A Revenue Forecasting Model for the Pima RTA: Updated to 2013

Prepared for:
Regional Transportation Authority of Pima County

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Executive Summary

On May 16, 2006, voters in Pima County approved a $2.1 billion regional transportation plan to be funded by a ½ percent sales tax and to be executed over 20 years expiring on June 30, 2026. The $2.1 billion revenue forecast was produced by the Economic and Business Research Center at the Eller College of Management, University of Arizona. In total, 51 transportation related projects in four elements (roadway, safety, transit, environment and economic vitality) were identified in the regional transportation plan consuming $1.998 billion of the forecasted revenues. The additional monies in the referendum were to cover financing.

The severe economic downturn beginning in late 2007 has resulted in $98.3 million less revenue than forecasted through fiscal year 2013. Expenses have also lagged partly because of slower than anticipated project delivery and partly because of a favorable construction cost environment. The favorable cost environment has yielded a savings of approximately 18 percent and, in aggregate, total program expenses are $221.7 million below plan through June 30, 2013.

The revised forecast included herein predicts a 17 percent decline in total revenues from $2.1 billion to $1.736 billion. This is roughly consistent with the 17 percent revenue decline the RTA has already experienced from actual sales tax receipts. The Economic and Business Research Center's revised forecast is based on IHS Global Insight's national model, using baseline assumptions that are assigned a 65 percent probability, but makes no assumptions about changes in Arizona state and local tax law. Nor does this economic forecast address the construction cost trends relative to the delivery of the regional transportation plan.

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Introduction

This forecasting model is an update to the one built in early 2005, which projected Pima County sales tax revenues to the Regional Transportation Authority (RTA). The enabling legislation allowed counties to set up a referendum that, if passed, would impose a sales tax rate on taxable sales categories at 10 percent of the Arizona state sales tax rate. For most taxable sales categories, the RTA sales tax rate is 0.5 percent. A notable exception is the tax on hotels/motels (sometimes referred to as the bed tax), which is taxed at 0.55 percent.

The previous model produced revenue projections that proved to be higher than actual revenues collected. The forecasts contained in this report are substantially lower and some of the reasons will be discussed in this introduction, as well as in the discussion of the estimated equations.

No economists -- either within Arizona or nationally -- and certainly no forecasters accurately predicted the devastating economic effects created by the bursting of the housing bubble and the great recession that began in late 2007. Economists at the Economic and Business Research Center discussed the rising housing prices, but the expectation was that the rise in housing prices would slow down, the housing market would soften because of the lack of affordability, and that the period of "overinvestment" would be followed by a period of correction. By mid-2006, evidence suggested that housing prices had stabilized and that building permits were declining, and in 2007, the potential for negative job growth was noted.[i] However, virtually no forecaster predicted the extent and consequence of the housing and foreclosure crises.

Rapidly growing states like Arizona were particularly vulnerable to the housing-fueled crisis. Because our housing "bubble" was substantially larger than that for the U.S. as a whole, the result was a much deeper recession in Arizona compared to most other states. Arizona's economic indicators fell rapidly and fell further than comparable measures for the U.S. as a whole. Currently, total employment in Pima County is approximately where it was in 2006. Total taxable sales (in nominal terms) in Pima County are approximately at the level they were in FY2006, roughly the time period when the previous revenue model was built (Figure 1). However, when adjusted for inflation, FY2013 taxable sales were back at FY2000 levels (Figure 2). The county has lost well over a decade of growth in the real (deflated) sales tax base. Even if the previous trend line were to pick up where it left off (and we don't expect that it will), it would be starting at a substantially lower level (in deflated terms) that existed in 2005.

Most of the extraordinary decrease in Pima County's sales tax base was due to the great recession and the housing crisis. But other weaknesses in the tax base have been identified as well. One weakness is related to legal constraints that limit the ability of government entities to fully tax a sale that occurs in Pima County. These legal restraints specifically affect the collection of the bed tax (hotel/motel receipts) and the collection of taxes on on-line sales (part of what should be retail sales). These restraints will be discussed in more detail below, when the individual equations are described. There are broader, more systemic problems, affecting the sales tax base in Pima County (and elsewhere), however.

Figure 1.

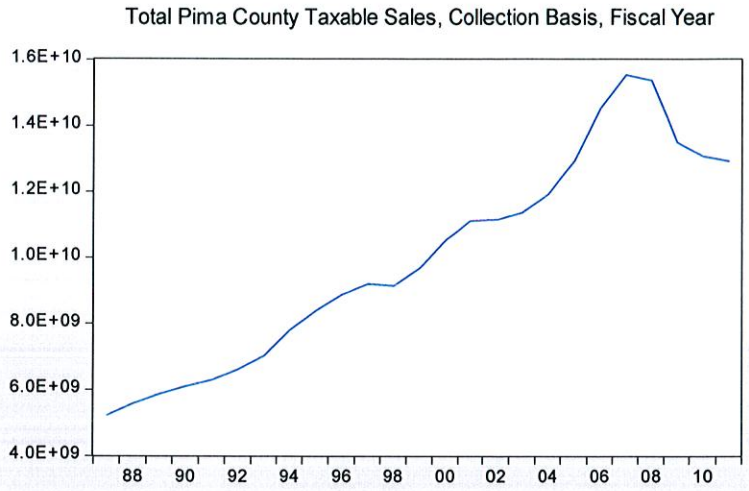
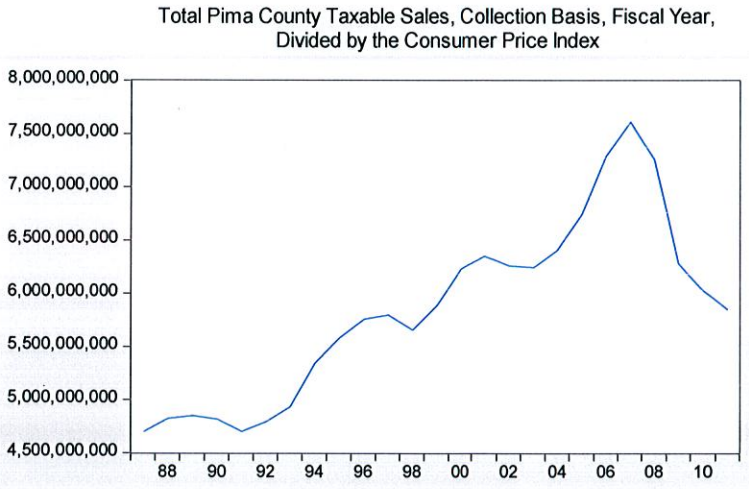


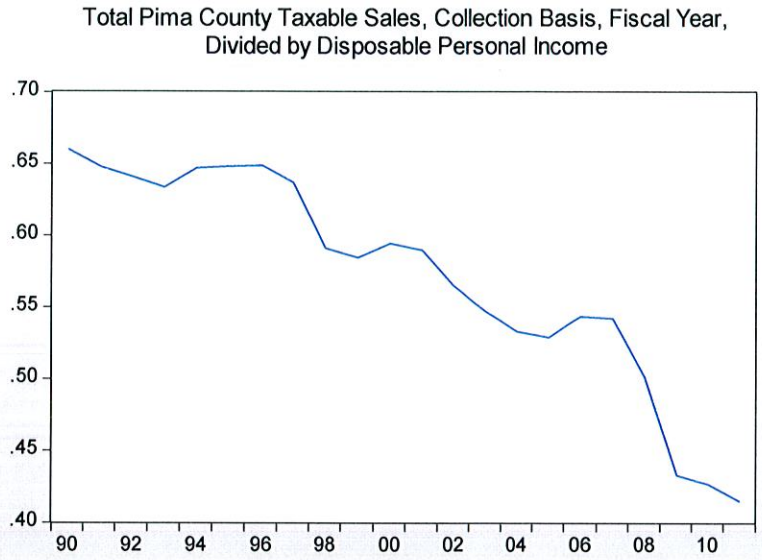
Figure 2.



The Shrinking Sales Tax Base

There are some troubling long-term trends in the sales tax base, trends that have substantially worsened since 2005. The taxable sales tax base is a diminishing share of personal income. This is shown very clearly in Figure 3. In just a little over 20 years, the total sales tax base as a share of after-tax (disposable) income has fallen from 65 percent to slightly over 40 percent. This is a reduction in the taxing capacity of over 50 percent in just a little over two decades. The downward sloping trend line is rather straight, although bumpy, through FY2005. Since then, the share of income spent on taxable items fell much faster, from approximately 54 percent in FY2006 and FY2007 to less than 42 percent in FY2011, a 29 percent drop in taxing capacity in just four fiscal years.[ii]

Figure 3.

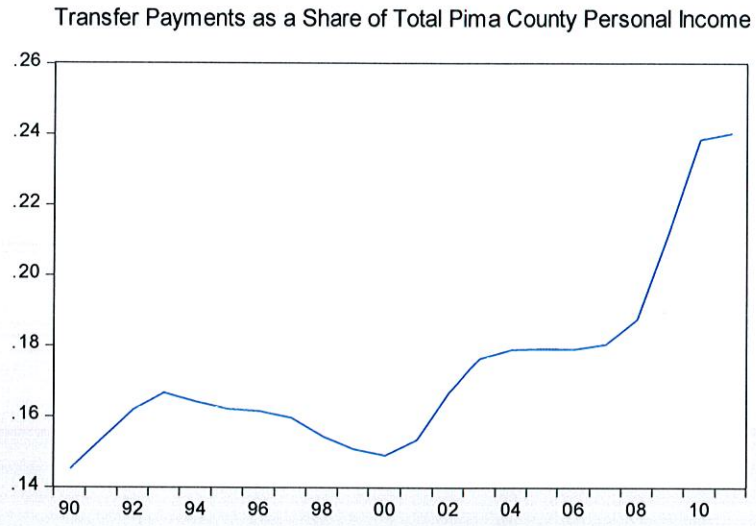


There are several potential reasons why the sales tax base is a declining share of income. Two of them are the aging of the population and the increasingly concentrated income distribution. A set of measures was created to capture the changing spending patterns as the population ages. Consumer expenditures, by age category, were obtained annually from the Consumer Expenditure Survey back to 1984. The portion of income spent on each category was computed by age group, by year. These categories were matched with Pima County's sales tax bases. For example, the share of income spent on utilities (electricity, gas and public utilities) was computed by age group for each year. For each year, a "weighted" share of income spent on utilities was computed where the weights corresponded to the share of population in each consumer age group. The resulting time series was available to use in the tax base equations to control for the aging of the population. In addition to a "weighted" share of income spent on utilities, one was calculated for restaurant and bar sales, retailing, and communications. These variables were each entered into their corresponding sales tax categories to control for the changing age distribution. Some of these variables were statistically significant in explaining a portion of the variation in their corresponding sales tax bases, but some were not. These will also be discussed below when presenting the final equations.

