of water exports from 4.7 million acre-feet per year on average (without the BDCP) to either 5.6 million acre-feet per year or to 5.2 million acre-feet per year (with the BDCP);
- Or, a restoration from as low as 3.2 million acre-feet per year due to restrictions on exports (without the BDCP) to either 5.6 million acre-feet per year or to 5.2 million acre-feet per year (with the BDCP).

The total value of Delta water exports was then estimated with respect to a wide variety of variables including real Delta water price appreciation, inflation effects, growth in the cost of delivering Delta water to local agencies, price elasticity of Delta water, and the proportion of Delta water for urban and agricultural water agencies.

➤ **Benefits and Costs For California From Water Transfers**

**Client:** *The Metropolitan Water District of Southern California*

**Address:** *P.O. Box 54153, Los Angeles, CA 90054; Fax: 213-217-6052*

**Contact:** *Jeff Kightlinger, General Manager and CEO, 213-217-6139 or jkightlinger@mwdh2o.com*

In 2007, Dr. Thornberg was one of two lead researchers on a large study focused on the benefits and costs to the State of California from water transfers. The project focused on a cost benefit analysis of water transfers in the state, by looking at the potential costs to agricultural output and the potential benefits for urban areas. On the cost side the report used a natural experiment, the California drought of the early 1990s, to estimate the impact of reduced water supply on agricultural output. This methodology is preferable to other techniques since it automatically builds in the mitigation efforts of farmers. Other studies have assumed a proportionate decline in output, which will inherently overestimate the potential impact. On the demand side the researchers traditional elasticity analyses to gauge the value of additional consumption on the consumer market.

➤ **Economic Advisor, Office of the California State Controller**

**Client:** *Office of the California State Controller*

**Address:** *300 Capitol Mall, Suite 621, Sacramento, CA 95814; Fax: 916-322-4404*

**Contact:** *David O'Toole, Director of Policy, 916-327-1091 or dotoole@sco.ca.gov*

Between 2008 and 2012, Dr. Thornberg served as a chief economic advisor/forecaster for the Office of the California State Controller. In this role Dr. Thornberg delivered comprehensive revenue and economic forecasts for the state to the Controller's Office twice per year. Dr. Thornberg also updated current revenue flows and provided economic background regarding why certain trends were occurring in the state's economy for the Controller's monthly revenue report.

The economic forecast models that Dr. Thornberg implemented for the State Controller's Office included projections of state unemployment rates, payroll employment, taxable sales, personal income, home construction sales and prices, non-residential construction permits, inflation, and population growth. Additionally, the forecasts were modeled to provide both long-and short-run outlooks. The long-run forecast was forward-looking and used long-run information, not simply information about current conditions. The firm forecast the state's underlying economic drivers before forecasting its revenues based on these projections. In its work for the State Controller, Dr. Thornberg applied its capability to build new long-run projections on top of already existing models.

Dr. Thornberg also provided a short-run forecast on cash flows to the Controller's Office on a month-to-month basis. This was done in part to allow the long-run forecast to be broken

down into monthly revenue flows in order to promote proper cash management. Dr. Thornberg's short-run forecasts are based on time series approaches where current trends in the data – along with monthly information on leading business indicators such as employment, unemployment, and building permits – are incorporated.

➤ **Economic Benefit Analysis, State Route 91 Corridor Improvement Project**

***Client:*** *Riverside County Transportation Commission*

***Address:*** *4080 Lemon Street, 3<sup>rd</sup> Floor, Riverside, CA 92501; Fax:*

***Contact:*** *Theresa Trevino, Chief Financial Officer, 951-787-7926, ttrevino@rctc.org*

Dr. Thornberg conducted an analysis of the planned expansion of the State Route 91 Corridor, specifically focusing on the economic impact of the investment, the time-savings the project would generate, and the impact the project would have on future economic growth in the region. Specifically, the analysis evaluated direct and indirect job creation from actual construction work, the value of time-savings by commuters, and the indirect impact on retail sales growth along the corridor. The analysis estimated that the \$1.3 billion project would generate more than \$2 billion in economic output, \$9.3 million annually in tax revenue, create 1800 jobs per year in Riverside County, and create a time savings value that would grow to between \$90 and \$129 million per year by 2015. Dr. Thornberg acted as media spokesperson for the analysis and regularly responded to requests for interviews and expert commentary.

