

**ROADMAP TO ARIZONA'S ECONOMIC RECOVERY:
A PACKAGE TO CREATE JOBS, IMPROVE THE
STATE'S ECONOMIC COMPETITIVENESS, AND
BALANCE THE BUDGET**

ADDENDUM: REVENUE FORECAST DETAILS

A Report from the Office of the University Economist

March 2010

Dennis Hoffman, Ph.D.

Professor, Department of Economics; Director, L. William Seidman Research Institute;
and Director, Office of the University Economist

Tom Rex, M.B.A.

Associate Director, Center for Competitiveness and Prosperity Research;
and Manager of Research Initiatives, Office of the University Economist

Center for Competitiveness and Prosperity Research
L. William Seidman Research Institute
W. P. Carey School of Business
Arizona State University
Box 874011
Tempe, Arizona 85287-4011

(480) 965-5362

FAX: (480) 965-5458

EMAIL: Dennis.Hoffman@asu.edu or Tom.Rex@asu.edu
wpcarey.asu.edu/research/competitiveness-prosperity-research
economist.asu.edu



ARIZONA STATE UNIVERSITY

REVENUE FORECAST

In Table 10 (page 71) in *Roadmap to Arizona's Economic Recovery: A Package to Create Jobs, Improve the State's Economic Competitiveness, and Balance the Budget*, a general fund revenue forecast is presented which includes the proposed changes to the revenue system. If the proposed changes are backed out of these figures, the baseline forecast can be obtained, as shown below in Table 1. This baseline forecast of general fund revenue is higher than the forecasts made by the Governor's Office of Strategic Planning and Budgeting (OSPB) and the Arizona Joint Legislative Budget Committee (JLBC). This addendum provides detail on the *Roadmap's* revenue projection.

The three key points discussed in this addendum are:

1. Arizona's economy is highly cyclical, growing much faster than the nation during economic expansions.
2. Revenues everywhere, but especially in Arizona given its revenue structure, are much more cyclical than the overall economy.
3. The revenue forecast in the *Roadmap* is actually conservative. Revenues relative to the size of the economy remain below the historical norm, even in fiscal year 2015.

TABLE 1
ONGOING REVENUES, BASELINE FORECAST,
FISCAL YEARS 2010 THROUGH 2015,
ARIZONA STATE GOVERNMENT GENERAL FUND
(In Billions)

Fiscal Year	Roadmap	JLBC	OSPB
2010	\$6.392	\$6.24	\$6.341
2011	7.058	6.73	6.779
2012	7.941	7.26	7.3*
2013	8.772	7.91	7.8*
2014	9.517	-	8.3*
2015	10.192	-	-

* Estimated from chart on page 4 of OSPB report

Sources:

Roadmap to Arizona's Economic Recovery: A Package to Create Jobs, Improve the State's Economic Competitiveness, and Balance the Budget, January 2010,
http://wpcarey.asu.edu/seidman/reports/UnivEconomist/Roadmap_01-10.pdf

Arizona Joint Legislative Committee, *Finance Advisory Committee Briefing Materials*, January 21, 2010
<http://www.azleg.gov/jlbc/facag012110.pdf>

Office of Strategic Planning and Budgeting, *The Executive Budget: Summary*, January 15, 2010,
http://www.ospb.state.az.us/documents/2010/FY2011_BudgetSummaryFINAL.pdf.