There are no good measures of income distribution over time in Pima County. However, there are a couple of measures that are correlated with how income is distributed. First is the share of income that is represented by transfer payments. Transfer payments are growing, partly because the population is getting older and a higher share is receiving social security payments. In addition, when wages stagnate and the jobs situation is weak, a higher percentage of people receive other forms of government transfers, including food stamps and unemployment insurance. Figure 4 shows of the portion of personal income that is transfer payments. This has risen from approximately 15 percent in 1990 to approximately 24 percent in 2011 and most of that increase occurred since 2007. Transfer payments are predominantly either temporary, safety net support for persons who are unemployed or earning below the poverty line, or they are social security payments made to retirees, the so-called "fixed-

income," as it has often been characterized. People receiving these types of payments are either in financial stress or are retired and they tend to spend less than they would otherwise.

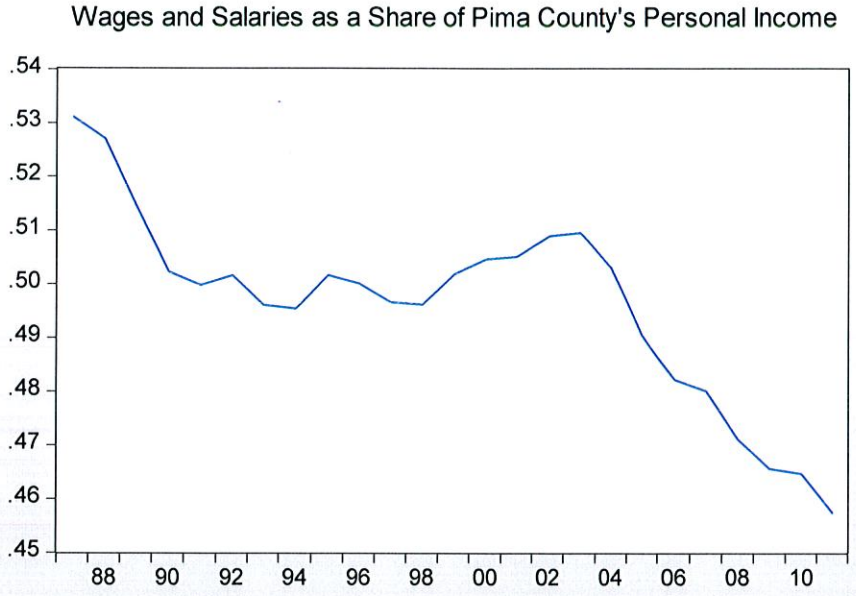
Figure 4.



Another measure that is related to the income distribution is the share of income going to workers via wages and salaries. The fact that wages have stagnated and the labor share of income is declining is an associated characteristic of the increasingly concentrated income distribution. Figure 5 shows the share of personal income that is attributable to wages and salaries. Wages and salaries as a share of personal income have fallen from 53 percent to approximately 46 percent. The share of income fell in the late 1980s and early 1990s and then it stayed fairly constant and actually started rising in the late 1990s and early 2000s. But after 2003, the share dropped substantially from 51 percent to 46 percent in 8 years. Although the decline in this share was not as precipitous as the decline in taxable sales relative to personal income, the 10 percent decline in the share of income can have a substantial effect on overall spending.

For decades, most forecasting models related local economic activities (as opposed to export-base activities that sell goods and services out of state) to personal income. But over time, the relationship between the sales tax base and personal income has substantially changed. It has become clear that it may not be just the level of personal income that is important in explaining taxable sales, it is also the source of income and, indirectly, how income is distributed across the population.

Figure 5.



Data Used in This Study

Two sets of data on taxable sales in Pima County are available from the Arizona Department of Revenue. The first set is the monthly data series that have been available for decades. These data are maintained by the state, are available by county, and are disaggregated into taxable sales classification codes, e.g., retailing (classification code 17), restaurants and bars (classification code 11), etc. This set will be referred to the TXS (Taxable Sales) series.

The other set of data is the revenues collected for the RTA, by category, since the RTA tax was implemented. This set of revenue data can be converted to taxable sales by dividing each category of revenues by the legislated RTA sales tax rate. For most of the categories, the sales tax rate is ½ of one percent, so revenues can be converted to taxable sales by dividing by 0.005. For the category associated with hotel/motel sales, the tax rate is 0.0055 and for non-metal mining (stone, clay, gravel), the tax rate is 0.00312. This set of data will be referred to as the RTA taxable sales series.

Although these series are similar, there are some underlying differences. First, the TXS data are disaggregated according to the legal definitions of the sales tax categories, which are based on the nature of the sale. In contrast, the RTA data series is based on the NAICS (North American Industrial Classification System) code of the business submitting the tax payments. NAICS codes are assigned to businesses based on their primary economic function, but any particular business must report more than one type of sale, based on the legal definitions of taxable sales.

A straightforward example of this might be a hotel that also operates a restaurant and a gift shop. When this hotel submits its monthly sales tax report to state and local governments, it reports sales in three different legal classifications: hotel/motel (bed) sales, classification 25; restaurant and bar sales,

classification 11; and retail sales, classification 17. When these tax bases are multiplied by the relevant RTA tax rates, the resulting revenues are combined and reported to the RTA under the NAICS category of hotels/motels (specifically, accommodations, NAICS code 721). The RTA hotel/motel series would include not only room sales but also other taxable sales made by the hotel. The TXS database for hotels/motels includes only the room rental portion of hotel/motels' sales. Note that if this were the only difference, the sum of all taxable sales in the TXS dataset and the computed taxable sales in the RTA dataset would be equal. But they are not identical because there are other differences, as well.

Another difference relates to the fact that the TXS data and the RTA data contain a slightly different list of taxable categories. The primary example of this is the RTA tax on real property rentals (state tax classification 13). The state tax rate on this sales classification was reduced over time and set to zero in 1996. Once the state sales tax rate was set to zero, the state no longer tracked that activity so it no longer appears in their total taxable sales figures. That category is taxed by the RTA so the revenues from this classification are included in RTA figures.

Finally, there is a difference in how/when delinquent taxes are recorded between the TXS and RTA series. If a sales tax filer is late, the TXS database is revised so the data represents when those sales occurred, not when the delinquent tax was paid. In contrast, the RTA dataset records when the taxes are paid to the RTA. Since this dataset represents tax revenue received by the RTA, they are never revised backward. A delinquent tax payment would simply be posted at the time it was deposited into the RTA account.

For modeling purposes, a fairly long time-series of data is required. The RTA revenue data series begins in July 2006, but there are almost zero revenues reported for that month. Without July, there is insufficient data to compute an annual figure for the fiscal year ending in June 2007. Therefore, the first full-year of data in the RTA dataset is FY2008. The last year is FY2013, for a total of only six years of annual fiscal year data.

Therefore, despite the differences noted above between the two data series, the TXS dataset is used to model the RTA sales tax bases. Then RTA tax revenues, by TXS categories, are estimated by multiplying by the appropriate tax rates. Finally, a residual is computed between actual RTA total revenues and the estimated revenues and that residual is modeled.

Model

The model described in the current report was developed to produce forecasts of the revenues derived from the RTA's one-half percent sales tax. The model is a structural model that forecasts revenues based on Pima County's economic activity and national economic conditions. Forecasts of Pima County's economic activity are obtained from the Forecasting Project, which regularly produces forecasts for the State of Arizona, the Phoenix Metropolitan Area and the Tucson Metropolitan Area (Pima County). Forecasts of national economic activity are obtained from Global Insight. This version of the RTA model is of annual frequency and produces forecasts of fiscal-year revenue from 2013 through 2043.

In this report, we present equations designed to forecast the following sales tax categories:
p_txs_bed25cbf = Pima County taxable sales in hotel/motel sales, collection basis, fiscal year

p_txs_com5cbf = Pima County taxable sales in communications, collection basis, fiscal year
p_txs_con15cbf = Pima County taxable sales in contracting, collection basis, fiscal year
p_txs_rb11cbf = Pima County taxable sales in restaurant and bar sales, collection basis, fiscal year
p_txs_re14cbf = Pima County taxable sales in personal rentals, collection basis, fiscal year
p_txs_rs17lfcbf = Pima County taxable sales in retail,[iii] collection basis, fiscal year
p_txs_ut4cbf = Pima County taxable sales in utilities, collection basis, fiscal year
p_rta_re13cbf + p_revrescb1f = RTA revenues that remain after multiplying all modeled taxable sales categories times the corresponding tax rates

The tax bases taxed at ½ percent were added together:
p_txs_modeled5 = p_txs_com5cbf + p_txs_con15cbf + p_txs_rb11cbf + p_txs_re14cbf + p_txs_rs17lfcbf + p_txs_ut4cbf

Then total estimated RTA revenues are as follows:
p_rta_totcb1f = p_txs_modeled5 * 0.005 + p_txs_bed25cbf * 0.0055 + (p_rta_re13 + p_revrescb1f)

This equation simply says that total RTA revenues are equaled to the sum of all the modeled taxable sales that are taxable at ½ percent times 0.005, plus the hotel/motel tax base times 0.0055 plus an RTA revenue residual. That residual represents all of the un-modeled sales tax base categories and adjusts for the timing difference between the TXS and the RTA data series. The un-modeled RTA revenue categories include transportation and towing ($0), railroads and aircraft, private railcar/pipelines, publishing, printing, amusements, rental of real property, jet fuel tax and other. These categories combined represent approximately $5.96 million, or 8.5 percent of the total in FY2013. Most of the $5.96 million is from the rental of real property ($4.59 million) and the rest ($1.37 million) is the sum of all the remaining un-modeled categories. A formal model of the tax base for the rental of real property cannot be estimated because the RTA series is only 8 years long and the TXS series ends in 1995. Attempting to tie the two series together is not feasible since there is a 12-year gap between the end of the taxable TXS figures and the start of the RTA revenue data. Therefore, the rental of real property was forecast using a simple model that contains only a trend variable. The remainder (p_revrescb1f), consisting of very small categories, are forecast by assumption based on a simple trend. Combined, the revenues from the rental of real property and the remainder are presented as "other" in the tables.