# Christopher Thornberg

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## Professional Experience

<b>Partner and Founder, Beacon Economics, LLC</b> <i>Regional and State Economic Forecasts, Industry Analysis, Litigation Consulting, Regional Economic Forecast Conferences, Economic Impact Studies, Board Briefings, Public Speaking.</i>	<b>2006-present</b>
<b>Member, Advisory Board, Paulson &amp; Co. Inc.</b> <i>Sits on the Advisory Board of one of Wall Street's most successful hedge funds.</i>	<b>2006-present</b>
<b>Chief Economist, California State Controller John Chiang</b> <i>Chief economic advisor and forecaster to California State Controller and key staff members.</i>	<b>2008-2012</b>
<b>Chair, Council of Economic Advisors, California State Controller John Chiang</b> <i>Chair of advisory group that counsels California's top fiscal officer about current and emerging issues affecting the state economy.</i>	<b>2008-2012</b>
<b>Editorial Board Member, Graziadio Business Report, Graziadio School of Business and Management, Pepperdine University</b> <i>Editorial board member of quarterly peer-reviewed report.</i>	<b>2006-2011</b>
<b>Visiting Lecturer, Rady School of Business at UC San Diego</b> <i>MBA Level Macroeconomics</i>	<b>2007-2008</b>
<b>Senior Lecturer, The Anderson School at UCLA</b> <i>MBA Level Managerial Economics, Global Economics, Business Forecasting</i>	<b>2000-2007</b>
<b>Senior Economist, UCLA Anderson Forecast</b> <i>Produced short and long run economic and demographic</i>	<b>2000-2006</b>

*forecasts for California, the East Bay, and Los Angeles. Conducted a variety of special studies and regional forecasts on consulting basis. Managed business development, conference content, and seminar organization.*

**Assistant Professor, Economics Departments at  
Clemson University** **1997-2000**

**Lecturer, USC Marshal School of Business** **1996-1997**

### **Education**

**Ph.D., Management** **1997**  
*Concentration in Business Economics*  
*The Anderson School at the University of California,  
Los Angeles*

**B.S., Business Administration** **1989**  
*State University of New York at Buffalo*

### **Refereed Publications**

“Failure of Trade Liberalization: A Study of GATS Negotiation” **2011**  
with Frances L. Edwards. Published in *Journal of International  
Business and Law*. Hofstra Law School.

“Ports Trade and Terrorism, Balancing the Catastrophic  
and the Chronic” with E. E. Leamer. Published in *Protecting  
the Nation’s Seaports: Balancing Security and Costs*. **2006**  
Public Policy Institute of California.

“Organizations and Incentives: Evidence from the Age of Sail” **2006**  
with D. K. Benjamin. Explorations in Economic History.

“Incentives Matter: Rules and Rewards in the Age of Sail” **2003**  
with D. K. Benjamin. Explorations in Economic History.

“Effort and Wages: A New Look at the Inter-Industry Wage  
Differentials” with E. E. Leamer. Published in *The Impact of  
International Trade on Wages*, Robert C. Feenstra, editor. **2000**  
NBER Working Paper #6626 1998. The University of Chicago  
Press.

### **Selected Other Publications and Projects**

"State of the State: 2009." Research Report conducted for the California Lieutenant Governor's <i>California Commission for Economic Development</i> .	<b>2009</b>
Special Regional Economic Forecasts. Riverside County, San Bernardino County, San Diego County, Orange County, Oakland MSA, San Francisco MSA, San Jose MSA, City of Los Angeles.	<b>2002-2009</b>
"An Economic Backdrop for Fiscal Reform in California" with Jon Haveman. Research report conducted for California Forward.	<b>2008</b>
"Waiting to Save: A Crisis of the Young" with Jon Haveman. Research report conducted for the AICPA.	<b>2008</b>
"Savings And Asset Accumulation Among Young Americans 25 to 34" with Jon Haveman. Research report conducted for the AICPA.	<b>2006</b>
"The Economic Impact of Land Fallowing Programs" with M. Bazdarich. Research report for the Metropolitan Water District.	<b>2006</b>
"Evaluation of Economic Impact of Proposed Hotel Development." Special Report for Concord Wilshire Hoover, LLC.	<b>2005</b>
"The California Economic Forecast" in <i>California Policy Options</i> . UCLA School of Public Policy.	<b>2002-2005</b>
"A Review of Land Fallowing Economic Impact Analyses: Debunking the Myths." Special Report for Metropolitan Water District of Southern California.	<b>2003</b>
"Healthcare and the Economy: Train or Drain?" The UCLA Anderson Forecast for the Nation and California.	<b>2002</b>
"The Economic Effect of the September 11th Attacks: A One-Year Retrospective." The UCLA Anderson Forecast for the Nation and California.	<b>2002</b>
"The Causes of the California Energy Crisis" in <i>California Policy Options</i> , UCLA School of Public Policy.	<b>2002</b>

"Short Circuit: Will the California Energy Crisis Derail the State's Economy?" CERA Special Report, with various authors. **2001**

"Whither the New Economy?" The UCLA Anderson Forecast for the Nation and California. **2001**

"Of Megawatts and Men: Understanding the Causes of the California Power Crisis." The UCLA Anderson Forecast for the Nation and California. **2001**

"A Year of NAFTA and a Peso Earthquake," with E. E. Leamer. The UCLA Anderson Forecast for the Nation and California. **1995**

**Litigation: Estimating Economic Damages**

(Sampling of recent cases)

Saenz v. Carl Karcher Enterprises, Inc. For Plaintiff. Case in progress. **2011**

Leslie v. Karmel Shuttle. For Plaintiff. Case settled prior to trial. **2011**

Russo v. Chipotle Mexican Grill. For Plaintiff. Case in progress.

