

After the Bubble: Sustaining Economic Prosperity

Appendix C: Definitions, Methodology, and Endnotes

January 2002

DEFINITION OF TERMS

- **Output (gross product):** The market value-added of goods and services produced in the region. The term “value-added “is defined as final sales in a given sector less the value of intermediate goods and services purchased to facilitate the production. Market value-added indicates that actual market prices of the goods or services are used to value output in each sector. In general, output can also be considered to be the sum total of payments to factors of production organized by companies in the sector, primarily labor and capital. In this sense, one can think of output as the sum of compensation paid to labor within the sector plus profits that accrue to the firms.
- **Real output:** Output adjusted for inflation. Currently, the Bureau of Economic Analysis’ calculation of gross state product utilizes national chain-weighted deflators at the 2-digit SIC industry. Value-added output is thus available from the BEA for the U.S. and 51 states at the 2-digit SIC industry level. The data is released in mid year and lags about 2 years. Currently, the last historical data point is 1999 for this release. 2000 data are estimates.
- **Labor productivity:** Output produced per unit of labor (Persons Employed in Production (PEP) or hours, if available)
- **Labor input:** labor input is measured as Person Employed in Production as a percentage of total population

PROJECT TEAM COLLECTED DATA AND ANALYZED ECONOMIC PERFORMANCE OF 24 REGIONS IN 2001, UP FROM EIGHT IN 1999

1999 pool

- Bay Area (nine county region)
- Los Angeles-Riverside-Orange County
- New York-Northern New Jersey-Long Island
- Houston-Galveston-Brazoria
- Seattle-Tacoma-Bremerton
- Boston
- Phoenix-Mesa
- Charlotte-Gastonia-Rock Hill