Variable Notation and Format of Estimated Equations

Descriptions of each of the equations are presented below. The method of estimation for each equation is Ordinary Least Squares and the time period used in estimation is provided for each equation. Some important notations:

- suffix "f" or "fy" means fiscal year [if no suffix "f" or "fy," data is calendar]
- suffix "cb" means "collection basis" so
- suffix "cbf" means "collection basis, fiscal year"
- prefix "p_txs_" means "Pima County taxable sales in category.."
- prefix "p_rta_ " means "RTA revenues in category ... "
- numbers in the p_rta_ and the p_txs_ variable names represent the taxable sales legal classification code
- log( ) means that the variable enters the equation as a logarithm to allow for non-linear relationships

To understand the tables describing each estimated equation, consider the following simple linear equation: dependent variable = constant + coefficient1 * variable 1 + coefficient2 * variable2. In the regression table, the dependent variable is listed at the top, the constant term is identified as the variable C, and variable1 and variable2 (and more) are listed down the left-hand column. The first column of numbers contains the estimated coefficients. The second column of numbers contains the standard errors of the coefficients, which represent the precision of the coefficient estimators. The 3rd column of numbers contain the t-statistics (the ratio of the first two columns), which measure the statistical significance of the coefficient. Generally, a coefficient with a t-statistic greater than or equal to 2 (in absolute value) is said to be "statistically significant," meaning the variable corresponding to that coefficient is important in explaining the variation in the variable on the left-hand side of the equation.

Among the statistics presented at the bottom of the equation, the easiest to describe is the one labeled "R-squared." This is a "goodness-of-fit" measure that describes the portion of the variation of the left-hand variable that is explained by the right-hand side variables. An R-square of 0.95 means that the variables on the right-side of the equation explain 95 percent of the variation in the dependent variable.

When both the left- and right-hand side variables are written as logarithms (i.e., log( )), the coefficients in the equation are the estimated "elasticities." Elasticity is a measure of the responsiveness of the left-hand side variables to changes in the right-hand side variables. An elasticity greater than 1 is said to be "elastic," because the left-hand side variable responds in a more than proportional way to changes in the right-hand side variable. An elasticity less than 1 is "inelastic," meaning that the left-hand variable changes less than proportionally to changes in the right-hand side variables. An elasticity of 1 is said be "unitary" and represents a proportional response.

In some equations there is an added "variable" that appears as AR(1). This is a serial autocorrelation correction term. Often, when using time-series data, the errors from a regression are not independent from each other. Instead, consecutive errors are correlated to each other. When this occurs, the coefficients are not affected (i.e., they are not biased), but the t-statistics are inflated. The presence of autocorrelation therefore makes some variables appear statistically significant when they are not. To correct for this, some of the equations have been corrected for serial autocorrelation and this will be noted by the presence of AR(1) among the list of variables.

Model Equations

Taxable Sales: Hotels and Motels (Category BED25)

The following is a graph of taxable sales in hotels/motels in Pima County. When last estimated, there had been a strong upward trend in this series, except for the period following 9/11 and the ensuing recession. Substantial numbers of hotel/motel beds had been built over the previous decade and expectations were that the hospitality industry would return to the trend line. It took a few years, but by 2006, deflated taxable sales appeared to have returned to the long-term trend. And then, at the end of 2007, the national housing crises created a major recession that hit Arizona harder than most of the rest of the country. Unlike most other taxable sales tax categories, hotel/motel sales in Pima County have shown little sign of recovery.

Currently, deflated taxable sales in hotels/motels in Pima County are on par with deflated sales back in the early 1990s (Figure 6). This is in spite of the fact that several other hotel/motel indicators suggest

that, by now, receipts in hotel/motels should be returning again to the long-run trend line. Deflated national consumer expenditures on accommodations also fell during the 9/11 period and during the housing crises (Figure 7). However, after reaching its low point in 2009, this measure began growing again and is closing on its historical trend line.

Figure 6.

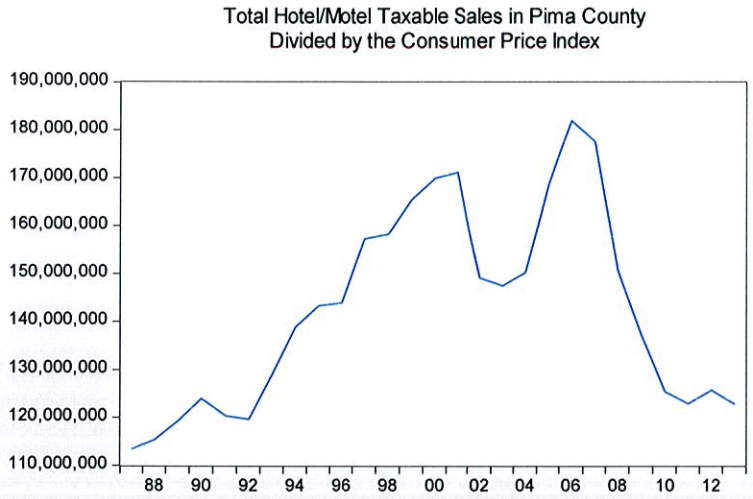
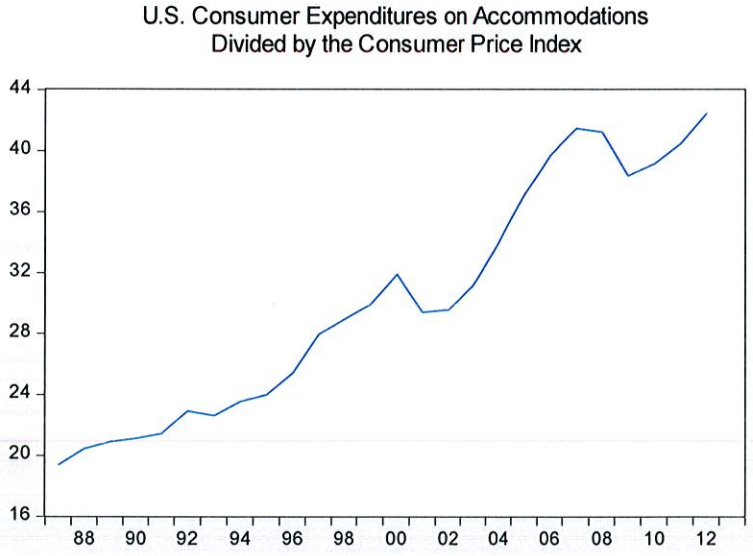


Figure 7.



Even local indicators suggest that hotel/motel taxable sales should not have fallen as low as they have. Deplaning passengers at the Tucson International Airport fell approximately 18 percent between 2007 and 2009 and they have stabilized but not recovered (Figure 8). The corresponding drop in deflated taxable sales was 25 percent between 2007 and 2009, but unlike deplaning passengers, sales continued

to fall after 2009 rather than stabilizing. In total, Pima County deflated taxable sales fell 45 percent and there is no evidence of a recovery in this series. Only one tourism set of data reflected the sharp decline in taxable hotel/motel sales, namely, crossings at the U.S.- Mexico border. Border crossings for the Nogales port of entry are in Figure 9. Although important to Pima County's retail and tourism-related economy, the decline in border crossings can only partially explain the decline in hotel/motel taxable sales. Mexican visitors are most likely to be day-trip visitors and the portion that stays in hotels is not large enough to fully account for the precipitous drop in this taxable sales category.

Figure 8.

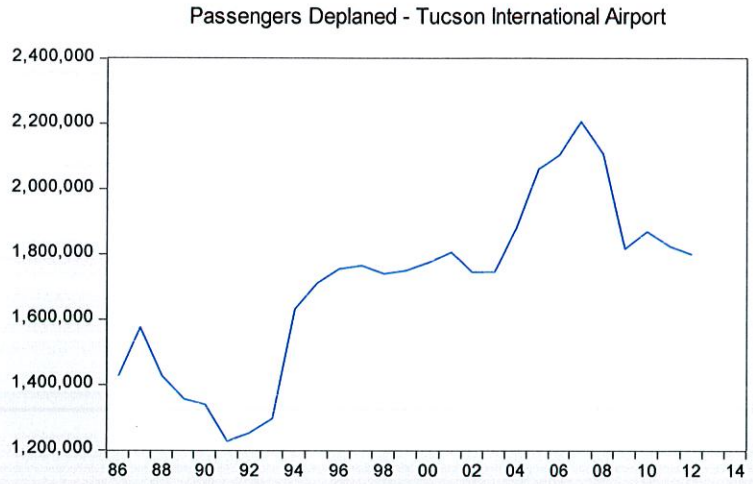
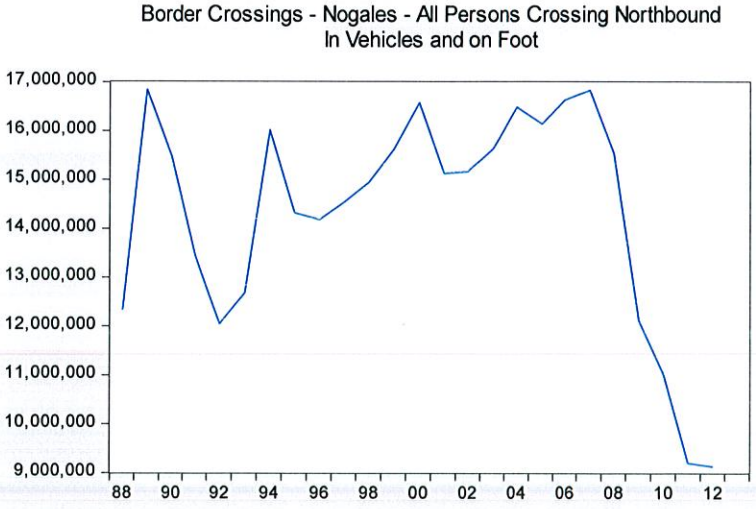


Figure 9.