Lawson v. Cascade Pump. For Plaintiff. Case in progress. **2011**

Robert Carlseen v. Malin. For Plaintiff. Case settled in arbitration. **2011**

Keck v. Mike Thompson. For Plaintiff. Case settled. **2010**

Davis v. Laguna Collision. For Plaintiff. Case settled prior to trial. **2010**

Dian Ashley v. Hilton Nashville. For Defendant. Case in progress. **2010**

Kenneth Gillissie v. THD At-Home Services. For Plaintiff. Case settled prior to trial. **2010**

Olympic Securities v. Fremer/Savel Architects. For Defendant. **2010**



Case in progress.

Jill Moulton v. Donald Primack. For Plaintiff. Case settled prior to trial.

**2010**

Howard Marguleas v. Cuatro Del Mar & Three Flags. For Plaintiff. Case in progress.

**2010**

### **Selected Public Presentations**

Allied Social Science Association  
Alquist California Fiscal Retreat  
American Institute of CPAs  
American Soc. of Women Accountants  
Antelope Valley Board of Trade  
Appraisal Institute  
Bank of America  
Beverly Hills Chamber of Commerce  
Builder 100 Conference  
Building Industry Assoc. Orange County  
Burr, Pilger & Mayer  
California Advancement Partnership for Schools  
California Capital Market Place Group  
California Cntr. for Regional Leadership  
California Credit Union League  
California Department of Finance  
Calif. Employment Development Dept.  
California Independent Bankers  
California Institute of Technology  
California Republican Party Retreat  
California School Board Association  
California Self Storage Association  
California Society of CPAs  
California State Association of Counties  
CIO Executive Summit  
City of Beverly Hills  
City of Concord  
City of Los Angeles  
Citizens Business Bank  
Colliers International  
Contra Costa Economic Partnership  
County Auditor's Assoc. of California  
Cushman and Wakefield  
East Bay Business Times  
Economics Dept, Layola Marymount University  
Entrepreneurs Organization  
Federal Home Loan Bank of Pittsburgh

Federal Home Loan Bank of San Francisco  
Information Technologies Credit Union Assoc.  
Institute of Real Estate Management  
International Council of Shopping Centers  
Investment Advisors Association  
Judicial Council of California  
Kaiser Permanente  
Los Angeles Business Council  
Los Angeles Business Journal  
Los Angeles Chamber of Commerce  
Los Angeles City Council  
Los Angeles City Homeland Security Summit  
Monterey County Board of Supervisors  
Moriah Society  
National Assoc. of Business Economists  
National Council of Postal Credit Unions  
NewWest.Net Conference  
Pepperdine School of Public Policy  
Public Policy Institute of California  
REOMAC  
Rutgers University, Money and History Workshop  
San Diego Regional Chamber of Commerce  
Sonoma County Economic Dev. Board  
South Bay Business Resource Network  
Sperry Van Ness  
The East Bay Economic Development Alliance  
The Pension Bridge  
The Riordan Programs  
UCLA Ziman Center for Real Estate  
UC San Diego Economics Roundtable  
Urban Land Institute  
Urban Self Storage, Inc.  
USC Real Estate Law Conference  
Von Grep Workshop, UCLA

## **Testimony**

*U.S. Congress House of Representatives Committee on Financial Services*  
“The Effect of the Lehman Brothers Bankruptcy on State and Local Governments.”  
On behalf of the County of San Mateo California.  
May 5, 2009

## **Teaching Experience**

Undergraduate: Microeconomics, International Trade, Managerial Economics, International Economics

Graduate: (MBA) Managerial Economics, Government and Regulation, Business Forecasting, Macroeconomics; (Ph.D.) International Finance, International Trade

## **Reviewed Articles and Books**

*Journal of International Economics, Review of International Economics, Explorations in Economic History.* Public Policy Institute of California.

## **Grants, Awards and Service**

Member, America's Edge	2010
Price Center Research Grant, UCLA	2005
CIBER Research Grant, UCLA	2002
Clemson University Center for International Trade, Summer Research Grant	2000
Lead Faculty Member- Clemson Summer Study Abroad to Asia	1999-2000
Faculty Committee for the Office of International Affairs, Clemson University	1999-2000
Faculty Advisor, MBA Student Association, Clemson University	1999-2000
Provost Grant for Computational Resources, Clemson University	1999
CIBEAR Registration Award Recipient	1999
Masters Thesis Chair for Pei Huang “The Impact of Capital Controls on Capital Flows”	1999
MBA Advisory Council and Curriculum Committee, Clemson University	1998-2000
Spiro Center Research Grant, Clemson University	1998
Foundation for Research in Economics and Education Research Grant	1998
Hayek Fund Research Grant	1998