Arizona's Economy is Highly Cyclical

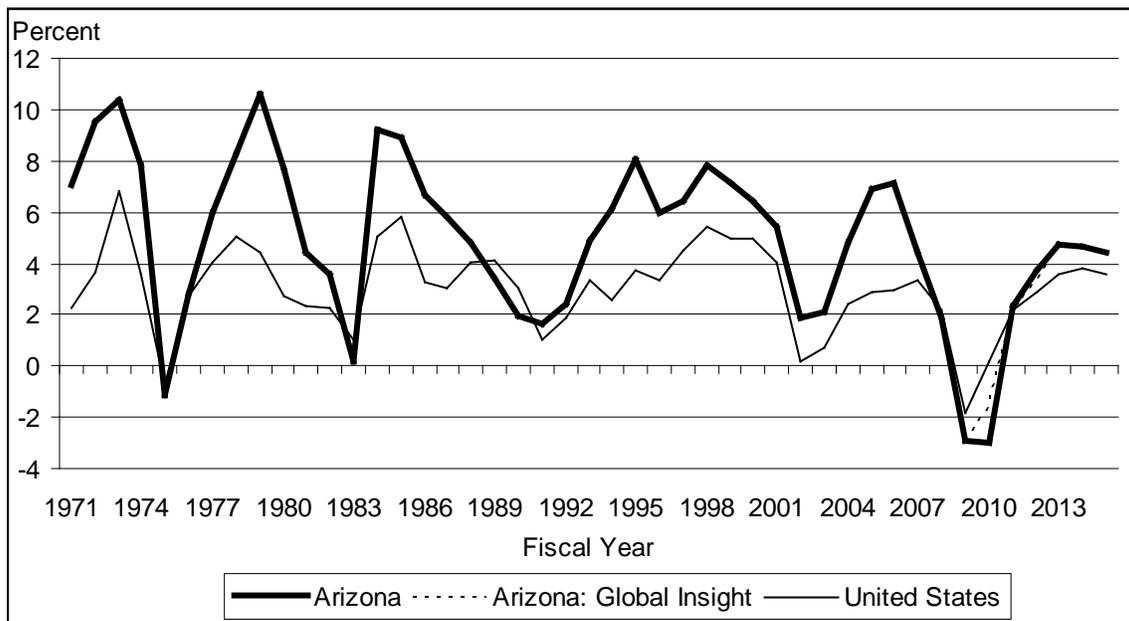
Much faster economic growth has occurred in Arizona than IN the nation during each of the last five economic expansions. In contrast, economic growth in Arizona typically slows during recessionary periods to about equal to the national average (see Chart 1).

Projected economic growth in Arizona from fiscal years 2010 through 2015 is more modest than the growth rates in the prior cycles, both in terms of level and the differential from the national average. Since the economic decline in Arizona was unusually deep and long during the just-ended recession, one might expect that economic growth in the upcoming expansion would be greater than that of prior expansions. Thus, a forecast of economic growth during the next expansion less than that of past expansions represents a conservative projection.

For a reasonableness check on the forecast of economic growth in Arizona used in the *Roadmap*, the personal income forecast is compared to that of Global Insight, a leading economic forecasting company. Its forecast of personal income growth in Arizona is higher in fiscal year (FY) 2010, marginally less in FYs 2011 and 2012, and identical from FYs 2013 through 2015.

Most of the reason for Arizona's much faster economic growth during economic expansions is the state's much faster population growth, as seen in Chart 2. The percentage change in Arizona's population has trended down over time due to its steadily rising population base. Constant numeric population change equates to declining percentage changes over time. The percentage growth between the mid-1990s and mid-2000s did not decline due to the greater

**CHART 1
INFLATION-ADJUSTED PERSONAL INCOME GROWTH IN ARIZONA
AND THE NATION, HISTORICAL AND PROJECTED**

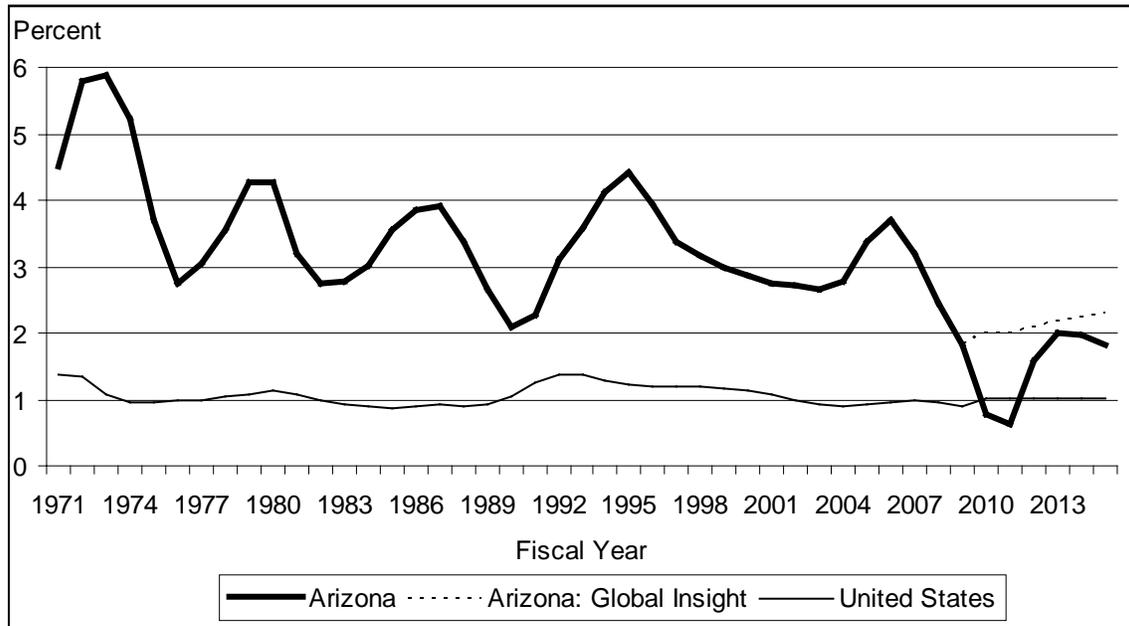


Source: U.S. Department of Commerce, Bureau of Economic Analysis (historical personal income and gross domestic product implicit price deflator) and Global Insight (projection).

numeric gains that occurred during this period, which were mostly the result of an influx of immigrants, most of whom were undocumented.