There is also a tax enforcement issue that affects the pattern of hotel/motel taxable sales in recent years. When hotel rooms are booked with a 3rd party on-line service, such as Orbitz Worldwide Inc.,

Priceline.com, Travelocity, Hotels.com, and Hotwire, the service pays sales taxes on the wholesale price of the rooms, not on the final rate it charges customers. Some states, e.g., Ohio and Hawaii,[iv] are trying to create legislation that would tax the full amount. The booking service companies argue that the "mark-up" is a charge for their services and should not be taxed. In a Florida case, a judge has ruled in favor with the online booking companies. Time will tell whether taxing authorities can alter statutes in such a way as to tax 3rd party online booking services, but at this point in time, the difference between the wholesale and retail room price is not taxable.

It was hoped that data could be found on the level and portion of hotel sales that are booked online by 3rd party sellers over time, but it is not available. A short series of total online travel sales from 2007 through 2012 was found on a website, but this includes all forms of travel sales, including airline tickets, and it included all on-line purchases, including those booked directly with hotels' websites. A much shorter time series was found that shows the share of all bookings made online for both leisure and business bookings. Again, these figures include all online sales to hotels, not just 3rd party bookings. Neither of these very short series was particularly useful for estimation of Pima County hotel/motel sales.

In estimation, the national variable on personal consumption expenditures on accommodations (CSVAC) was entered as a share of national disposable income. The equation also includes a trend variable (specified as the inverse of national population). In order to reduce the taxable sales variable to its current levels, two dummy variables were entered, dum2008on and dum2010on. Dum2008on is defined as 0 from the beginning of the series through 2007, then 1 from 2008 onward. Dum2010on is defined the same way but the "1s" begin in 2010.

These two dummy variables control for: a) the declines in border crossings, b) the declines in deplaning passengers and c) the declines in taxable sales due to the 3rd party bookings. These effects cannot be separated so they are captured in the dummies. The estimated equation results indicate that deflated taxable sales in hotel/motels to grow approximately 70 percent as fast as the national consumer expenditures on accommodations' share of income.

Dependent Variable: LOG(P_TXS_BED25CBF/CPIFY)
Method: Least Squares
Date: 10/25/13 Time: 15:08
Sample (adjusted): 1987 2012
Included observations: 26 after adjustments
Convergence achieved after 11 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.70937	3.688604	4.258894	0.0004
LOG(CSVAC_YPD)	0.700487	0.304893	2.297483	0.0325
DUM2008ON	-0.226821	0.049717	-4.562277	0.0002
DUM2010ON	-0.157905	0.050898	-3.102376	0.0056
LOG(1/NP)	-1.171371	0.427700	-2.738765	0.0127
AR(1)	0.326256	0.167184	1.951478	0.0651

R-squared	0.904037	Mean dependent var	18.77080
Adjusted R-squared	0.880046	S.D. dependent var	0.144812
S.E. of regression	0.050155	Akaike info criterion	-2.948229
Sum squared resid	0.050310	Schwarz criterion	-2.657899
Log likelihood	44.32698	Hannan-Quinn criter.	-2.864625
F-statistic	37.68272	Durbin-Watson stat	1.652880

Prob(F-statistic)	0.000000
Inverted AR Roots	.33

P_TXS_BED25CBF = taxable sales in hotel/motel, collection basis, fiscal year
CPIFY = consumer price index, fiscal year
CSVAC_YPD = CSVAC / YPD
CSVAC = U.S. Consumer Expenditures on accommodations
YPD = U.S. disposable personal income
DUM2008ON = 0 through 2007, 1 from 2008 onward
DUM2010ON = 0 through 2010, 1 from 2011 onward
NP = U.S. population

Taxable Sales: Communications (Category COM5)

Taxable sales in communications was estimated as a function of Pima County disposable personal. The equation explains 98 percent of the variation in the logarithm of taxable sales in communications. According to the following regression, taxable sales have grown approximately 82 percent as fast as disposable personal income in the county and that relationship is assumed to hold throughout the forecast period.

Several other specifications were tried for taxable sales in communications. The nationally forecasted variable for telecommunications was entered into the equation, with an adjustment for Pima County's income relative to that of the nation. Although this equation fit the historical data sufficiently well, the forecasted values were considered unreasonable low. Therefore, the simpler model that estimates communications expenditures as a function of local disposable personal income was used.

Dependent Variable: LOG(P_TXS_COM5CBF)
Method: Least Squares
Date: 11/07/13 Time: 14:21
Sample (adjusted): 1972 2011
Included observations: 40 after adjustments
Convergence achieved after 4 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.40525	0.661095	17.25205	0.0000
LOG(P_YPDFY)	0.822371	0.070776	11.61928	0.0000
AR(1)	0.697098	0.119047	5.855653	0.0000

R-squared	0.980936	Mean dependent var	18.90108
Adjusted R-squared	0.979905	S.D. dependent var	0.780129
S.E. of regression	0.110587	Akaike info criterion	-1.493985
Sum squared resid	0.452493	Schwarz criterion	-1.367319
Log likelihood	32.87969	Hannan-Quinn criter.	-1.448186
F-statistic	951.9146	Durbin-Watson stat	1.487469
Prob(F-statistic)	0.000000		

Inverted AR Roots	.70

P_TXS_COM5CBF = taxable sales in communications, collection basis, fiscal year
P_YPDFY = Pima County disposable personal income, fiscal year

Taxable Sales: Contracting (Category CON15)

The equation for contracting is driven by national fixed investment in both residential and non-residential structures. The dependent variable, specified as a logarithm, is Pima County's taxable sales in contracting. These national figures are averaged for the current and lagged year to correspond to the fiscal year, and adjusted to correspond to the size of Pima County's economy. The adjustment to the fixed investment series involved dividing by the two-period average of U.S. disposable income (to reflect U.S. fiscal disposable income), and multiplying by Pima County's fiscal year disposable income.

The elasticity on the national investment variable is close to 0.99. This means that Arizona's growth in contracting should follow the national investment variables, adjusting for differences in disposable income.

Dependent Variable: LOG(P_TXS_CON15CBF)
Method: Least Squares
Date: 10/25/13 Time: 14:59
Sample (adjusted): 1987 2011
Included observations: 25 after adjustments
Convergence achieved after 17 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.57571	0.818690	16.58224	0.0000
LOG(P_YPDFY/YPDFY* (IFRES(-1)+IFNRES(-1)))	0.986429	0.109774	8.986026	0.0000
AR(1)	0.712199	0.146596	4.858250	0.0001

R-squared	0.971163	Mean dependent var	20.87580
Adjusted R-squared	0.968542	S.D. dependent var	0.460099
S.E. of regression	0.081605	Akaike info criterion	-2.061681
Sum squared resid	0.146507	Schwarz criterion	-1.915416
Log likelihood	28.77101	Hannan-Quinn criter.	-2.021113
F-statistic	370.4588	Durbin-Watson stat	1.502115
Prob(F-statistic)	0.000000		

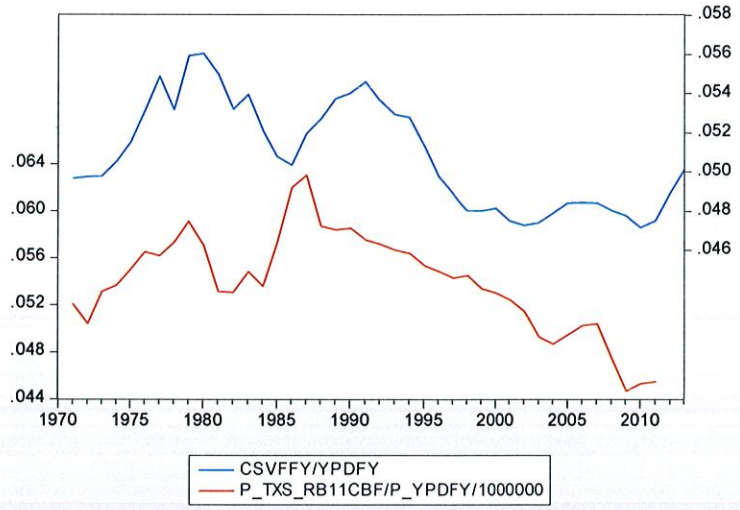
Inverted AR Roots	.71

P_TXS_CON15CBF is Pima County taxable sales in contracting, on a collection basis, fiscal year
CPIFY is the consumer price index for all urban consumers, U.S., fiscal year
P_YPDFY = Pima County disposable personal income, fiscal year
IFRES = U.S. fixed investment in residential structures
IFNRES = U.S. fixed investment in non-residential structures
YPD = U.S. disposable personal income

Taxable Sales: Restaurant and Bars (Category RB11)

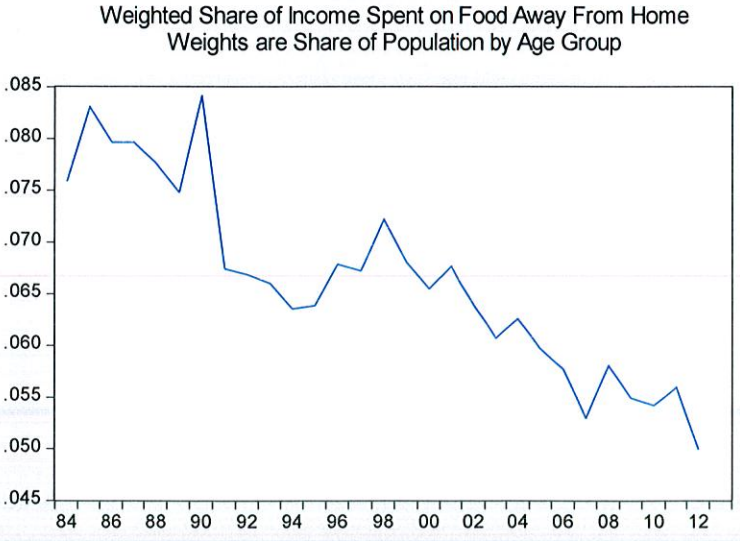
Pima County's taxable sales in restaurant and bars, relative to disposable income, behave similarly to those of the U.S., except they diverge toward the end of the series (Figure 10). To model this, the U.S. consumption of food away from home is adjusted by dividing by U.S. disposable personal income and multiplying by Pima County's personal income. To adjust for the divergence toward the end of the series, the ratio of Pima County's share of disposable income that is in transfer payments relative to that of the U.S. is entered.