2001 pool

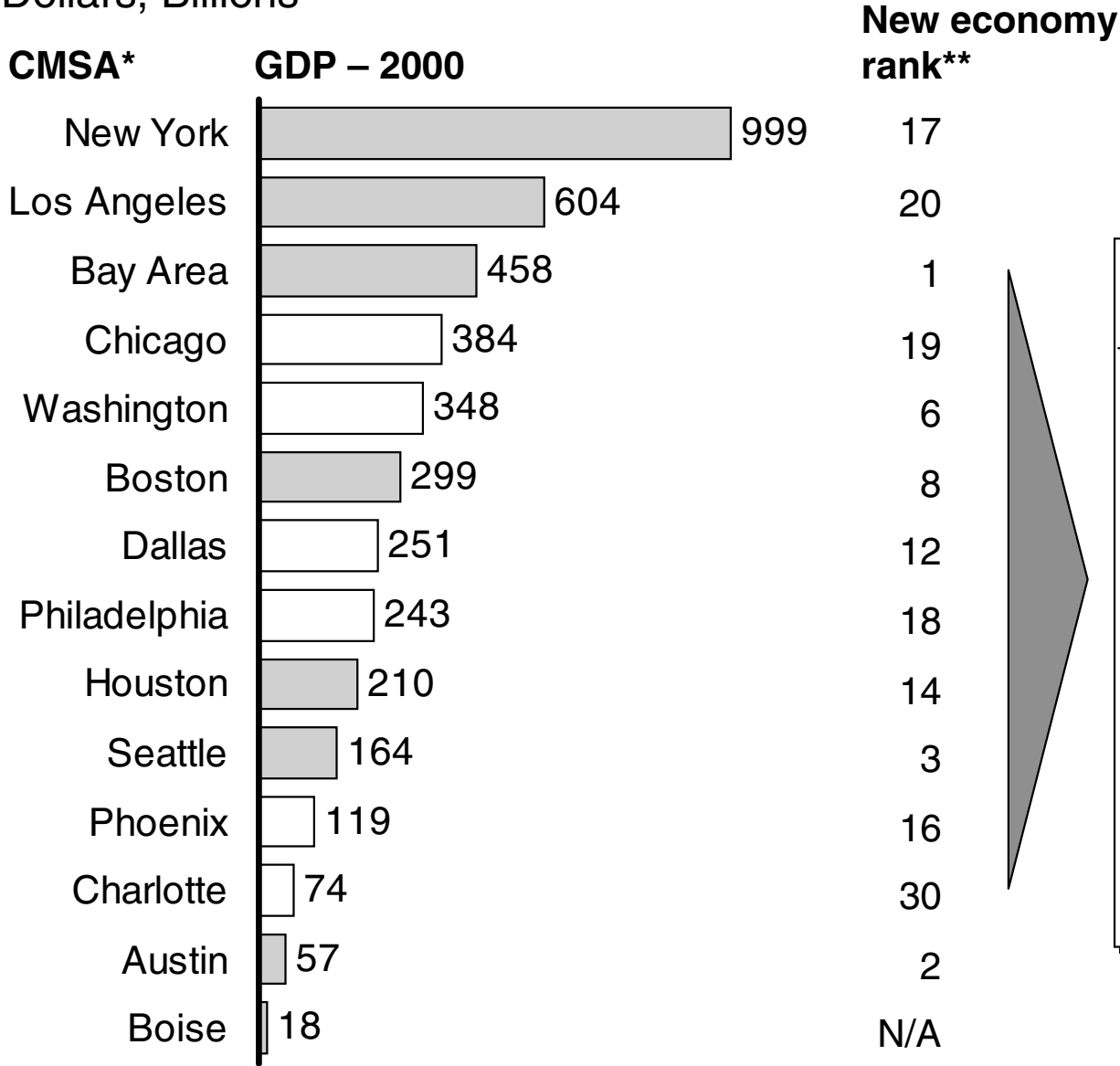
- Bay Area (nine county region)
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- Houston-Galveston-Brazoria
- Seattle-Tacoma-Bremerton
- Boston
- Phoenix-Mesa
- Charlotte-Gastonia-Rock Hill
- Chicago-Gary-Kenosha
- Washington, D.C.-Baltimore
- Atlanta
- Dallas-Fort Worth
- Austin-San Marcos
- San Diego
- Raleigh-Durham-Chapel Hill
- Denver-Boulder-Greeley
- Salt Lake City-Ogden
- Minneapolis-St. Paul
- Philadelphia-Wilmington-Atlantic City
- Detroit-Ann Arbor-Flint
- Las Vegas
- Boise
- Sacramento-Yolo
- Portland-Salem


Note: Region defined as Consolidated Metropolitan Statistical Area (CMSA).

Source: McKinsey analysis

FROM THE 24, EIGHT WERE SELECTED AS THE PRIMARY COMPARATIVE SET BASED ON SEVERAL CRITERIA

Dollars, Billions



 Selected as primary comparative region

Key criteria considered

Primary

- Regional center of diversified economic growth
- Regional center of new economy growth

Secondary

- Geographic proximity to Bay Area
- Similar industry mix as Bay Area
- Particularly strong economic performance
- Appearance in previous reports

* Consolidated metropolitan areas defined on previous page

** Includes measures for following criteria: Tech knowledge jobs, globalization, economic dynamism, transformation to digital economy, innovation capacity

DEFINITIONS OF PRIMARY REGIONS

Region	Components
Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties
Austin	Austin – San Marcos MSA
Boise	Ada and Canyon counties
Boston	Boston – Worcester, Lawrence, Lowell, Brockton, MA-NH MSA
Houston	Houston, Galveston-Texas City, and Brazoria PMSAs
Los Angeles	Los Angeles-Long Beach, Orange County, Riverside-San Bernadino, and Ventura PMSAs
New York	New York, Bergen-Passaic, Dutchess County, Jersey City, Middlesex-Somerset-Hunterdon, Monmouth-Ocean, Nassau-Suffolk, Newark, New Haven-Bridgeport-Stamford-Danbury-Waterbury, Newburgh, and Trenton PMSAs
Seattle	Seattle-Bellvue-Everett, Bremerton, Olympia, and Tacoma PMSAs