Undocumented immigration to Arizona is expected to be lower in the future due to the state's employer sanctions law that went into effect at the beginning of 2008. This is the cause of the slower population growth assumed in the *Roadmap* forecast. Its forecasted rates of growth are less than those of Global Insight.

**CHART 2
POPULATION GROWTH IN ARIZONA AND THE NATION,
HISTORICAL AND PROJECTED**



Source: U.S. Department of Commerce, Census Bureau (historical) and Global Insight (projection).

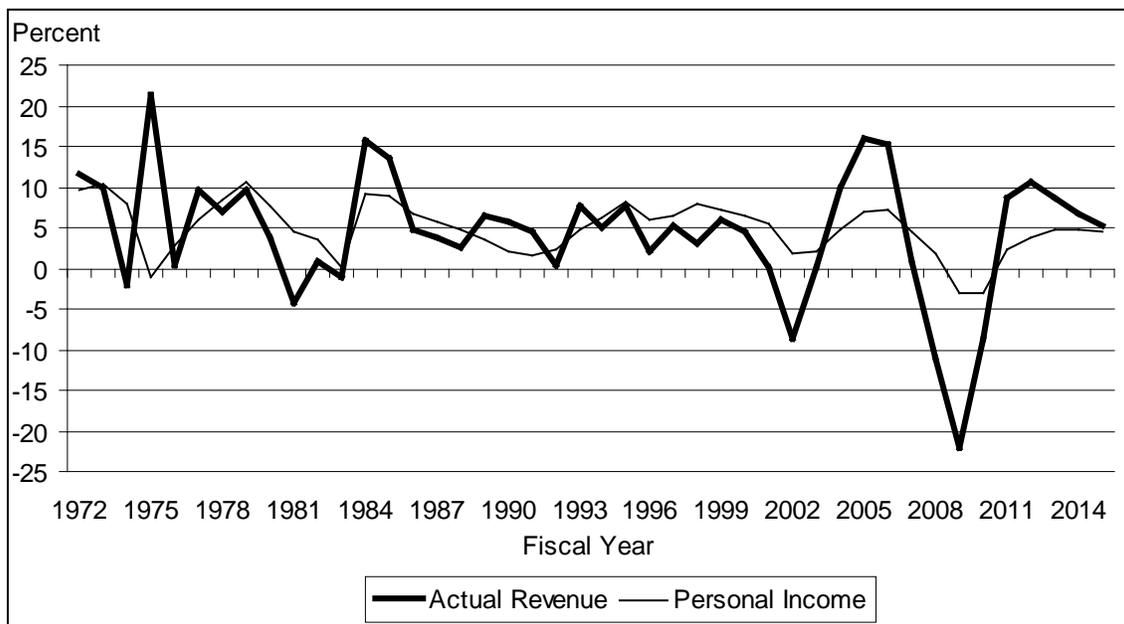
Revenues Are Much More Cyclical Than the Overall Economy

The growth rates of general fund revenue and personal income are displayed in Chart 3. However, because of the numerous changes made over time to tax rates, exemptions, credits, etc., there is little value in comparing actual revenues to a measure of economic growth. Thus, actual revenues have been adjusted. Since the late 1980s, the JLBC has estimated the impact of all tax law changes. These impacts have been brought forward, adjusted for inflation and population growth.

As seen in Chart 4, adjusted revenues to the Arizona general fund rise more than personal income during economic expansions and less during recessions. The magnitude of the differences in growth rates has become much greater in recent years, primarily the result of tax law changes that have narrowed the revenue base used by the general fund. About 90 percent of the revenue to the general fund now comes from the sales tax and the income tax, each of which are highly cyclical sources of revenue.