Figure 10. Consumption of Food Away From Home, Relative to Disposable Income, U.S. and Pima County



The equation for Pima County restaurant and bar sales also includes a third variable, which is associated with the restaurant expenditures and the aging of the population. The variable W_FXHOME_Y is the weighted share of income spent on food away from home, where the weights are the portions of persons in seven different age groups. This index was computed from annual Consumer Expenditure Surveys, by age group, from 1984 through 2012. The idea of this variable is to reflect the changing population's consumption behavior due to the changing age distribution. In Figure 11, this weighted share of income spent on food away from home falls over time.

Figure 11.



In the regression, this variable is multiplied times Pima's disposable income because the left hand side is measured in total spending, not share of income. The variable designed to control for changes in spending associated with the changing population distribution.

The regression explains over 99 percent of the variation over time in Pima County's taxable restaurant and bar sales. The elasticity on the adjusted national variable, adjusted for relative income, means that Pima County's restaurant and bar sales tend to grow 85 percent as fast as the national indicator. The sign on the ratio of transfer payment share of income is negative, as expected, since a relatively high share of income in transfer payments reflects an economy that may be performing below potential. The weighted share of income spent on food away from home has the expected positive sign. This variable becomes more important over time as the baby boom generation ages. All three variables in the regression are statistically significant.

Dependent Variable: LOG(P_TXS_RB11CBF)
Method: Least Squares
Date: 10/21/13 Time: 15:21
Sample (adjusted): 1986 2011
Included observations: 26 after adjustments
Convergence achieved after 9 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.93680	0.163259	85.36615	0.0000
LOG(P_YPDFY/YPDFY*CSVFFY)	0.858584	0.065769	13.05455	0.0000
LOG((P_YTPFY/P_YPFY)/ (YPTRFFY/YPFY))	-0.894595	0.175754	-5.090046	0.0000
LOG(W_FXHOME_Y*P_YPDFY)	0.151804	0.066749	2.274264	0.0336
AR(1)	0.350022	0.148553	2.356213	0.0283

R-squared	0.997737	Mean dependent var	20.55608
Adjusted R-squared	0.997306	S.D. dependent var	0.388742
S.E. of regression	0.020176	Akaike info criterion	-4.797649
Sum squared resid	0.008548	Schwarz criterion	-4.555708
Log likelihood	67.36944	Hannan-Quinn criter.	-4.727979
F-statistic	2315.092	Durbin-Watson stat	1.487864
Prob(F-statistic)	0.000000		

Inverted AR Roots	.35

P_TXS_RB11CBF = taxable sales in restaurant and bars, collection basis, fiscal year
P_YPDFY = Pima County disposable personal income, fiscal year
YPDFY = U.S. disposable personal income, fiscal year
CSVFFY = U.S. consumer expenditures in food away from home
P_YPTFY = Pima County transfer payments, fiscal year
P_YPFY = Pima County personal income, fiscal year
YPTRFFY = U.S. transfer payments, fiscal year
YPFY = U.S. personal income, fiscal year
W_FXHOME_Y = "weighted" share of income spent on food prepared outside the home, computed from the Consumer Expenditure Survey and Pima County's age distribution over time

Taxable Sales: Personal Rentals (Category RE14)

Taxable sales in personal rentals in Pima County are run off a similar national variable CSVTSMV, personal consumption expenditures on motor vehicle services. The largest component of this variable is

automobile leasing. This national variable was adjusted by dividing U.S. disposable personal income and multiplying by Pima County disposable income.

The equation explains 95 percent of the variation in personal rentals taxable sales. However, the growth is very slow. The elasticity on the national variable is 0.64, which means Pima's taxable sales in personal rentals has grown (and is projected to grow) only 64 percent as fast as the similar national variable, adjusted for relative Pima/US income.

Other specifications were tried, such estimating this category as a simple function of Pima County personal income. In that regression, the elasticity on income was under 0.5, meaning that this taxable sales category grew less than half as fast as personal income. Since a portion of personal rentals is automobile rentals, the national variable related to those was included in the final equation.

Dependent Variable: LOG(P_TXS_RE14CBF)
Method: Least Squares
Date: 11/06/13 Time: 13:38
Sample: 1987 2011
Included observations: 25
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.74955	0.792033	19.88496	0.0000
LOG(P_YPDFY*CSVTSMVFY/ YPDFY)	0.644012	0.130360	4.940246	0.0001
AR(1)	0.746496	0.168113	4.440448	0.0002

R-squared	0.950248	Mean dependent var	19.56736
Adjusted R-squared	0.945725	S.D. dependent var	0.313085
S.E. of regression	0.072939	Akaike info criterion	-2.286211
Sum squared resid	0.117043	Schwarz criterion	-2.139946
Log likelihood	31.57764	Hannan-Quinn criter.	-2.245643
F-statistic	210.0969	Durbin-Watson stat	1.431472
Prob(F-statistic)	0.000000		

Inverted AR Roots	.75

P_TXS_RE14CBF = taxable sales in personal rentals, on a collection basis, fiscal year
P_YPDFY = Pima County disposable personal income, fiscal year
CSVTSMVFY = U.S. personal consumption expenditures on motor vehicle services, fiscal year
YPDFY = U.S. disposable personal income, fiscal year

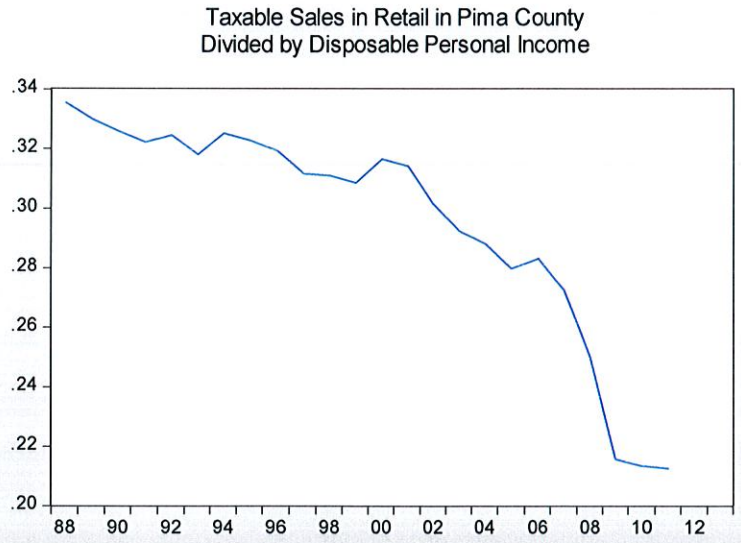
Taxable Sales: Retail Sales (Category RS17)

Food for home consumption was exempted from the retail sales tax in 1980, so the entire series used in estimation excludes food. In Arizona, taxable retail sales figures also exclude services so this tax base is comprised primarily of goods purchased locally. This has always been the largest of all the sales tax categories, but it is diminishing as a share of personal income (Figure 12). The data shown in Figure 12 are the ratio of Pima County's fiscal-year taxable sales in retail sales, on a collection basis, divided by disposable personal income. Pima County taxable sales are in dollars and disposable income is measured in millions. This graph shows that in 1986, Pima County's taxable retail sales were

approximately 34 percent of disposable personal income, but by 2009, this share had fallen to just a little over 21 percent of income. It has been diminishing through the entire period shown, but in recent years, starting in fiscal year 2000 and particularly since fiscal 2006, the downward trend became much steeper. A positive aspect of this graph indicates that the sharp decline in taxable retail sales as a share of personal income appears to have stabilized in the last two years of data.

There are several possible explanations for why the share of income spent on retailing has been diminishing over time. First is the existence of online sales that would diminish the sales of in-county brick and mortar businesses. A portion of the taxes paid on online sales would be recouped if those online purchases were from stores that have a legal nexus to the county. Specifically, online purchases from stores like Best Buy, Home Depot, Macy's would all charge state and local sales taxes as though those purchases were made locally in the stores. However, online purchases from out -of-area businesses, e.g., LLBean, Zappos.com, would not be charged the local ½ percent sales tax that would go to the RTA.

Figure 12.



A national "retail" sales figure was constructed to resemble the tax base used here in Arizona and Pima County. It was created by using national retail sales data, excluding gasoline sales and food for home consumption. As such, it included retail sales made online. This retail sales series was divided by the same series that excluded online sales. Figure 13 shows the ratio of total retail sales (including online sales) to retail sales (excluding online sales) in the U.S. This historical data series only went back to 1992 so data prior to 1992 were estimated simply by extending the series back a few years with a trend and holding it constant at 1.02 before that. From this graph, national online sales are an increasing share of total "retail" sales and currently represent 12 percent of the total. The name of the variable shown in Figure 13 is ONLINER2.

Adjusting Pima County's taxable retail sales to account for the pattern of online sales does not change the general pattern over time of those sales. Multiplying P_txs-rs17lfcbf by the ONLINE2 variable shown

in Figure 13 creates a higher series, but it shows almost the same amount of decline since 2000 (Figure 14).

Figure 13.