Note: MSA – Metropolitan Statistical Area; PMSA – Primary Metropolitan Statistical Area

Source: U.S. Census Bureau

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METHODOLOGY FOR ESTIMATING GROSS REGIONAL PRODUCT OF METROPOLITAN REGIONS

Description of estimating activity	Data source	Granularity
Collect officially reported output and employment data	<ul style="list-style-type: none"> • BEA 	<ul style="list-style-type: none"> • 2-digit SIC • State level
Distribute reported 2-digit output data into 3 & 4-digit SIC data at the state level in direct proportion to reported wages and salaries for each SIC code. Assume profits per dollar of wages in each SIC code are constant	<ul style="list-style-type: none"> • Economy.com 	<ul style="list-style-type: none"> • 3 & 4-digit SIC • State level
Distribute 2, 3 & 4-digit SIC data at the state level to county level, in direct proportion to the ratio of reported wages and salaries for each SIC code. Assume profits per dollar of wages in each SIC code are constant	<ul style="list-style-type: none"> • Economy.com 	<ul style="list-style-type: none"> • 2,3 & 4-digit SIC • County level
Aggregate 2,3 & 4-digit SIC data at the county level to MSA and CMSA levels	<ul style="list-style-type: none"> • Economy.com 	<ul style="list-style-type: none"> • 2,3 & 4-digit SIC • MSA and CMSA level

METHODOLOGY FOR CALCULATING IMPACT OF PRICE PREMIUM AND PRICE BUBBLE ON BAY AREA PRODUCTIVITY ADVANTAGE

Step	Description
<p>Compute deflators for long-term price premium of Bay Area goods and services over national average</p>	<ul style="list-style-type: none"> • Purchasing Power Parity (PPP) deflators for the Bay Area are available only for the years 1964, 1984, 1995 and 1998, published by the American Chamber of Commerce (ACCRA) • Consumer Price Index (CPI) data published by the Bureau of Labor Statistics annually was used to complete deflators for the missing years in the ACCRA series • Average of deflators over last forty years was used to estimate the long-term price premium of Bay Area goods and services over national average
<p>Compute short-term price bubble deflators for Bay Area goods and services</p>	<ul style="list-style-type: none"> • CPI growth rates for the Bay Area and nationally for the periods 1960-87, 1987-95 and 1995-99 for various sectors were computed using data published by the BLS • The difference between the long-term premium in the growth rate of CPI between the Bay Area and nationally, and that observed in the periods 1987-95 and 1995-99 was computed as the impact of a short term deflationary bubble, and a long-term inflationary bubble respectively
<p>Apply sector-specific deflators to adjust output for long-term price premium and for short-term price bubbles</p>	<ul style="list-style-type: none"> • Output data was adjusted for price effects by dividing output by respective deflators
<p>Compute impact of price effects on productivity</p>	<ul style="list-style-type: none"> • Productivity level was calculated with and without each price adjustment, and the differences computed

METHODOLOGY FOR CALCULATING IMPACT OF VENTURE CAPITAL

Step	Description
Calculate "excess" venture capital in Bay Area 1999-2000	<ul style="list-style-type: none"> • Measure long-term trend of venture capital investment 1990-1998 • Determine amount of capital deployed in excess of "expected" investment based on long-term trend
Estimate amount of "excess" spent in Bay Area economy	<ul style="list-style-type: none"> • Using distribution of funds by stage of company, estimate excess VC invested within the Bay Area for each stage • Using informed assumptions about how venture capital was typically spent in each stage (type of expense, location of expenses), estimate amount of capital that was spent in Bay Area
Calculate impact of "excess" venture capital on Bay Area output, employment and productivity	<ul style="list-style-type: none"> • Using estimate from above and assumptions on average all-in cost of employees, estimate impact on output and employment in Bay Area • Apply estimate impact on output and employment to productivity data