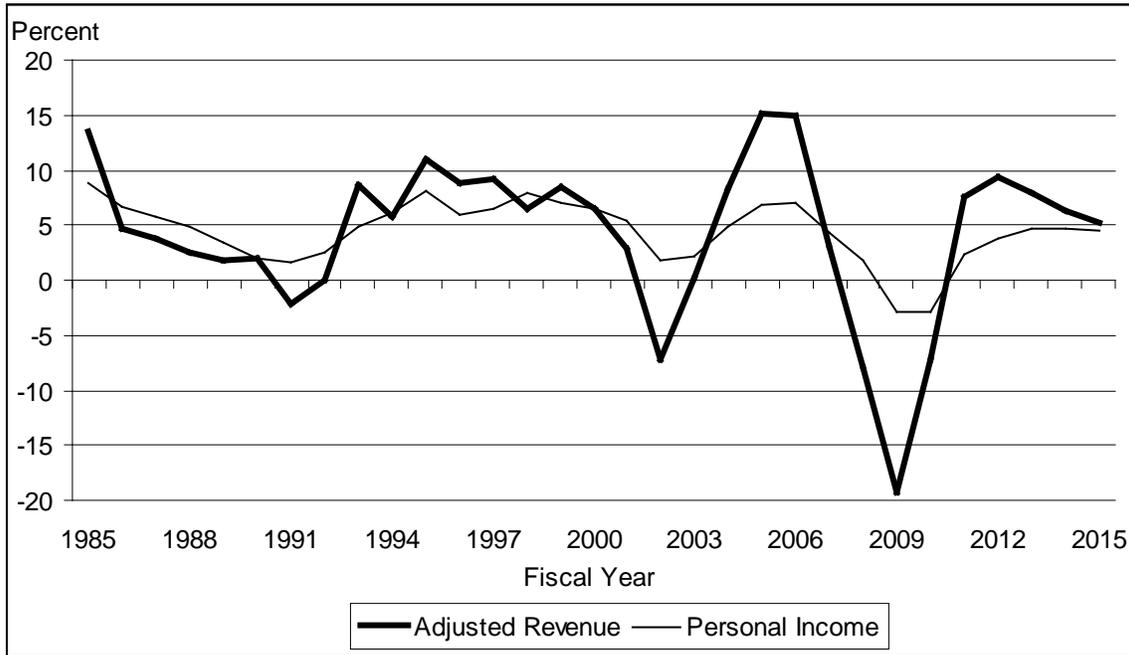
The forecasted rate of revenue growth used in the *Roadmap* is greater than the rate of personal income growth, but the differential is smaller than in the last economic expansion, when revenue was temporarily boosted by the real estate boom. Given the much greater decline in revenue than personal income during the recent recession, this represents a conservative forecast of revenue growth.

**CHART 3
INFLATION-ADJUSTED REVENUE (ACTUAL) AND PERSONAL INCOME
GROWTH IN ARIZONA, HISTORICAL AND PROJECTED**



Sources: Arizona Joint Legislative Budget Committee (historical revenue) and U.S. Department of Commerce, Bureau of Economic Analysis (historical personal income).

CHART 4
INFLATION-ADJUSTED REVENUE (ADJUSTED FOR TAX CODE CHANGES) AND
PERSONAL INCOME GROWTH IN ARIZONA, HISTORICAL AND PROJECTED



Sources: Arizona Joint Legislative Budget Committee (historical actual revenue and impact of tax code changes) and U.S. Department of Commerce, Bureau of Economic Analysis (historical personal income).