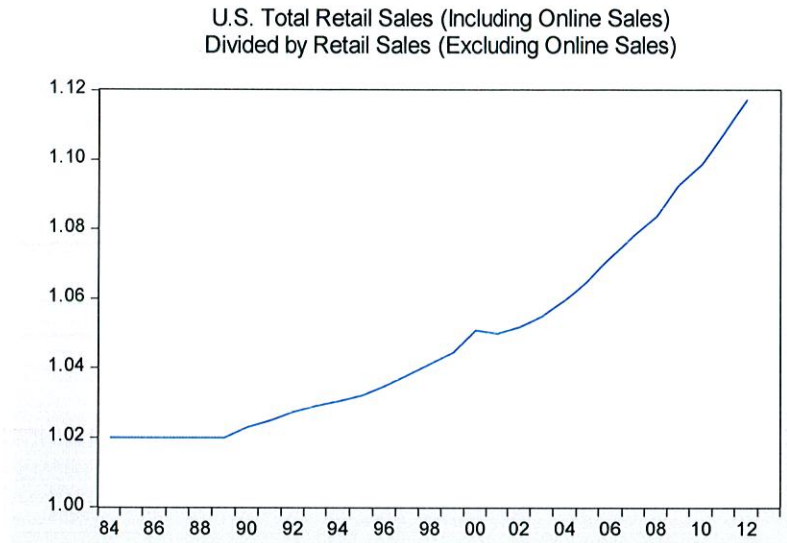
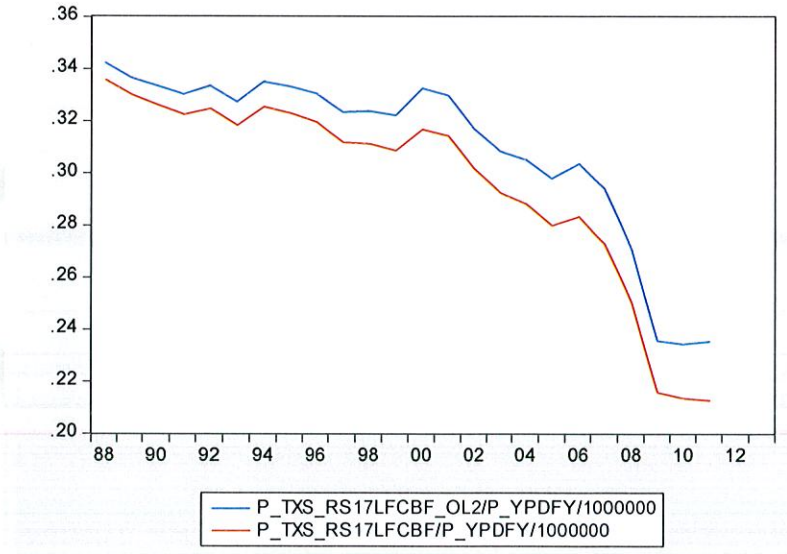


Figure 14. Estimate of Pima County Retail Sales, as Share of Disposable Income Including and Excluding Online Sales



Answers regarding causes of the declining retail sales tax base, as a share of personal income, must come from other sources. The income distribution may play a role when it comes to the share of income spent on taxable goods. High-income individuals tend to purchase fewer goods, as a share of their incomes, as do lower-income individuals. We don't have a time-series on the income distribution

for Arizona, but a characteristic of income that has accompanied the extreme skewing of the income distribution to the right, is the reduced share of income represented by wages and salaries, as discussed in the introduction of the report. Workers have received very little of the income gains made over the past decade.

The final equation specification has the ratio of taxable retail sales to personal income (as the logarithm) as the left-hand side variable. This is estimated as a function of the share of income that is wages and salaries and the ONLINER2 variable to control for the growth in non-taxable online retail sales. This equation explains approximately 97 percent of the variation in the dependent variable. Note that because the dependent variable is defined as the log of the share of disposable personal income, the implied elasticity on income is 1.0.

Dependent Variable: LOG(P_TXS_RS17LFCBF/P_YPDFY)
Method: Least Squares
Date: 10/28/13 Time: 11:57
Sample (adjusted): 1987 2011
Included observations: 25 after adjustments
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.71655	0.208347	65.83507	0.0000
LOG(P_YWSFY/ P_YPDFY)	1.665510	0.405796	4.104303	0.0005
LOG(ONLINER2)	-2.840424	0.840067	-3.381187	0.0028
AR(1)	0.624497	0.147896	4.222540	0.0004

R-squared	0.973277	Mean dependent var	12.59410
Adjusted R-squared	0.969459	S.D. dependent var	0.140157
S.E. of regression	0.024494	Akaike info criterion	-4.435166
Sum squared resid	0.012599	Schwarz criterion	-4.240146
Log likelihood	59.43957	Hannan-Quinn criter.	-4.381076
F-statistic	254.9472	Durbin-Watson stat	1.632463
Prob(F-statistic)	0.000000		

Inverted AR Roots	.62

P_TXS_RS17LFCBF = taxable retail sales (less food), on a collection basis, fiscal year
P_YWSFY = Pima County wages and salaries (component of personal income)
P_YPDFY = Pima County disposable personal income
ONLINER2 = the ratio of total retail sales (including on-line sales) to retail sales without on-line sales

Taxable Sales: Utilities (Category UT4)

Utility sales as a share of personal income has fallen dramatically since the energy-price induced hyper-inflation period of the late 1970s/early 1980s. Since then, the share of Pima County utility sales, relative to disposable personal income, has fallen steadily (Figure 15). This decline relative to income coincides with a similar pattern seen in the national utility (Figure 16).

Because Arizona's declining utility sales relative to disposable personal income looks similar to that of the U.S., this equation is driven off of U.S. personal consumption in utilities, adjusted for population (i.e., divided by U.S. population and multiplied by Pima County's population). This provides essentially a

measure of Pima County's utility consumption under the assumption that Pima County consumes utilities similar to the nation. In addition, a variable has been added to reflect the fact that Pima County's share of personal income that is made up of transfer payments is larger than that of the U.S. In other words, this variable adjusts for the fact that Pima County has not recovered from the recession quite as fast as the nation as a whole. Both variables are significant and have the expected signs.

Figure 15.

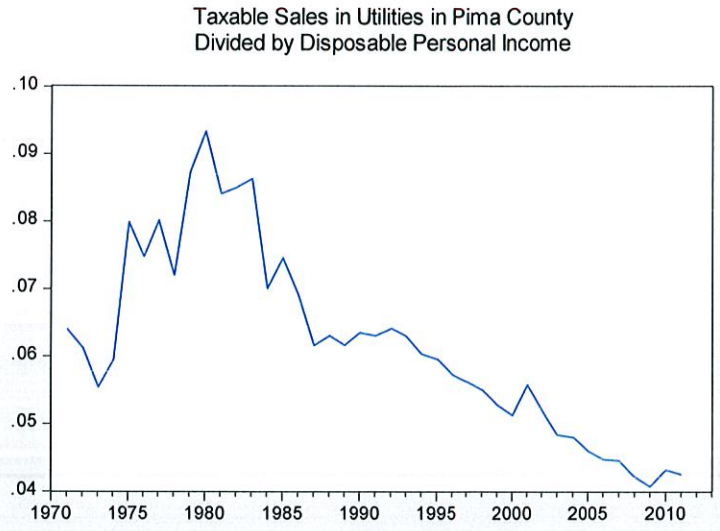
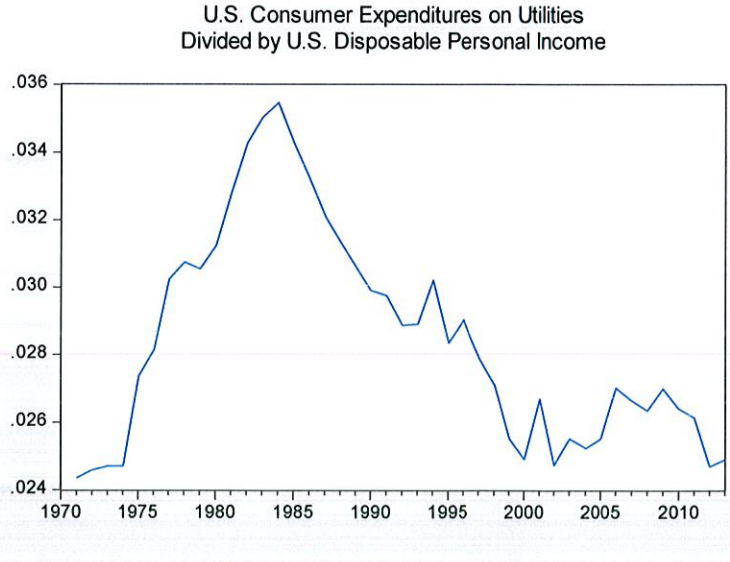


Figure 16.



The equation explains almost 99 percent of the variation in the logarithm of taxable utility sales. However, Pima County's tax base has grown and is projected to grow considerably slower than the

national utility sales, adjusted for relative population growth. The elasticity of 0.75 indicates that utility sales have grown approximately 75 percent as fast as the national variable.

Dependent Variable: LOG(P_TXS_UT4CBF)
Method: Least Squares
Date: 10/21/13 Time: 14:50
Sample (adjusted): 1986 2012
Included observations: 27 after adjustments
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.63405	0.823605	12.91159	0.0000
LOG((CSVUFY/NPFY)* P_POPFY)	0.753741	0.062016	12.15390	0.0000
AR(1)	0.688366	0.169151	4.069538	0.0004

R-squared	0.988237	Mean dependent var	20.57895
Adjusted R-squared	0.987257	S.D. dependent var	0.329826
S.E. of regression	0.037233	Akaike info criterion	-3.638823
Sum squared resid	0.033270	Schwarz criterion	-3.494841
Log likelihood	52.12411	Hannan-Quinn criter.	-3.596009
F-statistic	1008.152	Durbin-Watson stat	2.075618
Prob(F-statistic)	0.000000		

P_TXS_UT4CBF = Pima County taxable sales in utilities, collection basis, fiscal year
CSVUFY = U.S. Consumer expenditures on utilities, fiscal year
NPFY = U.S. population, fiscal year
P_POPFY = Pima county's population, fiscal year

Other RTA Tax Revenues

After all the above modeled categories of the sales tax base are multiplied by the corresponding RTA tax rate, they are subtracted from total RTA revenues. The resulting "other" category has two components: taxable sales in real rentals (category 13) and a residual that includes several very small categories of taxable sales (listed earlier in the report) and also implicitly includes adjustments to control for other differences between the RTA and the TXS data series.