METHODOLOGY FOR ASSESSING IMPACT OF CAPITAL INTENSITY

Approach

Findings

Capital intensity level

- Estimate capital intensity among largest Bay Area companies and benchmark to US average

- Two-thirds of the 15 largest employers in the Bay Area are significantly less capital intensive than the average for US companies
- However, data reported at the national level, not at the establishment level

Capital intensity growth

- Analyze growth in capital intensity among largest Bay Area companies between 1995-2000

- Capital intensity growth rates among the largest Bay Area employers are mixed, strengthening the hypothesis that, relative to the national average, the Bay Area did not witness an unusual build up in its capital intensity between 1995-2000.
- However, data reported at the national level, not at the establishment level

Triangulation using the energy proxy

- Triangulate analysis using regional and national energy consumption data to estimate establishment-specific capital intensity

- Energy consumption data further strengthens the hypothesis that the Bay Area is significantly less capital intensive than the average for US companies and did not witness an unusual build up between 1995-2000

* total fixed capital stock per employee invested in structures and equipment

ENDNOTES

Exhibit 3

- For comparison across regions at a fixed point in time, output per capita measured as total nominal output for the region divided by total population. Regional output data estimates provided by Economy.com (see Appendix for methodology)

Exhibit 9

- Output per capita over time computed as real output deflated to 1996 dollars divided by total population of region
- Labor inputs measured as the sum total of Persons Employed in Production (PEP) (including payroll, proprietors and all non-BLS sectors) divided by total population
- Labor productivity over time measured as real output deflated to 1996 dollars divided by PEP. Regional output data estimates provided by Economy.com (see Appendix for methodology)

Exhibit 10

- Labor productivity over time measured as real output deflated to 1996 dollars divided by PEP. Regional output data estimates provided by Economy.com (see Appendix for methodology)

Exhibit 11

- Labor productivity over time measured using real output deflated to 1996 dollars divided by Persons Employed in Production (PEP). Regional output data estimates provided by Economy.com (see Appendix for methodology)
- Analysis has been done up to 1999, since data for 2000 exists as estimates only. Actual data for 2000 will not be available until Spring 2002

ENDNOTES

Exhibit 12

- Labor productivity at a fixed point in time measured as nominal output divided by Persons Employed in Production (PEP)
- Venture capital bubble measured as the impact on total productivity advantage through increase in total output and jobs through an unsustainable increase in capital flow to private industries over short term periods. See Appendix for methodology
- Price bubble measured as the impact on total productivity advantage through increase in total output due to an unsustained increase in regional market value of nontradable goods and services over short-term periods, e.g., real estate, retail, services, restaurants, etc. See Appendix for methodology
- Sustained price premium effect measured as the impact on total productivity advantage through increase in total output due to sustained premium in regional market value of non-tradable goods and services over long-term periods, e.g., real estate, retail, services, restaurants, etc. See Appendix for methodology for estimating regional purchasing power parity (PPP)
- Activity mix measured as the impact on total productivity advantage due to companies locating a higher share of high wage functions (e.g., professionals and executives versus blue collar jobs) within the Bay Area relative to the national average
- Residual productivity is the residue after removing the impact of price premium and bubbles from total productivity advantage. This portion of productivity advantage is largely attributed to factors such as industry mix at a highly-granular level, activity mix, quality of workforce education and skills, quality of capital and technological spillovers

Exhibit 16

- FIRE does does not include real estate or securities and commodity brokers
- Utilities does not include telecom
- Manufacturing does not include computers or semiconductors
- Services does not include business services or computer programming
- Business services does not include computer programming
- Indexes real productivity data deflated to 1996 dollars

ENDNOTES

Appendix B – All Industry Cluster Performance charts

- Output and output per worker data are nominal figures
- Employment concentration index defined as: $(\text{Cluster employment in region} / \text{Total non-farm employment in region}) / (\text{Cluster employment in U.S.} / \text{Total non-farm employment in U.S.})$
- Growth rates of output and output per worker are calculated using real (inflation adjusted) data
- Output and productivity figures are nominal data.