The Revenue Forecast in the *Roadmap* Is Conservative

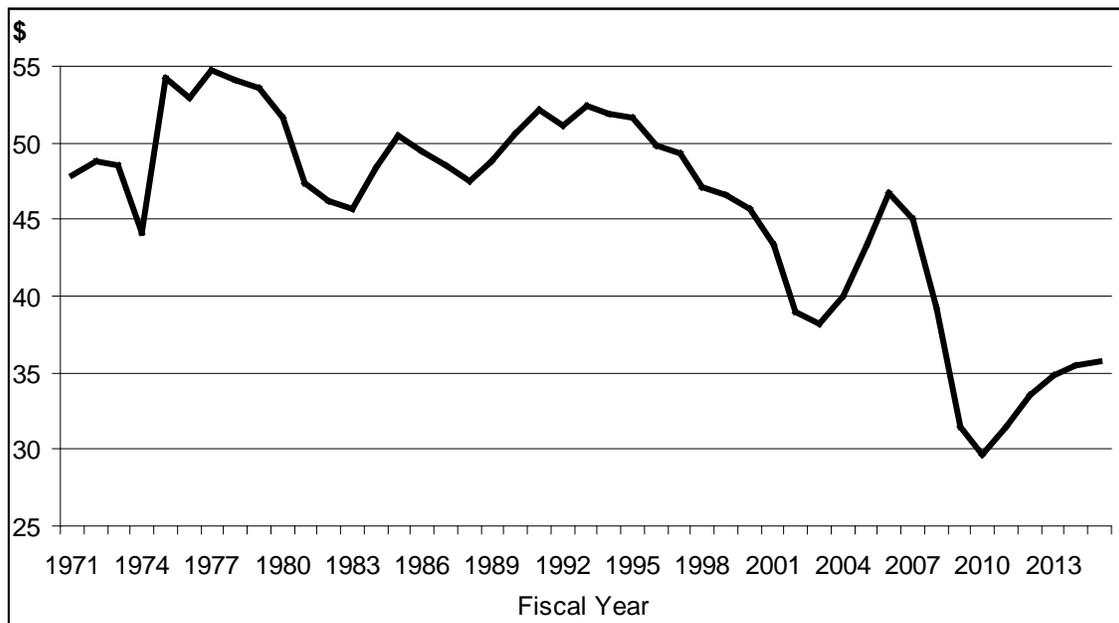
The conservative nature of the revenue forecast is most easily seen by expressing revenue per \$1,000 of personal income, as in Charts 5 and 6. The latter chart displays revenue after adjustment for the changes in tax laws. It shows that revenue per \$1,000 of personal income rises and falls with the economic cycle, going up and down roughly \$6 (12%) during a typical cycle. The decline in the last three years has been closer to \$15. Even after adjusting for an usually high peak in 2006, the decline was about double the typical \$6. Yet, the forecast used in the Roadmap is for growth of about \$6, in line with that of the historical average.

This forecast leaves projected revenue (after adjustment for tax law changes) per \$1,000 of personal income still about 10 percent less than the average historical value in FY 2015 and more than \$6 (about 15 percent) less than expected at the peak of an economic cycle. If revenue per \$1,000 of personal income were to return to normal by FY 2015, revenues in that year would be \$2.7 billion higher than projected.

An alternative measure—per capita revenue—is displayed in Charts 7 and 8. Forecasted revenues remain well below the trend line.

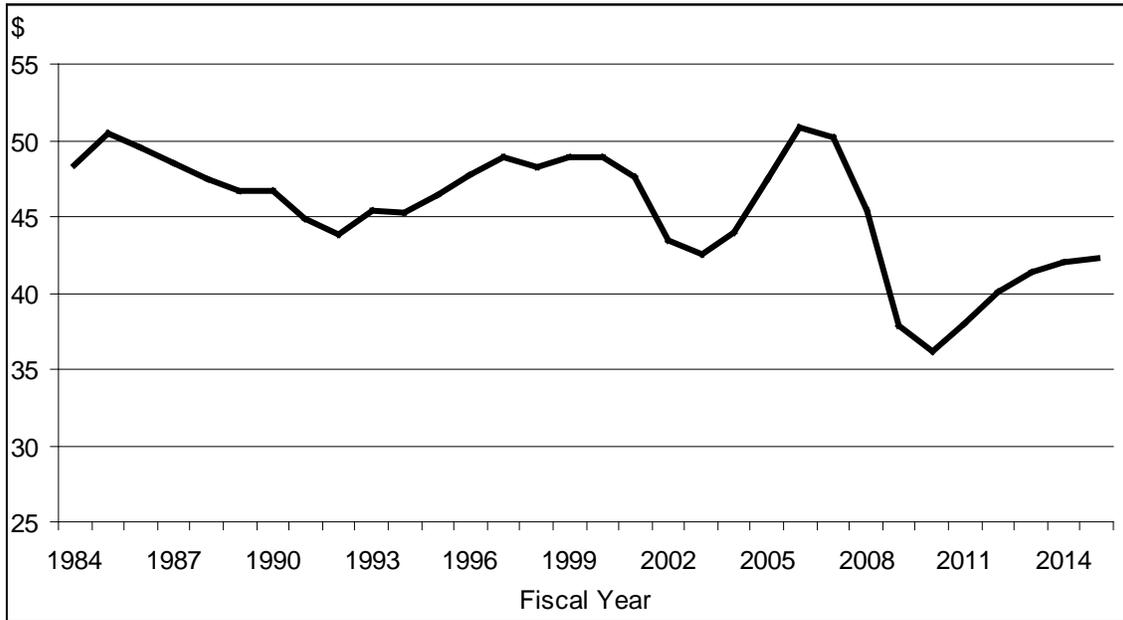
The revenue forecast really consists of various pieces: population growth, income growth per person, and revenue growth relative to income growth. As seen in Chart 2, the population growth that has been forecast is substantially below that of the past. As seen in Chart 9, projected per capita personal income growth relative to the national average is in line with that of prior