The Arizona Department of Revenue TXS taxable sales data for real property rentals (primarily commercial leases) ended in FY1995. Therefore we only have the very short RTA data series for this category. It is estimated as a logarithm in a simple trend model. The equation explains approximately 83 percent of the variation in the real property rental variable. A few other specifications were tried, such as using a cost inflator on the right-hand side, but no specification was found that explains the pattern of this data series any better than a trend line. Note that trends are frequently specified as 1/U.S. population because it introduces the possibility of a non-linear trend.

Dependent Variable: LOG(P_RTA_RE13CBF)
Method: Least Squares
Date: 11/20/13 Time: 15:31
Sample: 2008 2013
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.76575	6.063563	-1.940401	0.1243
LOG(1/NP)	-4.707118	1.056371	-4.455932	0.0112

R-squared	0.832323	Mean dependent var	15.25301
Adjusted R-squared	0.790403	S.D. dependent var	0.074148
S.E. of regression	0.033946	Akaike info criterion	-3.666866
Sum squared resid	0.004609	Schwarz criterion	-3.736279
Log likelihood	13.00060	Hannan-Quinn criter.	-3.944733
F-statistic	19.85533	Durbin-Watson stat	2.107253
Prob(F-statistic)	0.011195		

NP = U.S. population

The final component of "other" RTA revenues is p_revrescb1f. This small volatile component was forecast by assumption.

Computing Total RTA Revenues

Total RTA revenues are computed using two identities that were reported in the introduction and are repeated here. The first adds together the modeled components that are taxable at ½ percent. The second multiplies this sum times 0.005, add the bed tax revenue and adds the estimated residual.

p_txs_modeledcbf5 = p_txs_rs17lfcbf + p_txs_con15cbf + p_txs_ut4cbf + p_txs_rb11cbf + p_txs_re14cbf + p_txs_con15cbf

p_rta_totcb1f = p_txs_modeledcbf5*0.005 + p_txs_bed25cbf*0.0055 + p_rta_re13cbf + p_revrescb1f

In the tables, the "other" category equals the sum of p_rta_re13cbf and p_revrescb1f.

Forecasted Yield for RTA

Tables 1 and 2 contain the forecasted tax revenue for the RTA. In Table 1, the forecasted revenues are presented out to the year 2026, expressed as cumulative collections over the next 5-year, 10-year, and 13-year periods. The cumulative yield over the next four years, from 2014 through 2018, is projected to be approximately $410 million, over the next ten years the yield is projected to be $918 million and over the next 13 years, the cumulative yield is projected to be $1.27 billion.

Table 2 contains the same yield figures extended through 2043. Forecasted RTA tax revenues are projected to be $1.52 billion over the next 15 years, $2.24 billion over the next 20 years, $3.10 billion over 25 years and $4.14 billion over the entire 30 year forecast period.

Table 1
Projected Yield for RTA, Pima County (Thousands of Current Dollars)
Fiscal years 2014 through 2026, cumulative by 5-year intervals

	Actual				Cumulative Over Period		
					5 years	10 years	13 years
	2010	2011	2012	2013	2014-2018	2014-2023	2014-2026
Hotel/Motel	1,500	1,490	1,570	1,560	8,620	18,610	25,250
Communications	2,250	2,040	2,610	2,070	11,980	27,140	37,760
Contracting	6,320	6,640	6,850	7,240	53,980	133,230	190,110
Restaurant & Bar	6,930	7,080	7,510	7,750	42,720	96,650	134,950
Rental - Personal	1,750	1,800	1,910	1,890	10,230	23,470	32,190
Retail	32,660	33,130	35,540	37,310	213,880	471,820	646,600
Utilities	6,610	6,630	6,270	7,340	37,440	80,890	110,360
Other	4,980	5,510	5,150	5,220	30,760	66,540	90,710
Total	63,000	64,320	67,410	70,380	409,610	918,350	1,267,930

Collected, FY 07 - FY13	$	468,574
total Revenue, FY 07 - FY26	$	1,736,504

Table 2
Projected Yield for RTA, Pima County (Thousands of Current Dollars)
Fiscal years 2014 through 2043, cumulative by 5-year intervals

	Actual				Cumulative Over Period					
					5 years	10 years	15 years	20 years	25 years	30 years
	2010	2011	2012	2013	2014-2018	2014-2023	2014-2028	2014-2033	2014-2038	2014-2043
Hotel/Motel	1,500	1,490	1,570	1,560	8,620	18,610	29,940	42,620	56,780	72,590
Communications	2,250	2,040	2,610	2,070	11,980	27,140	45,550	67,870	95,100	128,530
Contracting	6,320	6,640	6,850	7,240	53,980	133,230	232,810	355,820	508,020	701,070
Restaurant & Bar	6,930	7,080	7,510	7,750	42,720	96,650	163,190	244,670	344,900	468,320
Rental - Personal	1,750	1,800	1,910	1,890	10,230	23,470	38,290	54,810	73,440	94,650
Retail	32,660	33,130	35,540	37,310	213,880	471,820	772,060	1,125,160	1,547,690	2,058,660
Utilities	6,610	6,630	6,270	7,340	37,440	80,890	131,720	191,830	263,400	348,850
Other	4,980	5,510	5,150	5,220	30,760	66,540	108,020	155,710	209,850	270,660
Total	63,000	64,320	67,410	70,380	409,610	918,350	1,521,580	2,238,490	3,099,180	4,143,330

Figures 17 and 18 present the RTA revenue projections in levels (current dollars) and as a percent change. The longer-term annual percent change of the forecast is approximately 4 percent.

Figure 17.

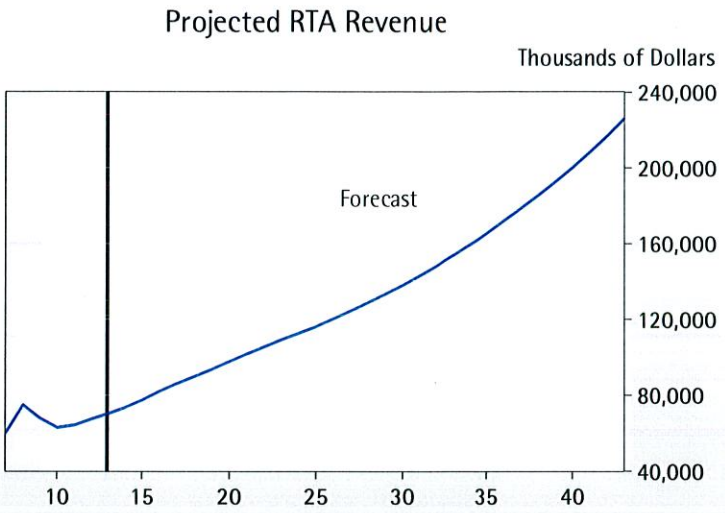
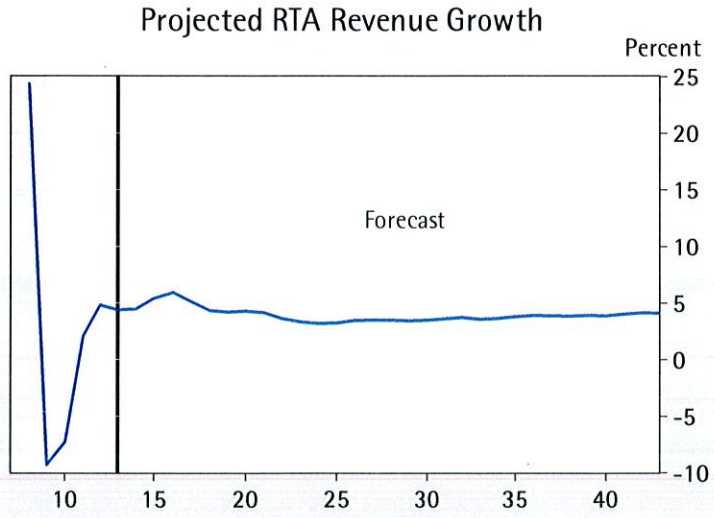


Figure 18.



Figures 19 and 20 provide levels and percent change, respectively, in the projected total RTA revenues in per capita terms. By 2043, RTA revenues will reach approximately $157 per capita. The longer-term growth rate in per capita RTA revenues is forecast to be 2.6 percent per year. The historical data series in these graphs is extremely short because the RTA "other" tax revenue category, comprised of real rentals and the non-modeled components, is a short series beginning in 2008.

Figure 19.