CHART 5
REVENUE (ACTUAL) PER \$1,000 OF PERSONAL INCOME IN ARIZONA,
HISTORICAL AND PROJECTED



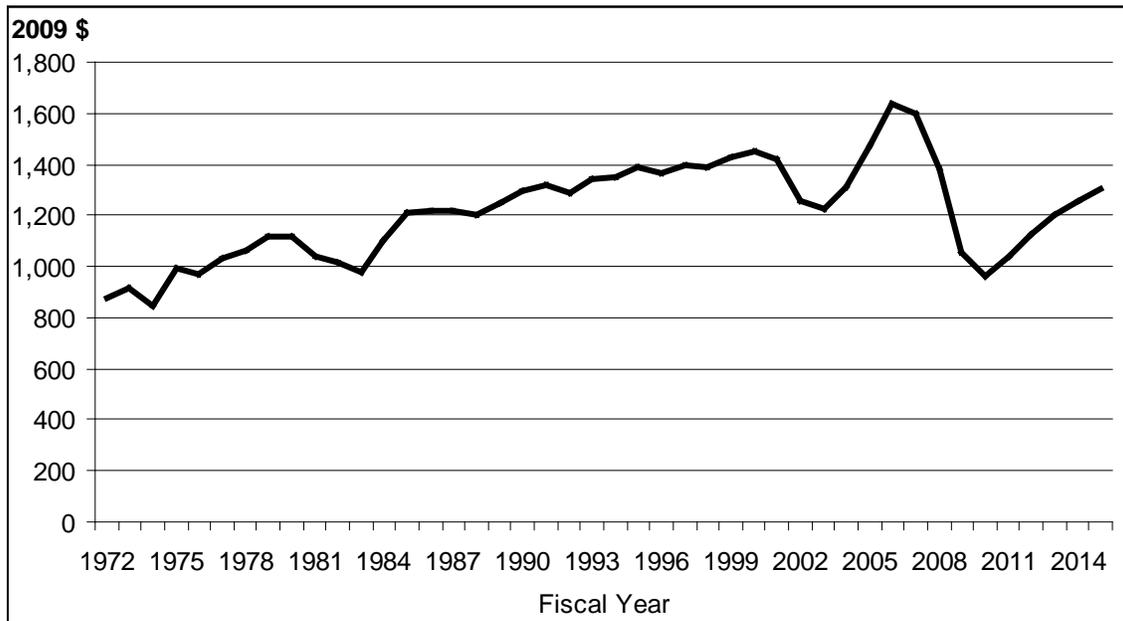
Sources: Arizona Joint Legislative Budget Committee (historical revenue) and U.S. Department of Commerce, Bureau of Economic Analysis (historical personal income).

**CHART 6
REVENUE (ADJUSTED FOR TAX CODE CHANGES) PER \$1,000 OF
PERSONAL INCOME IN ARIZONA, HISTORICAL AND PROJECTED**



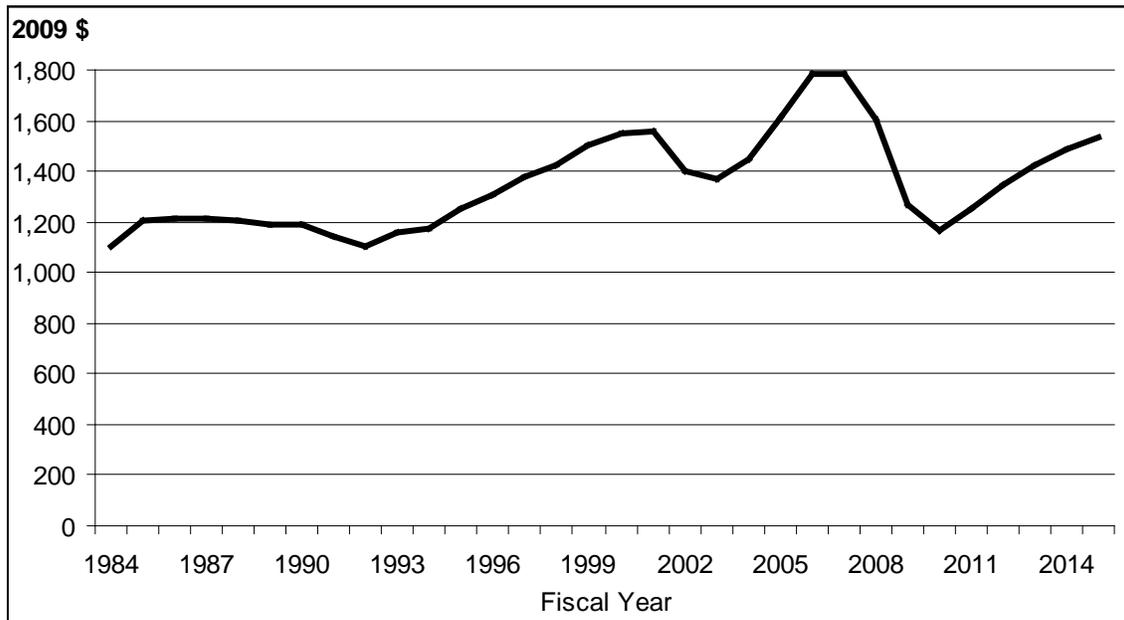
Sources: Arizona Joint Legislative Budget Committee (historical actual revenue and impact of tax code changes) and U.S. Department of Commerce, Bureau of Economic Analysis (historical personal income).

**CHART 7
INFLATION-ADJUSTED REVENUE (ACTUAL) PER CAPITA IN ARIZONA,
HISTORICAL AND PROJECTED**



Sources: Arizona Joint Legislative Budget Committee (historical revenue), U.S. Department of Commerce, Census Bureau (historical population), and U.S. Department of Commerce, Bureau of Economic Analysis (historical gross domestic product implicit price deflator).

CHART 8
INFLATION-ADJUSTED REVENUE (ADJUSTED FOR TAX CODE CHANGES)
PER CAPITA IN ARIZONA, HISTORICAL AND PROJECTED



Sources: Arizona Joint Legislative Budget Committee (historical actual revenue and impact of tax code changes), U.S. Department of Commerce, Census Bureau (historical population), and U.S. Department of Commerce, Bureau of Economic Analysis (historical gross domestic product implicit price deflator).

expansions, though the percentage increase does not peak as high as in any of the five prior recessions. In Chart 10, it can be seen that revenue growth per \$1,000 of personal income is less than that of the last expansion. The peak growth rate is higher than during the 1990s expansion, due to an assumed rebound from the steep decline during the just-ended recession. Despite this rebound, revenue per \$1,000 of personal income only reaches \$42 in FY 2015—the peaks of the prior cycles were \$49 or more (see Chart 6).

Thus, the revenue forecast used in the *Roadmap* is conservative. To argue for a lesser increase in revenue is in essence to argue that something radical happened to Arizona in the last three years that represents a permanent ratcheting down of one or more of the components:

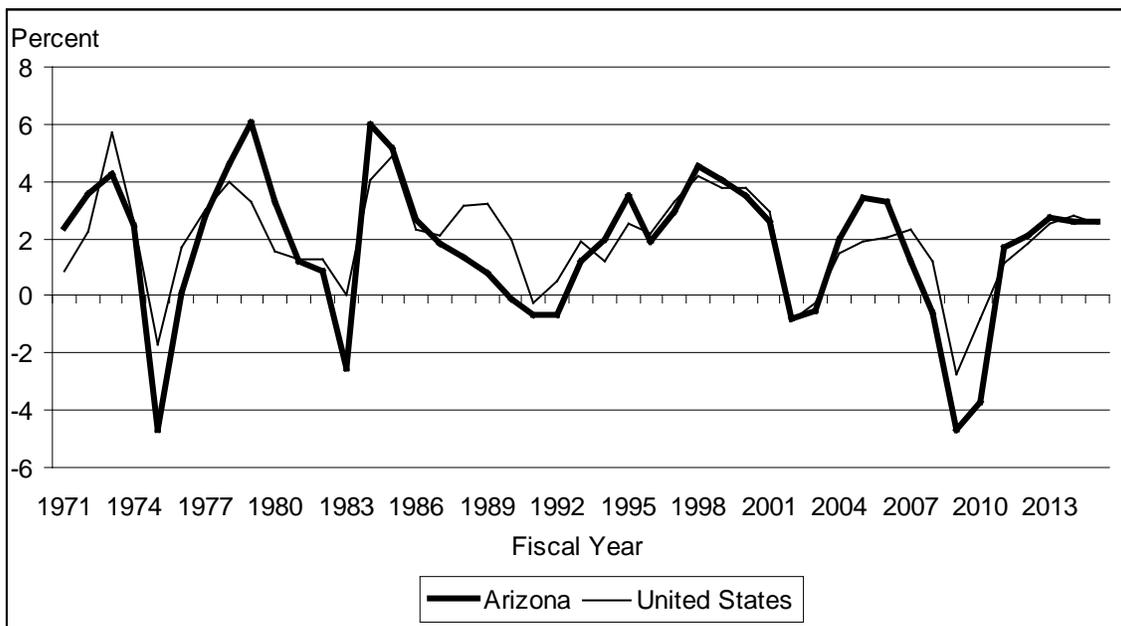
- Population growth (beyond the slow down assumed in the *Roadmap* forecast).
- Income growth per person.
- Revenue collections relative to income.