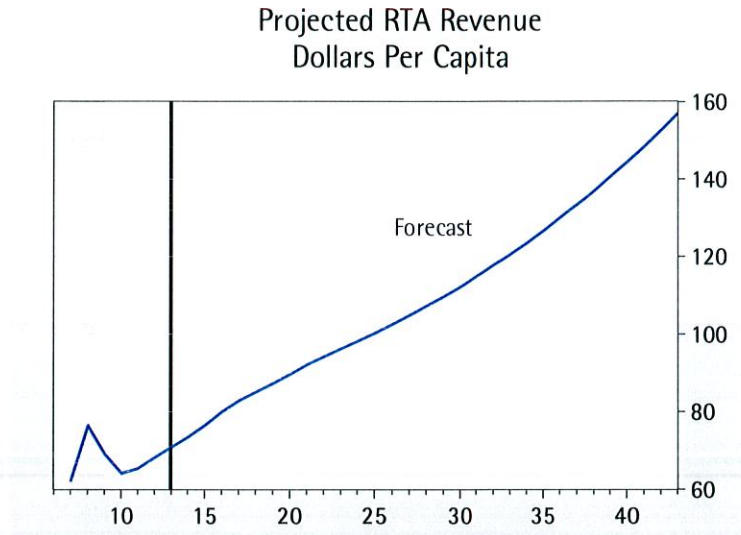
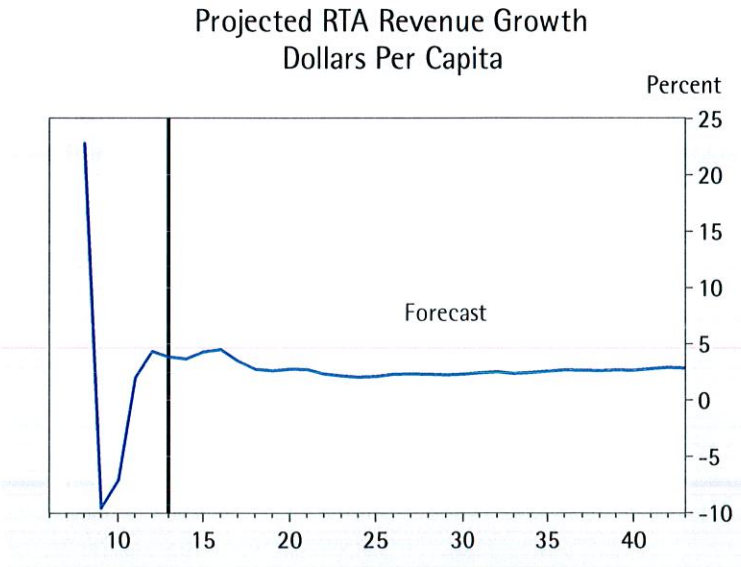


Figure 20.



The projected total RTA revenues, when divided by projected Pima County disposable personal income, continue to decline. The decline looks extremely severe in Figure 21 simply because the historical revenue series is extremely short. A longer historical series can be shown when the "other" category of RTA revenues is removed (Figure 22). In this graph, revenues as a share of disposable personal income continue to decline, but the projected decline is at a slower rate than in the historical data.

Figure 21.

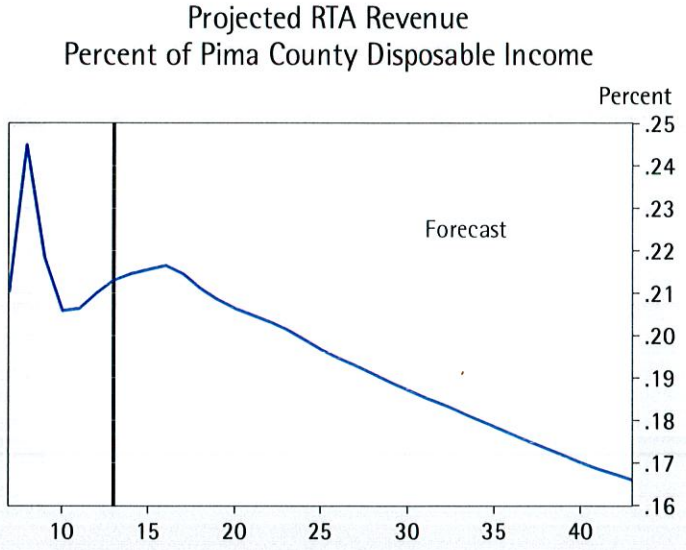
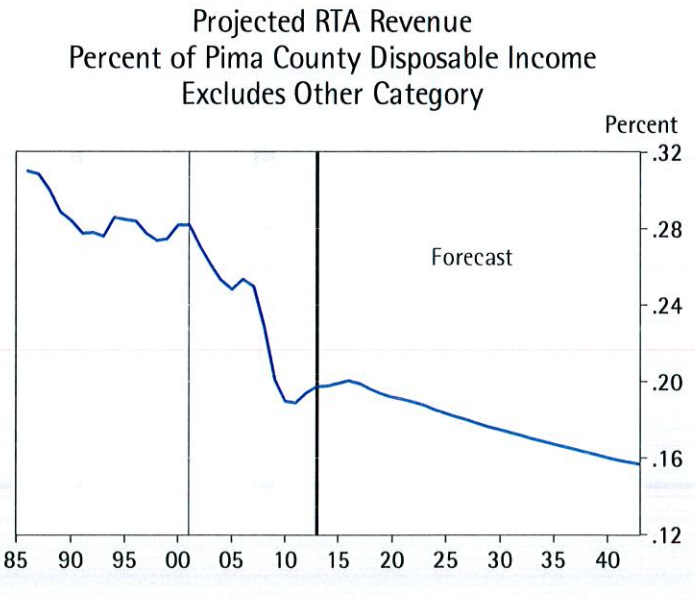


Figure 22.



Appendix Table A.1
Projected Yield for RTA, Pima County
Thousands of Current Dollars, Fiscal Year

	2007	2008	2009	2010	2011	2012	2013	2014
Hotel/Motel	1,994	1,755	1,621	1,495	1,495	1,575	1,564	1,627
Communications	2,414	2,400	2,332	2,253	2,040	2,613	2,073	2,172
Contracting	12,118	11,443	9,703	6,324	6,635	6,854	7,235	7,731
Restaurant & Bar	7,217	7,256	6,951	6,930	7,081	7,510	7,751	8,001
Rental - Personal	2,319	2,332	2,007	1,754	1,795	1,910	1,889	1,794
Retail	39,093	38,256	33,571	32,664	33,128	35,536	37,307	39,342
Utilities	6,391	6,456	6,344	6,615	6,629	6,266	7,343	7,089
Other	-	5,072	5,455	4,984	5,515	5,150	5,220	5,786
Total	60,490	74,971	67,984	63,018	64,317	67,413	70,381	73,543

	2015	2016	2017	2018	2019	2020	2021	2022
Hotel/Motel	1,678	1,724	1,769	1,821	1,876	1,935	1,998	2,067
Communications	2,270	2,382	2,512	2,647	2,778	2,911	3,038	3,157
Contracting	9,094	11,124	12,586	13,443	14,226	15,058	15,941	16,670
Restaurant & Bar	8,160	8,444	8,824	9,286	9,776	10,297	10,798	11,289
Rental - Personal	1,911	2,040	2,173	2,310	2,436	2,554	2,661	2,753
Retail	41,187	42,803	44,405	46,141	47,933	49,824	51,681	53,417
Utilities	7,264	7,466	7,715	7,904	8,112	8,393	8,722	8,992
Other	5,963	6,145	6,334	6,529	6,730	6,938	7,151	7,369
Total	77,526	82,128	86,319	90,080	93,868	97,910	101,991	105,715

	2023	2024	2025	2026	2027	2028	2029	2030
Hotel/Motel	2,115	2,162	2,212	2,266	2,318	2,371	2,426	2,479
Communications	3,277	3,403	3,536	3,675	3,819	3,970	4,127	4,288
Contracting	17,359	18,086	18,900	19,896	20,880	21,819	22,624	23,551
Restaurant & Bar	11,775	12,253	12,753	13,290	13,839	14,403	15,005	15,611
Rental - Personal	2,836	2,865	2,902	2,954	3,017	3,083	3,155	3,228
Retail	55,087	56,666	58,219	59,895	61,739	63,723	65,853	68,068
Utilities	9,231	9,503	9,820	10,150	10,500	10,855	11,228	11,615
Other	7,593	7,822	8,055	8,293	8,535	8,780	9,030	9,282
Total	109,273	112,759	116,399	120,419	124,646	129,004	133,448	138,121

	2031	2032	2033	2034	2035	2036	2037	2038
Hotel/Motel	2,534	2,592	2,651	2,710	2,770	2,831	2,893	2,956
Communications	4,456	4,634	4,819	5,013	5,219	5,438	5,664	5,899
Contracting	24,591	25,666	26,580	27,603	28,901	30,387	31,894	33,414
Restaurant & Bar	16,247	16,943	17,671	18,413	19,196	20,017	20,867	21,737
Rental - Personal	3,300	3,378	3,461	3,544	3,631	3,723	3,818	3,917
Retail	70,452	73,026	75,696	78,483	81,363	84,361	87,512	90,815
Utilities	12,011	12,417	12,844	13,305	13,782	14,299	14,823	15,359
Other	9,536	9,792	10,048	10,306	10,565	10,825	11,087	11,352
Total	143,127	148,449	153,770	159,378	165,427	171,882	178,560	185,449

	2039	2040	2041	2042	2043
Hotel/Motel	3,022	3,089	3,159	3,231	3,303
Communications	6,146	6,403	6,674	6,955	7,247
Contracting	35,057	36,649	38,434	40,436	42,472
Restaurant & Bar	22,651	23,609	24,636	25,714	26,811
Rental - Personal	4,021	4,127	4,239	4,354	4,469
Retail	94,306	97,982	101,948	106,180	110,554
Utilities	15,904	16,473	17,065	17,681	18,324
Other	11,618	11,887	12,159	12,435	12,714
Total	192,724	200,219	208,313	216,985	225,894

Endnotes

[i] See the forecasting articles by Marshall Vest in back issues of Arizona's Economy, posted on the Economic and Business Research Center website:
http://azeconomy.eller.arizona.edu/azeconomyissues/AEspring05.pdf
http://azeconomy.eller.arizona.edu/azeconomyissues/AZEconomyJan06.pdf
http://azeconomy.eller.arizona.edu/azeconomyissues/AZEconomyApr06.pdf
http://azeconomy.eller.arizona.edu/azeconomyissues/AZEconomyJan07.pdf
http://azeconomy.eller.arizona.edu/azeconomyissues/AEspring07.pdf

[ii] This series is short because the denominator, personal income at the county level, is typically available with an 18 month lag.

[iii] The name of the retail series includes the letters "lf" to indicate "less food." Until 1980, retail sales included food for home consumption and the EBR database continues to use the name, p_txs_rs17lfcbf, to indicate taxable sales in retail, less food.

[iv] "Confusion About Taxes from Online Hotel Bookings Continue as Ohio Bill Stalls," an online story from http://skift.com/2013/06/08/plan-to-tax-online-hotel-bills-stalls-in-ohio/ accessed November 2013.