A similar pessimism was present in the late 1980s and early 1990s, during the state’s previous long, deep down cycle relative to the nation that was the result of a boom-bust cycle in real estate. The 1987-92 economic slump was followed by more than a decade of population and economic growth in Arizona that set records for numeric gains in employment and population. Indeed, the historical record in Arizona is that forecasts issued during economic recessions have been too pessimistic, while those issued at times of strong economic growth have proven to be too optimistic.

Just as was the case in the early 1990s, there is little evidence of any structural changes in Arizona now (other than the passage of the employer sanctions law) that suggest much slower population or economic growth in the future. Instead, the state simply has experienced a recession in recent years, one longer and deeper than normal due to gross imbalances in real estate.

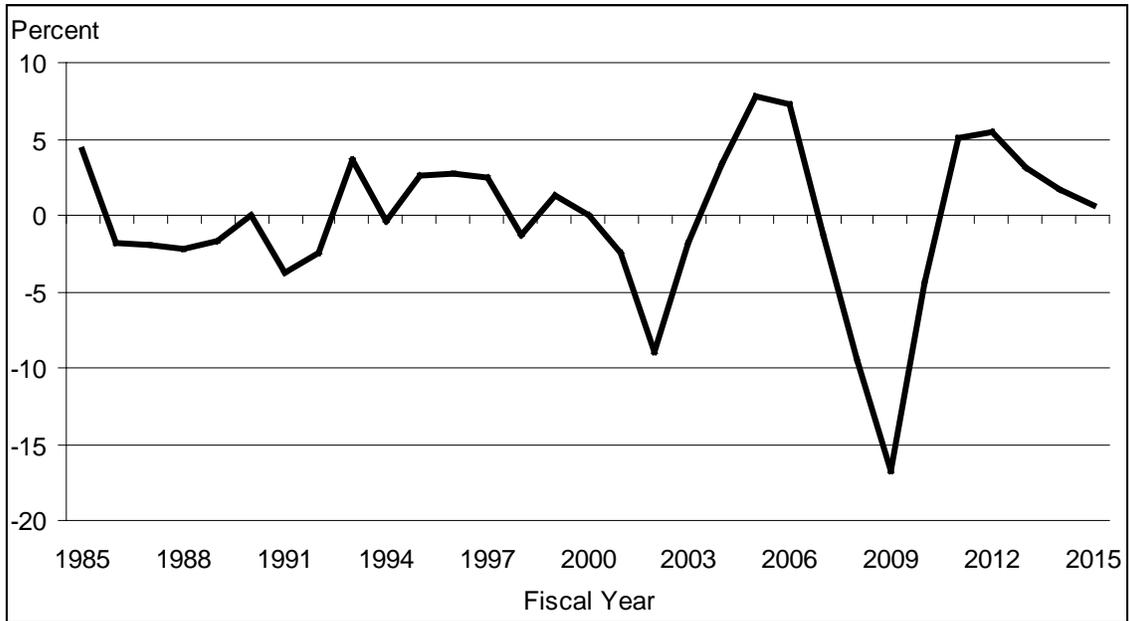
The largest concern about the forecast used in the *Roadmap* should be that revenue per \$1,000 of personal income remains below the historic norm, not that the projected revenue is too high.

**CHART 9
INFLATION-ADJUSTED PER CAPITA PERSONAL INCOME GROWTH
IN ARIZONA AND THE NATION, HISTORICAL AND PROJECTED**



Source: U.S. Department of Commerce, Bureau of Economic Analysis (historical per capita personal income and gross domestic product implicit price deflator).

CHART 10
INFLATION-ADJUSTED REVENUE (ADJUSTED FOR TAX CODE CHANGES)
PER \$1,000 OF PERSONAL INCOME GROWTH IN ARIZONA,
HISTORICAL AND PROJECTED



Sources: Arizona Joint Legislative Budget Committee (historical actual revenue and impact of tax code changes) and U.S. Department of Commerce, Bureau of Economic Analysis (historical personal income).